Building and Running an Open edX Course: Olive Release

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CONTENTS

GENERAL INFORMATION

1.1 Read Me

The edX *Building and Running an Open edX Course* guide is created using RST files and Sphinx. You, the user community, can help update and revise this documentation project on GitHub.

https://github.com/openedx/edx-documentation/tree/master/en_us/open_edx_course_authors/source

The edX documentation team welcomes contributions from Open edX community members. You can find guidelines for how to contribute to edX Documentation in the GitHub edx/edx-documentation repository.

1.2 Other edX Resources

Learners, course teams, researchers, developers: the edX community includes groups with a range of reasons for using the platform and objectives to accomplish. To help members of each group learn about what edX offers, reach goals, and solve problems, edX provides a variety of information resources.

To help you find what you need, browse the edX offerings in the following categories.

- *Resources for edx.org Learners*
- *The edX Partner Portal*
- *The Open edX Portal*
- *System Status*
- *Resources for edx.org Course Teams*
- *Resources for Researchers*
- *Resources for Developers*
- *Resources for Open edX*

All members of the edX community are encouraged to make use of the resources described in this preface. We welcome your feedback on these edX information resources. Contact the edX documentation team at docs@edx.org.

1.2.1 Resources for edx.org Learners

Documentation

The edX Help Center for Learners includes topics to help you understand how to use the edX learning management system. The Help Center is also available when you select **Help** while you are in a course, and from your edX dashboard.

In a Course

If you have a question about something you encounter in an edX course, try these options for getting an answer.

Note: If you find an error or mistake in a course, contact the course staff by adding a post in the course discussions.

- Check the **Course** page in the course. Course teams use this page to post updates about the course, which can include explanations about course content, reminders about when graded assignments are due, or announcements for upcoming events or milestones.

- Look for an "Introduction", "Overview", or "Welcome" section in the course content. In the first section in the course, course teams often include general information about how the course works and what you can expect, and also what they expect from you, in the first section in the course.

- Participate in the course discussions. Other learners might be able to answer your question, or might have the same question themselves. If you encounter an unfamiliar word, phrase, or abbreviation, such as "finger exercise" or "board work", search for it on the **Discussion** page, or post a question about it yourself. Your comments and questions give the course team useful feedback for improving the course.

- Investigate other resources. Some courses have a wiki, which can be a good source of information. Outside of the course, a course-specific Facebook page or Twitter feed might be available for learners to share information.

Resources on the edx.org Website

To help you get started with the edX learning experience, edX offers a course (of course!). You can find the edX Demo course on the edx.org website.

When you are working in an edX course, you can select **Help** to access a help center with frequently asked questions and answers.

If you still have questions or suggestions, you can contact the edX Support team for help.

For opportunities to meet others who are interested in edX courses, check the edX Global Community meetup group.

1.2.2 The edX Partner Portal

The edX Partner Portal is the destination for partners to learn, connect, and collaborate with one another. Partners can explore rich resources and share success stories and best practices while staying up-to-date with important news and updates.

To use the edX Partner Portal, you must register and request verification as an edX partner. If you are an edX partner and have not used the edX Partner Portal, follow these steps.

1. Visit partners.edx.org, and select **Create New Account**.

2. Select **Request Partner Access**, then fill in your personal details.

3. Select **Create New Account**. You will receive a confirmation email with your account access within 24 hours.

After you create an account, you can sign up to receive email updates about edX releases, news from the product team, and other announcements. For more information, see *Release Announcements by Email*.

Course Team Support in the edX Partner Portal

EdX partner course teams can get technical support in the edX Partner Portal. To access technical support, submit a support ticket, or review any support tickets you have created, go to partners.edx.org and select **Course Staff Support** at the top of the page. This option is available on every page in the Partner Portal.

1.2.3 The Open edX Portal

The Open edX Portal is the destination for learning about hosting an Open edX instance, extending the edX platform, and contributing to Open edX. In addition, the Open edX Portal provides product announcements and other community resources.

All users can view content on the Open edX Portal without creating an account and logging in.

To comment on blog posts or the edX roadmap, or subscribe to email updates, you must create an account and log in. If you do not have an account, follow these steps.

1. Visit open.edx.org/user/register.

2. Fill in your personal details.

3. Select **Create New Account**. You are then logged in to the Open edX Portal.

Release Announcements by Email

To receive and share product and release announcements by email, you can subscribe to announcements on one of the edX portal sites.

1. Create an account on the Open edX Portal or the edX Partner Portal as described above.

2. Select **Community** and then **Announcements**.

3. Under **Subscriptions**, select the different types of announcements that you want to receive through email. You might need to scroll down to see these options.

4. Select **Save**.

You will now receive email messages when new announcements of the types you selected are posted.

1.2.4 System Status

For system-related notifications from the edX operations team, including outages and the status of error reports. On Twitter, you can follow @edxstatus.

Current system status and the uptime percentages for edX servers, along with the Twitter feed, are published on the edX Status web page.

1.2.5 Resources for edx.org Course Teams

Course teams include faculty, instructional designers, course staff, discussion moderators, and others who contribute to the creation and delivery of courses on edx.org or edX Edge.

The edX Course Creator Series

The courses in the edX Course Creator Series provide foundational knowledge about using the edX platform to deliver educational experiences. These courses are available on edx.org.

> - *edX101: Overview of Creating a Course*
> - *StudioX: Creating a Course with edX Studio*
> - *BlendedX: Blended Learning with edX*
> - *VideoX: Creating Video for the edX Platform*

edX101: Overview of Creating a Course

The edX101 course is designed to provide a high-level overview of the course creation and delivery process using Studio and the edX LMS. It also highlights the extensive capabilities of the edX platform.

StudioX: Creating a Course with edX Studio

After you complete edX101, StudioX provides more detail about using Studio to create a course, add different types of content, and configure your course to provide an optimal online learning experience.

BlendedX: Blended Learning with edX

In BlendedX you explore ways to blend educational technology with traditional classroom learning to improve educational outcomes.

VideoX: Creating Video for the edX Platform

VideoX presents strategies for creating videos for course content and course marketing. The course provides step-by-step instructions for every stage of video creation, and includes links to exemplary sample videos created by edX partner institutions.

Documentation

Documentation for course teams is available from the docs.edx.org web page.

- Building and Running an edX Course is a comprehensive guide with concepts and procedures to help you build a course in Studio and then use the Learning Management System (LMS) to run a course.

  You can access this guide by selecting **Help** in Studio or from the instructor dashboard in the LMS.

- Using edX Insights describes the metrics, visualizations, and downloadable .csv files that course teams can use to gain information about student background and activity.

These guides open in your web browser. The left side of each page includes a **Search docs** field and links to the contents of that guide. To open or save a PDF version, select **v: latest** at the lower right of the page, then select **PDF**.

Note: If you use the Safari browser, be aware that it does not support the search feature for the HTML versions of the edX guides. This is a known limitation.

Email

To receive and share information by email, course team members can:

- Subscribe to announcements and other new topics in the edX Partner Portal or the Open edX Portal. For information about how to subscribe, see *Release Announcements through the Open edX Portal*.

- Join the openedx-studio Google group to ask questions and participate in discussions with peers at other edX partner organizations and edX staffers.

Wikis and Web Sites

The edX product team maintains public product roadmaps on *the Open edX Portal* and *the edX Partner Portal*.

The edX Partner Support site for edX partners hosts discussions that are monitored by edX staff.

1.2.6 Resources for Researchers

At each partner institution, the data czar is the primary point of contact for information about edX data. To set up a data czar for your institution, contact your edX partner manager.

Data for the courses on edx.org and edX Edge is available to the data czars at our partner institutions, and then used by database experts, statisticians, educational investigators, and others for educational research.

Resources are also available for members of the Open edX community who are collecting data about courses running on their sites and conducting research projects.

Documentation

The edX Research Guide is available on the docs.edx.org web page. Although it is written primarily for data czars and researchers at partner institutions, this guide can also be a useful reference for members of the Open edX community.

The *edX Research Guide* opens in your web browser, with a **Search docs** field and links to sections and topics on the left side of each page. To open or save a PDF version, select **v: latest** at the lower right of the page, and then select **PDF**.

Note: If you use the Safari browser, be aware that it does not support the search feature for the HTML versions of the edX guides. This is a known limitation.

Discussion Forums and Email

Researchers, edX data czars, and members of the global edX data and analytics community can post and discuss questions in our public research forum: the openedx-analytics Google group.

The edX partner portal also offers community forums, including a Research and Analytics topic, for discussions among edX partners.

Important: Please do not post sensitive data to public forums.

Data czars who have questions that involve sensitive data, or that are institution specific, can send them by email to data.support@edx.org with a copy to your edX partner manager.

Wikis

The edX Analytics team maintains the Open edX Analytics wiki, which includes links to periodic release notes and other resources for researchers.

The edx-tools wiki lists publicly shared tools for working with the edX platform, including scripts for data analysis and reporting.

1.2.7 Resources for Developers

Software engineers, system administrators, and translators work on extending and localizing the code for the edX platform.

Documentation

Documentation for developers is available from the edX Developer Documentation landing page.

GitHub

These are the main edX repositories on GitHub.

- The edx/edx-platform repo contains the code for the edX platform.
- The edx/edx-analytics-dashboard repo contains the code for edX Insights.
- The edx/configuration repo contains scripts to set up and operate the edX platform.

Additional repositories are used for other projects. Our contributor agreement, contributor guidelines and coding conventions, and other resources are available in these repositories.

Getting Help

The Getting Help page in the Open edX Portal lists different ways that you can ask, and get answers to, questions.

Wikis and Web Sites

The Open edX Portal is the entry point for new contributors.

The edX Engineering team maintains an open Confluence wiki, which provides insights into the plans, projects, and questions that the edX Open Source team is working on with the community.

The edx-tools wiki lists publicly shared tools for working with the edX platform, including scripts and helper utilities.

1.2.8 Resources for Open edX

Hosting providers, platform extenders, core contributors, and course staff all use Open edX. EdX provides release-specific documentation, as well as the latest version of all guides, for Open edX users. See the Open edX documentation page for a list of the documentation that is available.

1.3 edX Browser Support

Most current browsers will work on edX.org. For best performance, we recommend the latest versions of:

- Chrome
- Firefox

We also support the latest versions of:

- Microsoft Edge
- Safari

Note: If you use the Safari browser, be aware that it does not support the search feature for the guides on docs.edx.org. This is a known limitation.

GETTING STARTED

2.1 Getting Started with Studio

This topic describes the tools you use to build an Open edX course, and how to view your courses.

- *What Is Studio?*
- *What Is the LMS?*

2.1.1 What Is Studio?

Studio is the tool you use to build your courses.

You use Studio to create a course structure, and then add problems, videos, and other resources for learners.

With Studio, you can also manage the course schedule, identify members of the course team, set the grading policy, publish your course, and more.

You use Studio directly through your browser. You do not need any additional software.

2.1.2 What Is the LMS?

The LMS is the web-based tool where you view the courses you have created in Studio.

If you have not created a course, see *Creating a New Course in Studio*.

1. In Studio, locate your course on your dashboard and open your course.

2. On the **Course Outline** page, select **View Live**.

   Your course enrollment page opens in a new browser tab.

3. Select **Enroll** to enroll in your course. After you enroll in your course, it opens in the LMS.

To continue working on your course, return to the browser tab that shows Studio.

THREE

EXPLORING YOUR DASHBOARD AND PROFILE

Note: Your dashboard is available only from the LMS. If you are currently working in Studio, view the live version of your course to access your dashboard.

- *Accessing Your Courses from the Dashboard*
- *Adding Profile Information*
- *Updating Course-Specific Settings*

You can access course, account, or profile information from any page on the website, whether you are in a course or browsing the course catalog. Select the dropdown menu icon next to your username, and then choose one of the following menu options.

- *Dashboard* gives you access to the courses and programs that you have enrolled in, and to information such as course start and end dates, certificates, and email settings.

- *Profile* gives you the option to provide personal information about yourself that other course participants can see, such as an image and biographical information.

- Account gives you access to your account settings and preferences. For example, you can update your password or email address and set your time zone.

3.1 Accessing Your Courses from the Dashboard

Your dashboard lists all of the courses that you are enrolled in. When you create an account or enroll in a course, you automatically go to your dashboard. You can also access your dashboard by selecting the dropdown menu icon next to your username at the top of any page.
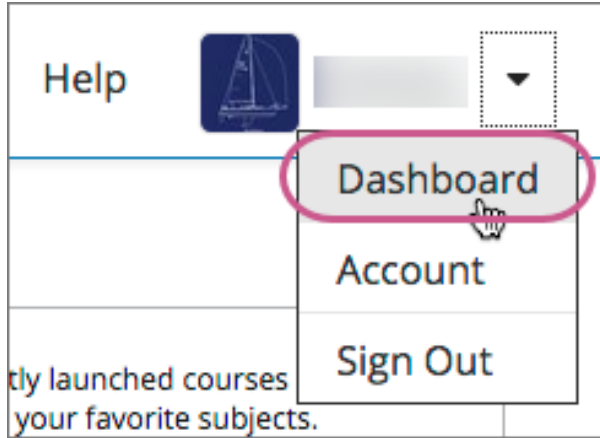
You can find information about your courses and change course-specific email subscription settings on your dashboard. For more information, see *Updating Course-Specific Settings*.

3.1.1 Sharing Your Courses on Social Media

On your dashboard, you can share the courses you are enrolled in on social media sites such as Facebook and Twitter.

This feature is available only if it has been enabled by your course provider.

1. Sign in to the social media site on which you want to share your course enrollment.

2. From your dashboard, find the course that you want to share.

3. Select the icon for the social media site where you want to share. A dialog box for the social media site you selected opens, with the course URL entered and a default social media message.

4. Optionally, modify the text of the social media message.

5. Select the appropriate button to publish your message on the social media site.

3.2 Adding Profile Information

Your personal profile allows you to optionally share information about yourself with other participants in the courses that you take. If you choose to add profile information, course teams and other learners in your courses can view the information that you share.

You can share either a limited profile or a full profile.

Note: If you are under 13 years of age, your limited profile only includes your username. You cannot add a profile picture.

- A limited profile shares only your username. You can also add a profile picture, if you are over 13 years of age.
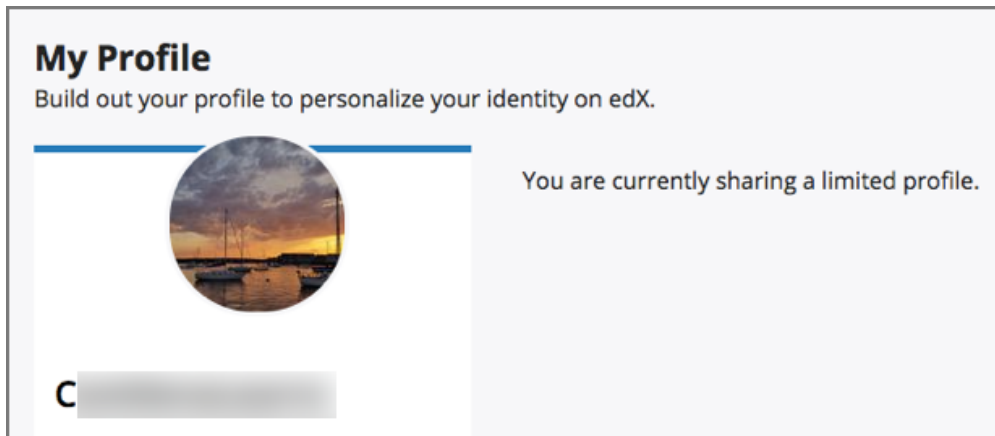
- A full profile includes the following details.

    - Your full name

    - Your username

    - Your profile image (optional)

    - The date that you joined edX

    - Your language (optional)

    - Your location (optional)

    - Information about you (optional)

    - Links to any course certificates that you have earned

    - Links to your social media accounts (optional)
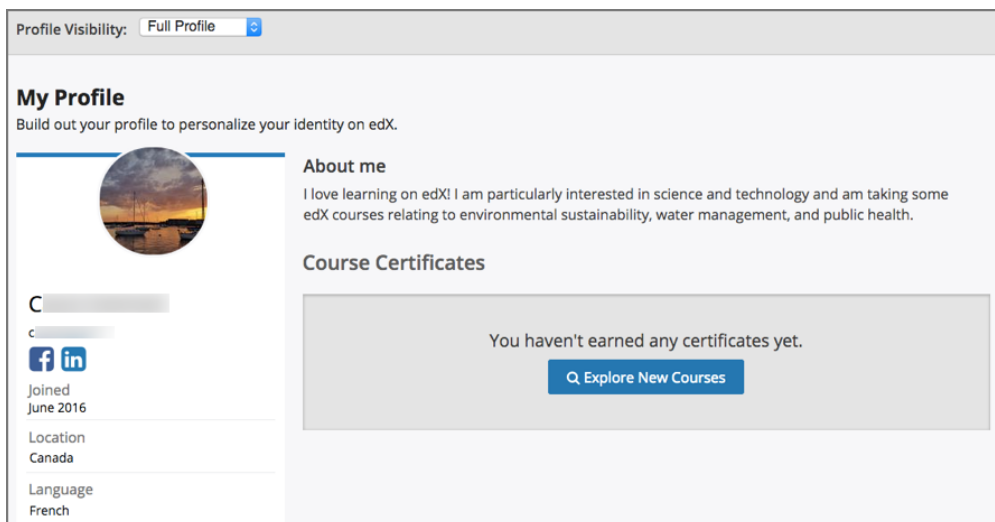
3.2.1 Add or Update a Limited Profile

A limited profile includes only your username and, optionally, an image.

Note: If you are under 13 years of age, your limited profile only includes your username. You cannot add a profile picture.

To add or update a limited profile, follow these steps.

1. At the top of any page, select **Dashboard** from the dropdown menu icon next to your username, then select the **Profile** tab.

2. In the header area of your profile page, for **Profile Visibility**, select **Limited Profile**.

3. (optional) Add an image that you want to associate with your username. Your image must be a .gif, .jpg, or .png file. The image must be between 100 bytes and 1 MB in size. If you do not add an image, the placeholder image appears as your profile image.

   1. Move your cursor over the placeholder image, and click **Upload an image**.
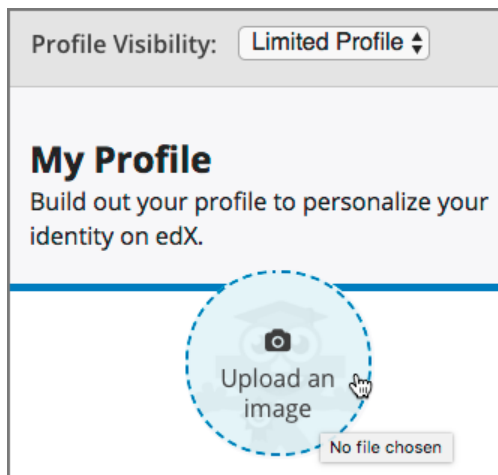
   2. In the file navigation window, select the image file that you want to use as your profile image, and then click **Open**.

   To change or remove your profile image, move your cursor over your image, and then select either **Change image** or **Remove**. When you remove your profile image, the placeholder image appears as your profile image.

The site saves your changes automatically.

3.2.2 Add or Update a Full Profile

Note: You must specify your year of birth on the **Account Settings** page before you can share a full profile. If you are under 13 years of age, you can share only a *limited profile*.

If you create a full profile, you share the following information in addition to your username and profile image.

- Your full name.

- Your location.

- Your language.

- A paragraph about yourself. You might include your interests, goals, or other information that you want to share. This paragraph can contain up to 300 characters.

- Links to your personal social media accounts.

To add or update your profile, follow these steps.

1. At the top of any page, select **Dashboard** from the dropdown menu icon next to your username, then select the **Profile** tab.

2. In the header area of your profile page, for **Profile Visibility**, select **Full Profile**.

3. (optional) Add a profile image.

   Your image must be a .gif, .jpg, or .png file that is less than 1 MB in size. If you do not add an image, the placeholder image appears as your profile image.

   1. Move your cursor over the placeholder image, and click **Upload an image**.

   2. In the file navigation window, select the image file that you want to use as your profile image, and then click **Open**.

   To change or remove your profile image, move your cursor over your image, and then select either **Change image** or **Remove**. When you remove your profile image, the placeholder image appears as your profile image.

4. On your profile page, move your cursor over the information that you want to change.

5. Click inside the field to choose an option from the list, or enter text.

The site saves your changes automatically.

Note: If you change your profile type from **Full Profile** to **Limited Profile**, your full name, location, language, and descriptive paragraph are no longer visible on your profile page. However, this information is saved, and becomes visible again to other learners and course teams if you change your profile back to **Full Profile**.

3.2.3 Add Links to Your Personal Social Media Accounts

If you select the **Full Profile** option, you can add social media icons on your profile that link to your personal Twitter, Facebook, or LinkedIn account pages.

To add links to your social media accounts to your profile, follow these steps.

1. At the top of any page, select **Account** from the dropdown menu icon next to your username.

2. On the **Account Settings** page, under **Social Media Links**, enter either your username or the URL to the profile page for each social media account that you want to add to your profile.

   For example, if your Facebook username is `edx`, you can enter either `edx` or `https://www.facebook.com/edx`.

   For LinkedIn, note that your username might include numbers. For example, if the URL of your LinkedIn profile page is `https://www.linkedin.com/in /firstname-lastname-123456/`, your LinkedIn username is `firstname- lastname-123456`.

The site saves your changes when you click outside the text field.

When you view your profile, icons for the social media icons that you added links for appear below your username. Other learners or course team members can click those icons to visit your social media account page.
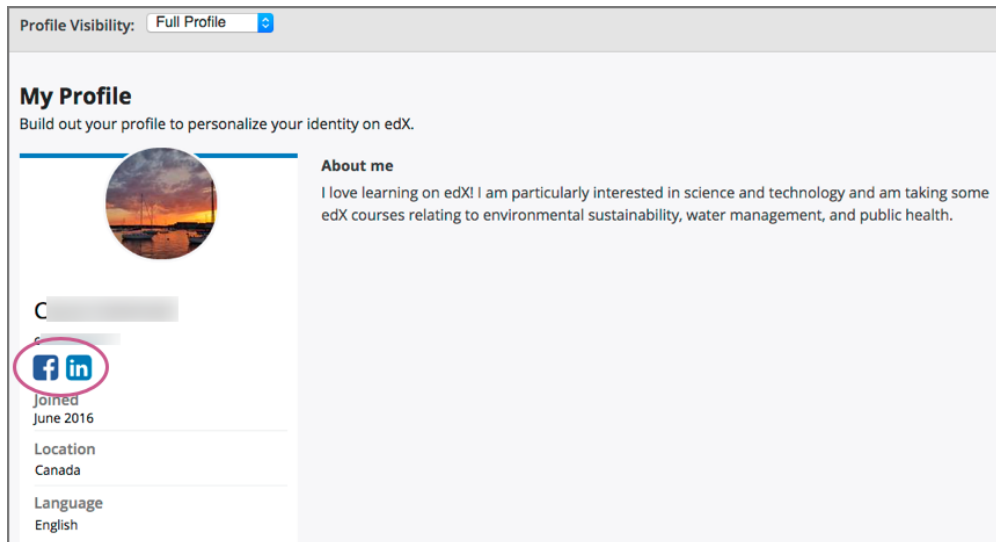
3.2.4 View Another Learner's Profile

You can view other learners' profiles through their posts, responses, or comments in course discussions.

1. On the **Discussion** page, select the username of any learner in a post, a response, or a comment.

   A page that displays the discussion activity only for the selected learner opens.

2. On the learner's **Discussion** page, select their linked username.

The learner's account profile page opens.

3.3 Updating Course-Specific Settings

From the dashboard, access the courses that you are enrolled in and change course-specific settings. You can also unenroll from a course from the dashboard.

3.3.1 Change a Course Email Preference

To subscribe or unsubscribe to emails from a course, follow these steps.

1. On your dashboard, locate the course.

2. Select the course settings icon. The course settings icon resembles a gear and appears next to **View Course** or **View Archived Course**.

3. Select **Email Settings**.

4. Select or clear the **Receive course emails** check box, and then select **Save Settings**.

Note: If you clear this check box, you will not receive any of the email messages that course teams send to communicate with enrolled learners in the course.

REACHING AS MANY LEARNERS AS POSSIBLE

The core mission of edX is to expand access to education for everyone. Keep in mind that the courses and course content that you create should be accessible to everyone, regardless of any physical limitation that they might have, and regardless whether they are accessing your course using a Web browser or using mobile apps.

For information about accessibility best practices, see *Accessibility Best Practices Guidance for Content Providers*.

4.1 Designing Your Course For a Mobile Experience

The percentage of learners who access MOOCs using smartphones is increasing every day. Most courses on edx.org can be viewed on smartphones using the edX Android and iPhone apps, although we still recommend that learners complete graded assignments on a desktop computer, depending on the type of assessments that their courses include. For information on which exercises and tools are mobile-ready, see the table in the *Introduction to Exercises and Tools* section.

To make the course experience for mobile learners as rewarding as it is for learners using desktop computers, keep the following best practices in mind as you design, test, and run your course.

- Course updates that you make might take longer to appear in the edX mobile apps than on the edX site. In particular, newly published content can take up to an hour to update on the Android app.

- Display names are critical for navigating through courses on smartphones. As you create course content, make sure you replace the default display names for every component with useful course component names.

- Keep display names and labels concise. Long display names and labels might wrap on smaller screens, or might not be easily viewable. For example, if several components have names that all start with the first five words and differ only after that, learners using smartphones to access your course might have difficulty distinguishing between components.

- Do not use Flash, which is not supported on mobile platforms, to create course content.

- Only use iFrames in course content where necessary, because iFrame content might not be responsive and cannot be optimized for viewing on a range of devices.

- If you develop course components in HTML, including course announcements, make sure you set relative rather than explicit sizes for objects such as images, tables, text, and so on, so that they will scale appropriately when viewed on displays of different sizes.

- Learners might be viewing your course materials on screens as large as a high-resolution Mac Thunderbolt display, or as small as a 5 inch smartphone screen, so it is difficult to size an image so that it displays well at all resolutions. In general, edX recommends keeping most images under 0.5MB in size so that learners who have low Internet bandwidth will not have trouble downloading the images. If you have a large image that requires zooming to view the full detail, in addition to providing an image that can be easily downloaded, link to a full resolution copy that can be opened separately from the course.

- When you make choices about the problem types to use for graded and ungraded assignments in your course, or which problem types to present in a single unit, keep the mobile experience in mind. Whenever possible, use mobile- ready assessment types. If you use assessment types that are not supported on smartphones, notify learners in the body of your course that they will not be able to complete assignments that contain unsupported assessment types using the edX iPhone and Android mobile apps.

- Timed and proctored exams cannot be completed using the mobile app.

- When learners access your course using the edX Android and iPhone apps, they progress from component to component by swiping through them. It might seem useful to include a Text component in a unit for the purpose of providing a demarcation point or guiding learners to the next unit, but having to swipe through too many "markers" with no real course content is not a good experience for mobile users.

- Make sure your JavaScript and CSS are compliant. You should verify that all components render correctly in the edX Android and iPhone apps as well as directly in the LMS.

4.1.1 Testing Your Course For Mobile Devices

If you have included some of the more complex problem types, or have highly customized the way course content displays, edX recommends that you test your course for multiple devices and displays.

To test the mobile experience of your course, sign in to your course using the edX Android or iPhone app, and view each course unit to make sure that it renders as you expect it to.

Note: Keep in mind that course updates that you make might not be immediately reflected in the edX mobile apps. In particular, newly published content can take up to an hour to update on the Android app.

FIVE

ACCESSIBILITY BEST PRACTICES GUIDANCE FOR CONTENT PROVIDERS

The core mission of edX is to expand access to education for everyone. We expect courses and course content developed on our platform to be accessible to everyone, regardless of any physical limitation that they might have.

In furtherance of our mission, edX is committed to incorporating accessibility into our website (http://www.edx.org), mobile applications, and platform (https://open.edx.org/) to meet a wide variety of requirements of learners with disabilities and to enable content providers to develop accessible course content.

The topics in this section are intended to help course teams understand how to develop courses that can serve the widest possible audience.

Note: Course teams should familiarize themselves with this best practices guidance and distribute it to any members of their teams who are responsible for creating course content.

5.1 What Is The edX Accessibility Best Practices Guidance Based On?

edX measures and evaluates accessibility primarily using the World Wide Web Consortium's Web Content Accessibility Guidelines (WCAG) 2.1 (05 June 2018). All features that are merged into edX repositories are expected to conform to Level AA of this specification and satisfy the requirements outlined in the edX Website Accessibility Policy.

As the edX platform is strongly based on well-accepted HTML5 markup standards and WAI-ARIA, we expect that learners who require additional accessibility tools such as screen readers and screen magnifiers will ejoy strong compatibility. We test regularly with the most popular accessibility tools.

In addition, our guidance is based on principles of universal design (usable by all, to the greatest extent possible, without the need for adaptation or specialized design) and Universal Design for Learning (UDL). Course teams who build courses based on these principles create an inclusive experience that considers the diverse set of learning styles and needs of all learners, including learners with disabilities, learners whose native language is not English, and learners with technical issues such as low bandwidth internet or no access to audio.

To supplement the accessibility of the materials you can create within our platform, we recommend that you engage the resources available at your institution to support learners with disabilities. Most institutions offer disability support services and information technology resources that provide accessibility advice and support. These trained professionals typically provide the following services, which may be equally applicable to courses that are taught online:

- Help with making disability accommodation decisions and advise you on what accommodations may be appropriate in light of the goals of the course and the instructional methodologies employed.

- Help with document accessibility remediation

- For live events, they can help with sourcing providers for learners' real-time captioning, signed-language interpretation, or cued speech transliteration needs.

For more information, see the following topics.

- *Supporting Learners with Diverse Needs*
- *Accessibility Best Practices for Developing Course Content*

5.2 Supporting Learners with Diverse Needs

Almost one fifth of the world's population has some kind of disability. Online courses can reduce many barriers to education for these learners by providing access to courses from any location, at any time, and through the use of assistive technologies.

edX is dedicated to creating a platform that is not only itself accessible, but also enables course content creators to create accessible content. If you encounter platform issues that you believe might affect your ability to provide accessible course content, please contact us at accessibility@edx.org. We welcome any comments and questions.

Note: Use of authoring tools other than those provided by edX might result in inaccessible course content. However, for clarity, use of edX authoring tools does not ensure that your course content will be accessible.

5.2.1 Who Are Our Learners?

In the following sections, we provide guidance on creating and delivering course content that allows students to use built-in accessibility functionality (such as text-to-speech and magnification features), assistive technologies, and alternative formats. These practices consider learners with diverse needs, such as those in the following list.

- Blind learners who use a screen reader, which reads page text aloud, or a Braille display device, which renders page text in refreshable Braille.

- Low-vision learners who use screen magnification software to enlarge or modify the contrast of text and other onscreen content.

- Learners with vision impairments, such as difficulty seeing in low-light conditions, who modify their browser or operating system to change background colors and text settings to make text easier to read.

- Learners with learning disabilities, such as dyslexia, who use text-to- speech technology that reads page content aloud.

- Physically disabled learners who control their computers using switching devices, voice recognition software, or eye gaze-activated technology instead of mouse devices or keyboards.

- Learners who modify their operating system settings to make the mouse or keyboard easier to use.

- Learners with hearing impairments who cannot access audio content and need the equivalent information in an alternative format, such as captions.

5.2.2 Removing Barriers to Learning

edX highly recommends that you implement the best practices in this document and in other resources. If you cannot easily address any of these barriers to providing accessible course content, edX recommends that you consult with resources at your organization such as Disability Services, or assistive technology and accessibility specialists.

The following resources might also assist you in producing accessible course content.

- User Agent Accessibility Guidelines (UAAG) may be useful if you're intending to implement a browser or browser extension that will be compatible with the edX platform.
- Authoring Tool Accessibility Guidelines (ATAG) guides our efforts to make edX Studio more accessible.
- HTML5 and WAI-ARIA (Accessible Rich Internet Applications) are the standards we follow to ensure that the edX platform is accessible. You should follow the same standards to ensure that learner content inside xBlocks (learning units) is accessible.
- EPUB 3.0 is edX's preferred document format for ensuring that redistributable learning materials are accessible, though Adobe PDF, Microsoft Office, and Google Docs may also be made accessible.
- The DAISY Consortium contributes to EPUB accessibility standards and has a tool for che checking EPUB document accessibility.
- MathML is edX's preferred markup format for all math content.
- MathJax is the system we use for rendering MathML content.
- WCAG2ICT covers non-web Information and Communications Technologies.

While your ability to support students in the MOOC context might be different from supporting on-campus students, we encourage you to develop a plan to respond to students who inform you of accessibility barriers to learning. However, given the large numbers of learners enrolling in many of the courses, you will quickly see how important it is to address accessibility concerns when creating a course.

5.3 Accessibility Best Practices for Developing Course Content

edX is dedicated to creating a platform that is not only itself accessible, but also enables course content creators to create accessible content. If you encounter platform issues that you believe might affect your ability to provide accessible course content, please contact us using one of the following methods. We welcome any comments and questions.

- Send an email message to accessibility@edx.org.
- Submit a comment on the edX Website Accessibility Policy page.
- Submit a comment on the Individualized Accessibility Process for Course Creators page.

Note: Use of authoring tools other than those provided by edX might result in inaccessible course content. However, for clarity, use of edX authoring tools does not ensure that your course content will be accessible.

- *Make Sure Your Course Content is Perceivable*
- *Make Sure Your Course Content is Understandable*
- *Use Best Practices for Describing Images*
- *Create Accessible Course Materials*
- *Use Best Practices for Mathematical Content*

- *Use Best Practices for Custom Content Types*

- *Create Accessible Media*

- *Use Best Practices for HTML Markup*

- *Apply Universal Design for Learning*

5.3.1 Make Sure Your Course Content is Perceivable

The WCAG guidelines are organized around several principles, one of which is that web content must be perceivable. That is, information and user interface components must be presentable to users in ways they can perceive; it cannot be invisible to all of their senses. In almost all cases, this means that the information should be available as text, which can be rendered or transformed into a format that can be perceived.

To produce content that is perceivable by all learners, follow these guidelines.

Include Text Alternatives for Non-Text Content

For any non-text content, provide text alternatives so that the content can be changed into other forms that people need, such as large print, braille, speech, symbols, or simpler language.

For non-text tests or exercises that would be invalid if presented in text, provide text alternatives that at least provide descriptions of the non-text content. Make sure that all images have useful alternative text that screen readers and other assistive technologies can read. For more information, see *Use Best Practices for Describing Images*.

Provide Alternatives for Time-Based Media

For time-based media, including pre-recorded audio or video content, provide alternative equivalent information, such as captions, audio description or pre-recorded sign language interpretation. For more information, see *Create Accessible Media*.

Make Sure Your Content is Adaptable

Design your course content so that it can be presented in different ways without losing information or structure. If your content includes specific information, structure, and relationships (such as sequence) that is conveyed through presentation, make sure the same information, structure, and relationships can be programmatically determined or are available in text. HTML is an ideal format in which to publish course content, because it provides semantic elements with stadardized roles, states, and properties. Users of assistive technologies rely on such semantic elements to effectively and efficiently consume and navigate content. Publish your content in HTML whenever possible.

Make sure your course content does not rely solely on sensory characteristics such as shape, size, visual location, orientation, or sound to be understood by learners.

Make It Easier for Learners to See and Hear Content

Make the default presentation as easy to perceive as possible, especially by making it easier for learners to distinguish foreground information from the background, in both visual and audio elements.

For visual elements, techniques include making sure the fonts you use are readable, and that there is sufficient contrast between the foreground and background. Do not use color as the sole means of visually distinguishing an element or conveying critical information. If you must create images that contain text, make sure that the text has good contrast with the background. Images of text cannot be scaled or color corrected as effectively as HTML text. If you choose to override edX platform's default font colors, make sure that the foreground and background colors have sufficient contrast.

For audio elements, make sure that foreground sounds are sufficiently louder than background sounds.

5.3.2 Make Sure Your Course Content is Understandable

Make sure your course content is readable and understandable. EdX courses have a global and diverse audience, including learners whose native language is not the language in which you created your course, as well as learners who have a disability that affects reading, such as dyslexia or a visual impairment.

Learners will be better positioned to access concepts in your content if you write in clear, straightforward language and the content is well structured.

Write Simply and Clearly

Avoid jargon. If unfamiliar words or phrases are relevant to the subject, explain them when they are first used, and include a glossary with your course materials. When you use an abbreviation or acronym, provide the full phrase the first time it appears. For example, "World Health Organization (WHO)."

The Center for Plain Language provides detailed resources on writing clearly and concisely, in language appropriate for your content and target audience.

See also the W3C's new Working Group Note on Making Content Usable for People with Cognitive and Learning Disabilities.

Make Your Course Easy to Navigate

One aspect of making your course understandable is making sure that learners can easily grasp its structure, find content, and determine where they are within the course.

Name your course sections, subsections, units, components, and discussion topics in a consistent way, and make sure the names are useful and easy to skim. Make an element's name descriptive of its content, and put important keyword information first in the name. These names are used in navigation menus, page headings, and section headings; they are signposts that help learners to navigate your course and read course content.

When you create written learning resources, break text into sections using HTML elements such as headings, paragraphs, and lists. Long blocks of unbroken text are a barrier to most readers. Segmented content is more inviting and is easier to navigate and search. See *Use Best Practices for HTML Markup* for guidance on creating accessible HTML.

When you provide links to external materials, use link text that clearly explains the link destination (for example, "Review the Course Syllabus"). Avoid using constructs such as "Review the Course Syllabus here", with only the word "here" serving as link text. For links that point to documents rather than web pages, include the document type in the link. For example, "Supplemental Reading for Week 1 (EPUB)". Screen reader users frequently browse lists of links, or navigate web pages by moving from one link to the next. Ensuring that link text is understandable without surrounding context is important.

5.3.3 Use Best Practices for Describing Images

When you use images (including diagrams, maps, charts, or icons) in your course content, you must provide text alternatives that provide information equivalent to the visual content, or that identify the purpose of such non-text content.

The text alternative for an image depends on the image's context and purpose, and might not be a simple description of the image's visual characteristics. In general, for every image, edX recommends that you provide a text alternative that provides the equivalent information that a sighted learner would obtain from viewing the image. If the image contains words that are important for understanding the content, include the words in the text alternative. If the image itself is being used as a link, the text alternative should describe the destination or action that will be performed when the link is activated.

The primary mechanism for providing a text alternative for an image in HTML is the `alt` attribute. The text value of this attribute is what screen reader users hear when they encounter the image in your content.

Note: All images *must* include an `alt` attribute. There are some cases, noted below, when an empty `alt` attribute (`alt=""`) is desirable. However, the `alt` attribute must never be omitted.

Note: For SVG elements, use `aria-label` instead of `alt` attributes. Non-interactive SVGs should also have `role="img"` and `focusable="false"`.

If an image description that captures the essential information in an image does not fit in 200 characters, you can instead add a Create useful and meaningful text alternatives for images in your course by following these guidelines for particular situations.

- *Images That Are Links or Controls*
- *Images That Contain Text*
- *Images That Contribute Meaning or Additional Context to the Page*
- *Graphs or Complex Visual Representations of Information*
- *Images With Unknown Descriptions at The Time of Publication*
- *Non-Informative Images*
- *Information Graphics (Charts, Diagrams, Illustrations)*
- *Accessible Images Resources*

Images That Are Links or Controls

If your image serves as a link to additional content or is an interactive form control such as a button, the value of the `alt` attribute should describe the destination of the link or the action that will be performed when the user clicks the image. For example, if a linked image of an envelope opens an email program to send an email, a useful text alternative is "Send message", rather than "Envelope."

Images That Contain Text

If your image contains text, the `alt` attribute would typically consist of exactly the same text as is contained in the image. However, there are a couple of conditions when having an empty `alt` attribute (`alt=""`) is the preferred solution.

If the text contained in the image is also available in nearby HTML, or otherwise accessible text, including it in the `alt` attribute would be redundant. In this case, setting an empty `alt` attribute (`alt=""`) is acceptable. Doing so effectively "hides" the image from screen reader users.

Note: All images *must* include an `alt` attribute so do not omit the `alt` attribute entirely. If the `alt` attribute is omitted entirely, screen readers will read the value of the `src` attribute (the path to the image on a web server) as a fallback. This is rarely helpful to the user and often results in a poor user experience.

If the text contained in the image is for decorative purposes only and adds no value to the content of the page, an empty `alt` attribute is also acceptable.

Images That Contribute Meaning or Additional Context to the Page

If the image is a simple graphic or photograph that provides additional context to the surrounding content, the `alt` attribute should briefly describe the image in a way that conveys that context.

Consider the following examples of meaningful alt attributes for a photo of the famous stone bridge, Ponte Vecchio in Florence, Italy.

- For a representative image of the bridge included on a page about Florence, a meaningful `alt` attribute would be "Photo of Ponte Vecchio, a famous bridge and shopping center in Florence, Italy."

- If the context of the page is about the bridge itself a meaningful `alt` attribute would be more specific: "Photo of Ponte Vecchio showing its three stone arches which span the Arno River."

- For a technical diagram, or illustration, on a page about the construction of the bridge the `alt` attribute would include the details conveyed visually, such as dimensions and materials used: "The Ponte Vecchio is a stone bridge with three arches and a span-to-rise ratio of 5 to 1."

- For a map intended to provide directions to the bridge, the `alt` attribute would provide directions as text.

Graphs or Complex Visual Representations of Information

If the image is a graph or represents a complex piece of information, include the information contained in the image as accessible text adjacent to the image, or provide a link to the information. The `alt` attribute should convey a summary of what the complex image conveys visually. For example, a line graph that represents the price of a stock over time might be "The price of the stock rises from $45 in January of 2015 to over $76 in June of 2015 with a significant drop of 30% during the month of March."

Note: For most charts, all of the data in the chart should be accessible. Summarization is not always appropriate. In some cases this means making a table available (visibly, as screen-reader-only text, or as a downloadable spreadsheet file).

Consider using a caption to display long descriptions so that the information is available to all learners. In the following example, the image element includes the short description as the `alt` attribute and the paragraph element includes the long description.

```
<img src="image.jpg" alt="Photo of Ponte Vecchio"> <p>Photo of Ponte Vecchio
showing its three stone arches and the Arno river</p>
```

Alternatively, provide long descriptions by creating an additional unit or downloadable file that contains the descriptive text and providing a link to the unit or file below the image.

```
<img src="image.jpg" alt="Illustration of Ponte Vecchio"> <p><a
href="description.html">Description of Ponte Vecchio Illustration</a></p>
```

Images With Unknown Descriptions at The Time of Publication

If a suitable text alternative is unknown at the time of publication (for example, a webcam image that updates every 10 minutes) provide an `alt` attribute that includes as much useful information as possible. For example, "Traffic on Interstate 90 at 5:45 PM June 26, 2015."

Non-Informative Images

Images that do not provide information, including purely decorative images, do not need text descriptions. For example, an icon that is followed by link text that reads "Course Syllabus (EPUB)" does not need alternative text.

For non-informative images that should be skipped by screen reading software, include an `alt` attribute but leave it with an empty value (also known as a NULL `alt` attribute).

```
<img src="image.jpg" alt="">
```

Note: While it is appropriate to have an empty `alt` attribute, it is never acceptable to omit the `alt` attribute entirely. If image elements do not include an `alt` attribute at all, a screen reader will read the path to the image, or, in the case of a linked image, announce the linked URL. This is rarely helpful to the user and often results in a poor user experience. Don't make blind learners guess what information an image conveys!

Information Graphics (Charts, Diagrams, Illustrations)

Graphics are helpful for communicating concepts and information, but they can present challenges for people with visual impairments. For example, a chart that requires color perception or a diagram with tiny labels and annotations will likely be difficult to comprehend for learners with color blindness or low vision. All images present a barrier to learners who are blind.

edX recommends that you follow these best practices for making information graphics accessible to visually impaired learners.

- Avoid using only color to distinguish important features of an image. For example, on a line graph, use a different symbol or line style as well as color to distinguish the data elements.

- Use colors that have a minimum 3:1 luminance contrast vs. the background color.

- Whenever possible, use an image format that supports scaling, such as .svg, so that learners can employ zooming or view the image larger. Consider providing a high-resolution version of complex graphics that have small but essential details.

- For every graphic, provide a text alternative that provides the equivalent information that a sighted learner would obtain from viewing the graphic. For charts and graphs, a text alternative could be a table displaying the same data. See *Use Best Practices for Describing Images* for details about providing useful text alternatives for images.

Accessible Images Resources

- W3C Resources on Alternative Text for Images

- W3C WAI Images Tutorial

- HTML5 - Requirements for providing text to act as an alternative for images

- WebAim provides general guidance on the appropriate use of alternative text for images.

- The DIAGRAM Center, established by the US Department of Education (Office of Special Education Programs), provides guidance on ways to make it easier, faster, and more cost effective to create and use accessible images.

- DataViz Accessibility working group

5.3.4 Create Accessible Course Materials

The source teaching materials for your course might exist in a variety of formats. For example, your syllabus might be in MS Word, your presentation slides in MS PowerPoint, and your textbooks in publisher-supplied PDF. It is important to consider how accessible these supplemental materials are before making them available through your course.

Carefully consider the document format you choose for publishing your course materials, because some formats support accessibility better than others. Whenever possible, create course materials in HTML format, using the tools available to you in edX Studio. When you make digital textbooks (ebooks) available within your course, ask digital book publishers for books in EPUB 3 format. This digital book format includes unparalleled support for accessibility. However, simply supporting accessibility does not always mean a document will be accessible. When you source ebooks from third parties, it helps to ask the right questions about accessibility.

- Can screen readers read the document text?

- For low-vision readers, can the text size, font, and spacing be changed (called "reflow")?

- Do images in the document include alternative text descriptions?

- Are all tables, charts, and math provided in an accessible format?

- Does all media include text equivalents?

- Does the document have navigational aids, such as a table of contents, index, headings, and bookmarks?

Natively accessible formats like those mentioned above might not always be available options. Other popular document formats included in edX courses include PDF, Microsoft Word, Excel, or PowerPoint. Many of the same accessibility techniques and principles that apply to authoring web content apply to these document formats as well.

- Images must have descriptive text associated with them.

- Documents should be well structured.

- Information should be presented in a logical order.

- Hyperlinks should be meaningful and describe the destination.

- Tables should include properly defined column and row headers.

- Color combinations should be sufficiently high contrast (as with websites).

The information that follows provides some practical guidance to publishing accessible course materials in popular formats.

- *Accessible Course Materials Resources*

- *Creating Accessible PDF Documents*

- *Creating Accessible Word Documents*
- *Creating Accessible Excel Documents*
- *Creating Accessible PowerPoint Documents*

Accessible Course Materials Resources

- The DAISY Consortium is a global partnership of organizations that supports and helps to develop inclusive publishing standards.
- The EPUB 3 format, widely adopted as the premier format for accessible digital books, is now managed by the W3C.
- The EPUB 3 working group has an automated EPUB 3 accessibility checker.

Creating Accessible PDF Documents

Not all ebooks are available in DAISY or EPUB 3 format. Portable Document Format (PDF) is another common format for course materials, including textbooks supplied by publishers. However, converting materials to PDF documents can create accessibility barriers, particularly for learners with visual impairments. Such learners rely on the semantic document structure inherently available in HTML, DAISY, or EPUB 3 to understand and effectively navigate PDF documents. For more information, see *HTML Markup Resources*).

Accessibility issues are very common in PDF files that were scanned from printed sources or exported from a non-PDF document format. Scanned documents are simply images of text. To make scanned documents accessible, you must perform Optical Character Recognition (OCR) on these documents, and proofread the resulting text for accuracy before embedding it within the PDF file. You must also add semantic structure and other metadata (headings, links, alternative content for images, and so on) to the embedded text.

When you export documents to PDF from other formats, it is important to ensure that the source document contains all the required semantic structure and metadata before exporting. Unfortunately, some applications do not include this information when exporting and require the author to add or "tag" the document manually using PDF editing software. You should carefully consider whether exporting to PDF is necessary at all.

Note: OpenOffice and LibreOffice will produce the best results when you export documents to PDF.

Best Practices for Authoring Accessible PDF Documents

- Explicitly define the language of the document so that screen readers know what language they should use to parse the document.
- Explicitly set the document title. When you export a file to PDF format, the document title usually defaults to the file name, not a human readable title.
- Verify that all images have alternative content defined or are marked as decorative only.
- Verify that the PDF file is "tagged". Make sure the semantic structure from the source document has been correctly imported to the PDF file.
- Verify that a logical reading order is defined. This is especially important for documents that have atypical page layouts or structure.
- If your document includes tables, verify that table headers for rows and columns are properly defined.

Note: When you export Microsoft Office documents as PDF, use the **Save as PDF** option. Make sure the **Document Structure Tags for Accessibility** option is selected (consult your software documentation for more details). PDFs generated from Windows versions of MS Office might be more accessible than those generated from Mac OS versions of MS Office. If you are using Mac OS, we highly recommend exporting from OpenOffice or LibreOffice.

Note: When you export from OpenOffice or LibreOffice, use the **Export as PDF** option. Make sure the **Tagged PDF** option is selected.

Evaluating PDF Files for Accessibility

EdX highly recommends using the tools available in Adobe Acrobat Pro (for example, "Accessibility Checker") to evaluate your PDF files for accessibility. Adobe Acrobat Pro also includes tools (for example, "Make Accessible") for fixing most common accessibility issues.

Accessible PDF Resources

- Microsoft provides detailed guidance on generating accessible PDFs from Microsoft Office applications, including Word, Excel, and PowerPoint.

- Adobe provides documentation on how to create and verify PDF accessibility.

- Adobe Accessibility (Adobe) is a comprehensive collection of resources on PDF authoring and repair, using Adobe's products.

- PDF Accessibility (WebAIM) provides a detailed and illustrated guide on creating accessible PDFs .

- The National Center of Disability and Access to Education has a collection of one-page "cheat sheets" on accessible document authoring.

Creating Accessible Word Documents

Many of the same accessibility techniques and principles that apply to authoring web content also apply to creating Word documents.

- Images must have descriptive text associated with them.

- Documents should be well structured.

- Hyperlinks should be meaningful and describe the destination.

- Tables should include properly defined column and row headers.

- Color combinations should be sufficiently high contrast.

- Verify the accessibility of your document using Microsoft's Accessibility Checker.

- Use standardized styles for formatting your text, such as Normal, Heading 1, and Heading 2, rather than manually formatting text using text styles and indents. Formatting text for its semantic meaning and not for its visual appearance allows users of assistive technology to consume and navigate documents effectively and efficiently.

Accessible Microsoft Word Resources

- Microsoft guide to creating accessible Word documents.

- Microsoft tool that allows you to check Word documents for accessibility issues.

Creating Accessible Excel Documents

Many of the same accessibility techniques and principles that apply to authoring data tables in HTML also apply to creating Excel spreadsheets.

- Images must have descriptive text associated with them. For more information, see Add alternative text to images and objects in Excel documents.

- Column and row headings should be programmatically identified.

- Hyperlinks in spreadsheets should be meaningful and describe the destination.

- Use a unique and informative title for each worksheet tab.

- Do not use blank cells for formatting.

- Color combinations should be high contrast.

- Verify the accessibility of your workbook using Microsoft's Accessibility Checker.

Accessible Microsoft Excel Resources

- Microsoft guide to creating accessible Excel workbooks.

- Microsoft tool that allows you to check Excel workbooks for accessibility issues.

Creating Accessible PowerPoint Documents

Many of the same accessibility techniques and principles that apply to authoring web content also apply to creating PowerPoint presentations.

- Images must have descriptive text associated with them. For more information, see Add alternative text to images and objects in PowerPoint documents.

- Column and row headings should be programmatically identified. For more information, see Specify column header information in tables in PowerPoint documents.

- Hyperlinks in presentations should be meaningful and describe the destination.

- Use a unique and informative title for each slide.

- Ensure that information is presented in a logical order

- Color combinations should be sufficiently high contrast.

- Verify the accessibility of your presentation using Microsoft's Accessibility Checker.

To make your content accessible and comprehensible to learners who use screen reading software, start in Outline view and include all of your content as text. After completing the outline, add design elements and images, and use the picture formatting options in MS PowerPoint to include detailed text descriptions of images that convey useful information to learners who cannot view the images. Use the **Home > Drawing > Arrange > Selection Pane** option to view the reading order of objects on each slide. If the reading order is not logical, change the order of the objects.

Accessible PowerPoint Resources

- Microsoft guide to creating accessible PowerPoint presentations.

- WebAIM's PowerPoint Accessibility.

- Microsoft tool that allows you to check Powerpoint documents for accessibility issues.

5.3.5 Use Best Practices for Mathematical Content

Math in online courses can be challenging to deliver in a way that is accessible to people with vision impairments. Non-scalable images of mathematical content cannot be sufficiently enlarged or navigated by low-vision users and are not accessible to blind users at all.

edX uses MathJax to render math content in a format that is clear, readable, and accessible to people who use screen readers. MathJax works together with math notation such as LaTeX and MathML to render mathematical equations as text instead of images. edX recommends that you use MathML to author your math content. MathJax renders MathML in a variety of formats on the client side, offering the end user the ability to consume math content in their preferred format.

edX Studio also supports authoring math directly in LaTeX using the LaTeX Source Compiler to transform LaTeX into MathML.

Accessible Mathematical Content Resources

- The MathJax website provides guidance on creating accessible pages using their display engine.

- The DO-IT project from the University of Washington provides guidance on creating accessible math content.

- The AccessSTEM website provides guidance on creating accessible science, technology, engineering and math educational content.

- Design Science shares information about making math accessible.

5.3.6 Use Best Practices for Custom Content Types

Using different content types in your courses can significantly add to the learning experience for your learners. This section covers how to design several custom content types so that your course content is accessible to all learners.

- *Simulations and Interactive Modules*
- *Online Exercises and Assessments*
- *Third-Party Content*
- *Accessible Custom Content Resources*

Simulations and Interactive Modules

Simulations, including animated or gamified content, can enhance the learning experience. In particular, they benefit learners who might have difficulty acquiring knowledge from reading and processing textual content alone. However, simulations can also present some groups of learners with difficulties. To minimize barriers to learning, consider the intended learning outcome of the simulation. Is your goal to reinforce understanding that can also come from textual content or a video lecture, or is it to convey new knowledge that other course resources cannot cover? Providing alternative resources will help mitigate the impact of any barriers.

Although you can design simulations to avoid many accessibility barriers, some barriers, particularly in simulations supplied by third parties, might be difficult or impossible to address for technical or pedagogic reasons. Understanding the nature of these barriers can help you provide workarounds for learners who are affected. Keep in mind that attempted workarounds for simulations supplied by third parties might require the supplier's consent if copyrighted material is involved. If you consider third party solutions, we encourage you to evaluate them for accessibility. The easiest way to do this is to contact the vendor and ask them about the accessibility of their product. Specifically, ask for their VPAT/ACR.

Consider the following questions when creating simulations, keeping in mind that as the course creator, you enjoy considerable freedom in selecting course objectives and outcomes. Additionally, if the visual components of a simulation are so central to your course design, providing alternative text description and other accommodations might not be practical or feasible.

- Does the simulation require vision to understand? If so, provide text describing the concepts that the simulation conveys.

- Is a computer mouse necessary to operate the simulation? If so, provide text describing the concepts that the simulation conveys.

- Does the simulation include flashing or flickering content that could trigger seizures?

  If so, and if this content is critical to the nature of the simulation, take these steps.

  - Do not make using the simulation a requirement for a graded assessment activity.

  - Provide a warning that the simulation contains flickering or flashing content.

Online Exercises and Assessments

For each activity or assessment that you design, consider any difficulties that learners with disabilities might have in completing it, and consider using multiple assessment options. Focus on activities that can be completed and submitted by all learners.

Some learners take longer to read information and input responses, such as learners with visual or mobility impairments and learners who need time to comprehend the information. If an exercise has a time limit, consider whether the allowed time is enough for all learners to respond. Advance planning might help to reduce the number of learners requesting time extensions.

Some online exercise question types, such as the following examples, might be difficult for learners who have vision or mobility impairments.

- Exercises requiring fine hand-eye coordination, such as image mapped input or drag and drop exercises, might present difficulties to learners who have limited mobility. Consider alternatives that do not require fine motor skills, unless, of course, such skills are necessary for effective participation in the course. For example, instead of a drag and drop exercise for mapping atoms to compounds, provide a checkbox or multiple choice exercise.

- Highly visual stimuli, such as word clouds, might not be accessible to learners who have visual impairments. Provide a text alternative that conveys the same information, such as an ordered list of words in the word cloud.

Third-Party Content

If you include links to third-party content in your course, be mindful of the accessibility of such resources. edX recommends that you evaluate third-party content prior to sharing it with learners.

You can use the eReader tool or *Adding Files to a Course* to incorporate third-party textbooks and other publications in PDF format into your course. You can also incorporate such materials into your course in HTML format. See *Creating Accessible PDF Documents* for guidance on working with third-party supplied PDFs, and *Use Best Practices for HTML Markup* for guidance on creating accessible HTML.

Accessible Custom Content Resources

- Provide access to digital publications, from the National Center for Accessible Media, provides best practices for describing graphs, charts, diagrams, and illustrations.

- AccessSTEM provides guidance on creating accessible science, technology, engineering and math educational content.

- The National Center on Educational Outcomes (NCEO) provides Principles and Characteristics of Inclusive Assessment and Accountability Systems.

5.3.7 Create Accessible Media

Media-based course materials help to convey concepts and can bring course information to life. We require all videos in edX courses to include timed text captions in SubRip (SRT) format. The edX media player displays caption files in an interactive sidebar that benefits a variety of learners, including learners who are hard of hearing or whose native language differs from the primary language of the media. This built-in universal design mechanism enhances your course's accessibility. When you create your course, you need to factor in time and resources for creating timed text captions.

Timed Text Captions

Timed text captions are essential to opening up a world of information for persons with hearing loss or literacy needs by making the readable equivalent of audio content available to them in a synchronized manner. Globally hearing loss affects about 10% of the population to some degree. It causes disability in 5% (360 to 538 million) and moderate to severe disability in 124 million people. Timed text captions also be helpful for learners whose native languages are languages other than the primary language of the media or who have cognitive conditions that benefit from visual. The edX media player displays timed text captions as links in an interactive area adjacent to the video, which allows all learners to navigate to a specific section of the video by selecting some location within the caption text.

Text caption files start with the text version of a video's spoken content and any non-spoken audio that is important to understanding the context of the video, such as [BUZZER], [LAUGHTER], or [THUNDER]. If you created your video using a script, you have a great start on creating the text caption file. Simply review the recorded video and update the script as needed. Proper editing should maintain both the original meaning, content, and essential vocabulary.

For situations where the video content includes a lot of information that cannot be easily described in audio, you can include references to an annotations file in the SRT file. Example: [See Note 5a].

Text captions can be uploaded to YouTube along with the video to create a timed text file in SubRip (SRT) format. YouTube can also automatically create caption files. Though you'll need to copy-edit the auto-generated captions to correct the inevitable errors, this feature can still be a big time saver because the auto-generated timestamps are generally quite accurate.

Otherwise, you will need to create the timed text caption file yourself or engage someone to do it. There are many companies that will create timed text captions (captions that synchronize the text with the video using time codes) for a

fee. SRT files should be associated with video components in Studio. See *Working with Video Components* for details on how to associate text captions with videos.

If you choose to create your own timed text caption files yourself, you must follow these guidelines.

- Each caption frame should not be on screen for less than three seconds.

- Each caption frame must not be on screen for less than two seconds.

- Each caption frame should not exceed more than 2 lines.

- Each caption frame must not exceed more than 3 lines.

- Each line should not exceed more than 32 characters

- All caption frames should be precisely time synched to the audio.

- When multiple speakers are present, it is sometimes helpful to identify who is speaking, especially when the video does not make this clear.

- Non-speech sounds like [MUSIC] or [LAUGHTER] should be added in square brackets.

Descriptions in Video

When you create video segments, consider how you will convey information to learners who cannot see what is happening in a video. Actions that are only visible on screen without any audible equivalent are not accessible to learners who have visual impairments.

For many topics, you can fully cover concepts in the spoken presentation. If it is practical to do so, you should audibly describe visual events as they happen in the video. For example, if you are illustrating dropping a coin and a feather together from a height, you should consider narrating your actions as you perform them. Ask yourself if your video would make sense if the learner were only listening to the audio content, for example while they were driving a car.

Downloadable Transcripts

For both audio and video transcripts, consider including a text file that learners can download and review using tools such as word processing, screen reader, magnifier/reflow, or literacy supprt software. All learners can use transcripts of media-based learning materials for study and review.

Accessible Media Resources

- Accessible Digital Media Guidelines provides detailed advice on creating online video and audio with accessibility in mind.

- Captioning Key by the National Association for the Deaf provides excellent guidance on creating described and captioned media.

- Closed Captioning & Subtitling Standards in IP Video Programming by 3PlayMedia discusses best practices in this recorded webinar and white paper.

5.3.8 Use Best Practices for HTML Markup

HTML is the best format for creating accessible content. It is well supported and adaptable across browsers and devices. Also, the information in HTML markup helps assistive technologies, such as screen reader software, to provide information and functionality to people with vision impairments.

Most of the problem type templates in edX Studio conform to our recommended best practices in terms of good HTML markup. You can manually add appropriate HTML tagging even if it does not exist in the component template. Depending on the type of component you are adding to your course in edX Studio, the raw HTML data is available either automatically or by selecting the "Advanced Editor" or "HTML" views.

Keep the following guidelines in mind when you create HTML content.

- Use HTML tags to describe the meaning of content, rather than changing its appearance. For example, you should tag a section title with the appropriate heading level (such as <h3>) rather than making the text appear like a heading by applying visual elements such as bold text and a larger font size. Format list items into a list rather than using images of bullets or indents. Using HTML to describe your content's meaning is valuable for learners who use screen readers, which, for example, can read through all headings of a specific level or announce the number of items in a list.

- Use HTML heading levels in sequential order to represent the structure of a document. Well-structured headings help learners and screen reader users to navigate a page and efficiently find what they are looking for.

  In your *HTML* and *problem* components, be sure to apply only heading levels 2 through 6 to your content. Because the components that you add are part of a complete page, and heading level 1 is already in use by other elements on the page, any text with a heading 1 style within an HTML or problem component can interfere with the functionality of tools such as screen readers.

- Use HTML list elements to group related items and make content easier to skim and read. HTML offers three kinds of lists.

  - Unordered lists, where the order of items is not important. Each item is marked with a bullet.

  - Ordered lists, where the order of items is important. Each item is listed with a number.

  - Definition lists, where each item is represented using term and description pairs (like a dictionary).

- Use table elements to format information that works best in a grid format, and include descriptive row and column headings. Tag row and column headers with the <th> element so screen readers can effectively describe the content in the table, and include the appropriate scope attribute on the <th> element.

HTML Markup Resources

- Creating Semantic Structure provides guidance on reflecting the semantic structure of a web page in the underlying markup (WebAIM).

- Creating Accessible Tables provides specific guidance on creating data tables with the appropriate semantic structure so that screen readers can correctly present the information (WebAIM).

5.3.9 Apply Universal Design for Learning

Universal Design for Learning focuses on delivering courses in a format so that as many of your learners as possible can successfully interact with the learning resources and activities you provide them, without compromising on pedagogic rigor and quality.

The principles of Universal Design for Learning can be summarized by the following points.

1. Present information and content in various ways.

2. Provide more than one way for learners to express what they know.

3. Stimulate interest and motivation for learning.

Course teams can apply these principles in course design by following several guidelines.

- Design resources and activities that can be accessed by learners in a variety of ways. For example, if there is a text component, provide the ability to enlarge the font size or change the text color. For images and diagrams, always provide an equivalent text description. For video, include text captions.

- Provide multiple ways for learners to engage with information and demonstrate their knowledge. This is particularly important to keep in mind as you design activities and assessments.

- Identify activities that require specific sensory or physical capability and for which it might be difficult or impossible to accommodate the accessibility needs of learners. For example, an activity that requires learners to identify objects by color might cause difficulties for learners with visual impairments. In these cases, consider whether there is a pedagogical justification for the activity being designed in that way. If there is a justification, communicate these requirements to prospective learners in the course description and establish a plan for responding to learners who encounter barriers. If there is no justification for the requirements, edX recommends that you redesign the learning activities to be more flexible and broadly accessible.

Universal Design for Learning Resources

- The National Center on Universal Design for Learning provides a helpful overview on Universal Design for Learning.

SETTING UP A COURSE

When you begin to set up a course, the first step is to plan and specify two types of basic information about your course.

- **Course** information remains true whether the course runs one time or multiple times. This is information such as the course title and number, subject, and course description.
- **Course run** information changes every time the course runs. This is information such as the course staff and start and end dates.

This section provides information about how to determine required course and course run information, as well as how to enter this information in Studio.

6.1 Planning Course Information

Course information remains true whether the course runs one time or multiple times. This section lists the optional and required information for courses, as well as guidelines to help you create an effective course and About page.

After you have determined the information for your course, you enter this information in Studio. For more information, see *Creating a Course*.

6.1.1 Course Title and Number

The course title (sometimes also called the course name) and number are important identifiers for your course. It is a good idea to use titles and numbers that are easy to understand and remember.

For information about how to add your course title and number, see *Creating a New Course in Studio*.

For guidelines for determining a course title and number, see the following topics.

- *Course Title Guidelines*
- *Course Number Guidelines*

Course Title Guidelines

When you determine the title of your course, consider the following guidelines.

- Use title capitalization and normal spacing and punctuation.
- Limit the course name to 70 characters. Many of the most effective course titles have 50 or fewer characters.
- If the course is part of a sequence, create a title that includes both sequence and course information, formatted as "Sequence: Course".
- Select a course title that clearly indicates the course subject matter.
- Make sure the course title follows search engine optimization (SEO) guidelines.
- Make sure the course title targets a global audience.

For information about how to add your course name, see *Creating a New Course in Studio*.

Note: The title that you specify when you create your course becomes part of the course URL. The course URL cannot be changed. However, if you want to change the way that your course title appears in Studio and the LMS, see *Change the Course Title*.

Example Course Titles

The following course titles are for stand-alone courses.

- English Grammar and Essay Writing
- Front-End Web Developing
- The Science of Happiness

The following course titles are for courses in a sequence or in a program such as an XSeries.

- Circuits and Electronics 1: Basic Circuit Analysis
- Circuits and Electronics 2: Amplification, Speed, and Delay
- Circuits and Electronics 3: Applications

Course Number Guidelines

Course numbers have the following guidelines.

- Course numbers can have a maximum of 10 characters.
- Characters can be letters, numbers, or periods.
- If a course consists of several modules, the course number can have an ending such as .1x or .2x.

Note: The number that you specify when you create your course becomes part of the course URL. The course URL cannot be changed. However, if you want to change the way that your course number appears in Studio and the LMS, see *Change the Course Number*.

For information about how to add your course number, see *Creating a New Course in Studio*.

Example Course Numbers

- CS002x

- BIO1.1x and BIO1.2x

- 6.002.1x and 6.002.2x

6.1.2 Images and Videos for a Course or Program

The About page for a course or program includes both a representative image and a short About video. The course or program image also appears in places such as learner dashboards and search engine results.

For information about how to add your course title and number, see *Creating a New Course in Studio*.

- *Representative Image Guidelines*
  - *Image Size Guidelines*
- *Course About Video Guidelines*

Representative Image Guidelines

A representative image is an eye-catching, colorful image that captures the essence of a course or program. These images are visible in the following locations.

- The About page.

- The learner dashboard.

- Search engine results.

When you create a course or program image, keep the following guidelines in mind.

- The image must not include text or headlines.

- You must have permission to use the image. Possible image sources include Flickr creative commons, Stock Vault, Stock XCHNG, and iStock Photo.

- Each course in a sequence or program must have a unique image.

Image Size Guidelines

Images must follow specific size guidelines.

Course Image Size

The course image that you add in Studio appears on the About page for the course and on the learner dashboard. It must be a minimum of 378 pixels in width by 225 pixels in height, and in .jpg or .png format. Make sure the image that you upload maintains the aspect ratio of those dimensions so that the image appears correctly on the dashboard.

Course About Video Guidelines

The course About video should excite and entice potential learners to enroll, and reveal some of the personality that the course team brings to the course.

This video should answer these key questions.

- Who is teaching the course?
- What university or institution is the course affiliated with?
- What topics and concepts are covered in your course?
- Why should a learner enroll in your course?

This video should deliver your message as concisely as possible and have a run time of less than two minutes.

Before you upload a course About video, make sure that it follows the same *video guidelines* as your course content videos.

Note:

- If you upload both a course image and a course About video, the course image appears on learner dashboards with a **play** icon superimposed on it. If you upload only a course video, the first frame of the video file appears with the **play** icon.

- The process for adding a course about video is different than the process for including videos as part of the content of your course. For more information about including video content, see Creating and Adding Video Content.

For information about how to add an About video to your course About page, see *Add a Course About Video*.

6.1.3 Course Description

Descriptive course information includes information such as the course short and long descriptions, as well as information about what learners will learn, the subject, and the difficulty level.

- *Course Short Description Guidelines*
- *Course Long Description Guidelines*
- *What You Will Learn Guidelines*
- *Subject Guidelines*
- *Level Guidelines*

Course Short Description Guidelines

An effective short description follows these guidelines.

- Contains 25–50 words.
- Functions as a tagline.
- Conveys compelling reasons to take the course.
- Follows search engine optimization (SEO) guidelines.
- Targets a global audience.

Example Short Descripton

The first MOOC to teach positive psychology. Learn science-based principles and practices for a happy, meaningful life.

Course Long Description Guidelines

Given the diversity of online learners, be sure to review your course description to ensure that it clearly communicates the target audience, level, and prerequisites for your course. Use concrete, unambiguous phrasing, such as a prerequisite of "understand eigenvalue decomposition" rather than "intermediate linear algebra".

An effective long description follows these guidelines.

- Contains 150–300 words.

- Is easy to skim.

- Uses bullet points instead of dense text paragraphs.

- Follows SEO guidelines.

- Targets a global audience.

Note: The first four lines of the course long description are visible when the About page opens. Learners can select "See More" to view the full description.

Example Long Descriptions

The following long description is a content-based example.

> Want to learn computer programming, but unsure where to begin? This is the course for you! Scratch is the computer programming language that makes it easy and fun to create interactive stories, games and animations and share them online.

> This course is an introduction to computer science using the programming language Scratch, developed by MIT. Starting with the basics of using Scratch, the course will stretch your mind and challenge you. You will learn how to create amazing games, animated images and songs in just minutes with a simple "drag and drop" interface.

> No previous programming knowledge needed. Join us as you start your computer science journey.

The following long description is a skills-based example.

> Taught by instructors with decades of experience on Wall Street, this M&A course will equip analysts and associates with the skills they need to rise to employment in the M&A field. Additionally, directors and managers who have transitioned, or hope to transition, to M&A from other areas such as equities or fixed income can use this course to eliminate skill gaps.

What You Will Learn Guidelines

The "what you will learn" information describes the skills and knowledge learners will acquire in the course in an itemized list. EdX recommends that you format each item as a bullet with four to ten words.

Example What You Will Learn

- Basic R Programming
- An applied understanding of linear and logistic regression
- Application of text analytics
- Linear and integer optimization

Subject Guidelines

A primary subject is required. Optionally, you can select up to two subjects in addition to the primary subject. Only the primary subject appears on the About page.

Example Subjects

A particular course might specify the following subjects.

- Primary subject: History
- Additional subject: Architecture
- Additional subject: Anthropology

Level Guidelines

Use the following guidelines to select the level for your course.

- Introductory - No prerequisites; a learner who has completed some or all secondary school could complete the course.
- Intermediate - Basic prerequisites; learners need to complete secondary school or some university courses.
- Advanced - Significant prerequisites; the course is geared to third or fourth year university students or master's degree students.

6.1.4 Additional Course Information

Optionally, you can share additional information on your About page. This section describes this information.

- *Skill and Knowledge Prerequisites*
- *Syllabus Guidelines*
- *FAQ Guidelines*
- *Learner Testimonial Guidelines*

You can add these optional items to your course About page. For more information, see *Creating a Course About Page in Studio*.

Skill and Knowledge Prerequisites

You might want to make sure that your learners have a specific set of skills and knowledge before they take your course. This information appears on the course About page.

Optionally, you can also require that learners complete a specific course before they enroll in your course, or that learners complete an entrance exam before they access course content. This information also appears on the About page, but you specify these prerequisites on the **Schedule & Details** page in Studio. For more information, see *Prerequisite Courses* and *Require an Entrance Exam*.

You add skill and knowledge prerequisites in Studio. For more information, see *Creating a Course About Page in Studio*.

Example Skill and Knowledge Prerequisites

- Secondary school (high school) algebra; basic mathematics concepts
- Graduate-level understanding of Keynesian economics
- Basic algebra
- Familiarity with eigenvalue decomposition

Prerequisite Courses

When you require that your learners pass a particular course before they enroll in your course, learners see information about course prerequisites on the course **About** page.

If learners have not completed the prerequisite course, they can enroll in your course and then see your course on their learner dashboards. However, unlike with other courses, the dashboard does not provide a link to the course content. The dashboard includes a link to the **About** page for the prerequisite course. Learners can enroll in the prerequisite course from the **About** page.

You enter this information in Studio. For more information, see *Prerequisite Courses*.

Entrance Exam

You can require your learners to pass an entrance exam before they access your course materials. If you include an entrance exam, learners who enroll in your course can access only the **Entrance Exam** page until they pass the exam. After learners pass the exam, they can access all released materials in your course.

You enter this information in Studio. For more information, see *Require an Entrance Exam*.

Best Practices for Entrance Exams

We strongly recommend that you follow several guidelines to help you and your learners have a positive experience with entrance exams.

- Make sure that your beta testers include the entrance exam when they test your other course content.

- Make sure that you mention the entrance exam in the course description on your course **About** page. Otherwise, learners will not know about the entrance exam before they enroll in your course and try to access course content.

- Add an announcement to the **Course Updates & News** page that contains information and instructions for learners who need to take the exam. When learners first try to access content in a course that has an entrance exam, they see the **Course Updates & News** page. We suggest that you include the following information.

  - To begin the course entrance exam, learners select **Entrance Exam**.

  - After learners complete the entrance exam, they must select **Entrance Exam** again or refresh the page in their browsers. After the page refreshes, learners can access all currently available course content.

Syllabus Guidelines

A syllabus is a review of content covered in your course, organized by week or module. To create an effective syllabus, keep the following guidelines in mind.

- Focus on topics and content.
- Do not include detailed information about course logistics, such as grading, communication policies, and reading lists.
- Format items as either paragraphs or a bulleted list.

You can add the syllabus to your course About page. For more information, see *Creating a Course About Page in Studio*.

You can also add a syllabus to your course in Studio by creating a custom page or a handout. For more information, see *Adding Custom Page Resources* and *Add a Course Handout*.

Example Syllabus

Week 1: From Calculator to Computer

Introduction to basic programming concepts, such as values and expressions, as well as making decisions when implementing algorithms and developing programs.

Week 2: State Transformation

Introduction to state transformation, including representation of data and programs as well as conditional repetition.

FAQ Guidelines

To help prospective learners, you can add any frequently asked questions (FAQ) and the answers to those questions to your About page.

You can add the FAQ to your course About page. For more information, see *Creating a Course About Page in Studio*.

Example FAQ

Q: Is the textbook required?

A: No, the textbook is not required. However, you will find that it more completely explains some of the concepts that we cover quickly in the course, and will add depth to your understanding.

Q: How much is the final exam worth?

A: The final exam is worth 30% of the total grade. You can find more information about the value of each assignment on your **Progress** page.

Learner Testimonial Guidelines

A learner testimonial is a quote from a learner in the course, demonstrating the value of taking the course.

To be effective, a testimonial should contain no more than 25-50 words.

You can add the learner testimonial to your course About page. For more information, see *Creating a Course About Page in Studio*.

Course Metadata

You may need to be able to make certain custom information about your course available to entities such as customer relationship management (CRM) software, a marketing site, or other external systems. This information is not visible to learners.

For example, you might want to make the following information available.

- The course difficulty
- The course ID in an external system
- Course prerequisites

You add this information as a JSON dictionary in Studio. For more information, see *Add Course Metadata*.

6.2 Planning Course Run Information

Course run information can change each time a course is run. This section lists the optional and required information for course runs, as well as guidelines to help you create an effective course and About page.

After you have determined the information for your course run, you enter this information in Studio. For more information, see *Creating a Course*.

6.2.1 Planning Course Staff

You can designate a team of people to help you run your course.

You add staff members in Studio. For more information, see *Adding Course Team Members in Studio*.

- *About Page Biography Guidelines*
- *Course Team Roles*
- *Administrative Team Roles*

About Page Biography Guidelines

Staff biographies for the course About page must include the following information.

- Name

- Title

- Email address

- Biography (1-2 paragraphs)

- Image

Note:

The instructor's image must meet the following requirements.

- Resolution of 110 x 110 pixels

- Under 256 KB in size

- .gif, .jpg, or .png file type

Additionally, biographies can optionally include the following information.

- Facebook, Twitter, and blog URLs

- List of major works

For information about how to enter this information in your course About page, see *Creating a Course About Page in Studio*.

Course Team Roles

To give team members access to Studio, the instructor dashboard in the LMS, and Insights, you assign one of these course team roles to them.

- Staff

- Admin

You can assign these privileged roles when you work in either the LMS or Studio. The people who have these roles can work on your course in Studio, the LMS, and Insights. For more information about assigning roles to team members in Studio, see *Add Course Team Members*.

You can also designate teams of people to beta test your course or to moderate and manage its discussions by assigning other roles in the LMS. Beta testers and discussion team members must be enrolled in your course, but they do not need to have the Staff or Admin role. For more information, see *Beta Testing a Course* and *Assigning Discussion Moderation Roles*.

For more information about how to add course team members, see *Adding Course Team Members in Studio*.

Administrative Team Roles

To provide access to features on the instructor dashboard in the LMS, you can assign the Staff role or the Admin role to course team members.

Team members who have either of these roles can work on your course in Studio immediately, and can also use the LMS and Insights. For more information about assigning roles while you run your course, see *Planning Course Staff*.

You can also designate teams of people to beta test your course and to moderate and manage its discussions by assigning other LMS roles. The beta testers and discussion administrators must be enrolled in your course, but they do not need to have Staff or Admin access. For more information, see *Beta Testing a Course* and *Assigning Discussion Moderation Roles*.

For more information about how to add course team members, see *Adding Course Team Members in Studio*.

The Staff Role

Course team members who have the Staff role can complete the following tasks.

- View the course before the course start date.

- Enroll and unenroll learners.

- Access and modify grades for individual learners. For example, users with the Staff role can reset an individual learner's attempt to answer a question.

- See course HTML errors.

- Send email messages to course participants.

- Activate course certificates.

The Admin Role

Course team members who have the Admin role can complete all the tasks that team members who have the Staff role can complete. In addition, they can complete the following tasks.

- Access and modify grades for all learners in a course. For example, users with the Admin role can reset all learners' attempts to answer a question.

- Add team members to, and remove them from, the Staff role.

- Add team members to, and remove them from, the Admin role.

- Add and remove team members as beta testers.

- Add team members to, and remove them from, the Discussion Admin or Discussion Moderator role.

- Add enrolled learners to, and remove them from, the Community TA or Group Community TA role.

Note: To moderate course discussions, team members must explicitly be added to a discussion moderation role in addition to having the course team Staff or Admin role. For more information, see *Assigning Discussion Moderation Roles*.

6.2.2 Scheduling a Course Run

Scheduling, which includes start and end dates as well as whether the course is self-paced or instructor-paced, changes with every course run.

After you determine scheduling for your course run, you enter this information in Studio before the course run begins. For more information, see *Creating a Course About Page in Studio*.

- *Guidelines for Start and End Dates*

- *Course Pacing*

Guidelines for Start and End Dates

The start and end dates you set for your course are important for prospective and current learners. Current learners see your course start or end date on their dashboards. You should consider your course dates carefully.

Course Start Date and Time

The course start date and time specify when learners can access published course content. By default, the course start date and time are set to **01/01/2030** at **00:00 UTC** to ensure that your course does not start before you intend it to.

The following guidelines can help you determine a course start date.

- Start on a Tuesday, Wednesday, or Thursday.

- Avoid major public holidays.

- Specify a month, day, and year. If you are unsure of the exact date, specify a day that is close to the estimated start date. For example, if your course will start near the end of March, specify March 31.

- Set the start time of your course early in the day, generally 00:00 Coordinated Universal Time (UTC) or earlier. Learners often expect the course to be available on the start date in their own time zones and try to access course content during the day. If you do not specify a start time for your course, the course starts at 00:00 UTC.

Although learners cannot access any part of your course before the course start date, course team members who are enrolled in the course and who have the staff, admin, or beta tester role can see published content in the course before the course start date. For information about testing your course content before the course start date, see *Beta Testing a Course*.

Note: You can set a different advertised start date for your course. You might do this if the exact start date is uncertain. For example, you could advertise the start date as "Coming Soon". For more information, see *Advertise a Different Start Date*.

Course End Date and Time

The course end date and time specify when learners can no longer earn credit toward certificates. Learners can continue to complete available coursework, but cannot earn credit after the course ends. Learners who have earned certificates can view the certificates soon after the course end date.

In self-paced courses, course teams can make certain course components unavailable based on the course end date. For example, course teams can make a final exam unavailable after the end date for a self-paced course. For more details, see *Hide a Subsection Based on Date*.

Important: If you do not set a course end date, learners cannot access earned certificates.

Enrollment Start Date and Time

As soon as enrollment starts, prospective learners can see your course in the course catalog, view the course **About** page, and enroll in the course.

The enrollment start date and time specify when learners can start to enroll in the course. Ensure that the enrollment start date is early enough to allow learners to both enroll in and prepare for the course.

Enrollment End Date and Time

The enrollment end date and time specify when learners can no longer enroll in the course. Ensure that the enrollment end date is late enough to allow learners adequate time to enroll. The enrollment end date cannot be later than the course end date.

The Learner's View of Course Start and End Dates

When learners browse courses, the start date for each course is visible in the course catalog and in the course's About page.
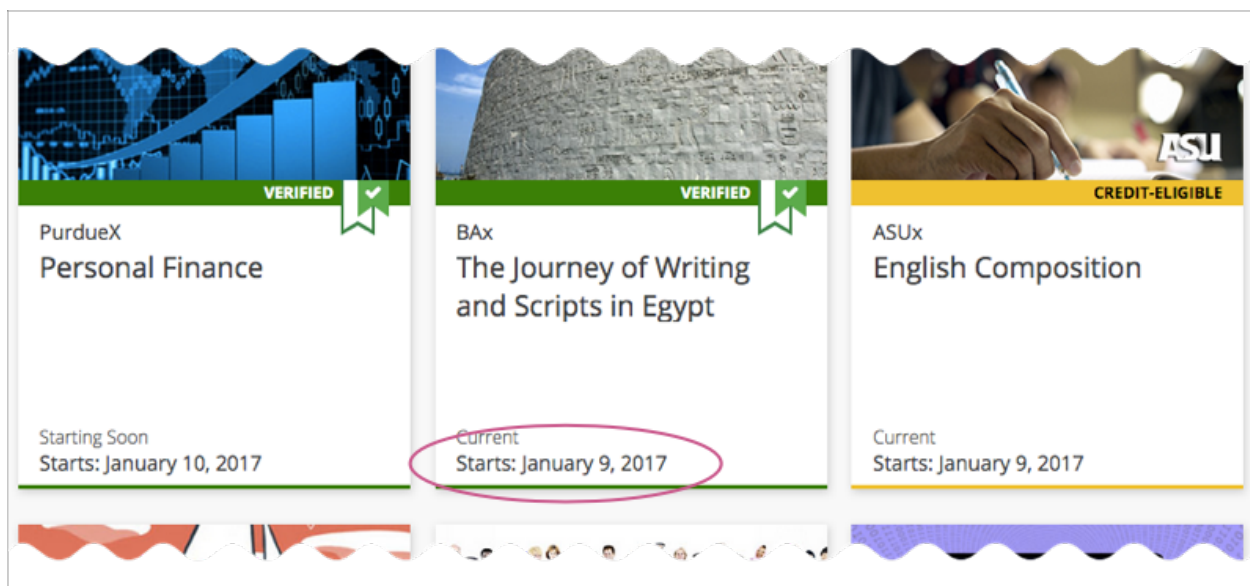
To find the URL of your course's **About** page in Studio, select **Settings**, and then select **Schedule & Details**.

After learners enroll in courses, the courses appear on their course dashboards. To access the dashboard, learners select their usernames and then select **Dashboard**. For a course that is in progress or has not yet started, the start date is visible. For a course that has ended, the course end date is visible.

Course Pacing

This topic describes the difference between instructor-paced and self-paced courses.

Overview of Course Pacing

When you create an edX course, you can set the schedule of the course, including due dates for assignments or exams, or you can allow learners to work at their own pace. Courses that follow a schedule that you set are known as instructor-paced courses. Courses that offer suggested due dates for assignment or exams based on the learner's enrollment date and the expected course duration are known as self-paced courses. These courses offer learners flexibility to modify the assignment dates as needed.

An indicator for the pacing for your course appears on the **Course Outline** page. By default, courses are instructor-paced.
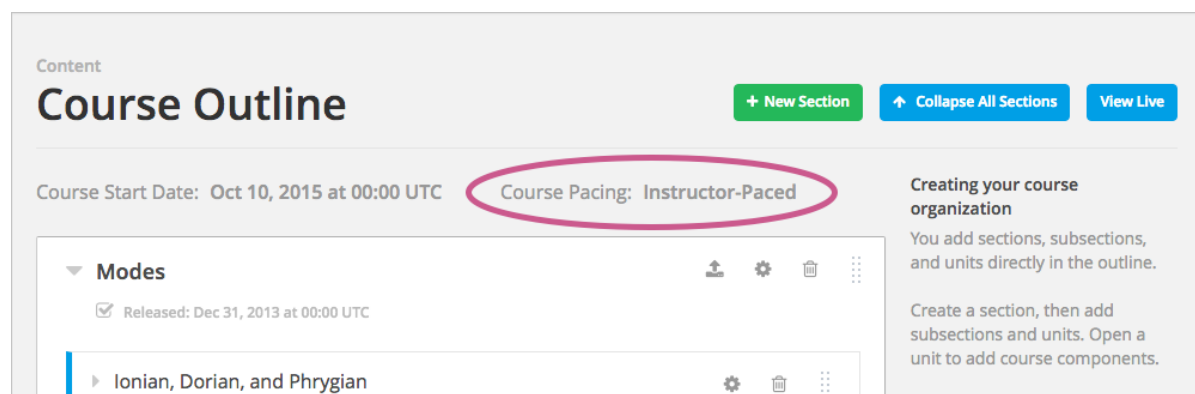
Note: You cannot change the course pacing after the course start date has passed.

Instructor-Paced and Self-Paced Courses

Instructor-paced courses progress at the pace that the course author sets. You set release dates for content and due dates for assignments, and assignment due dates are visible in the LMS. Learners cannot access course content before its release date, and learners must complete assignments by their due dates.

In self-paced courses, learners can access all course materials when the course begins, and assignment due dates follow a Personalized Learning Schedule (PLS) by default. You do not have the option to set release dates for course content. Learners can complete course material at any time before the course end date.

Note: If you set due dates for assignments or exams in an instructor-led course and later change the course to be self-paced, Studio stores the due dates that you previously set. If you change the course back to instructor- paced later, Studio restores the due dates.

Personalized Learning Schedule (PLS) is a feature in self-paced courses that creates a personalized schedule for learners by assigning suggested due dates to graded assignments.

A learner's PLS is based on their enrollment date and can have two types of pacing:

- PLS' **default pacing** automatically assigns due dates to graded subsections evenly throughout the course duration based on the total number of sections in the course.

- PLS' **custom pacing** allows course authors to assign due dates to graded subsections manually throughout the course duration.

For example, if there are 4 sections, each of which has a graded assignment, in an 8-week course, **default pacing** would assign due dates for every 2 weeks.

8 Week Self-Paced Course With **Default Pacing**	
Homework	Due in 2 weeks from learner's enrollment date
Lab	Due in 4 weeks from learner's enrollment date
Midterm Exam	Due in 6 weeks from learner's enrollment date
Final Exam	Due in 8 weeks from learner's enrollment date

Custom pacing allows for other relative due dates, such as setting an assignment to be due in 5 weeks instead of the 2 week interval.

8 Week Self-Paced Course With **Custom Pacing**	
Homework	Due in 2 weeks from learner's enrollment date
Lab	~~Due in 4 weeks from learner's enrollment date~~ Due in 5 weeks from learner's enrollment date
Midterm Exam	Due in 6 weeks from learner's enrollment date
Final Exam	Due in 8 weeks from learner's enrollment date

Now, Personalized Learning Schedule can be adapted to have:

1. Default pacing

2. Custom pacing

3. A mix of default and custom pacing, where the user sets custom pacing to some, but not all, graded assignments in a course. The rest of the assignments that are not set have default pacing applied to them.

Setting Custom Pacing in Personalized Learning Schedules

Once you have created a graded assignment in your self-paced course, the assignment is eligible to be included in a learner's Personalized Learning Schedule (PLS), and it will automatically inherit default pacing. Follow these steps to override the course's default pacing, and enable custom pacing:

1. Click on the subsection's configuration setting
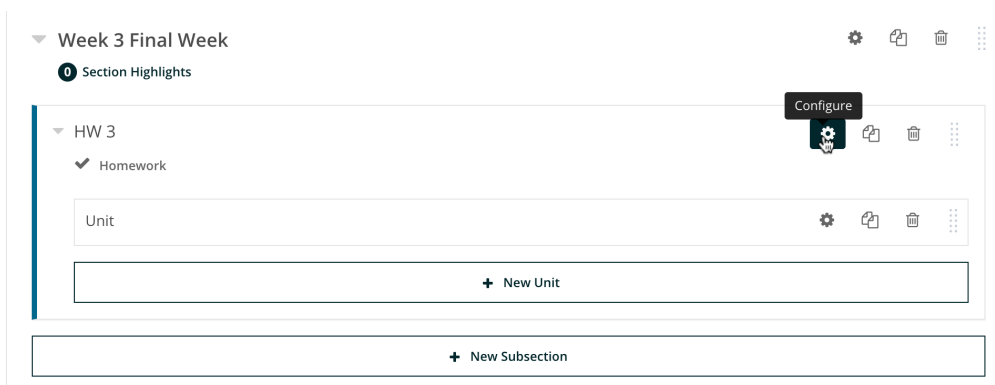
2. Type the number of weeks you would like the assignment to be due in starting from the learner's enrollment date. (Note: Leaving this field empty will cause the assignment to inherit default pacing)

HW 3 Settings

BASIC   VISIBILITY   ADVANCED

Grading

Grade as:

Homework

Due in:

3

weeks from learner enrollment date

If a learner starts on Jul 01, 2019, this subsection will be due on Jul 22, 2019.

Save   Cancel

3. Click "Save"

The relative due date you saved will now be published for all enrolled learners.

6.2.3 Additional Course Run Information

Optional additional information that may change with each course run includes information about the languages that course content is available in, as well as the time you expect learners to spend with your course.

For information about how to enter this content in Studio, see *Creating a Course About Page in Studio*.

Language Guidelines

You are required to specify a language or languages for the following content.

- Course content, including text
- Video transcripts

Optionally, you can also specify additional languages for course videos.

Effort Guidelines

Effort indicates the number of hours each week you expect learners to work on your course, rounded to the nearest whole number.

6.3 Creating a Course

This topic describes how to use Studio to create and set up a course, as well as enable several different course features and create a course About page.

6.3.1 Adding Course Team Members in Studio

After you have selected the members of your course team, you are ready to add team members in Studio.

For more information about selecting course team members, see *Planning Course Staff* .

- *Add Course Team Members*
- *Assign Course Team Roles*

Add Course Team Members

Course team members are users who help you build your course. To add someone to the course team, you must meet these prerequisites.

- You must have the Admin role in the course.
- The team member that you want to add must register a user account and activate the account.
- You need the same, registered email address for the team member you want to add.

Other course team members can edit the course and perform all tasks except adding and removing other team members and granting Admin access.

Note: Any course team member can delete content created by other team members.

To add a course team member, follow these steps.

1. Ensure you have Admin access.
2. Ensure that the new team member has registered and activated an account.
3. In Studio, from the **Settings** menu, select **Course Team**.
4. Select **Add a New Team Member**.
5. Enter the new team member's email address, then select **ADD USER**.

The new team member can now work on the course in Studio.

- To preview the course in the LMS, the team member must enroll in the course.
- To moderate course discussions, the team member must also have one of the discussion roles. For more information, see *Assigning Discussion Moderation Roles*.

You can also assign privileged roles to users when you work in the LMS by selecting **Instructor** and then **Membership**.

Assign Course Team Roles

Assigning a course team role to a user both adds the user to the course team and assigns the role to that user.

To assign the Staff or Admin role to a team member, you must meet these prerequisites.

- You must have the Admin role in the course.

- You need the email address or username of each team member you want to add.

- Each of those team members must register a user account for that email address or username, activate the account, and enroll in your course.

To assign a privileged role to a course team member, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Membership**.

3. In the **Course Team Management** section, select **Staff** or **Admin**.

4. Under the list of users who currently have that role, enter an email address or username, and then select **Add** for the role type.

To remove an assigned role, view the list of users and then select **Revoke access**.

6.3.2 Creating a New Course in Studio

This topic describes how to use Studio to create and set up a course.

- *Create a Course*

- *Edit a Course*

- *Change the Course Title or Number*

To create and run a course, you can either create an entirely new course in Studio, or you can re-run an existing course. For more information about re- running a course, see *Re-running a Course*.

You can also *export* and *import* courses as XML files. You can do this when you need to back up a course or edit the course in XML.

Create a Course

To create a course, follow these steps.

1. Sign in to Studio.

2. Select **New Course**.

3. Enter the following information about your course.

Important: The values that you enter for the organization, course number, and course run cannot be edited after you create your course.

- For **Course Name**, enter the title of your course. For example, the name might be "Sets, Maps, and Symmetry Groups". Use title capitalization for the course title, and normal spacing and punctuation.

- For **Organization**, you enter the identifier for your organization. Do not include spaces or special characters.

- For **Course Number**, you enter both a subject abbreviation and a number. For example, for public health course number 207, enter `PH207`. For math course 101x, enter `Math101x`. Do not include spaces or special characters in the course number.

Note: If your course will be public, be sure to include the "x". If it is exclusively an on campus offering, do not include the "x".

- For **Course Run**, you enter the term in which your course will run. For example, enter 2014SOND or T2_2014. Do not include spaces or special characters.

  The value that you enter for the run does not affect the course start date that you define for the course. For more information, see *Scheduling a Course Run*.

The organization, course number, and course run values that you enter are used to create the URL for your course. Because URLs do not have an unlimited length, the total number of characters that you enter for these values must be 65 or fewer.

4. Select **Create**.

   The *Course Outline* page opens. You can start developing course content. For more information, see *Getting Started with Course Content Development*.

Edit a Course

After you create a course, the course opens in Studio automatically and you can begin editing. Your next steps might include adding other *course team members*, setting the course *start and end dates*, or developing the *course outline*.

When you return to Studio later, your **My Courses** dashboard page lists the courses that you created as well as any courses for which you have course team privileges.

Note: After the end date for a course has passed, the course moves to the **Archived Courses** tab on the Studio dashboard. If the course that you want to edit is not visible on the **Courses** tab, look for the course on the **Archived Courses** tab.

To edit a course, select the course name. The Studio **Course Outline** page appears.

Change the Course Title or Number

The course title and number that you specify when you create your course become part of the course URL. The course URL cannot be changed. However, you can change the way that your course title and number appear in Studio and the LMS.

Change the Course Title

To change the way that your course title appears in Studio and the LMS, follow these steps.

Note: EdX does not recommended that you do this if your course is live.

---

1. Open the course in Studio.

2. On the **Settings** menu, select **Advanced Settings**.

3. In the **Course Display Name** field, enter the title that you want.

4. Select **Save**.

In Studio and the LMS, your course title changes to the value that you specify in the **Course Display Name** field. The URL for your course does not change.

Change the Course Number

To change the way that your course number appears in Studio and the LMS, follow these steps.

Note: EdX does not recommended that you do this if your course is live.

---

1. Open the course in Studio.

2. On the **Settings** menu, select **Advanced Settings**.

3. In the **Course Number Display String** field, enter the number that you want.

4. Select **Save**.

In Studio and the LMS, your course number changes to the value that you specify in the **Course Number Display String** field. The URL for your course does not change.

Add Course Metadata

To make certain information about your course available to entities such as customer relationship management (CRM) software, a marketing site, or other external systems, follow these steps.

1. Create a JSON dictionary that contains the metadata that you want to add.

2. In Studio, open your course, and then select **Advanced Settings** on the **Settings** menu.

3. In the **Other Course Settings** field, paste your JSON dictionary.

In case you can't find the **Other Course Settings** field in the **Advanced Settings**, set `ENABLE_OTHER_COURSE_SETTINGS` to `true` under `FEATURES` in `/edx/etc/studio.yml` and restart Studio.

6.3.3 Set the Course Run Schedule and Pacing in Studio

After you determine the start and end dates for a course run, and whether you want your course run to be self-paced or instructor-paced, you specify these settings on the **Schedule & Details** page in Studio.

For more information about determining how to schedule your course, see *Scheduling a Course Run*.

Set Start and End Dates and Times in Studio

To set dates and times for the course and for course enrollment in Studio, follow these steps.

Note: EdX recommends that you verify all important dates in Studio one week before you plan to start the course.

---

1. On the **Settings** menu, select **Schedule & Details**.

2. In the **Course Schedule** section, replace the placeholder dates and times with your own information.

   When you make changes on this page, a panel with options to save or cancel your work appears.

3. Select **Save Changes**.

Note: The times that you set are in Coordinated Universal Time (UTC). You might want to verify that you have specified the times that you intend by using a time zone converter such as Time and Date Time Zone Converter.

Advertise a Different Start Date

You can advertise a start date for your course that is different from the course start date you set in the **Schedule & Details** page. You might want to do this if the exact start date is uncertain.

You can enter a specific date or a description. For example, you could advertise the start date as either "15 Oct 2016" or "Anytime, self-paced".

To set an advertised start date in Studio, follow these steps.

1. On the **Settings** menu, select **Advanced Settings**.

2. Locate the **Course Advertised Start Date** field. The default value is `null`.

3. Enter the start date that you want learners to see for your course in MM/DD/YYYY format.

   A date value entered in MM/DD/YYYY format appears to learners in DD Mon YYYY format. For example, 10/15/2016 appears as 15 Oct 2016.

4. Add quotation marks (`"  "`) before and after the start date value. An example follows.

   ```
   "Anytime, self-paced"
   ```

5. Select **Save Changes**.

   A message lets you know whether your changes were saved successfully.

Note: If you do not change the default course start date (01/01/2030), and the **Course Advertised Start Date** policy value is `null`, no start date appears for the course. Learners just see that the course has not yet started.

Set Pacing for Your Course in Studio

Before you can use this feature to set up a self-paced course, it must be enabled using the Open edX Django admin panel. Follow these steps, or contact your Open edX site administrator for assistance.

1. Log in to your Open edX Django Admin panel.

2. In the **Self_Paced** section, locate **Self paced configurations**, and then select **Add**.

3. Select the **Enabled** and **Enable course home page improvements** checkboxes.

4. Select **Save**.

To set the pacing for your course, follow these steps.

Note: You cannot change the course pacing after the course start date has passed.

---

1. On the **Settings** menu, select **Schedule & Details**.

2. Scroll down to the **Course Pacing** section.

3. Under **Course Pacing**, select either **Instructor-Paced** or **Self-Paced**.

4. Select **Save Changes**.

6.3.4 Specifying Prerequisite Courses and Exams

In Studio, you can specify that learners must complete a specific course before they can take another course. You can also require learners to complete an entrance exam before they can access your course content.

For more information about course prerequisite options, see *Skill and Knowledge Prerequisites*.

Prerequisite Courses

To define one course as the prerequisite for another, you must be the course creator in both the current course and in the prerequisite course.

To specify a prerequisite course, follow these steps.

1. In Studio, open your course.

2. On the **Settings** menu, select **Schedule & Details**.

3. On the **Schedule & Details** page, locate the **Requirements** section.

4. Under **Prerequisite Course**, select a course from the list.

5. Select **Save Changes**.

Note: Currently, you can specify only one prerequisite course.

For more information about prerequisite courses, see *Prerequisite Courses*.

Require an Entrance Exam

To require an entrance exam, follow these steps.

1. In Studio, open your course.

2. On the **Settings** menu, select **Schedule & Details**.

3. On the **Schedule & Details** page, locate the **Requirements** section.

4. Select the **Require students to pass an exam before accessing course materials** option.

5. Select **Save Changes**.

After you save your changes, Studio automatically creates an **Entrance Exam** section in your course outline. To add content to your entrance exam, go to the course outline.

Create an Entrance Exam

You create your course entrance exam from the course outline in Studio. Creating entrance exam content is just like creating other course content. For more information, see *Adding Course Components*.

Adjust Scores in the Entrance Exam

If you find an error in the exam after learners have taken it, and corrections to the exam are unavoidable, you have several options to rescore the exam for individual learners. These options are available on the instructor dashboard.

In the LMS, select **Instructor** to access the instructor dashboard, and then select **Student Admin**. In the **Entrance Exam Grade Adjustment** section, the following options are available.

- **Reset Student Attempts**: Reset the value for one particular learner's attempts back to zero so that the learner can begin work over again. For more information, see *Reset Learner Attempts for a Problem*.

- **Rescore Student Submission**: Rescore the responses that a learner has submitted. For more information, see *Rescore Learner Submissions for a Problem*.

- **Delete Student State for Problem**: Delete a learner's entire history for the exam from the database. For more information, see *Delete a Learner's State for a Problem*.

Another option on the instructor dashboard is **Show Background Task History for Student**. If you reset learner attempts, rescore learner submissions, or delete learner state, the operation runs in the background. If you want to see a record of all the operations that have run for the entrance exam, select **Show Background Task History for Student**.

6.3.5 Creating a Course About Page in Studio

The course About page, sometimes called the course summary page, provides information about your course to learners. Learners can see the About page before they enroll in the course.

You add the contents of your course About page in Studio. For more information, see one of the following topics.

- *Describe Your Course*
- *Add a Course Image*
- *Add a Course About Video*
- *Set Course Effort Expectations*

Describe Your Course

Learners see a description of your course on the course About page, under the heading "About this course". The course description contains the following information about your course.

- The long course description. This description contains 150-400 words.

- Names of course staff, together with short bios and images. For best results, course staff images should be 110 x 110 px.

Additionally, a course description can contain the following information.

- Skill and knowledge prerequisites.

- Frequently asked questions.

- Available languages for text, videos, and video transcripts.

For more information about creating an effective course description, see *Course Description*.

To provide a description for your course, follow these steps.

1. From the **Settings** menu, select **Schedule & Details**.

2. In the **Introducing Your Course** section, locate the **Course Overview** field. This field contains a raw HTML template with placeholders for your course content.

3. Overwrite the placeholder content with information for your course, following the directions in the template. Do not edit HTML tags.

   If you want to include information that does not have a specific section in the template, such as languages, you can add this information in the "About This Course" section.

4. To test how the description will appear to learners, locate the text that follows the **Course Overview** field, and then select **your course summary page**.

5. Select **Save Changes**.

Add a Course Image

For more information about effective course images, see *Images and Videos for a Course or Program*.

To add a course image in Studio, follow these steps.

1. From the **Settings** menu, select **Schedule & Details**.

2. In the **Course Card Image** section, complete one of the following steps.

   - If you have not yet *added the image to the course*, select **Upload Course Card Image**, and then follow the prompts to find and upload your image.

   - If you have already *added the image to the course*, locate the text under the **Course Card Image** field, and then select **files & uploads**.

3. In the panel at the bottom of the screen, select **Save Changes**.

4. View your dashboard to test how the image will appear to learners.

Add a Course About Video

To upload a course About video, follow these steps.

1. Upload the video file to YouTube. When the file is uploaded, copy the code that appears between **watch?v=** and **&feature** in the URL. This code is the YouTube video ID.

   For example, in the following URL, **B-EFayAA5_0** is the code.

   ```
   https://www.youtube.com/watch?v=B-EFayAA5_0&feature=you.tube
   ```

2. From the **Settings** menu, select **Schedule & Details**.

3. Scroll down to the **Course Introduction Video** section.

4. In the field below the video box, enter the YouTube video ID that you copied in step 1. When you add the code, the video automatically loads in the video box.

5. When you make changes, a **Save Changes** option appears at the bottom right of the page. Select **Save Changes** after you add the course video.

6. View your course About page to test how the video will appear to learners.

Set Course Effort Expectations

The estimated effort that the course requires appears in the course About page.

To set the hours per week week estimate in Studio, follow these steps.

1. From the **Settings** menu, select **Schedule & Details**.

2. In the **Requirements** section, locate the **Hours of Effort per Week** field.

3. Enter the number of hours you expect learners to work on this course each week.

   When you make changes on this page, a panel with options to save or cancel your work appears.

4. Select **Save Changes**.

5. View your course About page to test how the requirements will appear to learners.

6.3.6 Setting Up Certificates in Studio

This section describes how to create and manage certificates for your course.

- *Overview*
- *Enable a Certificate*
- *Create a Certificate*
- *Edit a Certificate*
- *Specify a Different Course Title*
- *Specify a Different Course Number*
- *Specify a Different Certificates Available Date*
- *Delete a Certificate*
- *Preview Certificates*
- *Activate a Certificate*
- *Deactivate a Certificate*
- *Manage Certificate Images*

Note: Before you can issue certificates, the administrator for your instance of Open edX must configure the platform to allow course teams to generate and issue certificates. For more information, see Enabling Course Certificates in *Installing, Configuring, and Running the Open edX Platform*.

For more information about certificates, see these additional topics.

- *Obtaining Certificate Data*
- *Ending a Course*

For information about awarding badges for your course, see *Enable or Disable Badges for Your Course*.

Overview

Using Studio, you create and manage the certificates that learners can earn in your course.

The platform can automatically generate certificates as each learner passes the course for both self-paced and instructor-paced courses.

- For self-paced courses, certificates are available immediately after they are generated.

- For instructor-paced courses, certificates become available 48 hours after your course end date by default. You can also specify a different date to make certificates available. For more information, see *Specify a Different Certificates Available Date*.

When certificates become available, options for learners to view their certificates are available on the learner dashboard, the learner **Profile** page, and the course **Progress** page.

For more information about issuing certificates, see *Issuing Certificates*.

The design of certificates for your course, including your institution's logo, are configured on your instance of Open edX. For more information, see Enabling Course Certificates in *Installing, Configuring, and Running the Open edX Platform*.

Note: If your course is configured to issue certificates, you cannot start the course until the required certificates are *activated*.

For information about starting the course, see *Guidelines for Start and End Dates*.

Enable a Certificate

Before you can create certificates, you must ensure web certificates are enabled for your course. Web certificates are enabled by default for new courses, however older courses may need to have them enabled.

1. From the **Settings** menu, select **Advanced Settings**.

2. Click **Show Deprecated Settings**.

3. In the **Certificate Web/HTML View Enabled** field, enter `true`.

4. At the bottom of the page, select **Save Changes**.

In addition to enabling web certificates for your course, you have to add a course mode for the course you wish to create a certificate for.

1. Access the LMS Django Administration website for your instance of Open edX. To do this, go to `https://<host name of your Open edX instance>/admin`. For example, this might be `https://courses.YourOrganization.com/admin`.

2. Under **Course Modes > Course modes**, add a new course mode for course you want to create a certificate for.

Note: Different certificate types are available with the different course modes.

See *enrollment track* for more information about different course modes or certificate types.

Create a Certificate

To create a certificate for your course, follow these steps.

1. In Studio, from the **Settings** menu, select **Certificates**.

2. On the **Certificates** page, select **Add your first certificate** or **Add a new certificate**.

3. Add a signatory for each person associated with the course or organization whose name and title you want to appear on the certificate. You must specify at least one signatory. You can add as many signatories as needed.

5. Optionally, upload an image file showing the signature of each signatory.

   The image file must be a transparent .png file, 450px by 150px.

6. When you have finished creating your certificate, select **Create**.

   You can *preview the certificate* to see how it will appear to a learner taking the course in the selected mode.

   Your course certificate is not available for issuing to learners until it is *activated*.

Edit a Certificate

You can edit certificates before and after they are activated.

Only course team members with the Staff or Admin role can edit activated certificates.

> **Caution:** As a best practice, do not make changes to certificates in a running course if it is possible that certificates have already been issued to learners, because different learners might be awarded certificates with different details for the same course.
>
> If you must edit an activated certificate, you should *deactivate* the certificate before making changes to it.

To edit a certificate, follow these steps.

1. In Studio, from the **Settings** menu, select **Certificates**.

2. On the **Certificates** page, at the top of the certificate form, select the **Edit** icon.

3. When you have finished editing the certificate, select **Save**.

   After you save your changes, you can *preview the certificate* to make sure it appears as you want it to. You then need to *activate the certificate* before certificates can be issued.

Specify a Different Course Title

Optionally, you can specify an alternative course title to use on the certificate. You might want to use a different title on your course certificates if, for example, the official course name is too long to fit on the certificate.

1. In Studio, from the **Settings** menu, select **Certificates**.

2. On the **Certificates** page, at the top of the certificate form, select the **Edit** icon.

3. In the **Course Title Override** field, enter the alternative title for your course.

4. Select **Save**.

You can also specify an alternative course number. To do this, see *Set a Course Number Override*.

Specify a Different Course Number

Optionally, you can specify an alternative course number to use on the certificate.

You might want to use a different number on your course certificates if, for example, the official course number is meaningful only within your institution.

1. In Studio, select **Settings**, and then **Advanced Settings**.

2. Locate the **Course Number Display String** field. This field contains the course number you set to override the official course number on certificates.

3. Between quotation marks (" "), enter the course number you want displayed on certificates.

4. Select **Save Changes**.

   A message lets you know whether your changes were saved successfully.

Specify a Different Certificates Available Date

By default, certificates become available to learners 48 hours after your course ends. You can also specify a different date to make certificates available.

1. In Studio, open your course.

2. On the **Settings** menu, select **Schedule & Details**.

3. In the **Course Schedule** section, enter the date and time when you want to issue certificates in the **Certificates Available Date** and **Certificates Available Time** fields.

Delete a Certificate

You can delete a certificate that is not activated.

> **Caution:** Do not delete a certificate after the course has started. A learner who has already earned a certificate will no longer be able to access it.

To delete a certificate, follow these steps.

1. In Studio, from the **Settings** menu, select **Certificates**.

2. On the **Certificates** page, at the top of the certificate form, select the "Delete" icon.
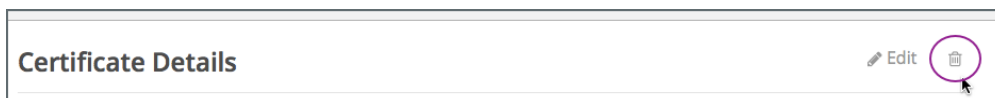
3. In the confirmation dialog, confirm that you want to delete the certificate.

Preview Certificates

After you have finished editing your certificate, you can preview a certificate for verification purposes. You select from the available course modes (such as "verified") to see how a certificate will appear to a learner taking the course in the selected mode.

1. In Studio, from the **Settings** menu, select **Certificates**.

2. On the **Certificates** page, select the course mode of the certificate you want to preview, then click **Preview Certificate**.

   You see the web view for the certificate, as a learner in the selected course mode would see it.

After previewing the certificate, you can *edit the certificate* further or *activate your certificate*.

Activate a Certificate

When you have verified your certificate, a course team member with the Admin or Staff role can activate the certificate.

Note: Course team members without the Admin or Staff role cannot activate a certificate.

To activate a certificate, follow these steps.

1. Make sure that you have the Admin or Staff role for the course. For more information, see *Planning Course Staff*.

2. In Studio, on the **Settings** menu, select **Certificates**.

3. On the **Certificates** page, select **Activate**.

After certificates are activated, learners in your course who attain a passing grade or otherwise qualify receive certificates.

Deactivate a Certificate

In some situations, after you have activated a certificate, you might need to deactivate the certificate to make changes.

As a best practice, do not make changes to certificates in a running course if the course has already issued certificates to learners.

To deactivate a certificate, follow these steps.

Note: Only course team members that have the Admin or Staff role can deactivate a certificate.

---

1. Make sure that you have the Admin or Staff role for the course. For more information, see *Planning Course Staff*.

2. In Studio, on the **Settings** menu, select **Certificates**.

3. On the **Certificates** page, select **Deactivate**.

The certificate is no longer active and the course team can edit it. No new certificates can be issued to learners while it is deactivated. Learners who have already been issued certificates can continue to access them.

Manage Certificate Images

When you add signatory image files to a certificate, the uploaded files are listed in Studio on the **Files & Uploads** page.

When you delete a certificate, images that you uploaded for use with that certificate are also deleted. However, if you edit a certificate and replace images, the unused image files remain on the **Files & Uploads** page. You can manually remove unused images. For information, see *Delete a File*.

Enable or Disable Badges for Your Course

Badges provide a way for learners to share their course achievements. For courses that have course completion badges enabled, learners receive a badge at the same time as they receive a course certificate, and have the option of sharing their badges to a badging site such as Mozilla Backpack.

The Open edX platform supports Open Badges, an open standard developed by the Mozilla Foundation. For more information about Open Badges, see the Open Badges web site.

If badging is enabled for your platform, course completion badges are enabled by default for your course. If you are unsure whether badging is enabled for your platform, or if you need help with configuring your course badges, contact your platform administrator.

To stop issuing badges in your course, follow these steps.

1. In Studio, from the **Settings** menu, select **Advanced Settings**.

2. Locate the **Issue Open Badges** policy key. The default value is `True`.

3. Change the setting to `False` and save your changes.

To enable badging for your course if it was previously disabled, change the value of the key to `True`.

6.3.7 Course Search

Learners can search much of the content of your course, including the course title, description, text, and video transcripts. Learners can search inside individual courses, or they can search all the courses that they are enrolled in at one time. When learners search all their courses at one time, they can filter search results based on course subject, type, and language.

Before learners can search your course, Studio must index your course content. Studio indexes your course content automatically every time you make a change to the content. You can also manually begin an indexing operation in Studio. To do this, select **Reindex** in the upper right corner of the **Course Outline** page.

The search engine returns not only exact matches for search terms, but also matches that contain the search term. These matches must contain the entire search term. For example, a search for "grade" returns results for "grades" and "graded", but a search for "graded" would not return "grade" or "grades".

When the search engine returns results, either for an individual course or across all courses, learners can select any search result to view that result in the course body.

For more information about the learner experience, see Searching the Course.

Note: Studio indexes most content that learners see on the **Course** page. However, Studio does not index course exercises and problems, including homework and exam problems. Studio also does not index course handouts or discussions. However, learners can search course discussions by using the **Search all posts** field on the **Discussions** page.

6.3.8 Creating a Custom Course

This topic describes custom courses on the edX platform (CCX).

Section Contents

- *Overview*
- *Custom Courses and Roles*
- *Enable Custom Courses for an Existing Course*
- *Add a CCX Coach*
- *Create the Custom Course*
- *The CCX Coach Dashboard*

Overview

You can create a custom course in the edX platform (CCX) to reuse course content. By using a CCX, you can run some or all of an existing course for a group of learners on a new schedule.

A CCX can contain only content from an existing course; you cannot author new content in a CCX.

Custom Courses and Roles

There are three roles involved in creating and running a CCX.

- **Admins** create the existing course and have privileges to create CCX coaches for their course.

- **CCX Coaches** select content from the existing course for the CCX. CCX coaches also enroll learners, set start and due dates for their scheduled content, and manage the grading policy for the CCX.

- **Learners** take the CCX and view the selected content on the specified schedule.

Enable Custom Courses for an Existing Course

CCX for a course is disabled by default.

You enable CCX in Studio. Ensure you have access to the course in Studio, then complete the following steps.

1. In Studio, from the **Settings** menu, select **Advanced Settings**.

2. Find the `Enable CCX` key and change the value to `true`.

3. Select `Save Changes`.

You can now add a CCX coach.

Add a CCX Coach

The first step to create a CCX is to create a CCX coach in an existing course. A CCX can have only one CCX coach.

You add a CCX coach through the Instructor Dashboard in the LMS. Ensure you have the Admin role in the course.

In addition, ensure that the user whom you would like to add as a CCX coach has registered in the LMS.

1. In the LMS, select **Instructor**, and then select **Membership**.

2. In the **Course Team Management** section, from **Select a course team role**, select **CCX Coaches**.

3. Enter the CCX coach's username or email address and select **Add CCX Coach**.

The user is added as a coach and enrolled in the course if she is not already enrolled.

If she's enrolled when she's added as a CCX coach, the coach will get an email to let her know.

When the CCX coach next logs into the LMS, the **CCX Coach** tab will be visible. The CCX coach dashboard is not accessible by course team members with other roles.

Create the Custom Course

When you have been made the CCX coach for a course, you can then access the course and create a CCX.

1. In the LMS, select the **CCX Coach** tab.

2. From the CCX coach Dashboard, enter the name for your CCX, then select **Coach a new Custom Course for edX**.

3. When the CCX is created, you are re-directed to the full CCX coach Dashboard.

Note: When entering a CCX name, consider that the name should distinguish your CCX from other CCXs based on the same course.

You can revisit your CCX by opening the original course and selecting the `CCX Coach` tab.

The CCX Coach Dashboard

The CCX coach Dashboard provides the tools for you to manage the CCX. The CCX coach Dashboard contains four tabs, described in the following sections.

Note: CCX coaches do not have the same level of access and control over content that team members with the Admin or Staff roles do, and do not have access to the Instructor Dashboard.

Schedule Tab

On the **Schedule** tab, you select the course content from the original course that is to be included in the CCX.

Use the drop-down lists to drill down through the course content and select an items from the content hierarchy. You then add those items in the order needed.

Select **add all units** to include all of the source course's content.

You can configure each unit to have its own start and due dates. You can select these before or after you add the unit to the CCX . After units are added, you can edit their start and due dates by hovering over or selecting that space on the CCX content hierarchy.

Select **Save changes** to save the content you configured.

Enrollment Tab

On the **Enrollment** tab, you can invite learners to a course, enroll learners in a course automatically, and remove learners from a course.

- To invite one or more learners to a course, enter one or more email addresses or usernames in the **Batch Enrollment** field, and then select **Enroll** under the field.

Note: If you want to enroll these learners automatically, select **Auto Enroll** under the **Batch Enrollment** field.

If you want these learners to receive an email invitation to the course, select **Notify users by email**. Learners are automatically enrolled in the course when they access the invitation.

- To remove learners from the course, use one of the following methods.

  - If the learner or learners are enrolled in the course and have active accounts on the Open edX instance, locate the username or email address for each learner in the **Student List Management** list, and then select **Revoke access** for that learner.

    Note: The **Student List Management** list contains only learners who are enrolled and have an active account.

  - If the learner or learners are enrolled in the course but do not have active accounts on the Open edX instance, enter the email addresses or usernames for the learners in the **Batch Enrollment** field, and then select **Unenroll** under the field.

Student Admin Tab

You use the **Student Admin** tab to view the gradebook and download learner grades.

Grading Policy Tab

Use the **Grading Policy** tab to modify the grading policy for the CCX.

A CCX coach can modify the grading policy of the underlying course for their CCX.

Note: As a CCX coach, you can modify the grading policy of the original course on which the CCX was based. Only attempt this if you are confident that you understand how your changes will affect grading. Modifying the grading policy can make your CCX unusable.

The grading policy is in JSON format. Verify that it is well-formed before selecting **Save Grading Policy**.

For information about how to develop your course content in the Studio course outline, see *Developing Your Course*.

DEVELOPING YOUR COURSE

Use the topics in this section to understand how to develop your course content in the Studio Outline page.

For information on building specific course component types, see *Adding Course Components*.

For information on creating exercises and tools, see *Adding Exercises and Tools*.

For information on creating content libraries from which you can randomly draw content for randomized assigments, see *Working with Content Libraries*.

7.1 Getting Started with Course Content Development

When you have finished *setting up your course*, you are ready to build your course content.

This section provides an outline of the steps involved in developing your course content, with links to more details.

- *Understanding Course Building Blocks*
- *Creating New Course Content*
- *Making Course Content Visible to Students*
- *Revising Content*

7.1.1 Understanding Course Building Blocks

Before you begin, you should understand the building blocks of an edX course.

- *The course outline* is the container for all of your course content. The outline contains one or more sections.
- *Course sections* are at the top level of your course and typically represent a time period. A section contains one or more subsections.
- *Course subsections* are parts of a section, and usually represent a topic or other organizing principle. A subsection contains one or more units.
- *Course units* are lessons in a subsection that learners view as single pages. A unit contains one or more components.
- *Course components* are objects within units that contain your actual course content.

7.1.2 Creating New Course Content

Once you understand the way edX courses are structured, you can start organizing your content and entering it into Studio.

You create *sections*, *subsections*, and *units* in the *course outline*.

For graded subsections, you also *set the assignment type and due date*.

You *create components* in the unit page.

In addition, you *control content visibility* by setting release dates on the outline and publishing units.

The following diagram summarizes the content creation workflow:
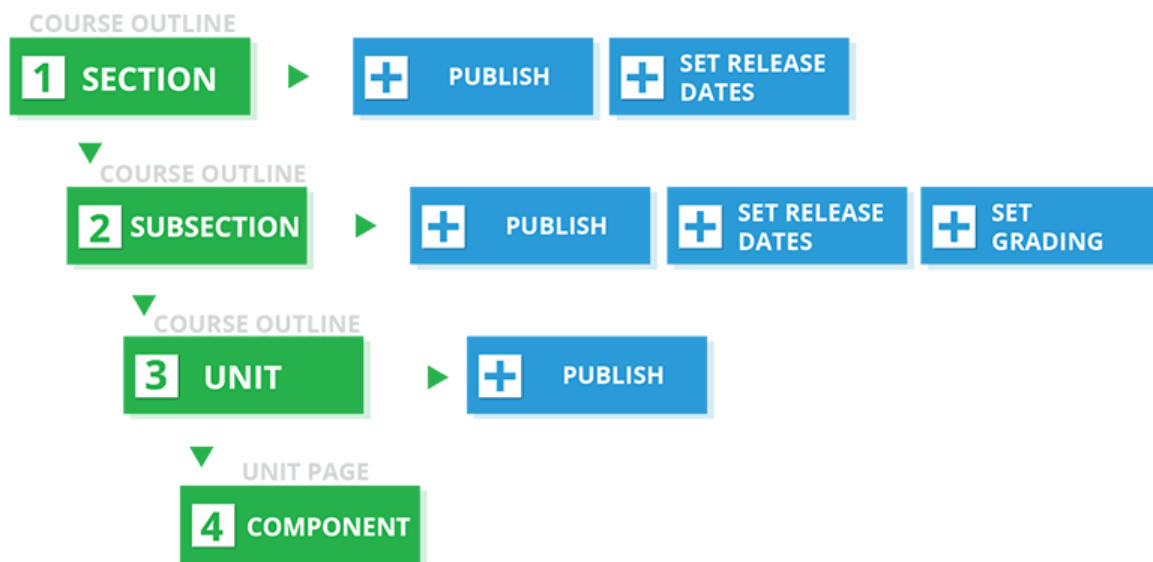
It is recommended that you *test course content* throughout the creation process, including making sure that the content is available for learners who access courses using the edX mobile apps. For more information, see *Designing Your Course For a Mobile Experience*.

Note: Keep in mind that course updates that you make might take longer to appear in the edX mobile apps than on the edX site. In particular, newly published content can take up to an hour to update on the Android app.

7.1.3 Making Course Content Visible to Students

Course content visibility depends on the following factors.

- The *course start date*.
- The release dates of the *section* and *subsection*.
- The *prerequisite subsections* that you configure.
- The *publishing status* of the unit.
- The *Hide content from learners* setting.
- The *content groups* or enrollment track groups that you have allowed to access the content.

- The use of the *Results Visibility* setting.

For more information, see *Controlling Content Visibility and Access*.

7.1.4 Making Course Content Searchable

Learners can search course text in *Text components* and video transcripts by using the **Search** box at the top of the **Course** page.

Before learners can search your course, Studio must index the content. Studio indexes all new course content automatically when you *publish* the content.

If necessary, you can manually reindex all of the content in your course at any time. Typically, you would only manually reindex your course content if learners see unexpected search results. To reindex your course content, select **Reindex Content** at the top of the **Course Outline** page. Reindexing usually takes less than 30 seconds.

7.1.5 Revising Content

You can revise your course content at any time.

- When you *reorganize sections, subsections, and units* in the outline, the new order is immediately visible to learners if the section and subsection are released.

- When you *edit a unit*, or *components* within a unit, you must *publish* those changes to make them visible to learners.

The following diagram summarizes the content revision workflow and content visibility:
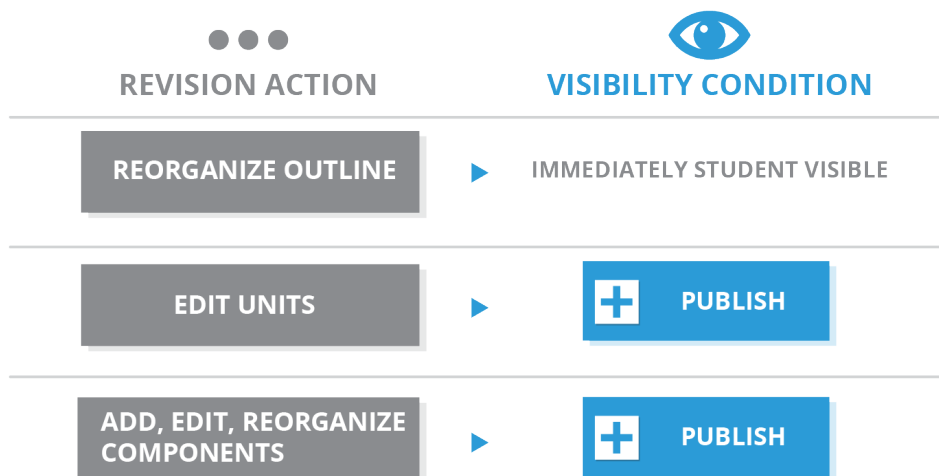
It is recommended that you *test course content* during the revision process, including making sure that the content is available for learners who access courses using the edX mobile apps. For more information, see *Designing Your Course For a Mobile Experience*.

Note: Keep in mind that course updates that you make might take longer to appear in the edX mobile apps than on the edX site. In particular, newly published content can take up to an hour to update on the Android app.

7.2 Developing Your Course Outline

As you develop your course, you work primarily in the edX Studio course outline. This section includes the following information about working with the course outline.

- *Open the Course Outline*

- *Understanding a Course Outline*

- *Navigate the Course Outline*

- *Add Content in the Course Outline*

- *Modify Settings for Objects in the Course Outline*

- *Publish Content from the Course Outline*

- *Reorganize the Course Outline*

- *Delete Content in the Course Outline*

See the following sections for information about working with the course building blocks in the course outline.

- *Developing Course Sections*

- *Developing Course Subsections*

- *Developing Course Units*

- *Developing Course Components*

7.2.1 Open the Course Outline

To view the course outline, follow these steps.

1. Sign in to edX Studio.

2. On the **My Courses** page, select the course you want to develop.

   The course outline opens by default when you open a course.

To open the outline when you are working in a course, from the **Content** menu, select **Outline**.

The first time you view an outline for a course, it contains no content. The following message is visible.

```
You haven't added any content to this course yet.
```

To add content, you *create a section*.

7.2.2 Understanding a Course Outline

Course authors build a course outline on the **Course Outline** page in Studio. Learners see this course outline in the LMS.

To view the course outline in the LMS, go to the **Course Outline** page in Studio, and then select either **Preview** or **View Live**.

In the following image, the Studio view of the course outline is on the left. On the right is the view of the course outline in the LMS.

The numbers represent the following levels.

1. *Sections*

2. *Subsections*

3. *Units*

Note: The **Course Outline** page does not show *components*. You add or access components by selecting the units that contain the components.

Course Progress Information

The course outline in the LMS also indicates a learner's progress through the course. A green check mark next to the name of a section, subsection, or unit indicates that a learner has completed all the following actions in the section, subsection, or unit.

- Viewed all of each video.

- Submitted answers for all of the problems.

- Viewed all HTML content for at least five seconds.

If a learner selects the **Resume Course** option, the course opens to the unit that the learner most recently completed.

For information about more specific learner data, including the learner's grades or answers for individual problems, see *Managing Learner Progress and Grades*.

7.2.3 Navigate the Course Outline

In Studio, you navigate the course outline by expanding and collapsing sections and subsections. Use the "drop-down" icon next to a section or subsection name to expand or collapse its contents.

When you expand a subsection, all units in the subsection are visible.
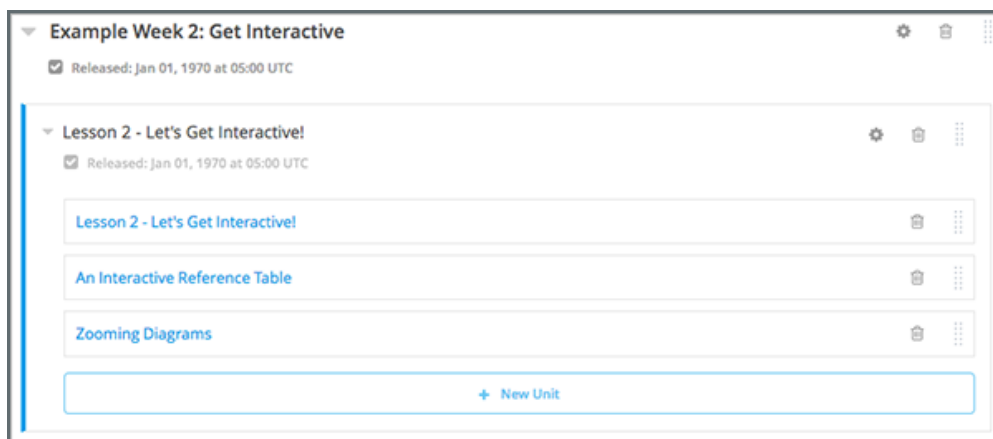
Select the name of a unit to open the *unit page*.

7.2.4 Add Content in the Course Outline

You can add content in the course outline by creating a new section, subsection, or unit, or by duplicating an existing unit, subsection, or section.

For information about adding content to a unit, see *Developing Course Components*.

Note: If you want to require an entrance exam for your course, you also create the exam in the course outline. Before you can create an exam, you must set your course to require an entrance exam in Studio. For more information, see *Require an Entrance Exam*.

Adding New Sections, Subsections, or Units

- To add a section to the outline, select **New Section**. This option appears at both the top of the page and below the current sections in the outline. For more information, see *Create a Section*.

- To add a subsection to the end of the section, expand the section and select **New Subsection**.

- To add a unit to the end of a subsection, expand the subsection and select **New Unit**. The *unit* page opens.

Duplicating Existing Sections, Subsections, or Units

To add a section, subsection, or unit by duplicating content that already exists in the course outline, select the **Duplicate** icon for the item that you want to duplicate. You see a **Duplicating** indicator at the bottom of the Studio page.

Duplicated items are added to the course outline immediately below the original item, with the name "Duplicate of <original item name>".

Note: Duplicated items inherit the release date of the item that they are duplicated from, but you must explicitly publish duplicated subsections and units before they are visible to learners. For more information about release statuses and visibility of sections to learners, see *Sections and Visibility to Learners*.

7.2.5 Modify Settings for Objects in the Course Outline

You modify settings for sections, subsections, and units in the course outline. Specifically, you can complete the following tasks.

- *Set a Section Release Date*
- *Hide a Section from Learners*
- *Set a Subsection Release Date*
- *Set the Assignment Type and Due Date for a Subsection*
- *Hiding a Subsection from Learners*
- *Hide a Unit from Learners*

To modify settings for a section, subsection, or unit, select the **Configure** icon for that object. In the following example, the **Configure** icon is circled for a section, a subsection, and two units.
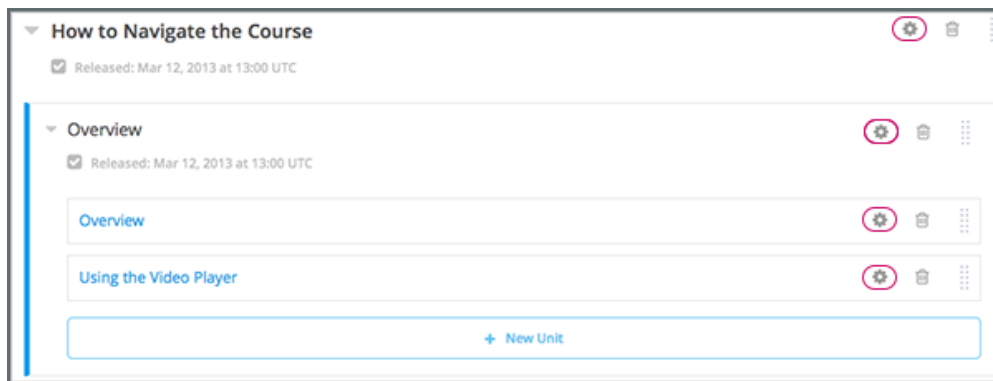
For more information, see the links above.

7.2.6 Publish Content from the Course Outline

You can publish new and changed units for an entire section or subsection. You can also publish individual units.

To publish new and changed units, select the **Publish** icon for a section, subsection, or unit. In the following example, the **Publish** icon is circled for a section, subsection, and unit.
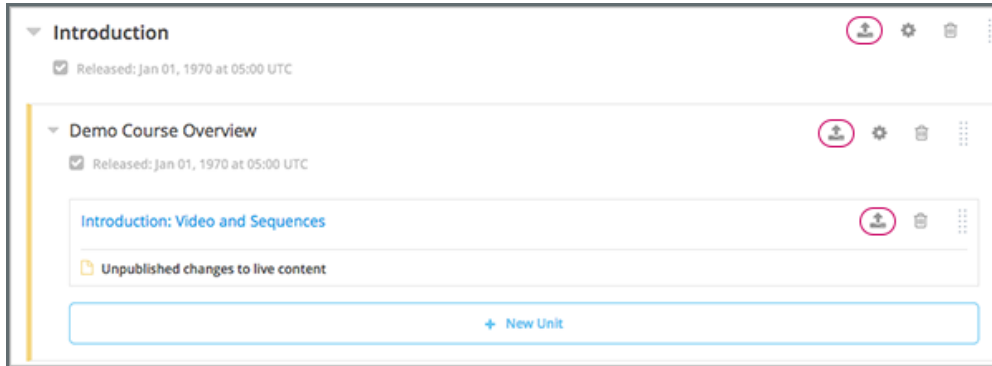
Note: The **Publish** icon only appears when there is new or changed content within the object.

For more information, see the following topics.

- *Unit Publishing Statuses*
- *Publish All Units in a Section*
- *Publish All Units in a Subsection*
- *Publish a Unit*

7.2.7 Reorganize the Course Outline

You can reorganize your course content by dragging and dropping sections, subsections, and units to new locations in the outline.

You can reorganize components by dragging and dropping them within the same unit, or by moving them from one unit to another unit. For more information, see *Reorganizing Components*.

To drag a section, subsection, or unit to another position in the course outline, move your cursor over the handle on the right of the object's box until the cursor changes to a four-headed arrow. For example, in the image below, the handle for the subsection Lesson 1 - Getting Started is selected.
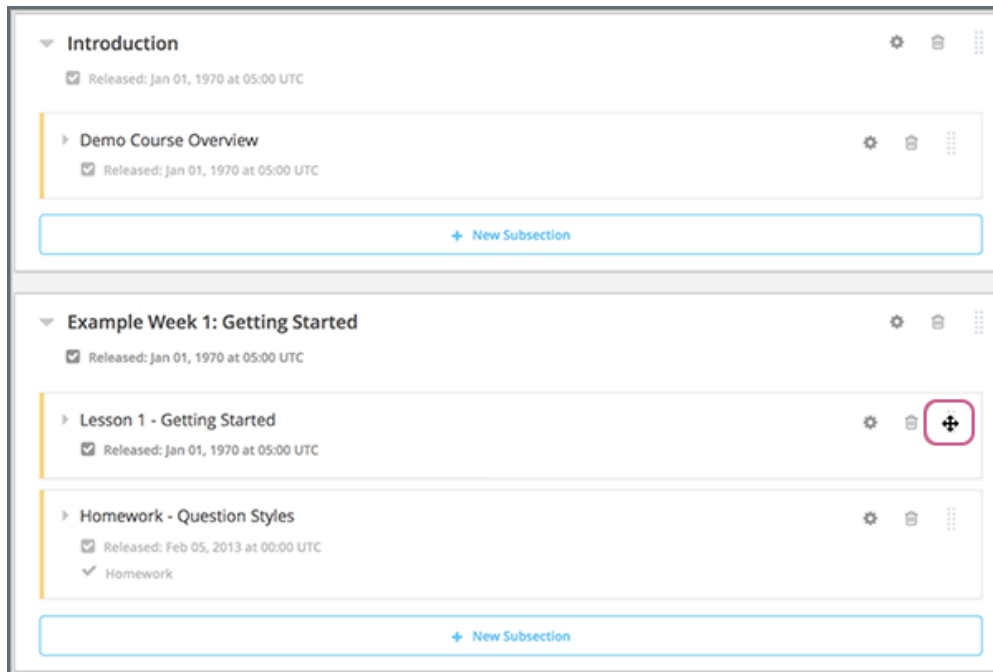
Then, select and drag the object to the location that you want.

If you expanded the section or subsection you are moving the object to, when you move the object, a blue line indicates where the object will land when you release the mouse button. For example, in the image below, the subsection Lesson 1 - Getting Started is being moved to the end of the section Introduction.
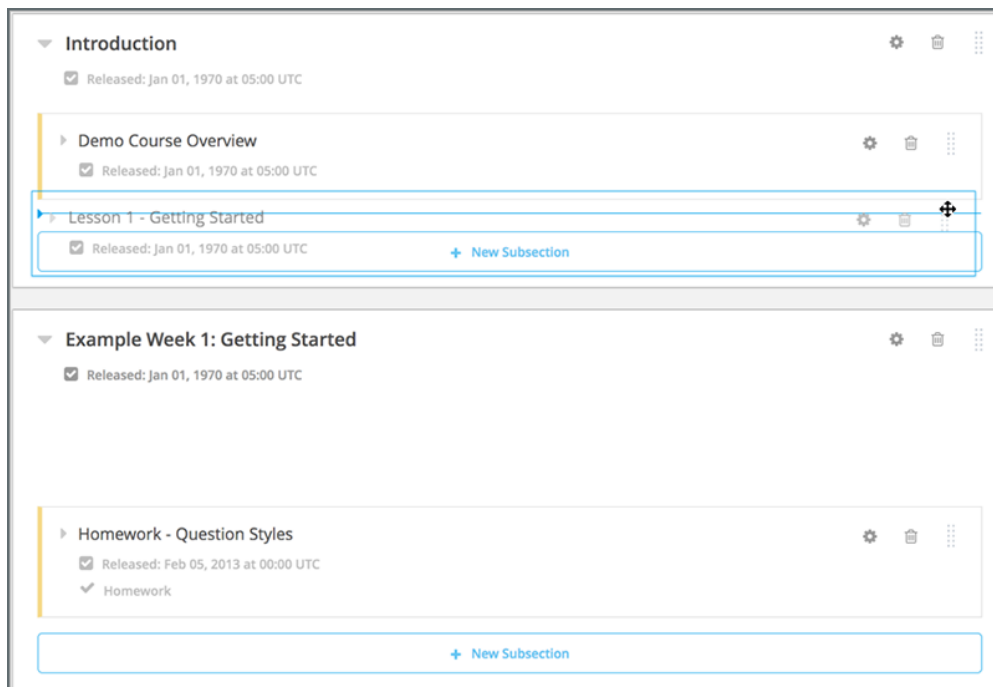
If you did not expand the section or subsection you are moving the object to, the outline of that section or subsection turns blue when you have moved the object to a valid location. You can then release the mouse button. For example, in the image below, the subsection Lesson 1 - Getting Started is being moved to the collapsed section Introduction.
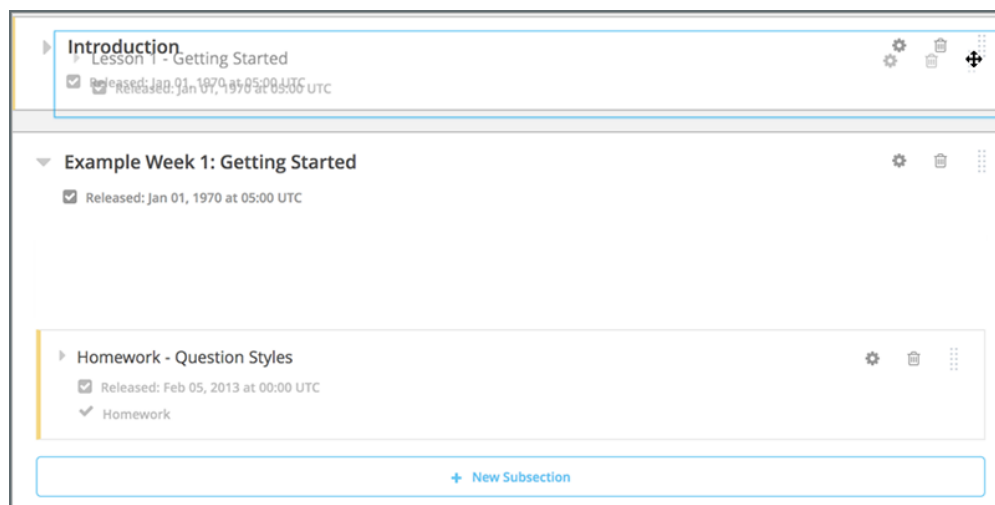
Note: When you move a subsection to a different section, the release date and time for that subsection does not change.

7.2.8 Delete Content in the Course Outline

You delete sections, subsections, and units from the course outline.

Warning: You cannot restore course content after you delete it. To ensure you do not delete content you may need later, you can move any unused content to a section in your course that you set to never release.

Select the **Delete** icon in the box for the object you want to delete.
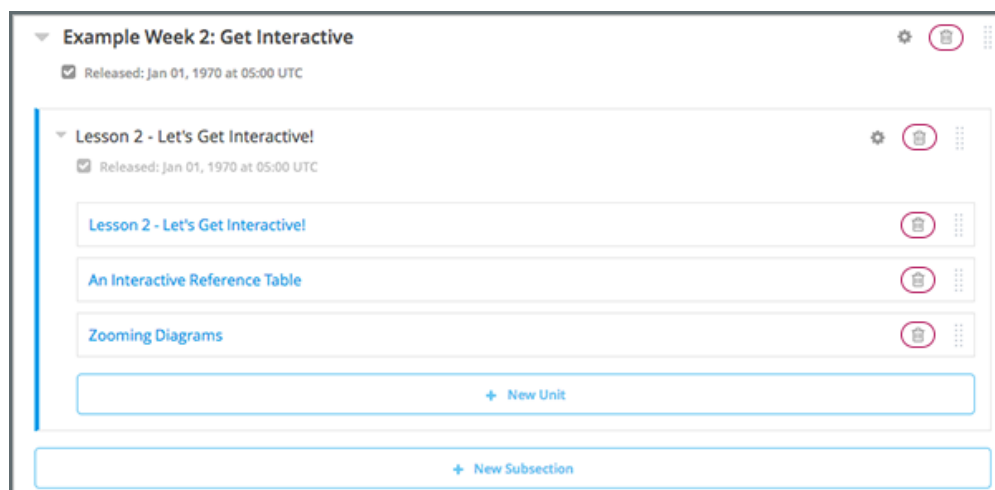
You are prompted to confirm the deletion.

Note: When you delete an object, all objects that it contains are deleted. For example, when you delete a subsection, all units in that subsection are deleted.

7.3 Developing Course Sections

To develop sections in your course, you must first understand the following topics.

- *What Is a Section?*
- *Viewing Sections in the Outline*
    - *Course Progress Information*
- *Sections and Visibility to Learners*
- *Release Statuses of Sections*
    - *Unscheduled*
    - *Scheduled*
    - *Released*
    - *Released with Unpublished Changes*
    - *Staff Only Content*
- *Create a Section*
- *Change a Section Name*
- *Set a Section Release Date*
- *Set Section Highlights for Highlight Emails*
    - *Send Highlight Emails*
- *Publish All Units in a Section*
- *Hide a Section from Learners*
- *Delete a Section*

7.3.1 What Is a Section?

A section is the topmost category in your course. A section can represent a time period in your course, a chapter, or another organizing principle. A section contains one or more subsections.

7.3.2 Viewing Sections in the Outline

In the following image, the Studio view of the course outline is on the left. On the right is the view of the course outline in the LMS.

The numbers represent the following levels.

1. *Sections*

2. *Subsections*

3. *Units*

Note: The **Course Outline** page does not show *components*. You add or access components by selecting the units that contain the components.

Course Progress Information

The course outline in the LMS also indicates a learner's progress through the course. A green check mark next to the name of a section, subsection, or unit indicates that a learner has completed all the following actions in the section, subsection, or unit.

- Viewed all of each video.

- Submitted answers for all of the problems.

- Viewed all HTML content for at least five seconds.

If a learner selects the **Resume Course** option, the course opens to the unit that the learner most recently completed.

For information about more specific learner data, including the learner's grades or answers for individual problems, see *Managing Learner Progress and Grades*.

7.3.3 Sections and Visibility to Learners

Learners cannot see any content in a section if the section's release date is unscheduled or has not passed.

If a section's release date has passed, learners can see content in the section if:

- The release date for the subsection that contains that content has passed.

- The unit has been published.

- The unit is not hidden from learners.

7.3.4 Release Statuses of Sections

As an course author, you control the release status of sections. For the content of a section to be visible to learners, the section must be released. See the following topics for more information about the possible release statuses of sections.

- *Unscheduled*

- *Scheduled*

- *Released*

- *Released with Unpublished Changes*

- *Staff Only Content*

Unscheduled

If you do not change the *course start date* default value, `1/1/2030 00:00:00` UTC, when you create a new section, its release date will appear as `Unscheduled`. When the section release date is unscheduled, learners cannot see any content in that section, regardless of the publishing status of that content.

If you have modified the course start date, when you create a new section, the default release date is the course start date.

To make the content available to learners, you must schedule the release date.

Scheduled

A section that is scheduled for release on a future date will not be visible to learners until after the release date. Regardless of the publishing status of content within the section, the entire section will not be visible to learners.

The scheduled date must pass for the section to be visible to learners.

Released

A section that is released is visible to learners; however, learners see only subsections within the section that are also released, and units that are published.

Released with Unpublished Changes

If you change a unit in a released section but do not publish the changes, learners see the last published version of the modified unit.

You must publish the unit for learners to see the updates.

Staff Only Content

A section can contain a unit that is hidden from learners and available to members of the course team only. That unit is not visible to learners, regardless of the release date of the section or subsection.

7.3.5 Create a Section

If you do not change the *course start date* default value, `1/1/2030`, when you create a new section, its release date will be `Unscheduled`.

If you have modified the course start date, when you create a new section, the default release date is the course start date.

Caution: If the course start date is in the past, newly created sections are immediately visible to learners.

To create a new section, follow these steps.

1. On the **Course Outline** page, select **New Section**. This option appears at both the top of the page and below the current sections in the outline.

   A new section appears at the end of the course content, with the section name selected.

2. Enter the name for the new section. A descriptive name can help learners locate content in the course. It can also help you select content when you analyze performance in edX Insights.

3. *Add subsections* to the new section as needed.

It is recommended that you *test course content* as you create new sections.

7.3.6 Change a Section Name

To edit a section name, move your cursor over the section name to show the **Edit** icon.

Select the **Edit** icon next to the section name. The name field becomes editable. Enter the new name, and then tab or click outside of the field to save the name.

7.3.7 Set a Section Release Date

To set the section release date, follow these steps.

1. Select the **Configure** icon in the section box.

> Released Section
>
> ☑ Released: Jan 01, 2014 at 00:00 UTC

The **Settings** dialog box opens.

2. Enter the release date and time for the section.

Note: The time that you set is in Coordinated Universal Time (UTC). You might want to verify that you have specified the time that you intend by using a time zone converter such as Time and Date Time Zone Converter.

---

1. Select **Save**.

For more information, see *Release Dates*.

7.3.8 Set Section Highlights for Highlight Emails

If your Open edX system adminstrator has configured your instance of the Open edX platform to send course highlight emails, you can send automatic email messages to learners in your course that contain three to five "highlights" of upcoming course content. A highlight is a brief description of an important concept, idea, or activity in the section. Your Open edX system administrator provides the template for this course highlight email, and you enter the highlights for the email in Studio.

For more information, contact your Open edX system administrator.

Note: The highlights that you specify persist when you re-run your course.

Send Highlight Emails

To send highlight emails to your learners, you must first set highlights for each section. When you have set section highlights, you then enable the **Course Highlight Emails** setting.

The number of highlights that you have set for a section is visible in the course outline, below the name of the section.

> ▼ Introduction
>
> ❸ Section Highlights
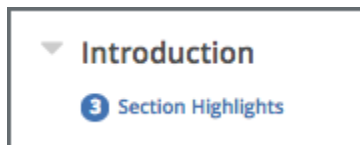
Set Course Section Highlights

Note: If your Open edX system adminstrator has not configured your instance of the Open edX platform to send course highlight messages, learners do not receive messages even if you enable highlights and enter highlights for each section.

To set highlights for a course section, follow these steps.

1. On the **Course Outline** page, locate the section you want, and then select **Section Highlights** under the section name.

2. In the **Highlights for <section name>** dialog box, enter three to five highlights for the section. Enter one highlight in each field. Each highlight can include up to 250 characters.

3. Select **Save**.

Enable Highlight Emails

After you have set and reviewed the highlights for each course section, you enable highlight emails.

To enable highlight emails, follow these steps.

1. On the **Course Outline** page, locate the **Course Highlight Emails** setting, and then select **Enable Now**.

2. In the dialog box that opens, select **Enable**.

Note: If you do not enable highlights, the edX platform does not send course highlight emails, even if you enter highlights for one or more sections.

You cannot disable highlight emails after you enable them. If you do not want to send highlight emails after you enable them, you can delete highlights in all sections.

7.3.9 Publish All Units in a Section

To publish all new and changed units in a section, select the **Publish** icon in the box for the section.
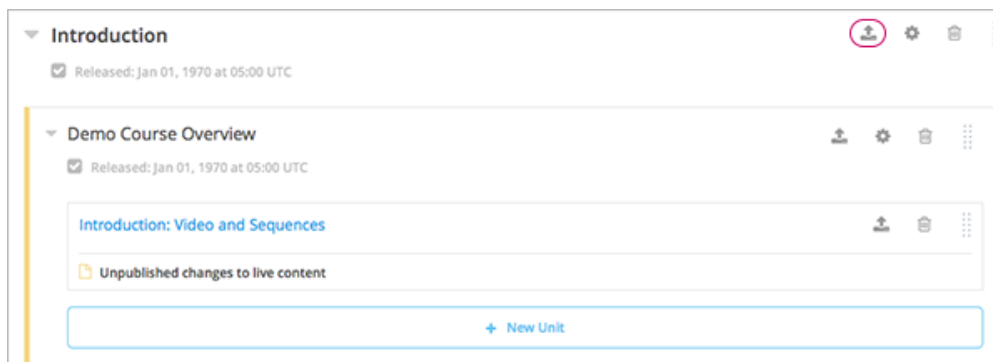
Note: The **Publish** icon only appears when there is new or changed content within the section.

For more information about statuses and visibility to learners, see *Unit Publishing Statuses*.

7.3.10 Hide a Section from Learners

You can hide all content in a section from learners, regardless of the status of subsections and units within the section.

For more information, see *Visibility Settings*.

To hide a section from learners, follow these steps.

1. Select the **Configure** icon in the section box.

   The **Settings** dialog box opens.

2. In the **Section Visibility** section, select **Hide from learners**.

3. Select **Save**.

Now, none of the content in the section is visible to learners.

To make the section visible to learners, repeat these steps and deselect **Hide from learners**.

> **Warning:** When you deselect **Hide from learners** for a section, not all content in the section is necessarily made visible to learners. If you explicitly set a subsection or unit to be hidden from learners, it remains hidden from learners. Unpublished units remain unpublished, and changes to published units remain unpublished.

7.3.11 Delete a Section

When you delete a section, you delete all subsections and units within the section.

> **Warning:** You cannot restore course content after you delete it. To ensure you do not delete content you may need later, you can move any unused content to a section in your course that you set to never release.

To delete a section, follow these steps.

1. Select the **Delete** icon in the section that you want to delete.

2. When you receive the confirmation prompt, select **Yes, delete this section**.

7.4 Developing Course Subsections

To develop subsections in your course, you must first understand the following topics.

- *What Is a Subsection?*
- *Viewing Subsections in the Outline*
    - *Course Progress Information*
- *Subsections and Visibility to Learners*
- *Release Statuses of Subsections*
    - *Scheduled with the Section*
    - *Unscheduled*
    - *Scheduled Later than the Section*
    - *Scheduled with Unpublished Changes*
    - *Released with Unpublished Changes*
    - *Released*
    - *Staff Only Content*
- *Create a Subsection*
- *Change a Subsection Name*
- *Set a Subsection Release Date*
- *Set the Assignment Type and Due Date for a Subsection*
- *Set Problem Results Visibility*
- *Publish All Units in a Subsection*
- *Hiding a Subsection from Learners*
    - *Entirely Hide a Subsection from Learners*
    - *Hide a Subsection Based on Date*
- *Delete a Subsection*

7.4.1 What Is a Subsection?

Sections are divided into subsections, which in turn contain one or more units. A subsection may represent a topic in your course, or another organizing principle. Subsections are sometimes called "lessons" or they might represent a week's worth of material.

7.4.2 Viewing Subsections in the Outline

In the following image, the Studio view of the course outline is on the left. On the right is the view of the course outline in the LMS.

The numbers represent the following levels.

1. *Sections*

2. *Subsections*

3. *Units*

Note: The **Course Outline** page does not show *components*. You add or access components by selecting the units that contain the components.

Course Progress Information

The course outline in the LMS also indicates a learner's progress through the course. A green check mark next to the name of a section, subsection, or unit indicates that a learner has completed all the following actions in the section, subsection, or unit.

- Viewed all of each video.

- Submitted answers for all of the problems.

- Viewed all HTML content for at least five seconds.

If a learner selects the **Resume Course** option, the course opens to the unit that the learner most recently completed.

For information about more specific learner data, including the learner's grades or answers for individual problems, see *Managing Learner Progress and Grades*.

7.4.3 Subsections and Visibility to Learners

Learners cannot see any content in a subsection until you schedule a release date, and that release date has passed.

If a subsection's release date has passed, learners can see content in the subsection if the following conditions are met.

- The release date of the parent section has passed.

- The units have been published.

- The subsection or the units are not hidden from learners.

To control whether learners have access to the subsection and its units after a subsection's release date, you can apply various visibility settings.

By default, the subsection and its units are available to learners, except for any units that you have explicitly hidden from learners.

You can also choose to entirely hide a subsection so that the subsection and its units are not visible to learners at all in the course navigation, or you can hide the contents of a subsection after the subsection due date has passed. For more information about subsection visibility settings, see *Hiding a Subsection from Learners*.

Note: Release dates and times that you set are in Coordinated Universal Time (UTC). You might want to verify that you have specified the time that you intend by using a time zone converter such as Time and Date Time Zone Converter.

Learners who have specified a time zone in their account settings see course dates and times converted to their specified time zone. Learners who have not specified a time zone in their account settings see course dates and times on their dashboards, in the body of the course, and on their **Progress** pages in the time zone that their browsers specify. Learners see other course dates and times in UTC.

7.4.4 Release Statuses of Subsections

As a course author, you control the release status of subsections. For the content of a subsection to be visible to learners, the subsection must be released. See the following topics for more information about the possible release statuses of subsections.

- *Scheduled with the Section*
- *Unscheduled*
- *Scheduled Later than the Section*
- *Scheduled with Unpublished Changes*
- *Released with Unpublished Changes*
- *Released*
- *Staff Only Content*

Scheduled with the Section

When you create a subsection, it is set by default to release on the same date and time as the section it is in. Therefore, published content in the subsection is visible to learners at the date and time the section is released.

When a subsection is in the "Scheduled with Section" state, and the section is scheduled, the subsection is visible in the outline with a vertical green bar next to the subsection's display name.

You can change the release date for a subsection to be different from the section it is in. For more information, see *Set a Subsection Release Date*.

Unscheduled

If the parent section is unscheduled, when you create a new subsection it will also be unscheduled.

Regardless of the publishing status of units within the subsection, no content in an unscheduled subsection is visible to learners.

When a subsection is unscheduled, the subsection is visible in the outline with a vertical gray bar next to the subsection's display name.

Content in the subsection is not visible to learners until you set a release date and the date passes.

Scheduled Later than the Section

You can set a subsection to release on a date after the section releases.

Content in a subsection that is scheduled for release on a future date is not visible to learners, even if some or all of the units in the subsection are published.

When a subsection is scheduled, even if the subsection is scheduled to release later than the section, the subsection is visible in the outline with a vertical green bar next to the subsection's display name.

The scheduled date must pass for the subsection to be visible to learners.

Scheduled with Unpublished Changes

You can make changes to a published unit before its parent subsection is released.

In this situation, when the release date for the subsection passes, the last published version of units within the subsection are made visible to learners. The changes in units are not visible to learners until you publish them.

When a subsection is scheduled but has unpublished changes, the subsection is visible in the outline with a vertical yellow bar next to the subsection's display name. When you expand the subsection, the unit that has unpublished changes is visible.

Released with Unpublished Changes

If you modify a unit within a released subsection, those modifications are not visible to students until you publish them.

When a subsection is scheduled but has unpublished changes, the subsection is visible in the outline with a vertical yellow bar next to the subsection's display name. When you expand the subsection, the unit that has unpublished changes is visible.

Released

A subsection that is released is visible to learners; however, learners see only units within the subsection that are published.

When a subsection is released, the subsection is visible in the outline with a vertical blue bar next to the subsection's display name.

Staff Only Content

A subsection can contain a unit that is hidden from learners and available to members of the course team only. That unit is not visible to learners, even if the subsection has been released.

When a subsection contains a unit that has staff-only content, the subsection is visible in the outline with a vertical black bar next to the subsection's display name.

7.4.5 Create a Subsection

To create a new subsection, follow these steps.

1. In the outline, expand the section in which you want to create a new subsection.

2. Select **New Subsection** at the bottom of the expanded section. A new subsection appears at the end of the section, with the subsection name selected.

3. Enter the name for the new subsection. A descriptive name can help learners locate content in the course. It can also help you select content when you analyze performance in edX Insights.

4. *Add units* to the new subsection as needed.

It is recommended that you *test course content* as you create new subsections.

7.4.6 Change a Subsection Name

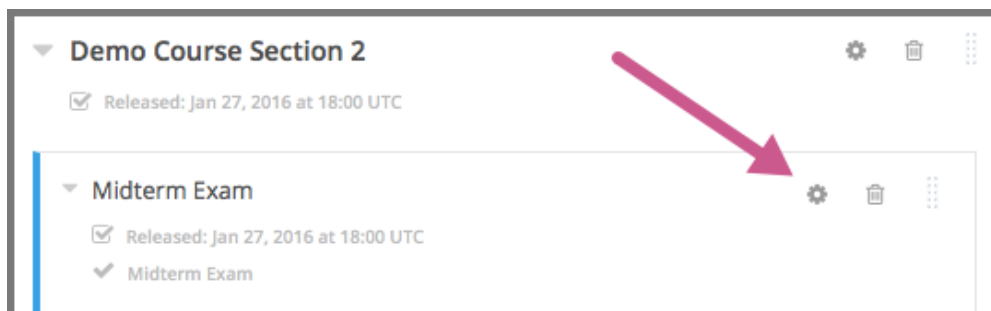To change a subsection name, select the **Edit** icon next to the subsection name. The name field becomes editable. Enter the new name, and then tab or click outside of the field to save the name.

7.4.7 Set a Subsection Release Date

To set the subsection release date, follow these steps.

1. Select the **Configure** icon in the subsection box.

The subsection settings dialog box opens.

2. On the **Basic** tab, under **Release Date and Time**, enter the release date and time for the subsection.

Note: The time that you set is in Coordinated Universal Time (UTC). You might want to verify that you have specified the time that you intend by using a time zone converter such as Time and Date Time Zone Converter.

Learners who have specified a time zone in their account settings see course dates and times converted to their specified time zone. Learners who have not specified a time zone in their account settings see course dates and times on their dashboards, in the body of the course, and on their **Progress** pages in the time zone that their browsers specify. Learners see other course dates and times in UTC.

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3. Select **Save**.

For more information, see *Release Dates*.

7.4.8 Set the Assignment Type and Due Date for a Subsection

You set the assignment type for problems at the subsection level.

When you set the assignment type for a subsection, all problems in the subsection are graded and weighted as a single type. For example, if you designate the assignment type for a subsection as **Homework**, then all problem types in that subsection are graded as homework.

Note: Unlike other problem types, ORA assignments are not governed by the subsection due date. Due dates for each ORA assignment are set in the assignment's settings. For details, see *Specify a Name and Dates*.

To set the assignment type and due date for a subsection, follow these steps.

1. Select the **Configure** icon in the subsection box.

   The subsection settings dialog box opens.

2. On the **Basic** tab, locate the **Grading** section.

3. In the **Grade as** list, select the assignment type for this subsection.

4. For **Due Date** and **Due Time in UTC**, enter or select a due date and time for problems in this subsection.

Note: The time that you set is in Coordinated Universal Time (UTC). You might want to verify that you have specified the time that you intend by using a time zone converter such as Time and Date Time Zone Converter.

Learners who have specified a time zone in their account settings see course dates and times converted to their specified time zone. Learners who have not specified a time zone in their account settings see course dates and times on their dashboards, in the body of the course, and on their **Progress** pages in the time zone that their browsers specify. Learners see other course dates and times in UTC.

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5. Optionally, for a course that has the timed exam feature enabled, select the **Advanced** tab to set the subsection to be *timed*.

6. Select **Save**.

For more information, see *Establishing a Grading Policy For Your Course*.

7.4.9 Set Problem Results Visibility

By default, when learners submit answers to problems, they immediately receive the results of the problem: whether they answered the problem correctly, as well as their scores. However, you might want to temporarily hide problem results from learners when you run an exam, or permanently hide results when you administer a survey. You can do this by using the **Assessment Results Visibility** setting.

Note: The **Assessment Results Visibility** setting is a subsection setting. You cannot change the visibility of individual problems. The **Assessment Results Visibility** subsection setting overrides the **Show Answer** setting for individual problems. Answers to problems are not visible when results are hidden.

The **Assessment Results Visibility** setting can be used with the following common problem types.

- *Checkbox Problem*
- *Dropdown Problem*
- *Multiple Choice Problem*
- *Numerical Input Problem*
- *Text Input Problem*

The **Assessment Results Visibility** setting can be used with the following advanced problem types.

- *Annotation Problem*
- *Circuit Schematic Builder Problem*
- *Custom JavaScript Display and Grading*
- *Custom Python-Evaluated Input*
- *Image Mapped Input Problem*
- *Math Expression Input Problems*
- *Problem Written in LaTeX*
- *Problem with Adaptive Hint*
- *Molecular Structure*

To change the results visibility for your subsection, follow these steps.

1. Select the **Configure** icon in the subsection box.

   The **Settings** dialog box opens.

2. Select the **Visibility** tab, and locate **Assessment Results Visibility**.

3. Select one of the available options.

   - **Always show results**: This is the default setting. Problem results and subsection scores are visible immediately when learners and staff submit answers.

   - **Never show results**: Subsection scores are visible, but problem results are never visible to learners or to course staff.

   - **Show results when subsection is past due**: For learners, results are not visible until the subsection due date (for instructor-paced courses) or the course end date (for self-paced courses) has passed. For course staff, results are always visible unless the staff member is *previewing or viewing the course as a learner*.

Note: If the subsection does not have a due date, or the course does not have an end date, results are always visible.

---

4. Select **Save**.

7.4.10 Publish All Units in a Subsection

To publish all new and changed units in a subsection, select the **Publish** icon in the box for the subsection.
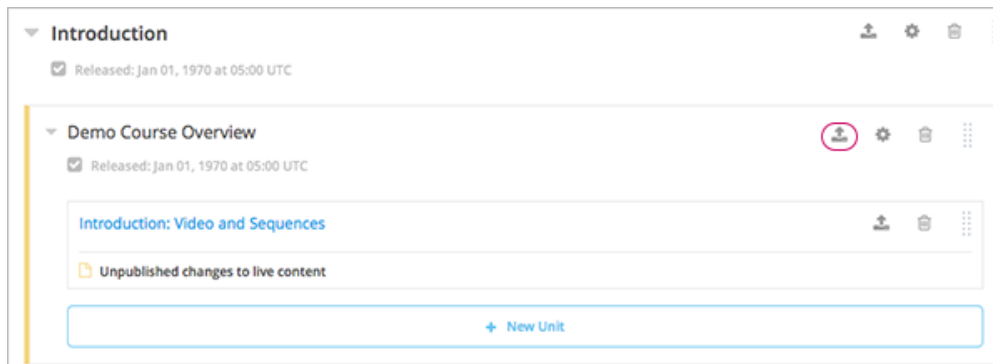
Note: The **Publish** icon only appears when there is new or changed content within the subsection.

See *Unit Publishing Statuses* for information about statuses and visibility to learners.

7.4.11 Hiding a Subsection from Learners

You can hide a subsection from learners in the following ways.

- *Entirely hide the subsection* so that it does not appear in course navigation. Subsections that are hidden in this way are not included when grades are calculated.

- *Prevent learners from accessing* a subsection's contents after its due date (for instructor-led courses) or the course end date (for self-paced courses) has passed, but keep the subsection visible in course navigation. Subsections that are hidden based on date remain included when grades are calculated.

You can also hide just the answers to problems in the subsection, leaving the problems visible. For more information, see *Set Problem Results Visibility*.

For more information, see *Visibility Settings*.

Entirely Hide a Subsection from Learners

You can completely hide a subsection and its content from learners, regardless of the status of units within the section. Subsections hidden in this way are not shown in the course navigation, and are not included when grades are calculated.

To entirely hide a subsection from learners, follow these steps.

1. Select the **Configure** icon in the subsection box.
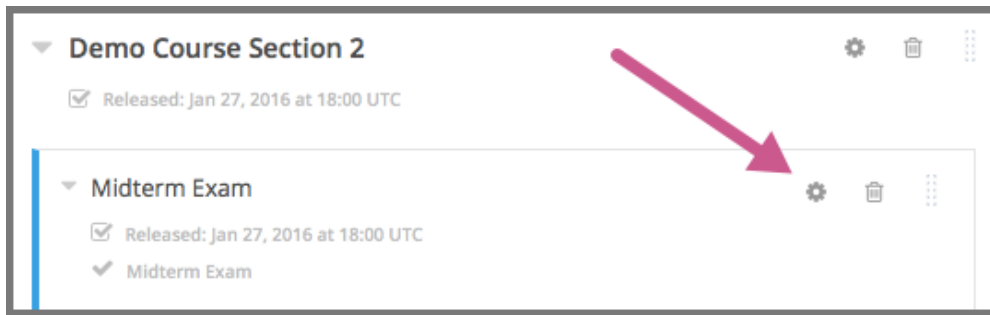
The subsection settings dialog box opens.

2. On the **Visibility** tab, locate **Subsection Visibility**, and then select **Hide entire subsection**.

3. Select **Save**.

None of the content in the subsection is visible to learners. In the course outline, the subsection is shown with a lock icon, indicating that it is available only to course staff.

To make the subsection visible to learners, repeat these steps and select **Show entire subsection**.

> **Warning:** When you make a previously hidden subsection visible, not all content in the subsection is necessarily made visible to learners. Units that were explicitly hidden from learners remain hidden.

Hide a Subsection Based on Date

You can make a subsection's content unavailable based on date. For example, you might want to make exam questions unavailable after a certain date. For instructor-led courses, this option uses the subsection's due date. For self- paced courses, this option uses the course's end date.

Subsections that are hidden in this way remain visible in the course navigation, and are included when grades are calculated. However, learners can no longer access the subsection's content after the due date or the course end date.

> **Note:** If you want to continue to show a subsection's content, but hide learners' results for problems in the subsection, see *Set Problem Results Visibility*.

To hide a subsection based on date, follow these steps.

1. Select the **Configure** icon in the subsection box.

   The subsection settings dialog box opens.

2. On the **Visibility** tab, locate **Subsection Visibility**, and then select the appropriate option.

   • In instructor-led courses, select **Hide content after due date**.

   • In self-paced courses, select **Hide content after course end date**.

3. Select **Save**.

Learners who access the subsection after the due date or course end date has passed are shown a message indicating that the subsection is no longer available because the due date (or course end date) has passed.

In the course outline in Studio, the subsection is shown with an icon and a "Subsection is hidden after due date" or "Subsection is hidden after course end date" message under the subsection's display name.

7.4.12 Delete a Subsection

When you delete a subsection, you delete all units within the subsection.

> **Warning:** You cannot restore course content after you delete it. To ensure you do not delete content that you might need later, you can move any unused content to a section in your course that you set to never release.

To delete a subsection, follow these steps.

1. In the subsection that you want to delete, select the **Delete** icon.

1. When the confirmation prompt appears, select **Yes, delete this subsection**.

7.5 Developing Course Units

To work with units in the course outline and develop your course, you need to understand the following concepts and complete the following tasks.

- *What Is a Unit?*
- *Viewing Units in the Outline*
- *Viewing the Unit Page*
- *Viewing Units as a Learner*
- *The Unit Workflow*
- *Unit Publishing Status and Visibility to Learners*
- *Unit Publishing Statuses*
- *Create a Unit*
- *Edit a Unit*
- *Set Access Restrictions For a Unit*
- *Preview a Unit*
- *Publish a Unit*
- *Discard Changes to a Unit*
- *View a Published Unit*
- *Hide a Unit from Learners*
- *Delete a Unit*

You add content to units with *course components*.

7.5.1 What Is a Unit?

A unit is a part of a *subsection* that learners view as a single page.

A unit contains one or more *components*, such as text with *HTML* markup, *problems*, a *discussion*, or a *video*.

7.5.2 Viewing Units in the Outline

In the following image, the Studio view of the course outline is on the left. On the right is the view of the course outline in the LMS.

The numbers represent the following levels.

1. *Sections*
2. *Subsections*
3. *Units*

Note: The **Course Outline** page does not show *components*. You add or access components by selecting the units that contain the components.

Course Progress Information

The course outline in the LMS also indicates a learner's progress through the course. A green check mark next to the name of a section, subsection, or unit indicates that a learner has completed all the following actions in the section, subsection, or unit.

- Viewed all of each video.
- Submitted answers for all of the problems.
- Viewed all HTML content for at least five seconds.

If a learner selects the **Resume Course** option, the course opens to the unit that the learner most recently completed.

For information about more specific learner data, including the learner's grades or answers for individual problems, see *Managing Learner Progress and Grades*.

7.5.3 Viewing the Unit Page

In Studio, when you select a unit name in the outline, the **Unit** page opens.

The following example shows a unit page in Studio with two components, with circles and text to show different areas and controls in the page.
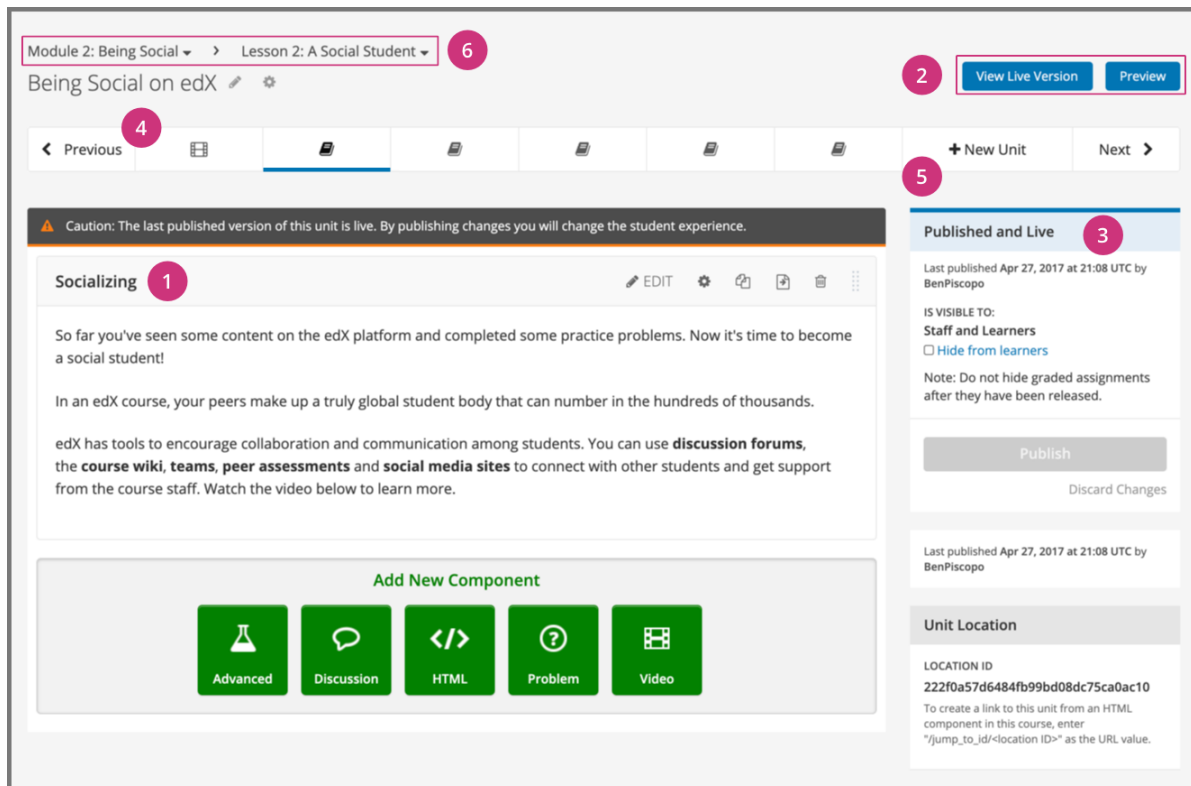
1. A component in the unit.

2. Options for testing the unit.

3. Status panel for the unit.

4. A unit navigation bar that shows where in the subsection this unit is located, and provides easy navigation options to nearby unit pages.

5. A way to add new units to a subsection through the unit navigation bar.

6. Navigation tools to quickly get to other sections or subsections.

7.5.4 Viewing Units as a Learner

To a learner using the edX learning management system (LMS), each unit in the subsection is represented by an icon in the unit navigation bar at the top of the **Course** page. The current unit is indicated with bold underlining in the unit navigation bar. The components in the current unit appear below the unit navigation bar.

The following image shows a subsection in the LMS that contains several units.
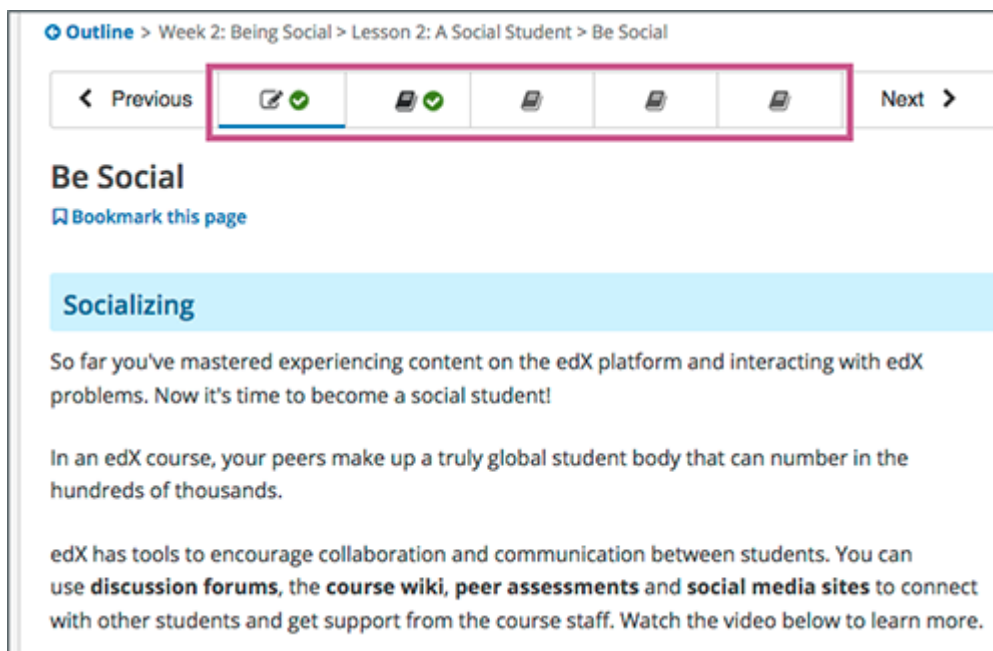
A green check mark next to a unit icon indicates that a learner has completed the unit. A learner has completed the unit if the learner has completed all the following actions.

- Viewed all of each video.

- Submitted answers for all of the problems.

- Viewed all HTML content for at least five seconds.

### 7.5.5 The Unit Workflow

When you have set up the *section* and *subsection* in the course outline, you then work with units.

The typical workflow includes these steps.

1. *Create a unit*.

2. *Add components to the unit*.

3. *Modify components in the unit*.

You *publish the unit* after you add all of its components. If you make additional modifications, you must publish the unit again for the changes to be visible to learners.

As you work through these steps, the publishing status of the unit changes. The publishing status controls the content available to learners, along with *release dates* (in an instructor-paced course). See the next section for more information.

Note: Release dates apply only to instructor-paced courses. For more information about instructor-paced and self-paced courses, see *Course Pacing*.

7.5.6 Unit Publishing Status and Visibility to Learners

The following information summarizes whether or not learners can see a unit.

- Learners never see a unit with the publishing status *Draft (Never Published)*.

- Learners never see a unit with the publishing status *Visible to Staff Only*. For more information, see *Hide a Unit from Learners*.

- Learners do not see a unit with the publishing status *Published Not Yet Released* until the *release date* (in an instructor-paced course). On the release date, the status changes to *Published and Live*.

- If the publishing status is *Published and Live*, learners see the current version of the unit.

- If the publishing status is *Draft (Unpublished Changes)*, learners see the last published version of the unit if the *release dates* for the containing section and subsection have passed.

- If you used *access settings* to specify that a unit is available only to specific groups of learners (such as content groups associated with particular cohorts, or enrollment track groups), only those learners who are in groups to which you have given access can see the unit after it is published and live.

For more information, see *Controlling Content Visibility and Access*. For information about testing content, see *Testing Your Course Content*.
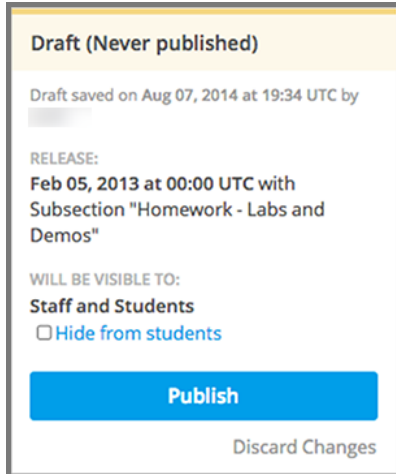
7.5.7 Unit Publishing Statuses

As a course author, you work with units that have the following statuses.

- *Draft (Never Published)*
- *Published and Live*
- *Published (not yet released)*
- *Draft (Unpublished changes)*
- *Visible to Staff Only*

Draft (Never Published)

When you create a new unit and add components to it, the unit's publishing status is **Draft (Never Published)**, as shown in the status panel.

Draft (Never published)

Draft saved on Aug 07, 2014 at 19:34 UTC by

RELEASE:
Feb 05, 2013 at 00:00 UTC with
Subsection "Homework - Labs and
Demos"

WILL BE VISIBLE TO:
Staff and Students
☐ Hide from students

Publish

Discard Changes

Note: The **Release** section applies only to instructor-paced courses. It does not appear for units in self-paced courses. For more information about instructor-paced and self-paced courses, see *Course Pacing*.

In Studio, you see the draft content as you develop the unit. Though you do not see the unit in the LMS, you can *preview the unit*.

Learners never see a unit with this status, even after the release date (in an instructor-paced course). You must *publish the unit* for it to be included in the LMS.

Published and Live

You published the unit and have not modified it. The release dates for the section and subsection have passed (in an instructor-paced course). You, and enrolled learners, see the current version of the unit.
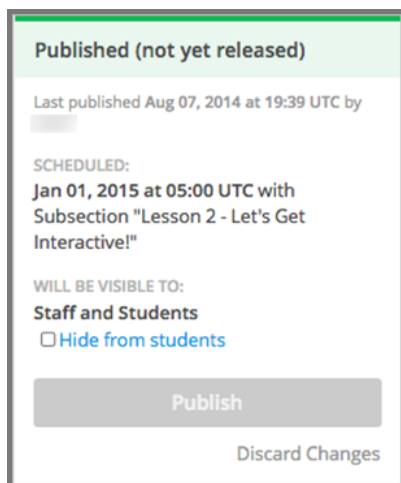
Published and Live

Last published Aug 07, 2014 at 19:37 UTC by

RELEASED:
Feb 05, 2013 at 00:00 UTC with
Subsection "Homework - Labs and
Demos"

IS VISIBLE TO:
Staff and Students
☐ Hide from students

Publish

Discard Changes

The **Release** section applies only to instructor-paced courses. It does not appear for units in self-paced courses. For more information, see *Course Pacing*.

Published (not yet released)

You published the unit, but the release date is still in the future. Learners cannot see this unit until the release date passes.

This status applies only to instructor-paced courses. It does not apply to self-paced courses.

Draft (Unpublished changes)

When you edit a published unit, whether or not it is released, the unit's publishing status changes to **Draft (Unpublished Changes)**, as shown in the status panel.

The **Release** section applies only to instructor-paced courses. It does not appear for units in self-paced courses.

In Studio, you see the draft content as you develop the unit. You can *preview the changes to a unit* to test how your changes will appear to learners after you publish the unit.
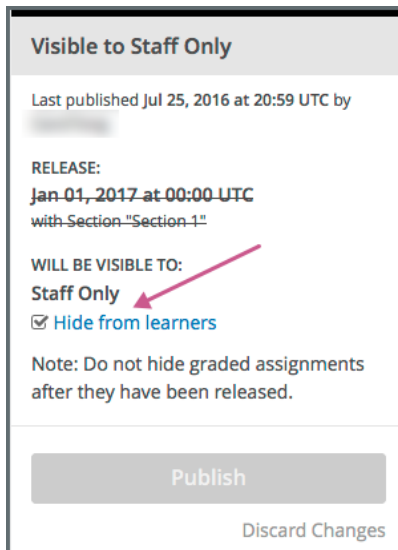
If the release date has passed in an instructor-paced course, learners see the last published version of the unit. If the release date is in the future, learners cannot see your content. You must *publish the unit* for learners to see your changes.

Visible to Staff Only

When you *hide a unit from learners*, the unit's publishing status changes to **Visible to Staff Only**.

The publishing status of a unit also changes to **Visible to Staff Only** if you hide the parent *section* or *subsection* from learners.

Learners never see a unit with this status, even if it has been published and the release date has passed (in an instructor-paced course).
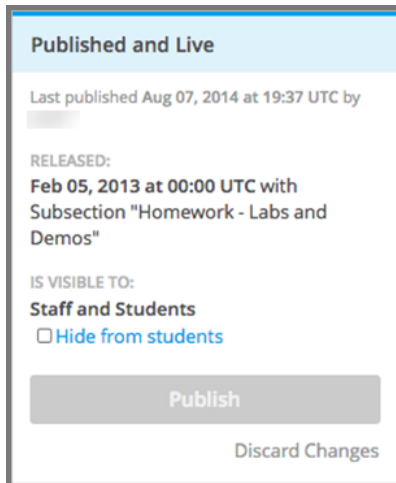

The **Release** section applies only to instructor-paced courses. It does not appear for units in self-paced courses.

7.5.8 Create a Unit

You can create a unit from the outline or create a unit in the same subsection from the unit page.

To create a unit from the outline, follow these steps.

1. In the outline, expand the subsection in which you want to create a new unit.

2. Select **New Unit** at the bottom of the expanded subsection. A new page opens for you to add components to the unit.

3. On the unit page, the unit name is selected. Supply an identifying name. A descriptive name can help learners locate content in the course. It can also help you select content when you analyze performance in edX Insights.

4. *Add components* to the new unit as needed.

To create a unit from a unit page, follow these steps.

1. In the **Unit Navigation Bar** area, select **New Unit**.
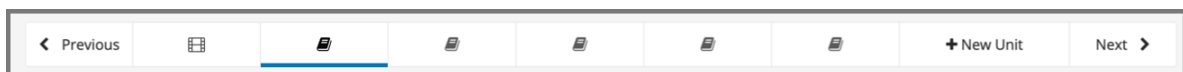
   The unit page for the new unit opens automatically.

2. On the unit page, the unit name is selected. Supply an identifying name. A descriptive name can help learners locate content in the course. It can also help you select content when you analyze performance in edX Insights.

3. *Add components* to the new unit as needed.

You must then *publish the unit* to make it visible to learners.

7.5.9 Edit a Unit

You can edit a unit in the following ways.

- *Edit the unit name*
- *Add components to units*
- *Reorganize Components in Units*

When you make any of these changes, if you previously published the unit, the state changes to *Draft (Unpublished Changes)*. You must then *publish the unit* to make your edits visible to learners.

If you are designing your course to *offer different content* to different groups of learners, you can also *Set access restrictions for the unit* to specify which learner groups a unit is available to.

Edit the Unit Name

To edit a unit name, on the unit page in Studio, select **Edit** next to the name.
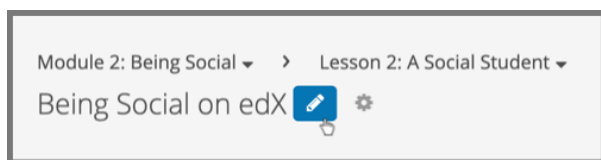
The name field becomes editable. Enter the new name, and then tab or click outside of the field to save the name.

Reorganize Components in Units

You can reorganize components within a unit by dragging and dropping them to new locations.

To change the location of a component, move your mouse pointer over the **Drag to reorder** handle on the component toolbar. The pointer changes to a four- headed arrow. You can then drag the component to the location that you want.

In the image that follows, the handle for the discussion component is selected.
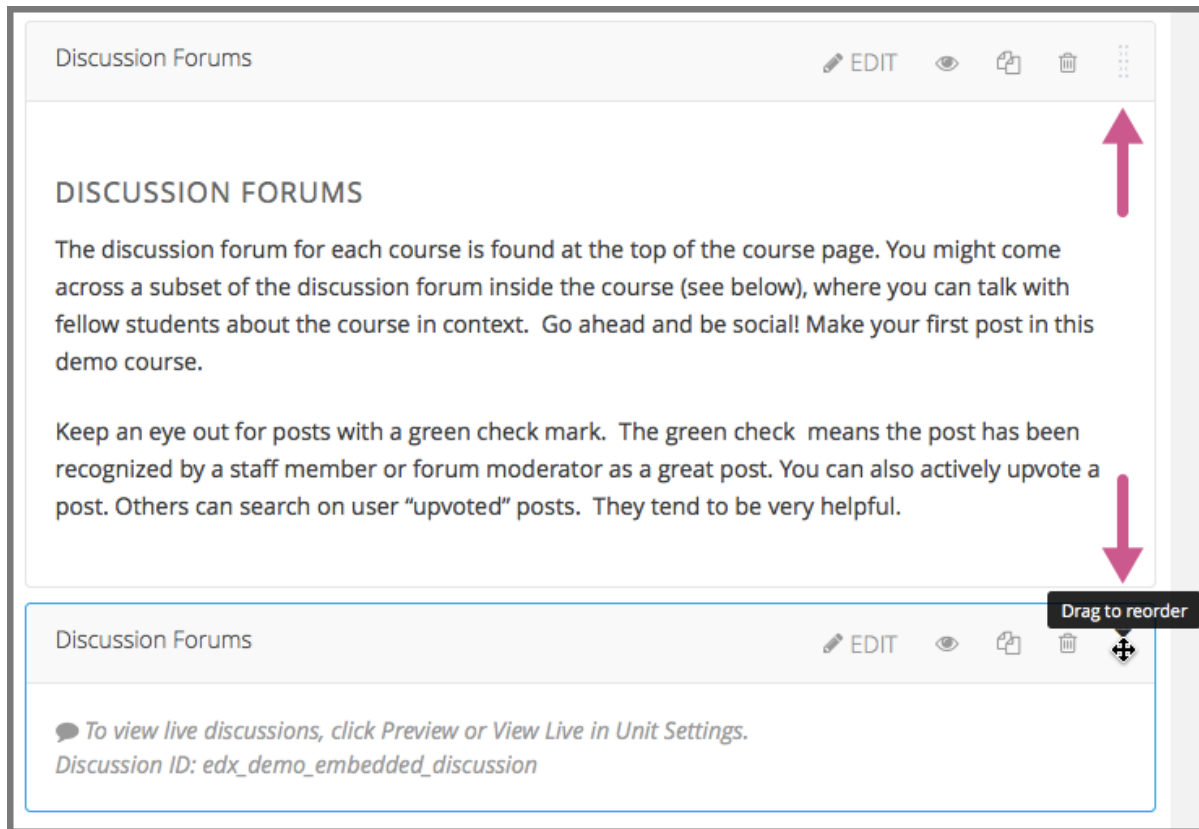
A blue outline indicates where the component will land when you release the mouse button. For example, in the image below, the discussion component is being moved to the top of the unit.
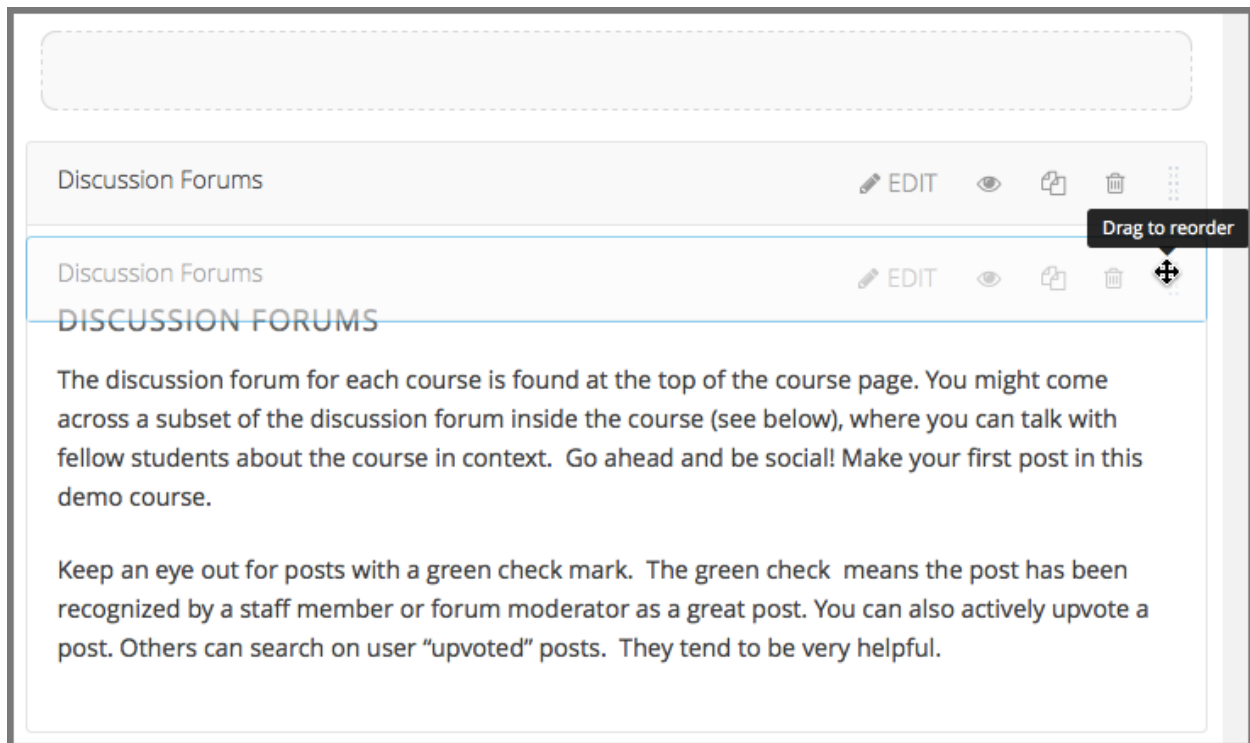
7.5.10 Set Access Restrictions For a Unit

If you have more than one enrollment track in your course, or if you have enabled cohorts, you can limit a unit's availability to specific groups of learners. For information about offering different content to different learner groups, see *Offering Different Content to Different Learner Groups*.

Note: A unit's group access settings are inherited by components in the unit. If you set additional group access restrictions for a component, make sure the component access settings do not contradict the unit access settings. For example, you cannot give Group A of learners access to a component if Group A does not have access to the unit that contains the component.

Tp specify a unit's access settings, follow these steps.

1. In Studio, select **Content**, and then select **Outline**.

2. For the unit that you want to restrict access to, select the **Configure** icon in the unit's toolbar.
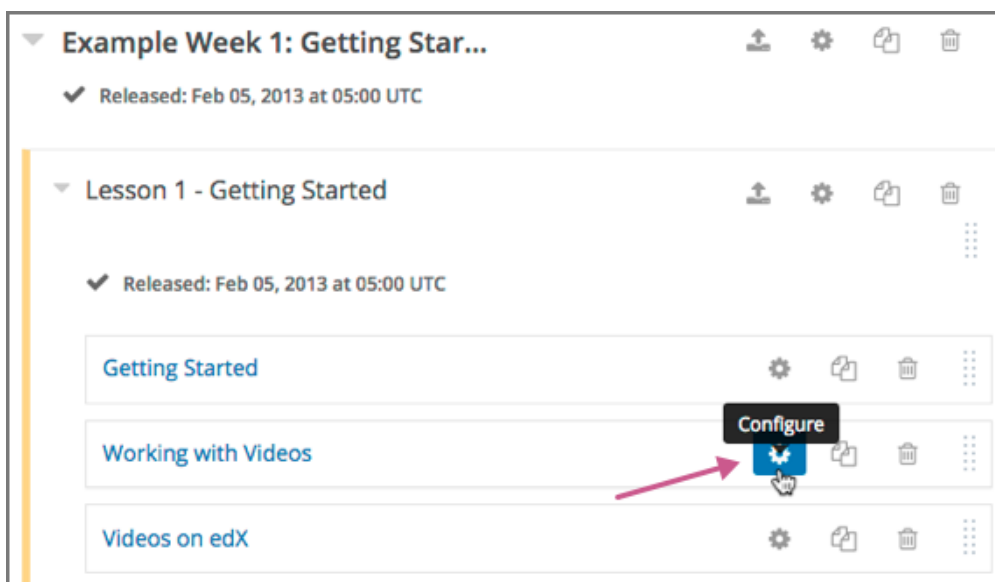
   You can also access the **Restrict access to** option from the gear icon next to a unit's name on a unit page in Studio.
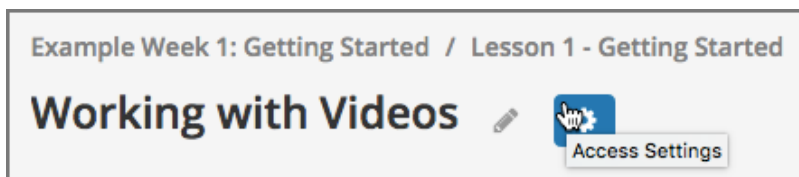
3. In the unit's **Settings** dialog box, for the **Restrict access to** option, select the group type by which you want to restrict access.

   The **Enrollment Track Groups** option is available only if your course has more than one *enrollment track*. The **Content Groups** option is available only if you have created *content groups* for use with cohorts.

After you select a group type, you see a list of the groups that exist for that group type.

4. Select the checkbox for each group for which you want the current unit to be available.

5. Select **Save**.

The groups which have access to the unit are listed under the unit title in the Studio course outline, as well as under the unit title on the unit page in Studio.

7.5.11 Preview a Unit

You preview a unit to review and test the content before it is visible to learners.

You can preview a unit before it is published and before the course is live. In a live course, after the unit is published and if there are no pending changes, previewing a unit is exactly the same as viewing the live version of the unit.

To preview the unit, select **Preview** above the status panel in the Studio unit page.

The unit opens in preview mode in the LMS.

Note: When you are revising a previously published unit, it can be helpful to preview your changes in one browser window and *view the published unit* in a second window.

For information about previewing and testing content, see *Testing Your Course Content*.

7.5.12 Publish a Unit

Publishing a unit makes the current version of the unit in Studio available to learners. In an instructor-paced course, the release dates for the section and subsection must also have passed for learners to access a published unit.

You publish a unit that has a status of *Draft (Never Published)* or *Draft (Unpublished Changes)*. When you publish a unit, the status changes to *Published and Live* or *Published Not Yet Released*.

You can publish a unit from the unit page or the course outline.

For more information about instructor-paced and self-paced courses, see *Course Pacing*.

Use the Unit Page to Publish a Unit

To publish the unit, select **Publish** in the status panel.

Use the Outline to Publish a Unit

To publish a unit from the outline, select the **Publish** icon in the box for the unit.
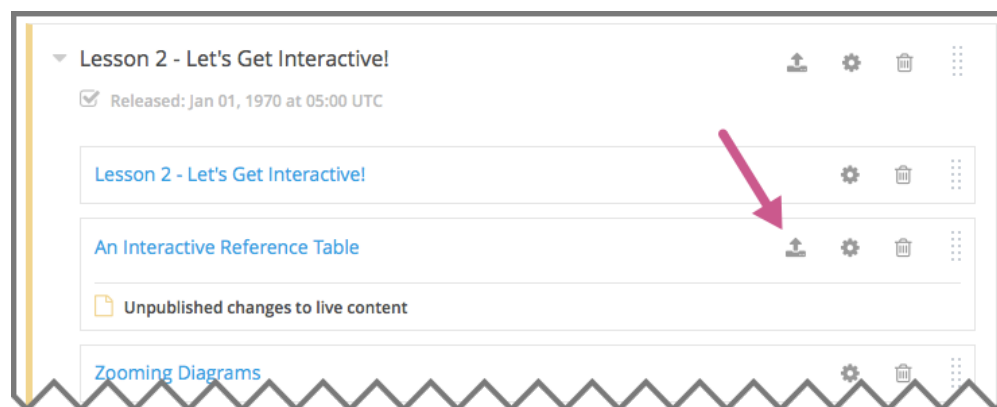
Note: The **Publish** icon only appears when there is new or changed content in the unit.

7.5.13 Discard Changes to a Unit

When you modify a published unit, your changes are saved in Studio, though the changes are not visible to learners until you publish the unit again.

If you decide that you never want to publish your changes, you can discard the changes so that Studio reverts to the last published version of the unit.

To discard changes and revert the Studio version of the unit to the last published version, select **Discard Changes** in the status panel.

> **Caution:** When you discard changes to a unit, the changes are permanently deleted. You cannot retrieve discarded changes or undo the action.

7.5.14 View a Published Unit

To view the last published version of a unit in the LMS, select **View Live Version** at the top of the page.

The unit page opens in the LMS in Staff view. You might be prompted to log in to the LMS.

If the unit status is *Draft (Unpublished Changes)*, you do not see your changes in the LMS until you publish the unit again.

If the unit status is *Draft (Never Published)*, **View Live Version** is not enabled.

For information about viewing and testing content, see *Testing Your Course Content*.

7.5.15 Hide a Unit from Learners

You can prevent learners from seeing a unit regardless of the unit status or the release schedules of the section and subsection.

For more information, see *Visibility Settings*.

You can hide a unit from learners using the course outline or the unit page.

Use the Unit Page to Hide a Unit

In the status panel, select **Hide from learners**.

The **Release** section applies only to instructor-paced courses. It does not appear for units in self-paced courses.

For more information, see *Controlling Content Visibility and Access*.

Use the Outline to Hide a Unit

1. Select the **Configure** icon in the unit box.
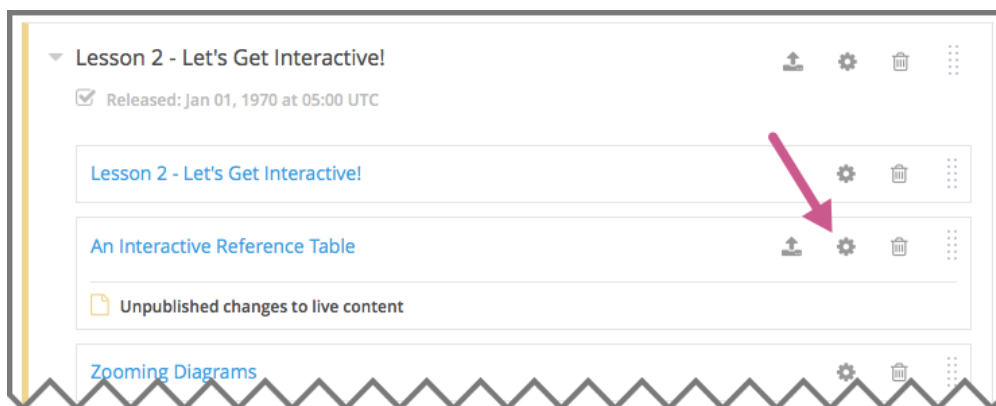
The **Settings** dialog box opens.

2. In the **Unit Visibility** section, select **Hide from learners**.

3. Select **Save**.

Make a Hidden Unit Visible to Learners

Before you make a hidden unit visible to learners, be aware that course content will immediately be visible to learners, as follows.

- For a hidden unit that previously was published, deselecting **Hide from learners** publishes the current content for the unit. If you made changes to the unit while is was hidden, those draft changes are published.

- When you make a section or subsection that was previously hidden visible to learners, draft content in units is *not* published. Changes you made since last publishing units are not made visible to learners.

You can make a hidden unit visible to learners from the unit page or the course outline. Follow the instructions above and clear the **Hide from learners** check box.

You are prompted to confirm that you want to make the unit visible to learners.

7.5.16 Delete a Unit

You delete a unit from the course outline in Studio.

When you delete a unit, you delete all components within the unit.

> **Warning:** You cannot restore course content after you delete it. To ensure that you do not delete any content that you need later, move the unit to a hidden section or subsection instead of deleting it.

To delete a unit, follow these steps.

1. On the course outline page in Studio, select the **Delete** icon in the box for the unit you want to delete.
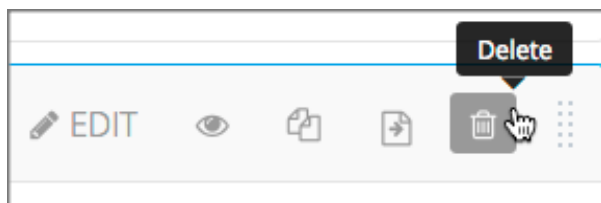
2. When you receive the confirmation prompt, select **Yes, delete this unit**.

7.6 Developing Course Components

This section describes how you develop course components.

- *What is a Component?*
- *Add a Component*
- *Edit a Component*
- *Set Access Restrictions for a Component*
- *Duplicate a Component*
- *Delete a Component*
- *Reorganizing Components*
- *Components that Contain Other Components*

For more information about specific component types, see the following topics.

- *Adding Course Components*
- *Adding Exercises and Tools*

7.6.1 What is a Component?

A component is the part of a unit that contains your actual course content. A unit can contain one or more components.

By default, Studio includes four basic types of components for you to add to your course.

- **Discussion** components provide discussion spaces in the body of your course. Learners can explore ideas about a lesson with their peers in a discussion space.
- **Text** components allow you to add text, images, and some types of learning tools to your course. Content in Text components is formatted as HTML.
- **Problem** components enable you to add many different types of exercises and problems to your course, from simple multiple choice problems to complex circuit schematic exercises.
- **Video** components contain the videos that you want to include in your course.

7.6.2 Add a Component

To add a component to the unit, follow these steps.

1. In Studio, open the page for the unit.
2. Under **Add New Component**, select a component type. The default component types are discussion, HTML, problem, and video.

For more information, see the documentation for the specific component type that you want to work with.

- *Working with Discussion Components*
- Working with Text Components

- *Working with Problem Components*
- *Working with Video Components*

After you add a component, it is not visible to learners until you *publish the unit*.

7.6.3 Edit a Component

To edit a component, you select **Edit** in the component's title bar in Studio.
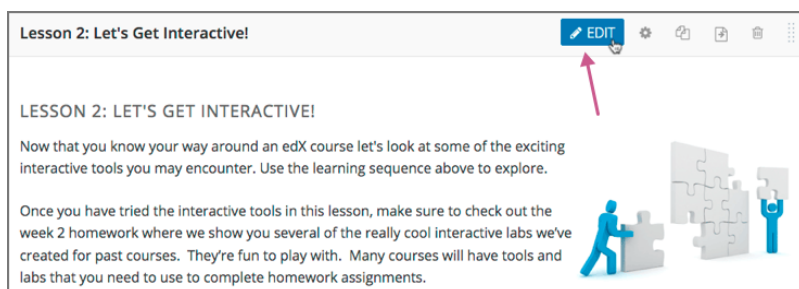
Then, follow instructions for the type of component you are editing.

After you edit a component, the changes are not visible to learners until you *publish the unit*.

Set the Display Name for a Component

The display name identifies the component. This name appears as a heading above the component in the LMS, and it identifies the component for you in Insights.

The following illustration shows the display name of a problem in Studio, in the LMS, and in Insights.
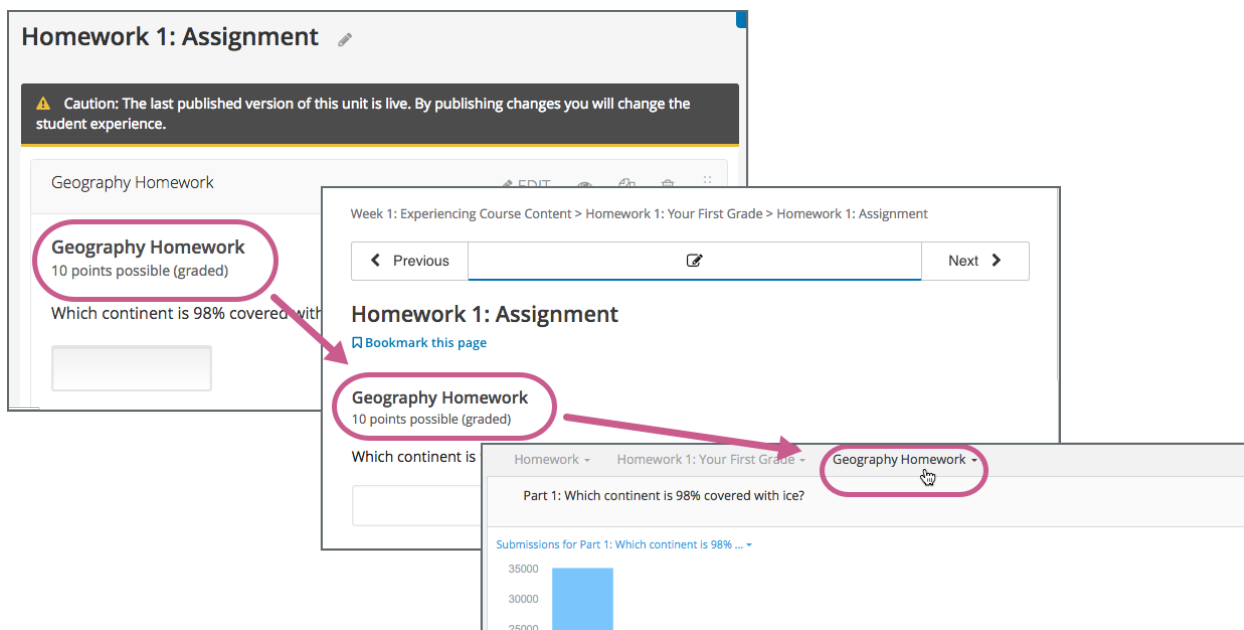
Unique, descriptive display names help you and your learners identify components quickly and accurately.

To set the display name for a component, follow these steps.

1. Edit the component. A dialog box opens.

- For a discussion or video component, the dialog box opens to the list of settings, including the **Display Name** field.

- For an HTML or problem component, the dialog box opens to an editing view. Select **Settings** to show the list of settings, including the **Display Name** field.

2. Edit the **Display Name** field.
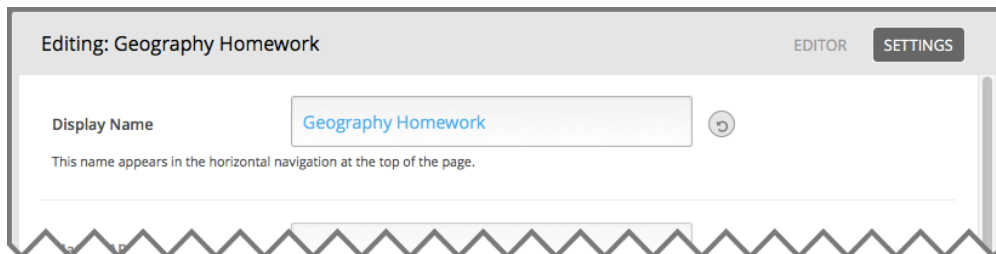
3. Select **Save**.

Different types of components have different fields in the **Settings** dialog box, but all of them have a **Display Name** field.

7.6.4 Set Access Restrictions for a Component

If you have more than one enrollment track in your course, or if you have enabled cohorts, you can limit a component's availability to specific groups of learners. For information about offering different content to different learner groups, see *Offering Different Content to Different Learner Groups*.

Note: Components inherit any group access restrictions that are set for their parent unit. If you set additional group access restrictions for a component, make sure the component access settings do not contradict the unit access settings. For example, you cannot give Group A of learners access to a component if Group A does not have access to the unit that contains the component.
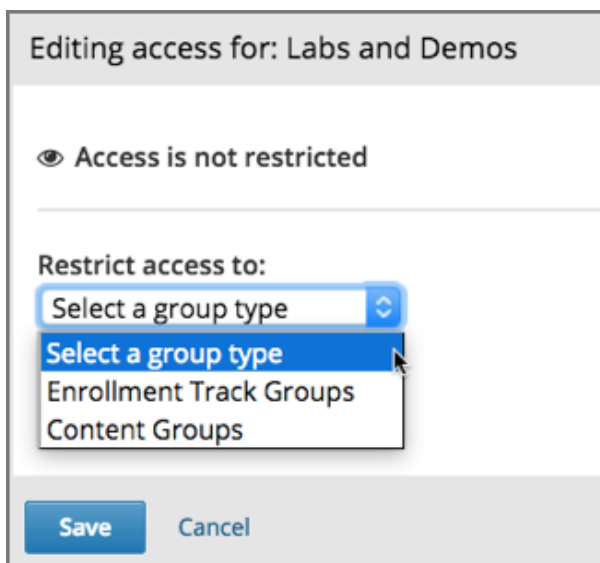
To specify a component's access settings, follow these steps.

1. In Studio, select **Content**, and then select **Outline**.

2. On a unit page, for each component for which you want to restrict access to, select the **Access Settings** icon.
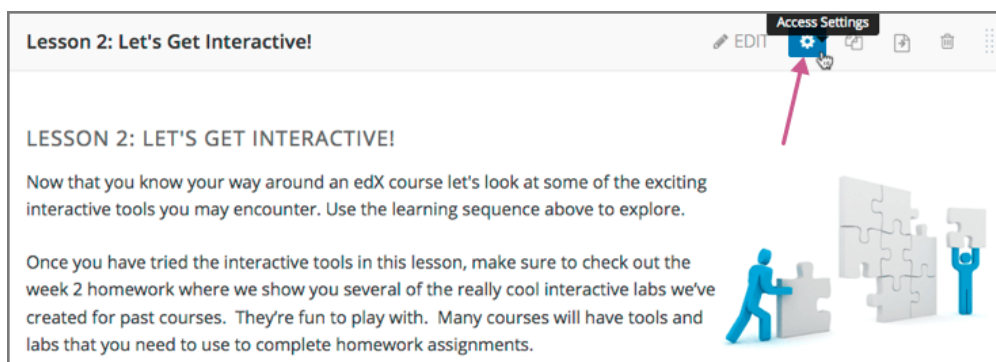
3. In the **Editing access** dialog box, for the **Restrict access to** option, select the group type by which you want to restrict access.

Note: The **Enrollment Track Groups** option is available only if your course has more than one *enrollment track*. The **Content Groups** option is available only if you have created *content groups* for use with cohorts.

After you have selected a group type, you see a list of the groups that exist for that group type.

4. Select the checkbox for each group for which you want the current component to be available.

5. Select **Save**.

The groups which have access to the component are listed under the component title in the Studio course outline.

In addition, on the unit page in Studio, a message in the publishing status bar indicates that some content in the unit is restricted to specific groups of learners.
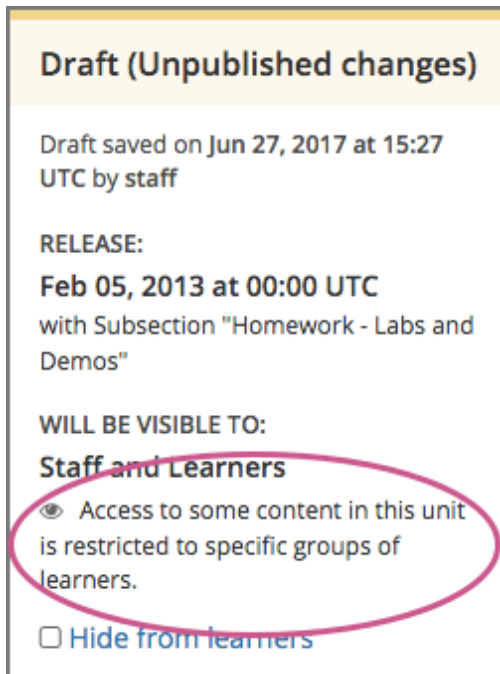
7.6.5 Duplicate a Component

When you duplicate a component, a new copy of that component is added directly beneath the first component. You can then modify the duplicate. In many cases, duplicating a component and editing the copy is a faster way to create new content.

To duplicate a component, select the **Duplicate** icon in the component header.
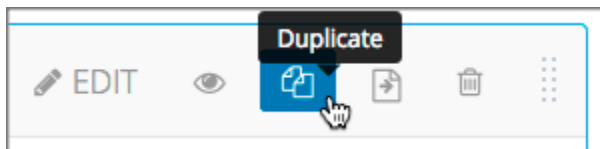
Then, follow instructions for the type of component you are editing.

After you duplicate a component, the new component is not visible to learners until you *publish the unit*.

Note: Duplicating content experiments after you have configured them is not supported.

7.6.6 Delete a Component

Caution: Be sure you want to delete the component. You cannot undo the deletion.

To delete a component, follow these steps.

1. Select the **Delete** icon in the component header.
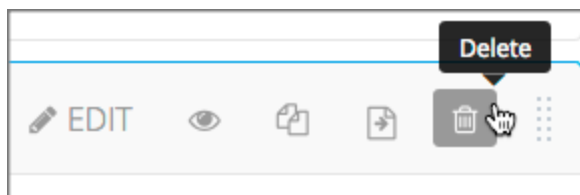
2. When you receive the confirmation prompt, select **Yes, delete this component**.

After you delete a component in Studio, the component remains visible to learners until you *publish the unit*.

7.6.7 Reorganizing Components

You can drag and drop components to a new position within their current unit, or you can move components from one unit to another unit.

- *Reorganize Components Within a Unit*
- *Move Components to Other Units*

Reorganize Components Within a Unit

To reorganize components within their current unit, you drag and drop components in the same way that you can drag and drop units, subsections, and sections on the **Course Outline** page. For more information, see *Reorganize the Course Outline*.

For components that consist of nested components (for example, a content experiment), you can also use drag and drop to move a child component into a different parent component, if both parents are expanded. For example, you can select the video component that is in Child Component A and drag it into Child Component B. Select the video component, and as you drag it into Child Component B, release the mouse button when a dashed outline of the component you are moving appears in the new location.
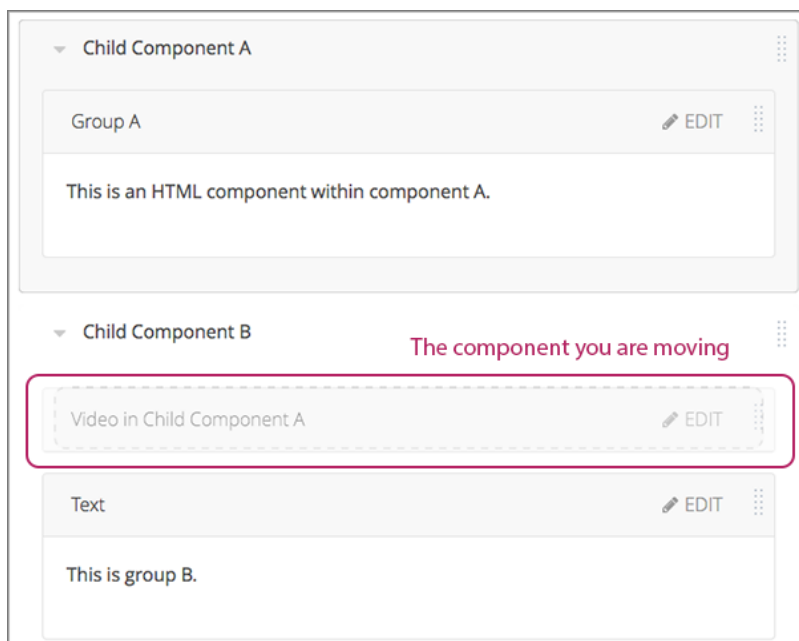
You can also drag a child component outside of a parent, so that the child moves to the same level as the parent.

Move Components to Other Units

To move components to another unit in the course outline, follow these steps.

1. Select the **Move** icon for the component that you want to move.
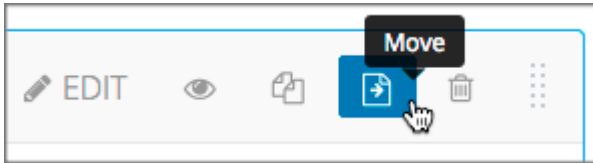
   A dialog box appears that displays your course outline tree, starting at the section level.

2. In the **Move** dialog box, navigate to the location where you want to move the component by selecting the section, the subsection, and then the unit.
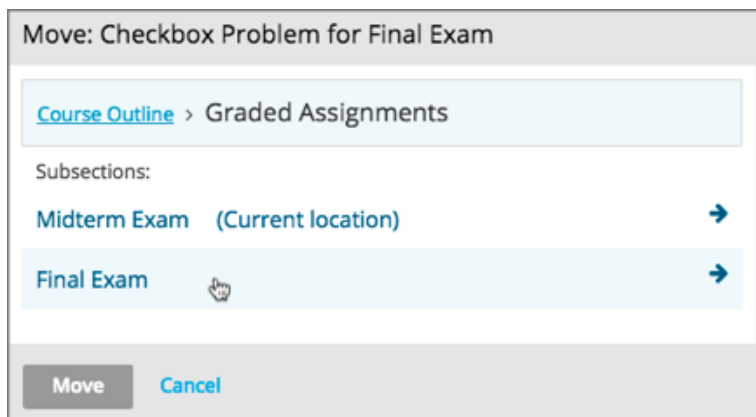
   The **Move** button is enabled only when your selected location is a valid level and location for moving your component. For example, when you move a component, the **Move** button is enabled only when you have navigated to a unit to which the component can be moved.

3. Select **Move**.

   The component moves to the new location. A success message appears that provides options to go to the new location or to undo the move.

Note: If the old and new locations of the component that you moved were previously published, your changes are not reflected in the learner's view of the course until you republish the affected units.

7.6.8 Components that Contain Other Components

For specific use cases, you configure course content so that components contain other components. For example, if you want to include conditional components or content experiments, you have to create components inside components. See *Creating Content Experiments* for more information.

The component that contains other components is referred to as the *parent*; the contained components are referred to as child components, or children.

On a unit page, a parent component appears with its display name and a **View** link.
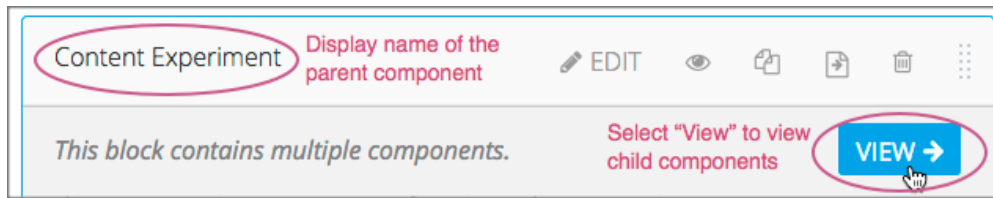
Edit a Parent Component

A parent component does not directly contain content. Content such as HTML, videos, or problems are in the child components.

A parent component has a display name. When the unit is private or in draft, select **Edit** in the parent component to change the display name.

Note: Parent components of a specific type, such as content experiments, have additional attributes that you edit.

View Child Components

When you select **View** in the parent component, the parent component page opens, showing all child components. In this example, Child Component A contains a Text component and a video.
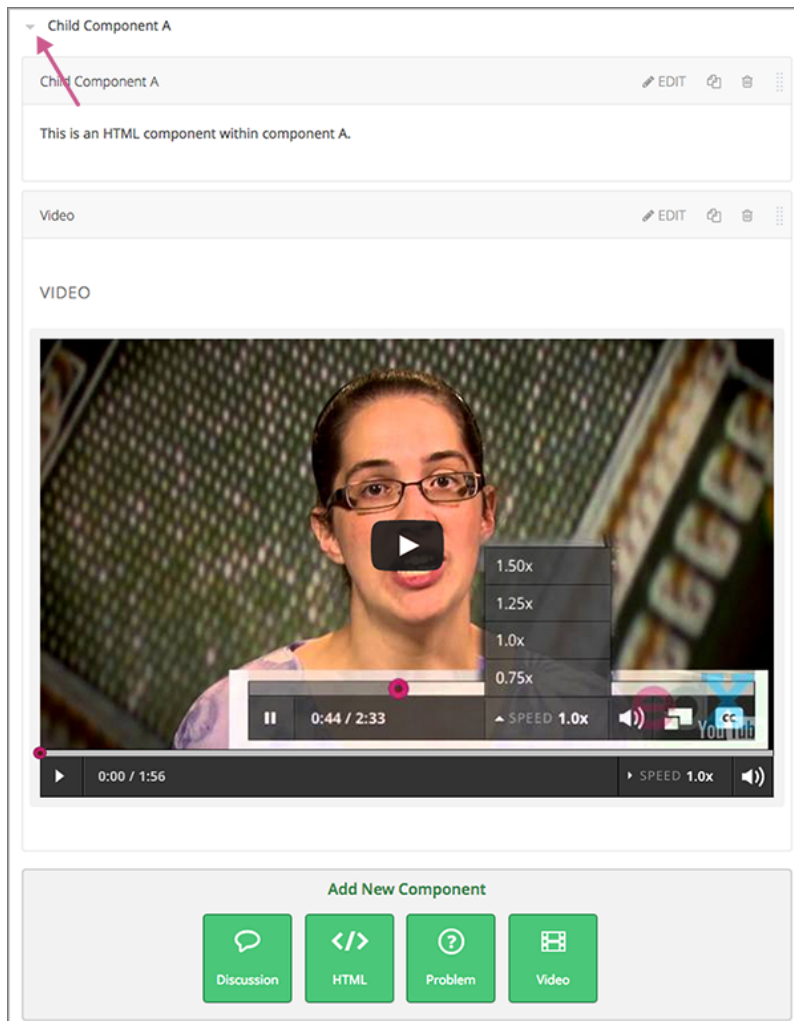
Select the arrow next to a child component name to collapse it and hide the component's contents. Select the arrow again to expand the component.

For more information, see the following topics.

- *Edit a Component*
- *Set the Display Name for a Component*
- *Duplicate a Component*
- *Delete a Component*

Add a Child Component

If the containing unit is private or in draft, you can add a child component in its parent component.

To add a child component, open and expand the parent component. Then, select the component type that you want under **Add New Component** within the parent component.

For more information, see the section for the specific component type that you want.

- *Working with Discussion Components*
- Working with Text Components

- *Working with Problem Components*

- *Working with Video Components*

XML for Parent and Child Components

You develop parent and child components in XML, then import the XML course into Studio to verify that the structure is as you intended.

For more information about working with your course's XML files, including information about terminology, see the EdX Open Learning XML Guide.

The following examples show the XML used to create the unit and components shown in Studio above.

The XML for the unit is as follows.

```
<vertical display_name="Unit 1">
    <html url_name="6a5cf0ea41a54b209e0815147896d1b2"/>
    <vertical url_name="131a499ddaa3474194c1aa2eced34455"/>
</vertical>
```

The `<vertical url_name="131a499ddaa3474194c1aa2eced34455"/>` element above references the parent component file that contains the child components.

```
<vertical display_name="Parent Component">
    <vertical url_name="2758bbc495dd40d59050da15b40bd9a5"/>
    <vertical url_name="c5c8b27c2c5546e784432f3b2b6cf2ea"/>
</vertical>
```

The two verticals referenced by the parent component refer to the child components, which contain the actual content of your course.

```
<vertical display_name="Child Component A">
    <html url_name="4471618afafb45bfb86cbe511973e225"/>
    <video url_name="fbd800d0bdbd4cb69ac70c47c9f699e1"/>
</vertical>
```

```
<vertical display_name="Child Component B">
    <html url_name="dd6ef295fda74a639842e1a49c66b2c7"/>
    <problem url_name="b40ecbe4ed1b4280ae93e2a158edae6f"/>
</vertical>
```

Theoretically, there is no limit to the levels of component nesting you can use in your course.

The Learner View of Nested Components

For learners, all parent and child components appear on the unit page.

Note: The visibility of nested components depends on the visibility of the parent unit. The parent unit must be public for learners to see nested components. For more information, see *Unit Publishing Status and Visibility to Learners*.

The following example shows the learner view of the unit described above.

1. SEPTEMBER 21

   Words of encouragement! This is a short note that most students will read.

   Anant Agarwal (6.002x Principal Instructor)

   Primary versus Secondary Updates:

   Unfortunately, the internet throws a lot of text at students, and they do not read everything that they are given. However, many students *do* read all that they are given, and so detailed explainations in this section will benefit the most concientious. Any essential information should be extremely quickly summarized in the primary section for skimmers.

   Star Forum Poster

   Students appreciate knowing that the course staff is reading what they post, and one of several ways that you can do this is by acknowledging the star posters in your announcements.

   This is group A.

   VIDEO

   This is group B.

   CHECKBOXES (1 point possible)

   A checkboxes problem presents checkbox buttons for student input. Students can select more than one option presented.

   ○ │ ☐ correct
   ☐ incorrect
   ☐ correct

7.7 Controlling Content Visibility and Access

As a member of the course team, you must carefully control which content is available to which learners, and when. Visibility settings, together with publishing states, are used to hide content from learners while still allowing course staff to view it. Access settings are used to specify which learner groups can access particular components or units.

You can control content visibility and access using the following Studio features.

- *Release Dates*
- *Unit Publishing Status*
- *Visibility Settings*
- *Access Settings*
- *Prerequisite Course Subsections*

You can also configure Open edX so that courses or course outlines are visible to anyone, not just registered and enrolled learners. For information, see Enabling Public Course Content.

7.7.1 Release Dates

In instructor-paced courses, you can specify release dates and times for sections and subsections. By defining release dates, you ensure that course content is available to learners on a planned schedule, without requiring manual intervention while the course is running.

Note: Self-paced courses do not have release dates for sections and subsections. For more information about instructor-paced and self-paced courses, see *Course Pacing*.

By default, a subsection inherits the release date and time of the section it is in. You can change the release date of the subsection to another date.

Published units are not visible to learners until the scheduled release date and time. When the section and subsection have different release schedules, published units are not visible until both dates have passed.

Course team members can access content that has not been released by *previewing the course*.

Note: When you set release times in Studio, times are in Coordinated Universal Time (UTC). You might want to verify that you have specified the times that you intend by using a time zone converter such as Time and Date Time Zone Converter.

Learners who have specified a time zone in their account settings see course dates and times converted to their specified time zone. Learners who have not specified a time zone in their account settings see course dates and times on their dashboards, in the body of the course, and on their **Progress** pages in the time zone that their browsers specify. Learners see other course dates and times in UTC.

For more information about setting release dates in an instructor-paced course, see the following topics.

- *Set a Section Release Date*
- *Set a Subsection Release Date*

7.7.2 Unit Publishing Status

You publish units to make them visible to learners. In both instructor-paced and self-paced courses, units must be published to be visible to learners. Learners see the last published version of a unit if the section and subsection it is in are released.

Learners do not see units that have never been published, and they do not see unpublished changes to units or components within units. Therefore, you can make changes to units in released subsections without disrupting the learner experience.

For more information, see *Unit Publishing Statuses*.

You can publish all changes in a section or subsection at once, or publish changes to individual units. For more information about publishing units, see the following topics.

- *Publish All Units in a Section*

- *Publish All Units in a Subsection*

- *Publish a Unit*

7.7.3 Visibility Settings

You can use the visibility controls in Studio to hide content from learners in both instructor-paced and self-paced courses.

You might choose to hide a unit from learners, for example, when that unit contains an answer to a problem in another unit in the same subsection. After the problem's due date, you can make the unit that contains the answer visible. You might also permanently hide a unit from learners if that unit provides instructions or guidance that is intended only for the course team. Only course team members would see that unit in the course.

Content that is hidden by being excluded from the course outline is never available to learners, regardless of the release and publishing status.

Important: Content that you make "invisible" to learners by excluding it from the course outline is also excluded from grading. As a best practice, do not hide sections, subsections, or units that contain graded content by excluding them from the course outline.

Instead, if you want to prevent learners from accessing graded content at certain times, you can use options to hide content based on due date or course end date. For more information, see *Hiding Graded Content* and *Hide a Subsection Based on Date*.

You can hide content at different levels, as described in the following topics.

- *Hide a Section from Learners*

- *Hiding a Subsection from Learners*

- *Hide a Unit from Learners*

- *Set Problem Results Visibility*

Note: Units and subsections inherit visibility settings from their parent subsections or sections. Be aware that when you make a previously hidden section or subsection visible to learners, all child subsections or units also become visible, unless you have explicitly hidden the subsection or unit. Subsections or units that are explicitly hidden remain hidden even when you change the visibility of their parent section or subsection.

Hiding Graded Content

Grading is affected if you hide sections, subsections, or units that contain graded problems in such a way that they are not included in the course navigation. When the platform performs grading for a learner, the grading process does not include problems that are not included in that learner's course outline.

If you want the problems in the subsection to remain visible, but you want to hide learners' results for these problems, see *Set Problem Results Visibility*.

Note: As a best practice, do not hide graded sections, subsections, or units by excluding them from the course outline. Content that is hidden in this way is not included when the platform performs grading for learners.

Instead, if you want to prevent learners from accessing the content of a subsection while the subsection itself remains visible in the course navigation, you can use the option to hide a subsection or timed exam's content based on date. In instructor-led courses, you can hide a subsection based on its due date. In self-paced courses, you can hide a subsection based on the course's end date. For more details, see *Hide a Subsection Based on Date*.

7.7.4 Access Settings

In the course outline in Studio, you can use access settings to specify which learner groups can access particular components or units. You can restrict access based on one group type, such as *content group* or *enrollment track*.

For example, if you have cohorts enabled in your course, you can use content groups to give access to particular components or units in your course only to learners in specific cohorts. If your course has more than one enrollment track, you might provide the same practice assignments to all learners yet provide learners in the certificate track with different exams from non- certificate learners.

- *Modify access settings for a unit*
- *Modify access settings for a component*

For information about creating differentiated content based on cohorts, see *Creating Cohort-Specific Course Content*.

For information about creating differentiated content based on enrollment track, see Enrollment Track Specific Courseware Overview.

7.7.5 Prerequisite Course Subsections

You can lock subsections of your course until learners complete other, prerequisite subsections. If a subsection has a prerequisite, it is displayed in the course outline with a lock icon, and learners cannot view the subsection content until they have earned a minimum score in the prerequisite subsection.

Note: You must first Enabling Course Prerequisites before prerequisite course subsections can be used.

Enable Subsection Prerequisites

To enable prerequisite subsections in a course, follow these steps.

1. From the **Settings** menu, select **Advanced Settings**.

2. In the **Enable Subsection Prerequisites** field, enter `true`.

3. Select **Save Changes**.

Create a Prerequisite Subsection

To prevent learners from seeing a subsection of your course until they have earned a minimum score or completed a minimum portion in a prerequisite subsection, follow these steps.

Note: Make sure that you configure subsection prerequisites in the order that you intend for learners to encounter them in the course content. The prerequisite configuration controls do not prevent you from creating a circular chain of prerequisites that will permanently hide them from learners.

Note: You cannot use *open response assessments* that have a point value of 0 as the prerequisite for other course subsections.

---

1. Enable subsection prerequisites for your course. For more information, see *Enable Subsection Prerequisites*.

2. Select the **Configure** icon for the subsection that must be completed first. This is the prerequisite subsection.
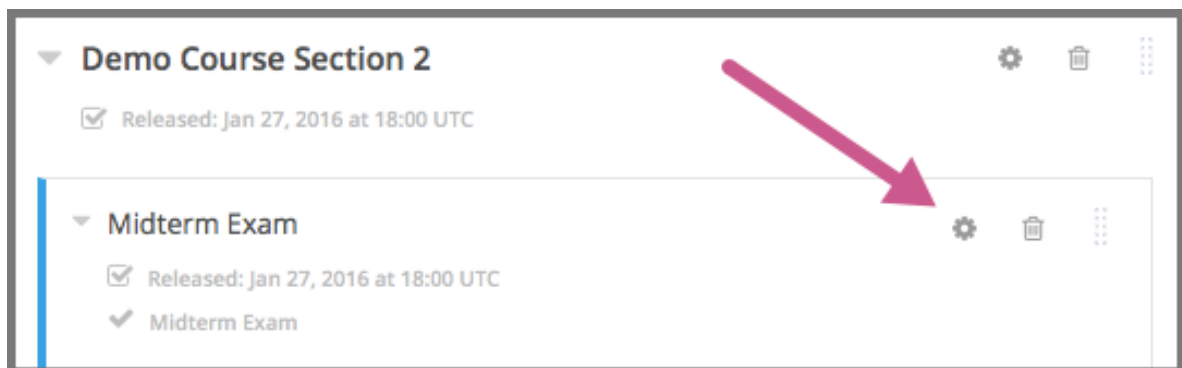
3. Select the **Advanced** tab.

4. Under **Use as a Prerequisite**, select **Make this subsection available as a prerequisite to other content**.

5. Select **Save**.

6. Select the **Configure** icon for the subsection that will be hidden until the prerequisite is met.

7. Select the **Advanced** tab, and then locate the **Limit Access** section.

8. In the **Prerequisite** list, select the name of the subsection you want to specify as the prerequisite.

Custom Javascript Problem Settings

BASIC   VISIBILITY   ADVANCED

Limit Access

Select a prerequisite subsection and enter a minimum score percentage
and minimum completion percentage to limit access to this subsection.
Allowed values are 0-100

Prerequisite:

Chemical Equation Problem

Minimum Score:

Minimum Completion Percentage:

80

Use as a Prerequisite

☐ **Make this subsection available as a prerequisite to other
content**

Save   Cancel
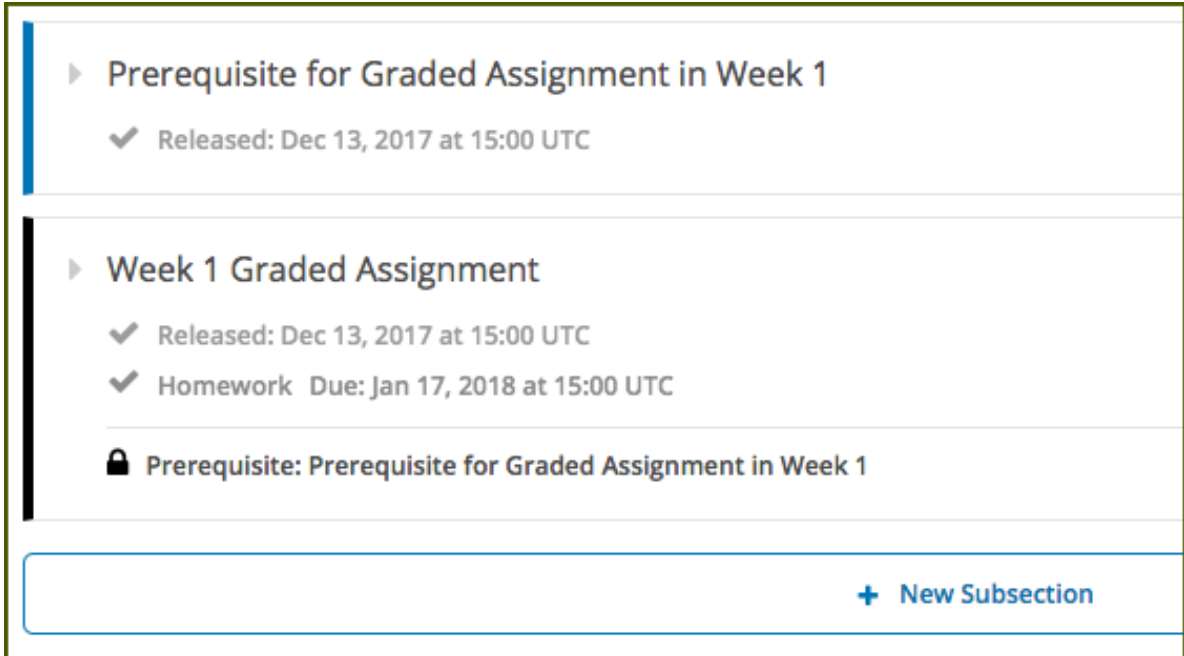
9. To require that learners achieve a minimum score in the prerequisite subsection before the current subsection opens, enter the percent of the total score that learners must earn in the **Minimum Score** field. If the prerequisite section is not a problem set, set **Minimum Score** to 0 and set **Minimum Completion Percentage** to a value greater than zero.

   For example, if the prerequisite subsection includes four problems and each problem is worth the same number of points, set the **Minimum Score** to 75 to require at least three correct answers.

   To require that learners complete a minimum portion of the prerequisite subsection before the current subsection opens, enter the percent of the prerequisite subsection that learners must complete in the **Minimum Completion Percentage** field.

   If you set both the **Minimum Score** field and the **Minimum Completion Percentage** field to a value greater than zero, then learners must satisfy both conditions in the prerequisite section before they can view the current subsection. The default value for both the **Minimum Score** field and the **Minimum Completion Percentage** field is 100.

7.7. Controlling Content Visibility and Access

10. Select **Save**.

11. In the course outline, if a subsection has a prerequisite, the prerequisite name appears under the subsection name.

Note: Prerequisite course subsection settings are not retained when you *export or import a course*, or when you *re-run a course*.

7.8 Course Licensing

You can specify licensing options for your course content as well as for each video in your course. By specifying the license, you communicate to learners whether and how they can reuse your course content.

You specify licensing options in Studio. For more information, see *Set Course Content Licensing in Studio*.

- *License Options*
- *Set Course Content Licensing in Studio*
- *Set Video Licensing*
- *Learners' View of Licenses*

7.8.1 License Options

For your course content and for each video in your course, you can select one of the following license options.

- All Rights Reserved
- Creative Commons

All Rights Reserved

All Rights Reserved indicates to learners that you own the copyright but reserve all rights for sharing copies of course content or videos. Learners cannot reuse or republish course content or videos that have All Rights Reserved licenses.

Creative Commons License

The Creative Commons license indicates to learners that you own the copyright but are granting certain permissions for reuse, depending on the license options that you select.

When you create a new course, the default terms are set to All Rights Reserved. You can change the terms for your course in the **Schedule & Details** page in Studio.

License Option	Description
Attribu-tion	This option allows others to copy, distribute, display, and perform your copyrighted work but only if they give credit to you in the way that you request. This option is enabled for all Creative Commons licenses on edX course content. You cannot clear this option.
Noncom-mercial	This option allows others to distribute, display, and perform your work – and derivative works based upon it – but for non-commercial purposes only.
No Deriva-tives	This option allows others to distribute, display, and perform only verbatim copies of your work, not derivative works based upon it. You cannot use this option with the **Share Alike** option.
Share Alike	This option allows others to distribute derivative works only under a license identical to the license that governs your work. You cannot use this option with the **No Derivatives** option.

For more information, see the Creative Commons website.

7.8.2 Set Course Content Licensing in Studio

When you have determined what licenses you want your course content to have, you set course content licensing in Studio.

For more information about licensing options, see *Course Licensing*.

When you create a new course, the license is set to **All Rights Reserved**. You can change the license for your course in the **Schedule & Details** page in Studio.

The license options that you select apply to all course content, including videos, unless you explicitly specify different licensing options for your videos. Learners see the license at the bottom of all pages in the course.

1. From the **Settings** menu, select **Schedule & Details**.

2. Scroll to the bottom of the page to view the **Course Content License** section.

3. Select the license option for your course.

   - To grant learners to right to share and use course content, select **Creative Commons**. The Creative Commons options are displayed.

   Select the *Creative Commons license options* to apply.

   - To reserve all course content rights, select **All Rights Reserved**.

4. Select **Save** at the bottom of the page to save your changes.

7.8.3 Set Video Licensing

If you intend for a specific video to have a different license than the course as a whole, you must set the license in the *video advanced options*.

For example, you might license for your course under Creative Commons, but use a video from another party that is copyrighted. In this case, you can set the license for that particular video to **All Rights Reserved**.

If a video is to have the same license as the course as a whole, you do not need to set the license for the video.

7.8.4 Learners' View of Licenses

When they view content in the **Course** tab, learners see the license that you set for the course at the bottom of the page.

If the video has a different license than the course as a whole, learners see the license at the bottom right of the video player.
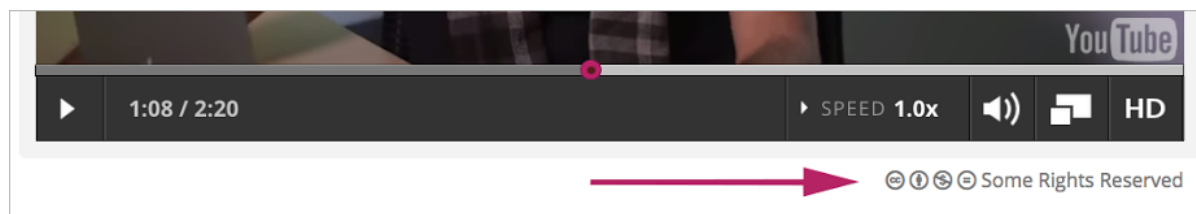
For the course and for videos, if you choose **All Rights Reserved**, learners see **All Rights Reserved**; if you choose **Creative Commons** and select any allowed combination of options, learners see **Some Rights Reserved** and can select the link to see details.

7.9 Testing Your Course Content

The way your course looks in Studio is different from the way that learners will see and experience it when it is live in the LMS. As a best practice, you should test content continually as you build your course, by interacting with the course content from a learner's point of view.

The method that you choose for experiencing the course content as a learner depends on the publishing status of the content.

- For published and released content, use *View Live*.
- For draft and unreleased content, use *Preview*.

For more information, see the following topics.

- *Viewing Published and Released Content*
- *Previewing Draft Content*
- *Viewing Course Content Based on Roles*

Beta testing your course is another way to evaluate course content. For information about setting up a beta test for your course, see *Beta Testing a Course*.

To test content before a course has started, you can add yourself as a beta tester on the instructor dashboard. Make sure to set the course start date and the appropriate **Days Early for Beta** value. For more information, see *Beta Testing a Course*.

7.9.1 Viewing Published and Released Content

If your course has started, you can view published and released course content from the point of view of a learner. When you select **View Live** or **View Live Version** from the course outline in Studio, you can choose specific views in the LMS to experience the course content exactly as a particular learner would.

Note: For courses that have not started, **View Live** mode provides only **Staff** view, and you can only view content that has a publishing status of Published.

In courses that have started, when you use **Staff** view in **View Live** mode, keep the following points in mind.

- In addition to units that have a publishing status of *published and live* you also see units that are published but not yet released.

- You see published units that are in *Visible to Staff Only* or *Draft (Unpublished changes)* status, regardless of the release dates of the containing section or subsection, but you see only the latest published version of such units.

- You do not see units that are in *Draft (Never Published)* status. To see these units, you must use Preview mode, as described in *Previewing Draft Content*.

- If you view the course in a role other than **Staff**, you do not have access to the **Instructor** tab or to staff functions such as **View Unit in Studio**, **Staff Debug Info**, or **Submission History**.

For information about unit publishing statuses, see *Unit Publishing Statuses*.

View Published and Released Content

To view published and released content as it would appear to members of different groups, follow these steps.

1. From the Studio **Course Outline** page, select **View Live**. Alternatively, from a unit page, select **View Live Version**.

   A separate browser tab opens for the course in the LMS.

2. In the LMS, select one of the **View this course as** options, as described in *Viewing Course Content Based on Roles*.

The course view refreshes to present published course content as a learner in the selected group would see it.

For more information about each view, see *Staff View*, *Learner View*, or *Specific Learner View*. For more information about viewing cohort-specific course content, see *Viewing Cohort-Specific Course Content*.

7.9.2 Previewing Draft Content

Before your course has started, or before you release content to learners, you can test how the content will appear when it is released.

Similar to *viewing published content*, you can choose specific views in the LMS to experience draft or unreleased course content as learners belonging to different groups would, but you select **Preview** from the course outline in Studio instead of **View Live**.

In **Preview** mode, if you use one of the student-based **View course as** options, you can see draft course content unrestricted by release date. You see any content that has a publishing status of *Published and Live* as well as content with publishing statuses of *Draft (Never Published)* or *Draft (Unpublished changes)*.

When you use **Staff** view in preview mode, you also see any content that is *Visible to Staff Only*.

Preview Draft Content

To preview draft content and see how it would appear to members of different groups when it is released, follow these steps.

1. From a unit page in the **Course Outline** in Studio, select **Preview**.

   A separate browser tab opens for the course in the LMS.

2. In the LMS, select one of the **View this course as** options, as described in *Viewing Course Content Based on Roles*.

The course view refreshes to present course content as it is currently configured in Studio, and as a learner in the selected group would see it.

Note: If you use randomized content blocks in your course, you cannot preview unpublished units that contain content from randomized content blocks, because the randomized content is not assigned until after the unit is published. For information about viewing the actual content that has been assigned to a particular learner from a randomized content block in a live course, see *Specific Learner View*.

7.9.3 Viewing Course Content Based on Roles

When you select **View Live** or **Preview** from the course outline in Studio, you can see how it would appear to members of different groups by selecting one of the **View this course as** options in the LMS.
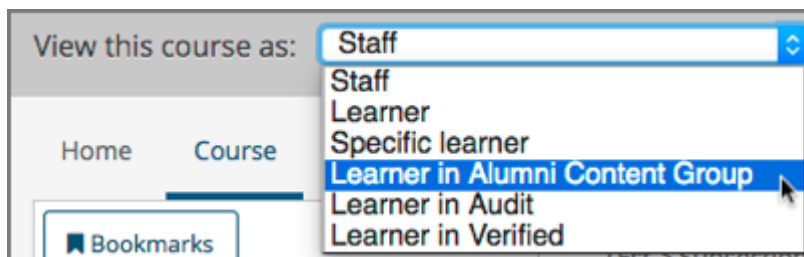
The following table summarizes the content that is available in either **View Live** mode or **Preview** mode when you choose a role for viewing the content.

"View this course as" Role	In "View Live" Mode	In "Preview" Mode
Staff	You see content that has any of the publishing statuses *Published and Live*, *Published (not yet released)*, or *Draft (Unpublished changes)*. In **Staff** view, you also see content that is *Visible to Staff Only*.	In addition to the content you would see in "View Live" mode, you also see content that is in *Draft (Never Published)* status. In **Staff** view, you also see content that is *Visible to Staff Only*.
Learner	You see content that has a status of *Published and Live*, and that is intended for all learners. For example, you see content that is not intended for a specific cohort group. In **Student** view, you do not see content that is *Visible to Staff Only*.	In addition to the content that you would see in "View Live" mode, you also see content that has a status of *Draft (Never Published)* or *Draft (Unpublished changes)*. In **Student** view, you do not see content that is *Visible to Staff Only*.
Specific Learner	You see content that has a status of *Published and Live*, and is intended for the specific learner whose email or username you enter.	**Specific student** view is not available for unpublished content or if the course has not started.
Learner in a Specific Content Group	You see content that has a status of *Published and Live* that would be available to learners who belong to the specified content group.	In addition to the content you would see in "View Live" mode, you also see content that has a status of *Draft (Never Published)* or *Draft (Unpublished changes)* that would be available to learners who belong to the specified content group.
Learner in an Enrollment Track	You see content that has a status of *Published and Live* that would be available to learners who are in the specified enrollment track.	In addition to the content you would see in "View Live" mode, you also see content that has a status of *Draft (Never Published)* or *Draft (Unpublished changes)* that would be available to learners who are in the specified enrollment track.

Note: When a unit's state is *Published and Live*, the preview and the live versions of the course are exactly the same. In this case, selecting either **View Live** or **Preview** gives you the same view of that unit.

Staff View

Staff view displays content in your course as any member of the course team would experience it.

When you view your course content using **Staff** view, you can execute tests to make sure that your course works the way you intend. For example, before the release date of a subsection, members of the course team can work through the problems to verify that the correct answer receives a green check for correct, and that any answer other than the correct one receives a red X for incorrect.

When you use **Staff** view in the LMS, you can go back to Studio to edit course content in the following ways.

- On a unit page, select **View Unit in Studio** to open the unit within the course outline in Studio.

- From the instructor dashboard, select **View Course in Studio** to open the course outline in Studio.

- On the **Progress** page, select **View Grading in Studio** to open the **Grading** page in Studio.

Learner View

Learner view displays content in your course as an enrolled learner in your course would experience it.

Note: If your course uses randomized content blocks, or if your course is designed so that learners in different enrollment track groups or content groups are shown different content, you can select an option from the **View Course As** dropdown list to see the content that a specific learner sees, or that a learner in a specific group sees. For more information, see *Specific Learner View* or *Viewing Cohort-Specific Course Content*.

Specific Learner View

Note: This view is available only if your course has started, and only for content that has a status of *Published and Live*.

Specific learner view displays published content in your live course as the learner that you specify experiences it. When you view the **Progress** page, the page displays grades and progress for the learner that you have specified.

When you view your course content as **Specific student**, be aware of the following limitations.

- You cannot view open response assessment problems as a specific learner.

- In courses with randomized content blocks, you see the actual problem that was assigned to a specific learner. This view allows you to evaluate a request to adjust a grade or reset the number of attempts for a problem. For details about adjusting grades or resetting attempts, see *Adjust Grades for One or All Learners*.

Learner in a Content Group View

This view displays content as a learner who belongs to the specified content group would experience it. You can use this view to verify that content designed for learners in a specific content group is displaying as intended.

For details about content groups, and about creating and previewing cohort-specific content, see *Content Groups*, *Creating Cohort-Specific Course Content*, and *Viewing Cohort-Specific Course Content*.

Learner in an Enrollment Track Group View

This view displays content as a learner who is in a specific enrollment track would experience it. You can use this view to verify that content designed for learners in a specific enrollment track is displaying as intended.

For more information about enrollment track groups, and about creating and previewing enrollment track based content, see About Enrollment Track Groups and Access and Enrollment Track Specific Courseware Overview.

ADDING COURSE COMPONENTS

Use the topics in this section to understand how to create course content of different types.

For information on creating exercises and tools, see *Adding Exercises and Tools*.

For information on how to develop your course content in the Studio Outline page, see *Developing Your Course*.

8.1 Working with Text Components

This section describes how to work with Text components in Studio.

- *Text Component Overview*
- *Options for Editing Text Components*
- *Create a Text Component*
- *Add a Link in a Text Component*
- *Add an Image to a Text Component*

8.1.1 Text Component Overview

HTML, or HyperText Markup Language, is the standard markup language used to create web pages. Web browsers present HTML code in a more readable format.

When students see text and images in your course, they are seeing HTML code that is formatted and presented by their browsers. For more information about HTML, see Wikipedia.

Text Components

Text components are the basic building blocks of your course content. You use Text components to add and format text, links, images, and more. You can work with your Text components in a "visual" or WYSIWYG editor that hides the HTML code details, or in a "raw" editor that requires you to mark up your content.

Note: Review *Developing Your Course* and *Use Best Practices for HTML Markup* before you start working with Text components.

8.1.2 Options for Editing Text Components

You can use two different editing interfaces to work with a Text component.

- *The Visual Editor*

  With the visual editor you create, edit, and format content in a word processing-like interface, without using HTML markup directly. With the visual editor, you can more easily format your content, and add links and images.

  The visual editor includes an **HTML** option for you to review the HTML markup and make small formatting changes to your content. However, this HTML option does not provide the detailed control you can get with the raw HTML editor, nor does it support custom formatting or scripts.

  If you add a Text component and select **Text**, when you select **Edit** the visual editor opens by default.

- *The Raw HTML Editor*

  If you prefer to mark up your content directly with HTML markup, you can use the raw HTML editor. If you need to include custom formatting or scripts in your content, you must use the raw HTML editor.

  If you add a Text component and select **Raw HTML**, when you select **Edit** the raw HTML editor opens by default.

  There is no way to switch between the Visual Editor and the Raw HTML editor once one is selected.

Note: If you copy text from another source and paste it into either the visual or raw HTML editor, be sure to proofread the result carefully. Some applications automatically change quotation marks and apostrophes from the "straight" version to the "smart" or "curly" version. Both editors require "straight" quotation marks and apostrophes.

The Visual Editor

The visual editor provides a "what you see is what you get" (WYSIWYG) interface that allows you to format text by selecting options at the top of the editor.

The following image shows callouts for the editing options and is followed by descriptions.

1. Arrows that perform undo/redo actions.

2. Select a formatting style for the selected text, such as paragraph, `preformatted` (monospace), or a heading level.

Note: The available heading levels in the Text component editor begin with heading 2 (`<h2>`). Text components are part of a complete page, and elements outside the Text component use heading level 1 by default. Because tools such as screen readers use heading levels to navigate through pages, using heading level 1 inside a Text component can interfere with the functionality of these tools.

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3. Format the selected text in bold, or remove this formatting. The editor inserts `<strong>` tags around the selected text.

4. Format the selected text in italics, or remove this formatting. The editor inserts <em> tags around the selected text.

5. Underline the selected text, or remove this formatting. The editor encloses the selected text in the tag <span style="text-decoration: underline;">.

6. Change the color of the selected text. The editor encloses the selected text in the tag <span style="color: color-hex-code;">.

7. Change the background color of the selected text. The editor encloses the selected text in the tag <span style="background-color: color-hex-code;">.

8. Align text and images to the left. The editor adds style="text-align: left;" to the <p> tags that surround the text.

9. Center text and images. The editor adds style="text-align: center;" to the <p> tags that surround the text.

10. Align text and images to the right. The editor adds style="text-align: right;" to the <p> tags that surround the text.

11. Justify text and images. The editor adds style="text-align: justify;" to the <p> tags that surround the text.

12. Create a bulleted list, or remove this formatting. The editor inserts <ul> tags around the selected text, and encloses each paragraph in <li> tags.

13. Create a numbered list, or remove this formatting. The editor inserts <ol> tags around the selected text, and encloses each paragraph in <li> tags.

14. Decrease and increase the indentation of the selected paragraph.

15. Insert an image at the cursor. For more information, see *Add an Image to a Text Component*.

16. Create a hypertext link from the selected text. For more information, see *Add a Link in a Text Component*.

17. Remove a hypertext link from the selected text.

18. Format the selected paragraph as a blockquote. The editor inserts <blockquote> tags around the selected text, which is then displayed as a separate indented paragraph.

19. Format the selected text as a code block, or remove this formatting. The editor inserts <code> tags around the selected text, which is then displayed in a monospace font.

20. The table toolbar icon lets you drop in a table component and selecting a given cell lets you create, remove, or adjust rows and columns.

21. You can easily add emoticons to your text content. This can be a way to break up long stretches of content.

22. We have introduced a way to to include special characters into your text content, including mathematical and symbolic elements.

23. Inject a horizontal line in the highlighted content.

24. Clear formatting button which removes all font formatting from the selected text. This does not remove paragraph formatting (e.g. blockquote).

25. Review the HTML markup.

Note: The visual editor is not available for *course handouts*.

Review HTML Markup in the Visual Editor

To review the HTML markup added to content in the visual editor, select **HTML** from the visual editor's toolbar. The HTML source code editor opens.
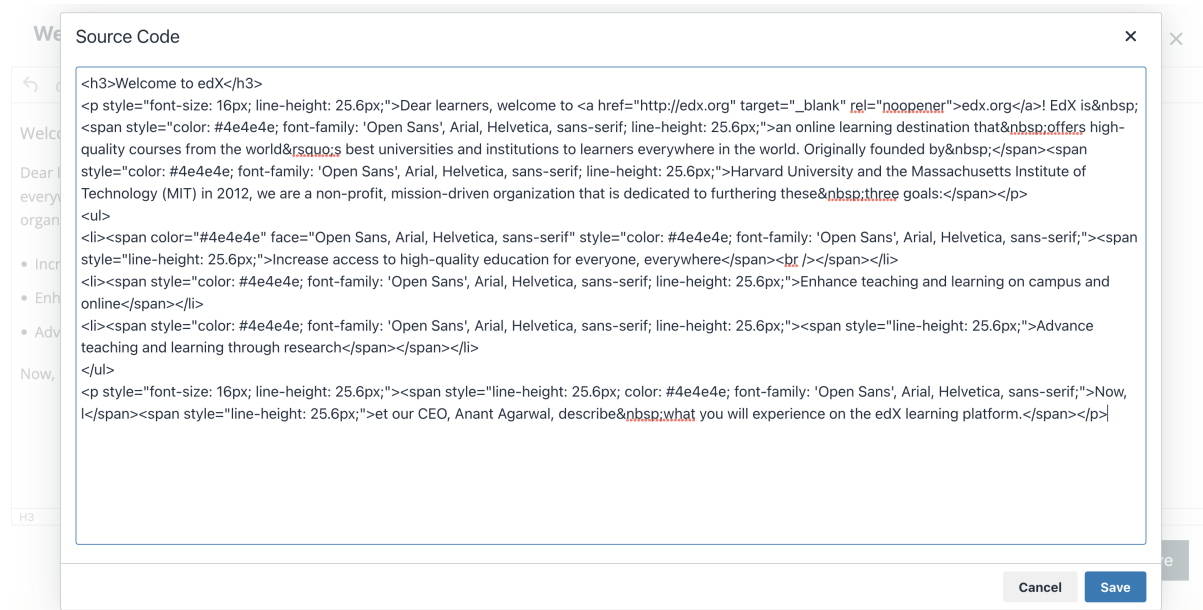
You can edit text and the HTML markup in this editor. However, you cannot add custom styles or scripts in this editor. To do this, you must use the *raw HTML editor* instead.

Select **Save** to return to the visual editor. The visual editor attempts to correct any problems with the markup that you entered. For example, if you do not provide a close paragraph tag, the editor adds the tag for you.

You can then continue working in the visual editor.

> **Warning:** Selecting **OK** in the source code editor does not save your changes to the Text component. To save your changes and close the component, select **Save** in the visual editor. If you select **Cancel**, the changes you made in the HTML source code editor are discarded.

The Raw HTML Editor

The raw HTML editor is a text editor. It does not offer a toolbar with formatting options.

Raw HTML ✏   ✕

You are using the raw HTML editor.

<p>This is a Raw HTML editor that saves your HTML exactly as you enter it.
This means that even malformed HTML tags will be saved and rendered as-is.
There is no way to switch between Raw and Visual Text editor types, so be
sure this is the editor you should be using!</p>

Cancel   **Save**
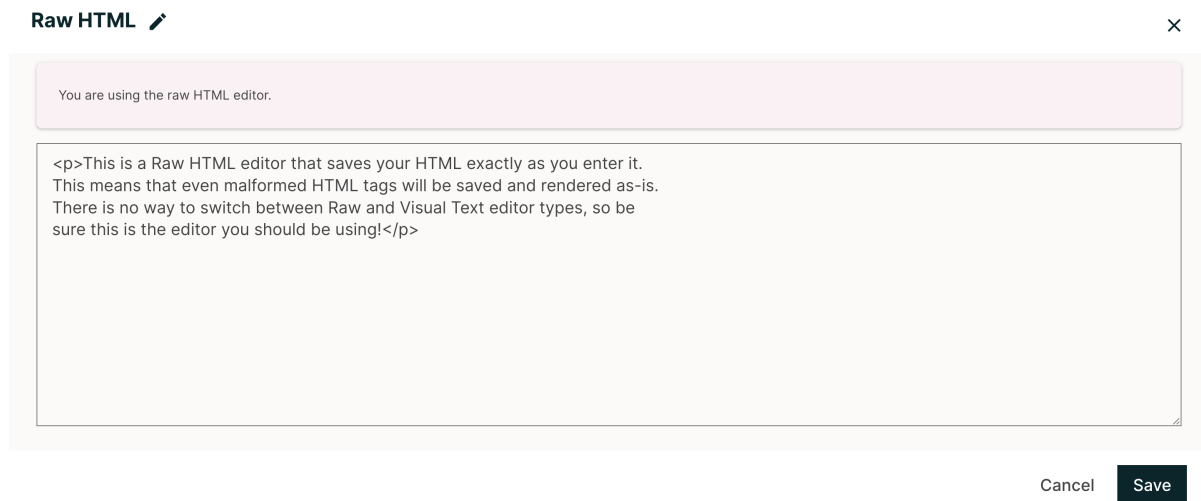
When you use this editor, you must supply valid HTML. The raw HTML editor does not validate your HTML code. If you use this editor, you should thoroughly test the HTML content in your course.

Important: When you add a heading to a Text component, make sure that you use only heading level 2 <h2> through heading level 6 <h6>. Text components are part of a complete page, and elements outside the Text component use heading level 1 by default. Because tools such as screen readers use heading levels to navigate through pages, using heading level 1 inside a Text component can interfere with the functionality of these tools.

8.1.3 Create a Text Component

1. Under **Add New Component**, select **Text**.

2. Select the template.

   The rest of these instructions assume that you selected **Text**, which creates an empty Text component with the *visual editor* selected.

   An empty Text component appears at the bottom of the unit, and the Text component opens in the visual editor.

3. Enter and format your content. You can *review the HTML markup*.

4. To enter a display name for the component, select the Pencil icon next to the title in the top left corner of the visual editor. Changing the display name from it's default value to a unique, descriptive display name can help you and your learners identify course content quickly and accurately. If no title is present, the platform shows "Text" as the name of the component when in Studio.

5. Select **Save**.

When you use the visual editor, you can also perform the following tasks.

- *Add a Link in a Text Component*

- *Add an Image to a Text Component*

- Import LaTeX Code

Text Component Templates

When you create a Text component, you select from a list of templates and editor types, inlcuding the following:

- Text

- Announcement

- IFrame Tool

- Raw HTML

The **Text** template loads the Visual Editor with no pre-canned text.

The **Announcement** and the **IFrame Tool** templates load the Visual Editor with pre-canned text that instructs the user how to format Announcements, or how to use IFrames.

The **Raw HTML** editor type uses the raw HTML editor by default. All other options use the visual editor by default. There is no way to switch between Visual and Raw editor types once selected.

8.1.4 Add a Link in a Text Component

When you use the visual editor, to add a link to a website, course unit, or file in a Text component, you work with the **Insert link** dialog box.

For more information, see the following tasks.

- *Add a Link to a Website*

- *Add a Link to a Course Unit*

- *Add a Link to a File*

Add a Link to a Website

1. Select the text that you want to use as the link text.

2. Select the link icon in the toolbar.

3. In the **Insert/Edit link** dialog box, enter the URL of the website that is the destination for your link in the **URL** field.

4. If you want the link to open in a new window, select the dropdown arrow next to the **Open Link In...** field, and then select **New Window**. If not, you can leave the default value.

5. Select **OK**.

6. Save the Text component.

7. To test the link, select **View Live Version** or **Preview**. When the unit opens in the LMS, select the linked text and verify that the correct website opens.

Add a Link to a Course Unit

Note: When you create a link to another component, the unit of that destination component must be published for the link to work.

---

1. Obtain the location ID of the unit you want to link to.

    1. In Studio, open the page for the unit that you want to link to in Studio, and then locate **Unit Location** in the right pane.

    2. Under **Unit Location**, select and copy the alphanumeric text in the **Location ID** field.
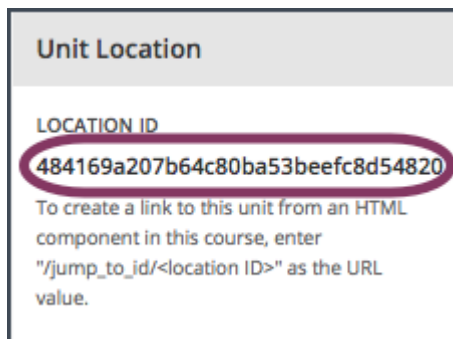
2. Open the Text component where you want to add the link.

3. Select the text that you want to make into the link.

4. Select the link icon in the toolbar.

5. In the **Insert link** dialog box, enter a value that resembles the following value in the **URL** field.

    `/jump_to_id/<location ID>`

    Make sure to replace <location ID> (including the brackets) with the location ID that you copied in step 1, and make sure that you include both forward slashes (/).

Caution: Ensure you use `/jump_to_id/<location ID>` as the URL value. Do not use the URL of the unit that you see in the browser address bar. If you do not use `/jump_to_id/<location ID>`, the link will be broken if you export and then import the course.

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1. If you want the link to open in a new window, select the dropdown arrow next to the **Open Link In...** field, and then select **New Window**. If not, you can leave the default value.

2. Select **Insert**.

3. Save the Text component and test the link.

Add a Link to a File

Tip: When you add links to files, open the Text component and the **Files & Uploads** page in separate browser windows. You can then more quickly copy file URLs.

You can add a link in a Text component to any file that is uploaded for the course. For more information about uploading files, see *Adding Files to a Course*.

Note: Do not use this method to add images to Text components. Instead, use the method in *Add an Image to a Text Component*.

1. On the **Files & Uploads** page, locate the file that you want, and then select **Studio** in the **Copy URLs** column.

    Note: You must use the **Studio** URL to link to the file, not the **Web** URL. For more information, see *Adding Files to a Course*.

1. In the Text component where you want to add the link, select the text that you want to make into the link.

2. In the toolbar, select the link icon.

3. In the **Insert link** dialog box, paste the Studio URL for the file in the **URL** field. For example, the URL might resemble the following URL.

    `/static/FileName.pdf`

    Make sure that you include both forward slashes (/).

4. (optional) If you want the link to open in a new window, select the dropdown arrow next to the **Open Link In...** field, and then select **New Window**. If not, you can leave the default value.

5. Select **OK**.

6. Save the Text component and test the link.

8.1.5 Add an Image to a Text Component

When you use the Visual Editor, you can add any image from your computer to a Text component. You can see a preview of the image before you add it to the component.

Note:

- Before you add an image, make sure that you obtain copyright permissions for images you use in your course, and that you cite sources appropriately.

- To add effective alternative text for images, review *Use Best Practices for Describing Images*.

- You can only add one image at one time.

- Each individual image file must be smaller than 10 MB.

To add an image to a Text component, you can use one of the following procedures.

- *Locate an image* by using the **Browse Your Computer** option in the **Add Image** dialog box.

- *Select an image* that you have previously uploaded.

Locate an Image on Your Computer

1. In the Text component, position the cursor where you want to add an image, and then select the image icon on the toolbar.

2. In the **Add an Image** dialog box, **Upload a New Image (10 MB max)**.

3. In the dialog box that opens, locate the file that you want to add, and then select **Open**, or locate the image in the Image Gallery, and then select **Next**.

   As soon as your image is selected, the **Image Settings** dialog box opens.

4. In the **Edit Image Settings** dialog box, add an image description.

   • In the **Alt Text** field, enter alternative text for the image. This text becomes the value of the `alt` attribute in HTML and is required for your course to be fully accessible. For more information, see *Use Best Practices for Describing Images*.

   • If your image is a decorative image that does not convey important information, select the **This image is decorative (no alt text required)** checkbox.

5. (optional) Specify the width and height of your image. For more information, see *Change the Image Size*.

6. Select **Save**.

7. Save the Text component and test the image.

Select a Previously Uploaded Image

1. When you upload an image, the image automatically becomes available in a gallery list that opens when you add an image to a Text component.

2. In the Text component, position the cursor where you want to add an image, and then select the image icon on the toolbar.

3. In the **Add an Image** dialog box, locate the image in the gallery list, and then select **Next**. There are sort and filter options available for the gallery list to make it easy to find the image you need.

4. In the **Image Settings** dialog box, complete one of the following options.

   • In the **Alt Text** field, enter alternative text for the image. This text becomes the value of the `alt` attribute in HTML and is required for your course to be fully accessible. For more information, see *Use Best Practices for Describing Images*.

   • If your image is a decorative image that does not convey important information, select the **This image is decorative (no alt text required)** checkbox.

5. (optional) Specify the width and height of your image. For more information, see *Change the Image Size*.

6. Select **Save**.

7. Save the Text component and test the image.

Format an Image in a Text Component

You have several options for formatting an image in a Text component.

- *Align an Image*

- *Change the Image Size*

Align an Image

To align your image to the right, the left, or the center, follow these steps.

1. In the Text component, select the image.

2. On the toolbar, select the left align, right align, or center icon.

Change the Image Size

To change the size of your image, follow these steps.

1. In the Text component, select the image that you want to edit, and then select the Contextual image icon that appears above the image.

2. In the **Image Settings** dialog box, locate **Image Dimensions**, and then enter the values that you want for the **Width** and **Height** options.

Note: To make sure that the image keeps the same proportions when you change the image size, make sure that **Lock proportions** is selected, and enter a number in only the **Width** field or the **Height** field. After you tab or click outside that field, the number in the other field changes to a value that maintains the image proportions.

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3. Select **Save**.

If you want to change the image back to the original size, clear the values in the **Width** and **Height** fields.

8.2 Working with Video Components

You use video components to add videos to your course in Studio. In video components, you add the name and location of your video, as well as the video transcript. Learners view your videos in the LMS.

For information about the way learners interact with videos, see Watching Videos on the edX Video Player.

For more information about adding videos to your course, see Creating and Adding Video Content.

For more information about options in the video component, see *Specifying Additional Video Options*.

8.3 Working with Discussion Components

This section describes how to work with discussion components in Studio.

- *Overview*
- *Create a Discussion Component*
- *A Learner's View of the Discussion*

8.3.1 Overview

You can add discussion components to a unit to pose questions about other components, such as videos or text, in the unit. A discussion component gives learners a chance to respond to and interact with each other about a specific subject.

Discussion topics that you create by adding discussion components in your course are known as content-specific discussion topics.

For more information about discussions, see these topics.

- *Creating Course Discussions*
- *Guidance for Discussion Moderators*
- *Setting up Discussions in Courses with Cohorts*

8.3.2 Create a Discussion Component

Note: EdX recommends that you add a Text component before each discussion component to introduce the topic that you want learners to discuss. The discussion component itself does not contain any text and can be easy for learners to overlook.

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1. Under **Add New Component**, select **Discussion**.

   > **Warning:** You should always use these steps to create a discussion component. Do not create discussion components by using the **Duplicate** button in Studio. Duplicated discussion components result in discussion topics containing the same conversations, even if users post in different discussions.

2. In the discussion component that appears, select **Edit**.

3. Follow the guidelines in the editor to fill in the **Category**, the **Display Name**, and the **Subcategory** fields.

   Note: Each **Category/Subcategory** pair for the discussion topics in your course must be unique.

   The value in the **Display Name** field identifies the discussion in the course content. The default display name for new discussion components is "Discussion". Changing the default to a unique, descriptive display name can help you and your learners identify different topics quickly and accurately. If you delete the default display name and do not enter your own identifying name, the platform supplies "discussion" for you.

The values in the **Category** (1) and **Subcategory** (2) fields are visible to learners in the list of discussion topics on the **Discussion** page.
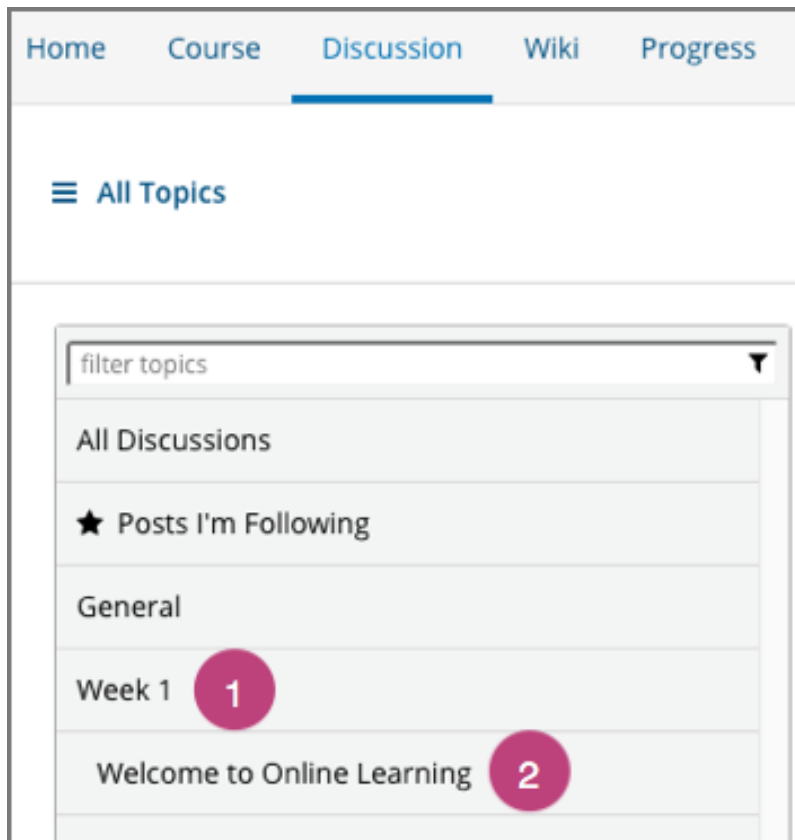
4. Select **Save**.

Note: On the **Discussion** page, you cannot see category and subcategory names of discussion components that you created until after the course has started and the unit is released. For more details about when discussion topics are visible, see *Understanding When Learners Can See Discussion Topics*.

8.3.3 A Learner's View of the Discussion

When you add a discussion component to a unit, in the LMS, learners see only the discussion, together with the display name of the discussion component, the category, and the subcategory. EdX recommends that you add an HTML component before each discussion component where you add some text to introduce the discussion topic.

In the following example, the discussion component follows an HTML component. Learners select **Add a Post** to post their own contributions.

Content-specific topics that you add using discussion components are included on the course **Discussion** page in the same way as course-wide discussion topics as included. In the following example, the category (1) and the subcategory (2) of the discussion component is shown in the list of discussion topics.

8.4 Working with Problem Components

This section introduces the core set of problem types that course teams can add to any course by using the problem component. It also describes editing options and settings for problem components.

- *Adding a Problem*
- *The Learner View of a Problem*
- *Editing a Problem in Studio*
- *Defining Settings for Problem Components*
- *Including Multiple Questions in One Component*
- *Adding Feedback and Hints to a Problem*
- *Awarding Partial Credit for a Problem*
- *Problem Randomization*
- *Modifying a Released Problem*

For information about specific problem types, and the other exercises and tools that you can add to your course, see *Problems, Exercises, and Tools*.

8.4.1 Adding a Problem

To add interactive problems to a course in Studio, in the course outline, at the *unit* level, you select **Problem**. You then choose the type of problem that you want to add from the **Common Problem Types** list or the **Advanced** list.

The common problem types include relatively straightforward CAPA problems such as multiple choice and text or numeric input. The advanced problem types can be more complex to set up, such as math expression input, open response assessment, or custom JavaScript problems.

The common and advanced problem types that the problem component lists are the core set of problems that every course team can include in a course. You can also enable more exercises and tools for use in your course. For more information, see *Enabling Additional Exercises and Tools*.

Adding Graded or Ungraded Problems

When you *establish the grading policy* for your course, you define the assignment types that count toward learners' grades: for example, homework, labs, midterm, final, and participation. You specify one of these assignment types for each of the subsections in your course.

As you develop your course, you can add problem components to a unit in any subsection. The problem components that you add automatically inherit the assignment type that is defined at the subsection level. For example, all of the problem components that you add to a unit in the midterm subsection are graded.

For more information, see *Set the Assignment Type and Due Date for a Subsection*.

8.4.2 The Learner View of a Problem

All problems on the edX platform have these component parts, some of which can be configured. For configurable options, you can specify whether and when an option is available in problems.

1. **Problem text.** The problem text can contain any standard HTML formatting.

   Within the problem text for each problem component, you must identify a question or prompt, which is, specifically, the question that learners need to answer. This question or prompt also serves as the required accessible label, and is used by screen readers, reports, and Insights. For more information about identifying the question text in your problem, see *The Simple Editor*.

2. **Response field.** Learners enter answers in response fields. The appearance of the response field depends on the type of the problem.

3. **Rendered answer.** For some problem types, the LMS uses MathJax to render plain text as "beautiful math."

4. **Submit.** When a learner selects **Submit** to submit a response for a problem, the LMS saves the grade and current state of the problem. The LMS immediately provides feedback about whether the response is correct or incorrect, as well as the problem score. The **Submit** option remains available if the learner has unused attempts remaining, so that she can try to answer the problem again.

   > **Note:** If you want to temporarily or permanently hide learners' results for the problem, see *Set Problem Results Visibility*.

5. **Attempts.** You can set a specific number of attempts or allow unlimited attempts for a problem. By default, the course-wide **Maximum Attempts** advanced setting is null, meaning that the maximum number of attempts for problems is unlimited.

   In courses where a specific number has been specified for **Maximum Attempts** in Advanced Settings, if you do not specify a value for **Maximum Attempts** for an individual problem, the number of attempts for that problem defaults to the number of attempts defined in Advanced Settings.

6. **Save.** The learner can select **Save** to save his current response without submitting it for grading. This allows the learner to stop working on a problem and come back to it later.

7. **Reset.** You can specify whether the **Reset** option is available for a problem. This setting at the problem level overrides the default setting for the course in **Advanced Settings**.

If the **Reset** option is available, learners can select **Reset** to clear any input that has not yet been submitted, and try again to answer the question.

- If the learner has already submitted an answer, selecting **Reset** clears the submission and, if the problem includes a Python script to randomize variables and the randomization setting is **On Reset**, changes the values the learner sees in the problem.

- If the problem has already been answered correctly, **Reset** is not available.

- If the number of **Maximum Attempts** that was set for this problem has been reached, **Reset** is not available.

8. **Show Answer.** You can specify whether this option is available for a problem. If a learner selects **Show Answer**, the learner sees both the correct answer and the explanation, if any.

    If you specify a number in **Show Answer: Number of Attempts**, the learner must submit at least that number of attempted answers before the **Show Answer** option is available for the problem.

9. **Feedback.** After a learner selects **Submit**, an icon appears beside each response field or selection within a problem. A green check mark indicates that the response was correct, a green asterisk (*) indicates that the response was partially correct, and a red X indicates that the response was incorrect. Underneath the problem, feedback text indicates whether the problem was answered correctly, incorrectly, or partially correctly, and shows the problem score.

Note: If you want to temporarily or permanently hide learners' results for the problem, see *Set Problem Results Visibility*.

In addition to the items above, which are shown in the example, problems also have the following elements.

- **Correct answer.** Most problems require that you specify a single correct answer.

    Note: If you want to temporarily or permanently hide learners' results for the problem, see *Set Problem Results Visibility*.

- **Explanation.** You can include an explanation that appears when a learner selects **Show Answer**.

- **Grading.** You can specify whether a group of problems is graded.

- **Due date.** The date that the problem is due. Learners cannot submit answers for problems whose due dates have passed, although they can select **Show Answer** to show the correct answer and the explanation, if any.

Note: Problems can be **open** or **closed**. Closed problems, such as problems whose due dates are in the past, do not accept further responses and cannot be reset. Learners can still see questions, solutions, and revealed explanations, but they cannot submit responses or reset problems.

There are also some attributes of problems that are not immediately visible. You can set these attributes in Studio.

- **Accessible Label.** Within the problem text, you can identify the text that is, specifically, the question that learners need to answer. The text that is labeled as the question is used by screen readers, reports, and Insights. For more information, see *The Simple Editor*.

- **Randomization.** In certain types of problems, you can include a Python script to randomize the values that are presented to learners. You use this setting to define when values are randomized. For more information, see *Randomization*.

- **Weight.** Different problems in a particular problem set can be given different weights. For more information, see *Problem Weight*.

8.4.3 Editing a Problem in Studio

When you select **Problem** and choose one of the problem types, Studio adds an example problem of that type to the unit. To replace the example with your own problem, you select **Edit** to open the example problem in an editor.

The editing interface that opens depends on the type of problem you choose.

- For common problem types, the *simple editor* opens. In this editor, you use Markdown-style formatting indicators to identify the elements of the problem, such as the prompt and the correct and incorrect answer options.

- For advanced problem types (with the exception of *open response assessment*), the *advanced editor* opens. In this editor you use open learning XML (OLX) elements and attributes to identify the elements of the problem.

  For open response assessment problem types, you define the problem elements and options by using a graphical user interface. For more information, see *Create an Open Response Assessment Assignment*.

You can switch from the simple editor to the advanced editor at any time by selecting **Advanced Editor** from the simple editor's toolbar.

Note: After you save a problem in the advanced editor, you cannot open it again in the simple editor.

The Simple Editor

When you edit one of the *common problem types*, the simple editor opens with a template that you can use as a guideline for adding Markdown formatting. The following templates are available.

- *Checkbox Problem* and Checkboxes with Hints and Feedback

- *Dropdown Problem* and Dropdown with Hints and Feedback

- *Multiple Choice Problem* and Multiple Choice with Hints and Feedback

- *Numerical Input Problem* and Numerical Input with Hints and Feedback

- *Text Input Problem* and Text Input with Hints and Feedback

Blank common problems also open in the simple editor but they do not provide a template.

Adding Markdown Formatting

The following image shows the multiple choice template in the simple editor.
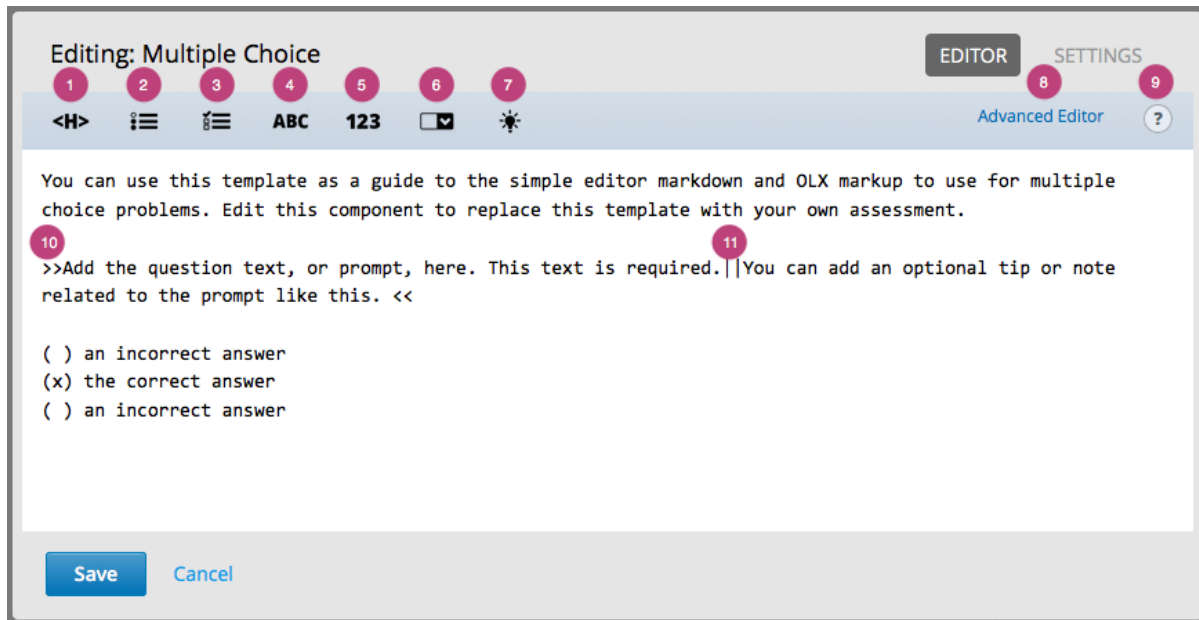
The simple editor includes a toolbar with options that provide the required Markdown formatting for different types of problems. When you select an option from the toolbar, formatted sample text appears in the simple editor. Alternatively, you can apply formatting to your own text by selecting the text and then one of the toolbar options.

Descriptions of the Markdown formatting that you use in the simple editor follow.

1. **Heading**: Identifies a title or heading by adding a series of equals signs (=) below it on the next line.

2. **Multiple Choice**: Identifies an answer option for a multiple choice problem by adding a pair of parentheses (( )) before it. To identify the correct answer option, you insert an x within the parentheses: ((x)).

3. **Checkboxes**: Identifies an answer option for a checkboxes problem by adding a pair of brackets ([ ]) before it. To identify the correct answer option or options, you insert an x within the brackets: ([x]).

4. **Text Input**: Identifies the correct answer for a text input problem by adding an equals sign (=) before the answer value on the same line.

5. **Numerical Input**: Identifies the correct answer for a numerical input problem by adding an equals sign (=) before the answer value on the same line.

6. **Dropdown**: Identifies a comma-separated list of values as the set of answer options for a dropdown problem by adding two pairs of brackets ([[ ]]) around the list. To identify the correct answer option, you add parentheses (( )) around that option.

7. **Explanation**: Identifies the explanation for the correct answer by adding an [explanation] tag to the lines before and after the text. The explanation appears only after learners select **Show Answer**. You define when the **Show Answer** option is available to learners by using the *Show Answer* setting.

8. **Advanced Editor** link: Opens the problem in the *advanced editor*, which shows the OLX markup for the problem.

9. **Toggle Cheatsheet**: Opens a list of formatting hints.

10. **Question or Prompt**: Identifies the question that learners need to answer. The toolbar does not have an option that provides this formatting, so you add two pairs of inward-pointing angle brackets (>> <<) around the question text. For example, >>Is this the question?<<.

    - You must identify a question or prompt in every problem component. In problems that include *multiple questions*, you must identify each one.

    - The *Student Answer Distribution* report uses the text with this formatting to identify each problem.

    - Insights also uses the text with this formatting to identify each problem. For more information, see Using edX Insights.

11. **Description**: Identifies optional guidance that helps learners answer the question. For example, when you add a checkbox problem that is only correct when learners select three of the answer options, you might include the description, "Be sure to select all that apply." The toolbar does not have an option that provides this formatting, so you add it after the question within the angle brackets, and then you separate the question and the description by inserting a pair of pipe symbols (||) between them. For example, >>Which of the following choices is correct? ||Be sure to select all that apply.<<.

Adding Text, Symbols, and Mathematics

You can also add text, without formatting, to a problem. Note that screen readers read all of the text that you supply for the problem, and then repeat the text that is identified as the question or prompt immediately before reading the answer choices for the problem. For problems that require descriptions or other text, you might consider adding a Text component for the text immediately before the problem component.

When you enter unformatted text, note that the simple editor cannot interpret certain symbol characters correctly. These symbols are reserved HTML characters: greater than (>), less than (<), and ampersand (&). If you enter text that includes these characters, the simple editor cannot save your edits. To resolve this problem, replace these characters in your problem text with the HTML entities that represent them.

- To enter >, type >.

- To enter <, type <.

- To enter &, type &.

To add mathematics, you can use LaTeX, MathML, or AsciiMath notation. Studio uses MathJax to render equations. For more information, see *Using MathJax for Mathematics*.

The Advanced Editor

When you edit one of the *advanced problem types*, the advanced editor opens with an example problem. The advanced editor is an XML editor that shows the OLX markup for a problem. You edit the following advanced problem types in the advanced editor.

- *Circuit Schematic Builder Problem*

- *Custom JavaScript Display and Grading*

- *Custom Python-Evaluated Input*

- *Drag and Drop* (Deprecated)

- *Image Mapped Input Problem*

- *Math Expression Input Problems*

- *Problem Written in LaTeX*

- *Problem with Adaptive Hint* and Problem with Adaptive Hint in LaTex

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8.4. Working with Problem Components

- *Molecular Structure*

For the *Open Response Assessment* advanced problem type, a dialog box opens for problem setup.

Blank advanced problems do not provide an example problem, but they also open in the advanced editor by default.

The following image shows the OLX markup in the advanced editor for the same example multiple choice problem that is shown in the simple editor above.
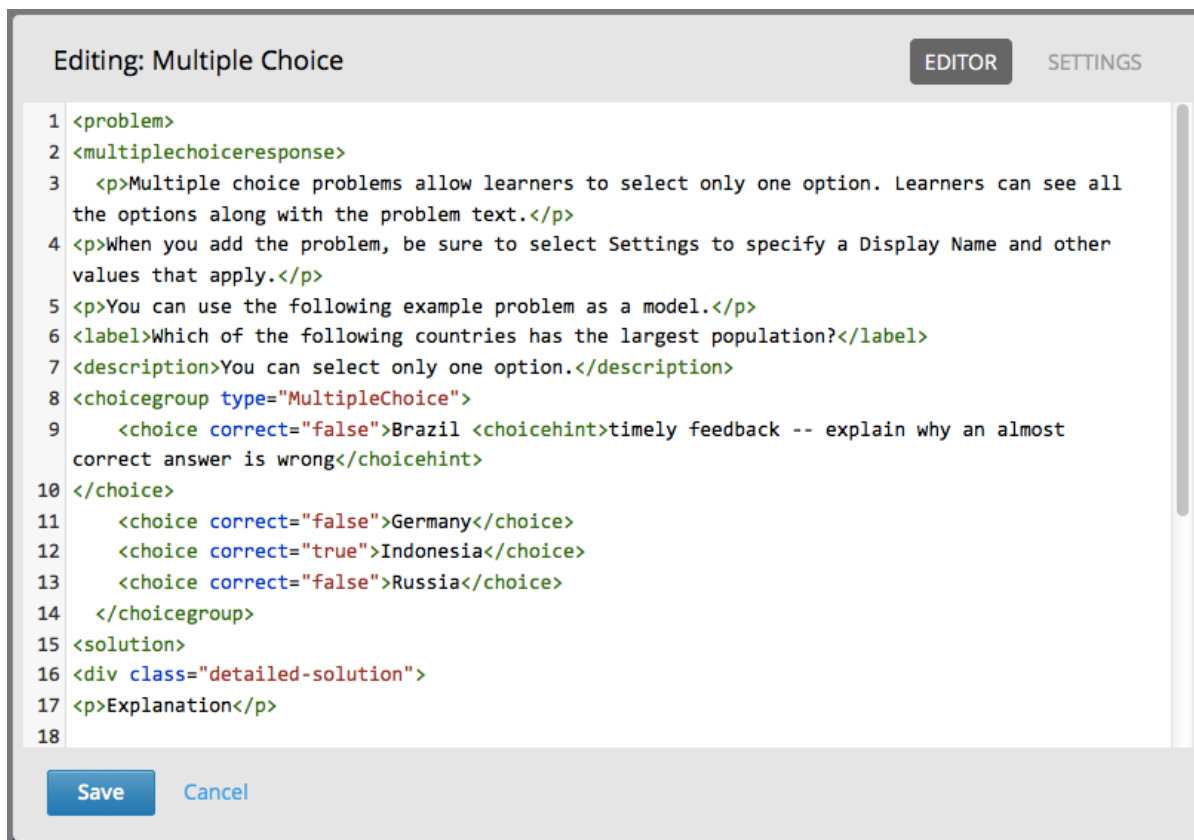
For more information about the OLX markup to use for a problem, see the topic that describes that problem type.

8.4.4 Defining Settings for Problem Components

In addition to the text of the problem and its Markdown formatting or OLX markup, you define the following settings for problem components. To access these settings, you edit the problem and then select **Settings**.

- *Display Name*
- *Maximum Attempts*
- *Problem Weight*
- *Randomization*
- *Show Answer*
- *Show Answer: Number of Attempts*
- *Show Reset Button*

- *Timer Between Attempts*

If you do not edit these settings, default values are supplied for your problems.

Note: If you want to temporarily or permanently hide problem results from learners, you use the subsection-level **Results Visibility** setting. You cannot change the visibility of individual problems. For more information, see *Set Problem Results Visibility*.

Display Name

This required setting provides an identifying name for the problem. The display name appears as a heading above the problem in the LMS, and it identifies the problem for you in Insights. Be sure to add unique, descriptive display names so that you, and your learners, can identify specific problems quickly and accurately.

The following illustration shows the display name of a problem in Studio, in the LMS, and in Insights.
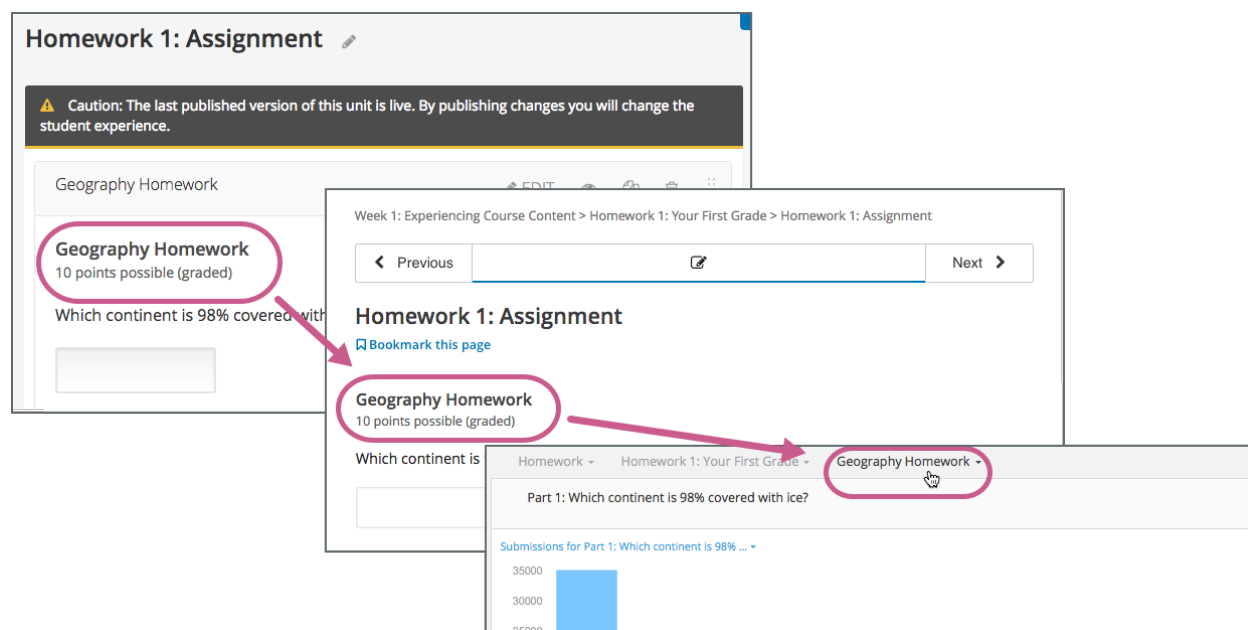
For more information about metrics for your course's problem components, see Using edX Insights.

Maximum Attempts

This setting specifies the number of times that a learner is allowed to try to answer this problem correctly. You can define a different **Maximum Attempts** value for each problem.

A course-wide **Maximum Attempts** setting defines the default value for this problem-specific setting. Initially, the value for the course-wide setting is null, meaning that learners can try to answer problems an unlimited number of times. You can change the course-wide default by selecting **Settings** and then **Advanced Settings**. Note that if you change the course-wide default from null to a specific number, you can no longer change the problem-specific **Maximum Attempts** value to unlimited.
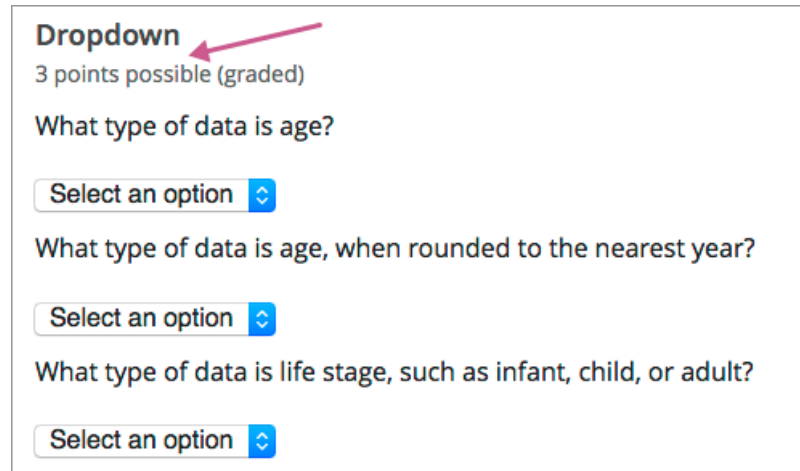
Only problems that have a **Maximum Attempts** setting of 1 or higher are included in the answer distribution computations used in edX Insights and the Student Answer Distribution report.

Note: EdX recommends setting **Maximum Attempts** to unlimited or a large number when possible. Problems that allow unlimited attempts encourage risk taking and experimentation, both of which lead to improved learning outcomes. However, allowing for unlimited attempts might not be feasible in some courses, such as those that use primarily multiple choice or dropdown problems in graded subsections.

Problem Weight

Note: The LMS scores all problems. However, only scores for problem components that are in graded subsections count toward a learner's final grade.

This setting specifies the total number of points possible for the problem. In the LMS, the problem weight appears near the problem's display name.

By default, each response field, or answer space, in a problem component is worth one point. You increase or decrease the number of points for a problem component by setting its **Problem Weight**.

In the example shown above, a single problem component includes three separate questions. To respond to these questions, learners select answer options from three separate dropdown lists, the response fields for this problem. By default, learners receive one point for each question that they answer correctly.

For information about how to define a problem that includes more than one question, see *Including Multiple Questions in One Component*.

Computing Scores

The score that a learner earns for a problem is the result of the following formula.

Score = Weight × (Correct answers / Response fields)

- **Score** is the point score that the learner receives.
- **Weight** is the problem's maximum possible point score.
- **Correct answers** is the number of response fields that contain correct answers.
- **Response fields** is the total number of response fields in the problem.

Examples

The following are some examples of computing scores.

Example 1

A problem's **Problem Weight** setting is left blank. The problem has two response fields. Because the problem has two response fields, the maximum score is 2.0 points.

If one response field contains a correct answer and the other response field contains an incorrect answer, the learner's score is 1.0 out of 2 points.

Example 2

A problem's weight is set to 12. The problem has three response fields.

If a learner's response includes two correct answers and one incorrect answer, the learner's score is 8.0 out of 12 points.

Example 3

A problem's weight is set to 2. The problem has four response fields.

If a learner's response contains one correct answer and three incorrect answers, the learner's score is 0.5 out of 2 points.

Randomization

Note: This **Randomization** setting serves a different purpose from "problem randomization". This **Randomization** setting affects how numeric values are randomized within a single problem and requires the inclusion of a Python script. Problem randomization presents different problems or problem versions to different learners. For more information, see *Problem Randomization*.

For problems that include a Python script to generate numbers randomly, this setting specifies how frequently the values in the problem change: each time a different learner accesses the problem, each time a single learner tries to answer the problem, both, or never.

Note: This setting should only be set to an option other than **Never** for problems that are configured to do random number generation.

For example, in this problem, the highlighted values change each time a learner submits an answer to the problem.

If you want to randomize numeric values in a problem, you complete both of these steps.

- Make sure that you edit your problem to include a Python script that randomly generates numbers.

- Select an option other than **Never** for the **Randomization** setting.

The edX Platform has a 20-seed maximum for randomization. This means that learners see up to 20 different problem variants for every problem that has **Randomization** set to an option other than **Never**. It also means that every answer for the 20 different variants is reported by the Answer Distribution report and edX Insights. Limiting the number of variants to a maximum of 20 allows for better analysis of learner submissions by allowing you to detect common incorrect answers and usage patterns for such answers.

For more information, see *Student Answer Distribution* in this guide, or Review Answers to Graded Problems or Review Answers to Ungraded Problems in *Using edX Insights*.

Important: Whenever you choose an option other than **Never** for a problem, the computations for the Answer Distribution report and edX Insights include up to 20 variants for the problem, **even if the problem was not actually configured to include randomly generated values**. This can make data collected for problems that cannot include randomly generated values, (including, but not limited to, all multiple choice, checkboxes, dropdown, and text input problems), extremely difficult to interpret.

You can choose the following options for the **Randomization** setting.

Option	Description
Always	Learners see a different version of the problem each time they select **Submit**.
On Reset	Learners see a different version of the problem each time they select **Reset**.
Never	All learners see the same version of the problem. For most courses, this option is supplied by default. Select this option for every problem in your course that does not include a Python script to generate random numbers.
Per Student	Individual learners see the same version of the problem each time they look at it, but that version is different from the version that other learners see.

Show Answer

This setting adds a **Show Answer** option to the problem. The following options define when the answer is shown to learners.

After All Attempts	Learners will be able to **Show Answer** after they have used all of their attempts. Requires max attempts to be set on the problem.
After All Attempts or Correct	Learners will be able to **Show Answer** after they have used all of their attempts or have correctly answered the question. If max attempts are not set, the learner will need to answer correctly before they can **Show Answer**.
After Some Number of Attempts	Learners will be able to **Show Answer** after they have attempted the problem a minimum number of times (this value is set by the course team in Studio).
Always	Always present the **Show Answer** option. Note: If you specify **Always**, learners can submit a response even after they select **Show Answer** to see the correct answer.
Answered	Learners will be able to **Show Answer** after they have correctly answered the problem.
Attempted	Learners will be able to **Show Answer** after they have made at least 1 attempt on the problem. If the problem can be, and is, reset, the answer continues to show. (When a learner answers a problem, the problem is considered to be both attempted and answered. When the problem is reset, the problem is still considered to have been attempted, but is not considered to be answered.)
Attempted or Past Due	Learners will be able to **Show Answer** after they have made at least 1 attempt on the problem or the problem's due date is in the past.
Closed	Learners will be able to **Show Answer** after they have used all attempts on the problem or the due date for the problem is in the past.
Correct or Past Due	Learners will be able to **Show Answer** after they have correctly answered the problem or the due date for the problem is in the past.
Finished	Learners will be able to **Show Answer** after they have used all attempts on the problem or the due date for the problem is in the past or they have correctly answered the problem.
Never	Learners and Staff will never be able to **Show Answer**.
Past Due	Learners will be able to **Show Answer** after the due date for the problem is in the past.

Show Answer: Number of Attempts

This setting limits when learners can select the **Show Answer** option for a problem. Learners must submit at least the specified number of attempted answers for the problem before the **Show Answer** option is available to them.

Show Reset Button

This setting defines whether a **Reset** option is available for the problem.

Learners can select **Reset** to clear any input that has not yet been submitted, and try again to answer the problem.

If the learner has already submitted an answer, selecting **Reset** clears the submission and, if the problem contains randomized variables and randomization is set to **On Reset**, changes the values in the problem.

If the number of Maximum Attempts that was set for this problem has been reached, the **Reset** option is not visible.

This problem-level setting overrides the course-level **Show Reset Button for Problems** advanced setting.

Timer Between Attempts

This setting specifies the number of seconds that a learner must wait between submissions for a problem that allows multiple attempts. If the value is 0, the learner can attempt the problem again immediately after an incorrect attempt.

Adding required wait time between attempts can help to prevent learners from simply guessing when multiple attempts are allowed.

If a learner attempts a problem again before the required time has elapsed, she sees a message below the problem indicating the remaining wait time. The format of the message is, "You must wait at least {n} seconds between submissions. {n} seconds remaining."

8.4.5 Including Multiple Questions in One Component

In some cases, you might want to design an assessment that combines multiple questions in a single problem component. For example, you might want learners to demonstrate mastery of a concept by providing the correct responses to several questions, and only giving them credit for problem if all of the answers are correct.

Another example involves learners who have slow or intermittent internet connections. When every problem appears on a separately loaded web page, these learners can find the amount of time it takes to complete an assignment or exam discouraging. For these learners, grouping several questions together can promote increased engagement with course assignments.

When you add multiple questions to a single problem component, the settings that you define, including the display name and whether to show the **Reset** button, apply to all of the questions in that component. The answers to all of the questions are submitted when learners select **Submit**, and the correct answers for all of the questions appear when learners select **Show Answer**. By default, learners receive one point for each question they answer correctly. For more information about changing the default problem weight and other settings, see *Defining Settings for Problem Components*.

Important: To assure that the data collected for learner interactions with your problem components is complete and accurate, include a maximum of 10 questions in a single problem component.

Adding Multiple Questions to a Problem Component

To design an assignment that includes several questions, you add one problem component and then edit it to add every question and its answer options, one after the other, in that component. Be sure to identify the text of every question or prompt with the appropriate Markdown formatting (>> <<) or OLX <label> element, and include all of the other required elements for each question.

- In the simple editor, you use three hyphen characters (---) on a new line to separate one question and its answer options from the next.

- In the advanced editor, each question and its answer options are enclosed by the element that identifies the type of problem, such as <multiplechoiceresponse> for a multiple choice question or <formularesponse> for a math expression input question.

- You can provide a different explanation for each question with the appropriate Markdown formatting ([explanation]) or OLX <solution> element.

As a best practice, edX recommends that you avoid including unformatted paragraph text between the questions. Screen readers can skip over text that is inserted among multiple questions.

The questions that you include can all be of the same problem type, such as a series of text input questions, or you can include questions that use different problem types, such as both numerical input and math expression input.

Note: You cannot use a *Custom JavaScript Display and Grading Problem* in a problem component that contains more than one question. Each custom JavaScript problem must be in its own component.

An example of a problem component that includes a text input question and a numerical input question follows. In the simple editor, the problem has the following Markdown formatting.

```
>>Who invented the Caesar salad?||Be sure to check your spelling.<<
= Caesar Cardini
[explanation]
Caesar Cardini is credited with inventing this salad and received a U.S. trademark for␣
↪his salad dressing recipe.
[explanation]
---
>>In what year?<<
= 1924
[explanation]
Cardini invented the dish at his restaurant on 4 July 1924 after the rush of holiday␣
↪business left the kitchen with fewer supplies than usual.
[explanation]
```

That is, you include three hyphen characters (`---`) on a new line to separate the problems.

In the advanced editor, the problem has the following OLX markup.

```xml
<problem>
  <stringresponse answer="Caesar Cardini" type="ci">
    <label>Who invented the Caesar salad?</label>
    <description>Be sure to check your spelling.</description>
    <textline size="20"/>
    <solution>
      <div class="detailed-solution">
        <p>Explanation</p>
        <p>Caesar Cardini is credited with inventing this salad and received
         a U.S. trademark for his salad dressing recipe.</p>
      </div>
    </solution>
  </stringresponse>

  <numericalresponse answer="1924">
    <label>In what year?</label>
    <formulaequationinput/>
    <solution>
      <div class="detailed-solution">
        <p>Explanation</p>
        <p>Cardini invented the dish at his restaurant on 4 July 1924 after
         the rush of holiday business left the kitchen with fewer supplies
         than usual.</p>
      </div>
    </solution>
  </numericalresponse>
</problem>
```

8.4.6 Adding Feedback and Hints to a Problem

You can add feedback, hints, or both to the following core problem types.

- *Checkbox Problem*
- *Dropdown Problem*
- *Multiple Choice Problem*
- *Numerical Input Problem*
- *Text Input Problem*

By using hints and feedback, you can provide learners with guidance and help as they work on problems.

Feedback in Response to Attempted Answers

You can add feedback that displays to learners after they submit an answer.

For example, the following multiple choice problem provides feedback in response to the selected option when the learner selects **Submit**. In this case, feedback is given for an incorrect answer.

Best Practices for Providing Feedback

The immediacy of the feedback available to learners is a key advantage of online instruction and difficult to do in a traditional classroom environment.

You can target feedback for common incorrect answers to the misconceptions that are common for the level of the learner (for example, elementary, middle, high school, college).

In addition, you can create feedback that provides some guidance to the learner about how to arrive at the correct answer. This is especially important in text input and numeric input problems, because without such guidance, learners might not be able to proceed.

You should also include feedback for the correct answer to reinforce why the answer is correct. Especially in questions where learners are able to guess, such as multiple choice and dropdown problems, the feedback should provide a reason why the selection is correct.

Providing Hints for Problems

You can add one or more hints that are displayed to learners. When you add hints, the **Hint** button is automatically displayed to learners. Learners can access the hints by selecting **Hint** beneath the problem. A learner can view multiple hints by selecting **Hint** multiple times.

For example, in the following multiple choice problem, the learner selects **Hint** after having made one incorrect attempt.

The hint text indicates that it is the first of two hints. After the learner selects **Next Hint**, both of the available hints appear. When all hints have been used, the **Hint** or **Next Hint** option is no longer available.

Best Practices for Providing Hints

To ensure that your hints can assist learners with varying backgrounds and levels of understanding, you should provide multiple hints with different levels of detail.

For example, the first hint can orient the learner to the problem and help those struggling to better understand what is being asked.

The second hint can then take the learner further towards the answer.

In problems that are not graded, the third and final hint can explain the solution for learners who are still confused.

Create Problems with Feedback and Hints

You create problems with feedback and hints in Studio. Templates with feedback and hints configured are available to make creating your own problems easier.

While editing a unit, in the **Add New Component** panel, select **Problem**. In the list that opens, select **Common Problem Types**. Templates for problems with feedback and hints are listed.

Add the problem type you need to the unit, then edit the component. The exact syntax you use to configure hints and feedback depends on the problem type. See the topic for the problem type for more information.

- *Checkbox Problem*
- *Dropdown Problem*
- *Multiple Choice Problem*

- *Numerical Input Problem*
- *Text Input Problem*

8.4.7 Awarding Partial Credit for a Problem

You can configure the following problem types so that learners can receive partial credit for a problem if they submit an answer that is partly correct.

- *Checkbox*
- *Multiple Choice*
- *Numerical Input*
- *Write-Your-Own Grader*

By awarding partial credit for problems, you can motivate learners who have mastered some of the course content and provide a score that accurately demonstrates their progress.

For more information about configuring partial credit, see the topic for each problem type.

How Learners Receive Partial Credit

Learners receive partial credit when they submit an answer in the LMS.

In the following example, the course team configured a multiple choice problem to award 25% of the possible points (instead of 0 points) for one of the incorrect answer options. The learner selected this incorrect option, and received 25% of the possible points.

Partial Credit and Reporting on Learner Performance

When a learner receives partial credit for a problem, the LMS only adds the points that the learner earned to the grade. However, the LMS reports any problem for which a learner receives credit, in full or in part, as correct in the following ways.

- Events that the system generates when learners receive partial credit for a problem indicate that the answer was correct. Specifically, the `correctness` field has a value of `correct`.

  For more information about events, see Problem Interaction Events in the *EdX Research Guide*.

- The **AnswerValue** in the *Student Answer Distribution* report is **1**, for correct.

- The edX Insights insights:student performance reports count the answer as correct.

Course teams can see that a learner received partial credit for a problem in the learner's submission history. The submission history shows the score that the learner received out of the total available score, and the value in the `correctness` field is `partially-correct`. For more information, see *Learner Answer Submissions*.

Adding Tooltips to a Problem

To help learners understand terminology or other aspects of a problem, you can add inline tooltips. Tooltips show text to learners when they move their cursors over a tooltip icon.

The following example problem includes two tooltips. The tooltip that provides a definition for "ROI" is being shown.
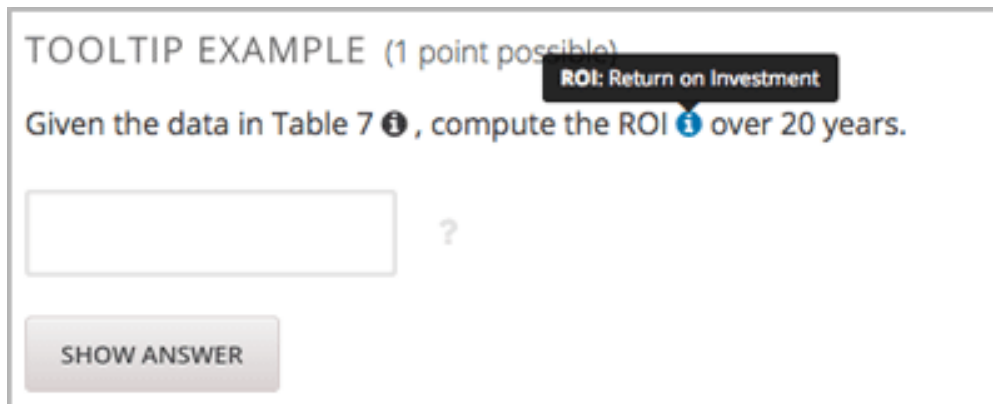
Note: For learners using a screen reader, the tooltip expands to make its associated text accessible when the screen reader focuses on the tooltip icon.

To add the tooltip, you wrap the text that you want to appear as the tooltip in the `clarification` element. For example, the following problem contains two tooltips.

```
<problem>
    <text>
        <p>Given the data in Table 7 <clarification>Table 7: "Example PV
          Installation Costs", Page 171 of Roberts textbook</clarification>,
          compute the ROI <clarification><strong>ROI</strong>: Return on
          Investment</clarification> over 20 years.
        </p>
    . . .
```

8.4.8 Problem Randomization

Presenting different learners with different problems or with different versions of the same problem is referred to as "problem randomization".

You can provide different learners with different problems by using randomized content blocks, which randomly draw problems from pools of problems stored in content libraries. For more information, see *Randomized Content Blocks*.

Note: Problem randomization is different from the **Randomization** setting that you define in Studio. Problem randomization presents different problems or problem versions to different learners, while the **Randomization** setting controls when a Python script randomizes the variables within a single problem. For more information about the **Randomization** setting, see *Randomization*.

Creating randomized problems by exporting your course and editing some of your course's XML files is no longer supported.

8.4.9 Modifying a Released Problem

> **Warning:** Be careful when you modify problems after they have been released. Changes that you make to published problems can affect the learner experience in the course and analysis of course data.

After a learner submits a response to a problem, the LMS stores that response, the score that the learner received, and the maximum score for the problem. For problems with a **Maximum Attempts** setting greater than 1, the LMS updates these values each time the learner submits a new response to a problem. However, if you change a problem or its attributes, existing learner information for that problem is not automatically updated.

For example, you release a problem and specify that its answer is 3. After some learner have submitted responses, you notice that the answer should be 2 instead of 3. When you update the problem with the correct answer, the LMS does not update scores for learners who originally answered 2 for the problem and received the wrong score.

For another example, you change the number of response fields to three. Learners who submitted answers before the change have a score of 0, 1, or 2 out of 2.0 for that problem. Learners who submitted answers after the change have scores of 0, 1, 2, or 3 out of 3.0 for the same problem.

If you change the weight setting for the problem in Studio, however, existing scores update when the learner's **Progress** page is refreshed. In a live section, learners will see the effect of these changes.

Workarounds

If you have to modify a released problem in a way that affects grading, you have two options to ensure that every learner has the opportunity to submit a new response and be regraded. Note that both options require you to ask your learners to go back and resubmit answers to a problem.

- In the problem component that you changed, increase the number of attempts for the problem, and then ask all of your learners to redo the problem.

- Delete the entire problem component in Studio and replace it with a new problem component that has the content and settings that you want. Then ask all of your learners to complete the new problem. (If the revisions you must make are minor, you might want to duplicate the problem component before you delete it, and then revise the copy.)

For information about how to review and adjust learner grades in the LMS, see *Adjust Grades for One or All Learners*.

8.5 Working with Content Libraries

This section describes how to work with content libraries in Studio.

- *Content Libraries Overview*
- *Create a New Library*
- *Edit a Library*
- *Add Components to a Library*
- *View the Contents of a Library*
- *Edit Components in a Library*
- *Delete a Library*
- *Give Other Users Access to Your Library*
- *Exporting and Importing a Library*

8.5.1 Content Libraries Overview

In Studio, you can create a library to build a pool of components for use in randomized assignments in your courses. You can add Text components, problems, and video components to a library. Open response assessment and discussion components are not supported in libraries.

Note: Content libraries are available only for courses that have course identifiers in this format: `{key type}:{org}+{course}+{run}`. For example, `course-v1:edX+DemoX+Demo_2015`. Your course identifier appears in the browser address bar as the final part of the URL when you open your course in Studio. For more details, see *Create a Course*.

After creating a library and adding components to it, if you have *enabled content libraries* in your course, you can use these library components in randomized assignments in your course. You do this by adding a randomized content block to a course unit and specifying the name of the library from which the randomized content is to drawn. You also specify the number and type of problems that each learner is assigned. For information about randomized content blocks, see *Randomized Content Blocks*.

Libraries have separate users and levels of access from courses. Initially, only the person who created the library has access. She can add other users to the library. For details, see *Give Other Users Access to Your Library*. The libraries that you create or have access to are listed on the **Libraries** tab on the Studio Home page.

8.5.2 Create a New Library

Use *content libraries* to build a pool of components that can be used in randomized assignments in your courses.

To create a new library, follow these steps.

1. Log in to Studio.
2. Select **New Library**.
3. Enter the required information for your new library, then select **Create**.

Note: Enter new library information carefully. The values in these fields become part of the URL for your library, therefore the total number of characters in the **Library Name**, **Organization**, and **Library Code** fields must be 65 or fewer.

Create a New Library

Library Name *

> e.g. Computer Science Problems

The public display name for your library.

Organization *

> e.g. UniversityX or OrganizationX

The public organization name for your library. This cannot be changed.

Library Code *

> e.g. CSPROB

The unique code that identifies this library. **Note: This is part of your library URL, so no spaces or special characters are allowed.** This cannot be changed.

- For **Library Name**, enter the public display name for your library. Choose a meaningful name that will help you and other course team members to identify the library. For example, "Level 200 Math Problems". When you add a randomized content block to a course unit, you use the library name to specify this library as a source for the randomized assignment.

- For **Organization**, enter the identifier for your university. For example, enter HarvardX or MITx. Do not include spaces or special characters.

- For **Library Code**, enter an identifier for your library that is unique within your organization. This code becomes part of the URL for your library, so do not include spaces or special characters in the code.

4. Select **Create**.

You see the new library, to which you can now add components. For information about adding components to a library, see *Add Components to a Library*.

After you create a library, you are automatically assigned an **Admin** role for the library. For information about adding other users to a library after you create it, see *Give Other Users Access to Your Library*.

8.5.3 Edit a Library

After you create a library, the only change you can make to the initial library information is to the name. However, at any time, you can make changes to the components in your library, including adding or deleting components or editing the settings of components. For details about editing the contents of a library, see *Edit Components in a Library* and *Add Components to a Library*.

To change the name of a library, follow these steps.

1. Log in to Studio.

2. Select **Libraries**, then select the library whose name you want to edit.

3. Select the **Edit** icon next to the library name.

   The library name field becomes editable.

---
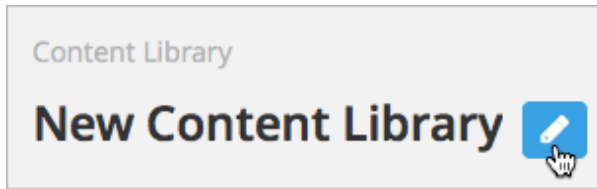
4. In the library name field, make edits or enter a new library name.

5. Select anywhere outside the library name field to save your changes.

For details about giving other users access to the library, see *Give Other Users Access to Your Library*.

8.5.4 Add Components to a Library

To add new *components* to your library, follow these steps.

1. Log in to Studio.

2. Select **Libraries**, then select the library that you want to add components to.

3. Select **Add Component**, then select the component type that you want to add under **Add New Component**.

For more information about the types of components you can add to a library, see these topics.

- Working with Text Components

- *Working with Problem Components*

- *Working with Video Components*

After you add a component to a library, you can edit its settings. These settings are retained when the component is selected from the library and used in a course.

When a component from the library is used in a randomized content block, you can further edit the component as it exists in the unit, without affecting the original version in the library. For details, refer to *Edit Components in a Library* and *Getting the Latest Version of Library Content*.

8.5.5 View the Contents of a Library

To view the entire contents of a library in Studio, follow these steps.

1. Log in to Studio.

2. Select **Libraries**, then select the library whose components you want to view.

3. Optionally, select **Hide Previews** at the top right of the library page to collapse the component previews and see only the list of component display names. To return to the full preview of components in the library, select **Show Previews**.

The components in the library are shown in the order in which they were added, with the most recently added at the bottom. If your library has more than 10 components, additional components are shown on other pages.

The range of the components shown on the current page, and the total number of components, are shown at the top of the page.

You can navigate through the pages in the following ways.

- Use the **<** and **>** buttons at the top and bottom of the list to navigate to the previous and next pages.

- At the bottom of the page, you can edit the first number in the page range. Select the number to place your cursor in the field, then enter the page number you want to jump to.

To view the list of matching components in the library, see *View the Matching Components in a Randomized Content Block*.

To view the randomized content that was assigned to a specific learner, see *Specific Learner View*.

8.5.6 Edit Components in a Library

After you have added components to a library, you can edit, duplicate, or delete them.

For step-by-step instructions for editing, duplicating, or deleting components, refer to the following topics.

- *Edit a Component*
- *Duplicate a Component*
- *Delete a Component*

Note: If you modify components in your library that are in use in a course, these updates in the "source" library are not reflected in the course unless you manually update the randomized content block in the course unit. For details about updating library components used in your course to match the latest version in the library, see *Getting the Latest Version of Library Content*.

8.5.7 Delete a Library

You cannot delete a library. Instead, you can discontinue use of an unwanted library. To do so, first make sure that none of its components are in use in any courses, then delete all components in the library. You can also *edit the name of the library* to make it clear to other course team members that the library should not be used as a source of randomized assignment content in courses.

For details about deleting components in a library, see *Edit Components in a Library*.

8.5.8 Give Other Users Access to Your Library

When you create a library, you are automatically assigned an Admin role in that library.

You can give other Studio users access to your library. Depending on the level of access that you give them in the library, additional library users can view and use library content in courses, edit library content, or add and manage other library users. All users to whom you give library access must be registered with Studio and have an active account.

These are the levels of access for libraries.

- **User** – Users can view library content and can use library components in their courses, but they cannot edit the contents of a library.
- **Staff** – Staff can use library components in their courses. In addition, as content co-authors, they have full editing privileges in a library.
- **Admin** – Admins have full editing privileges for a library. In addition, they can add and remove other team members from library access. There must be at least one user with Admin privileges in a library.

Note: The levels of access for libraries are hierarchical. You can add new library members only with the **User** level of access, after which you can give them the **Staff** level of access. You can give the **Admin** level of access only to people who already have the **Staff** level of access.

Add a User to the Library

To grant a user initial **User** access to a library, follow these steps.

Note: Only library users with the **Admin** level of access can add users to the library.

1. Ensure that the new library member has an active Studio account.

2. On the Studio home page, select the **Libraries** tab and locate the library to which you are adding this user.

3. From the **Settings** menu select **User Access**.

4. On the **User Access** page, select **Add a New User**.

5. Enter the new user's email address, then select **ADD USER**.

   The new user is added to the list of library members with the **User** level of access.

Remove a User from the Library

You can remove users from the library at any time, regardless of the level of access that they have.

To remove a user from the library, follow these steps.

1. In Studio, select the **Libraries** tab and locate your library.

2. From the **Settings** menu select **User Access**.

3. On the **User Access** page, locate the user that you want to remove.

4. Hover over the user's box and select the trash can icon.

   You are prompted to confirm the deletion.

5. Select **Delete**.

   The user is removed from the library.

Add Staff or Admin Access

The levels of access for libraries are hierarchical. You can add new library members only with the **User** level of access, after which you can give them the **Staff** level of access. You can give the **Admin** level of access only to people who already have the **Staff** level of access.

To give a library member a higher level of access to the library, follow these steps.

1. In Studio, select the **Libraries** tab and locate your library.

2. From the **Settings** menu select **User Access**.

3. On the **User Access** page, locate the user to whom you are giving additional privileges.

   • If he currently has **User** access, select **Add Staff Access**.

- If he currently has **Staff** access, select **Add Admin Access**.

The user's display listing is updated to indicate the new level of access. In addition, their listing now includes a button to remove their current level of access and move them back to their previous level of access. For details about reducing a user's level of access to a library, see *Remove Staff or Admin Access*.

Remove Staff or Admin Access

After you have granted users **Staff** or **Admin** access, you (or other **Admin** library users) can reduce their levels of access.

To remove **Staff** or **Admin** access from a library user, follow these steps.

1. In Studio, select the **Libraries** tab and locate your library.

2. From the **Settings** menu select **User Access**.

3. On the **User Access** page, locate the user whose access level you are changing.

   - If she currently has **Staff** access, select **Remove Staff Access**.

   - If she currently has **Admin** access, select **Remove Admin Access**.

     The user's display listing is updated to indicate the new role.

Note: There must always be at least one Admin for a library. If there is only one user with the Admin role, you cannot remove him or her from the Admin role unless you first assign another user to the Admin role.

8.5.9 Exporting and Importing a Library

You can *export* and *import* a content library in Studio.

> **Warning:** When you import a library, the imported library completely replaces the existing library and its contents. You cannot undo a library import. Before you proceed, we recommend that you export the current library, so that you have a backup copy of it.

Export a Library

There are several reasons why you might want to export your library.

- To save your work in progress

- To edit the XML in your library directly

- To create a backup copy of your library

- To share with another course team member

When you export your library, Studio creates a **.tar.gz** file (that is, a .tar file compressed using GNU Zip). This export file contains the problems in the library, including any customizations you made in the library to problem settings. The export does not include library settings such as user access permissions.

To export a library, follow these steps.

1. In Studio, select the **Libraries** tab.

2. Locate the library that you want to export.

---

3. From the **Tools** menu, select **Export**.

4. Select **Export Library Content** and specify where you want the file to be saved.

When the export process finishes, you can access the .tar.gz file on your computer.

Import a Library

You might want to import a library if you developed or updated library content outside of Studio, or if you want to overwrite a problematic or outdated version of the library.

> **Warning:** When you import a library, the imported library completely replaces the existing library and its contents. You cannot undo a library import. Before you proceed, we recommend that you export the current library, so that you have a backup copy of it.

The library file that you import must be a .tar.gz file (that is, a .tar file compressed using GNU Zip). This .tar.gz file must contain a library.xml file.

To import a library, follow these steps.

1. In Studio, select the **Libraries** tab.

2. Locate the library to which you want to import the new library content.

3. From the **Tools** menu, select **Import**.

4. Select **Choose a File to Import** and select the .tar.gz file that you want to import.

5. Select **Replace my library with the selected file**.

> **Warning:** The import process has five stages. During the first two stages (Uploading and Unpacking), do not navigate away from the **Library Import** page. Doing so causes the import process to end. You can leave the page only after the Unpacking stage completes. We recommend that you do not make important changes to the library until all stages of the import process have finished.

6. When the import process finishes, select **View Updated Library** to view the imported library.

Note: If your imported library includes changes to components that are in use in a course, the course does not reflect these library updates until you manually update the randomized content block in the course unit. For details about updating library components used in your course to match the latest version in the content library, see *Getting the Latest Version of Library Content*.

CREATING AND ADDING VIDEO CONTENT

Videos in a course supplement active learning components, such as discussions and problems. Videos can be effective for presenting motivating material, showing experiments, reducing cognitive load for complex content, and other purposes.

When you create video content, you need to keep various guidelines in mind. This section describes these guidelines, as well as video technical specifications, how to add video content to your course, and how to specify options for your videos.

For more information about how learners can interact with course videos, see Watching Videos on the edX Video Player.

Important: It is very important that all of your videos are accessible to learners with disabilities. Be sure to review *Create Accessible Media* before you create videos for your course.

9.1 Video Process Overview

The following diagram outlines the general process for adding videos to a course.
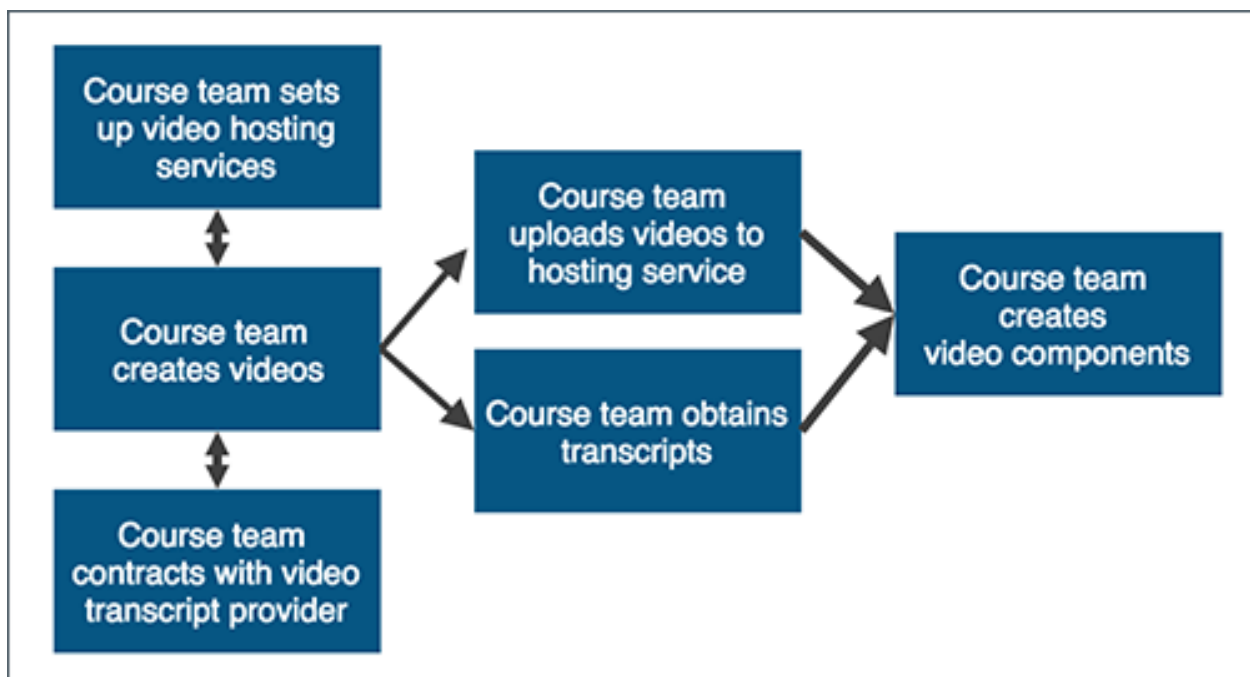
1. The course team *prepares to add videos to the course*. These steps can happen simultaneously.

   - The course team sets up a third party *hosting service* to provide a location for course videos.

   - The course team *creates videos*.

   - The course team *contracts with a third party transcript provider*, such as 3Play Media or cielo24.

2. The course team *uploads the videos* to the third party hosting service.

3. The course team *creates video components* and adds the video location to the components.

4. The course team *uploads transcripts* in the video component.

9.2 Preparing a Video

Before you add a video to a course, you need the following items.

- A place to *host*, or store, your videos.

- A video that meets the recommended *specifications*.

- A *transcript* for the video.

For more information, see the following topics.

9.2.1 Set Up a Hosting Service

You must work with a third party hosting site to make your videos available for streaming or download.

To host your videos, you can use any video hosting site that you want, such as Amazon S3 or YouTube.

When you select a video hosting site, we strongly recommend that you keep the following information in mind.

- If you host your videos on YouTube, you must follow all rules and restrictions that are associated with YouTube.

- The hosting site might have to handle high traffic volume.

- Not all hosting sites are available in all countries or regions. We recommend that you upload videos to more than one hosting site.

- Learners' internet connections vary widely. We recommend that you make your videos available for both download and streaming.

- The URL for your videos must end in .mp4, .mpeg, .webm, or .ogg. The video player cannot support videos that you upload on sites such as Vimeo, Dailymotion, or other sites that use their own player.

Note: To help make sure all standard browsers can play your video, we strongly recommend that you use .mp4 format.

9.2.2 Create a Video

Your videos can contain whatever content you want to include in the course. The following resources can help you to create good video content that is based on extensive experimental research in student learning.

- The Creating Video for the edX Platform course
- Richard E. Mayer's 12 Principles of Multimedia Learning

When you create video files, keep the following guidelines in mind.

- *General Guidelines*
- *File Naming Conventions*
- *Video Compression Specifications*

General Guidelines

- Videos should be as short as possible. Learners are more likely to finish watching videos that are no more than 5-10 minutes long.
- Each video file that you upload must be less than 5GB in size.
- Each video should follow established *file naming conventions* and *video compression specifications*.
- The video player supports videos in .mp4, .mov, .mpeg, .webm, and .ogg format. However, to help make sure all standard browsers can play your video, we **strongly** recommend that you use the .mp4 format.
- We strongly recommend that you create copies of your videos in the following resolutions. When multiple resolutions are available, the video player automatically plays the best video for each learner's device and internet connection.
    - 1080p
    - 720p
    - Mobile 360p

File Naming Conventions

To facilitate identifying and tracking video files, we strongly recommend that organizations define and use a naming convention for all video files in all courses. At a minimum, your naming convention should include these elements.

- A course identifier.
- The year of the initial course run.
- A revision or version number.

For example, you might use the following naming convention.

```
{course number}_{year}_{section}_{subsection}_{unit}_{version}.{type}
```

This convention might yield the following file name.

```
SPU27_2015_S1_SS3_U4_v2.mp4
```

Additionally, when you name your video files, we recommend that you follow these guidelines.

- Make sure that each video file in your organization has a unique name.

- Include only alphanumeric characters and underscores in video file names.

- Make sure that the video file name contains no special characters, such as ç, å, or ó.

- Do not use periods except for the period before the file name extension (for example, .mp4).

Video Compression Specifications

The following video compression specifications are strongly recommended, but not required.

Codec	H.264 .mp4
Resolution & Frame Rate	1920x1080, progressive, 29.97 fps **Note:** Typically, you export at the same frame rate that was used when you created the media file. For example, if you create the file in a country that uses the *PAL* system, you export at 25 fps instead of the *NTSC* standard of 29.97 fps.
Aspect	1.0
Bit Rate	VBR, 2 pass
Target *VBR*	5 mbps
Max *VBR*	6 mbps
Audio	*AAC* 44.1 / 192 kbps

9.2.3 Obtain a Video Transcript

Transcripts are required for all videos. Transcripts help learners with hearing impairments understand audio content, and they are helpful for learners who speak other languages.

Transcripts are available to learners in the following ways.

- Learners can select the **Show transcript** (") icon in the video player's control bar to show the transcript next to the video. The transcript automatically scrolls as the video plays. Learners can select a line in the transcript to jump to the point in the video where that line is spoken.

- Learners can show the transcript file as overlaid closed captions for the video by selecting the **CC** icon in the video player's control bar.

- You can allow learners to download transcripts so that learners can read the transcripts offline. For more information, see *Enable Video and Transcript Downloads*.

Obtaining a Video Transcript

When you work with a transcript provider, you send your videos to the transcript provider, and the provider sends you the completed transcripts. You later upload the transcripts when you create a video component.

Transcript File Naming Conventions

To prevent errors when you upload your video transcripts, we recommend the following conventions for naming your transcript files.

- Give each transcript file an identifying name that is unique across all of your course uploads, including non-transcript files.

- Make sure that the transcript contains no special characters, such as ç, å, or ó.

- Make sure that the file type (`.srt`) is in lowercase.

- Do not include periods in file names other than the period before the .srt file type.

9.3 Upload a Video

To make a video visible in your course, you create a video component in a unit in Studio, and then you add the following information for the video to the video component.

To upload a video to a third party hosting site, follow the instructions for that site. Keep the following guidelines in mind.

- If you host your videos on YouTube, you must follow all rules and restrictions that are associated with YouTube.

- The URL for the video that you upload on a third party hosting site must end in .mp4, .mpeg, .webm, or .ogg. The video player cannot support videos that you upload on sites such as Vimeo, Dailymotion, or other sites that use their own player.

  To help make sure all standard browsers can play your video, edX strongly recommends that you use .mp4 format.

  The video URL might resemble the following example.

  `https://s3.amazonaws.com/edx-course-videos/edx-edx101/EDXSPCPJSP13-G030300.mp4`

- If you have copies of a video in multiple resolutions, you must upload each copy to the hosting site. For more information, see *General Guidelines*.

- After you upload a video on a hosting site, you must make sure you have the URL for that copy of the video. If you upload copies of your video on more than one hosting site, make sure you have the URL for each video location.

For more information about hosting your videos, see *Set Up a Hosting Service*.

9.4 Adding a Video to a Course

To make a video visible in your course, you create a video component in a unit in Studio, and then you add the following information for the video to the video component.

- A display name for the component.

- The video location.

  The video location is the video URL that is created when you upload the video to the hosting site. The video URL might resemble the following example.

  `https://s3.amazonaws.com/edx-course-videos/edx-edx101/EDXSPCPJSP13-G030300.mp4`

- The video transcript.

9.4.1 Add a Video and Transcript

To add a video and its transcript, follow these steps.

1. In Studio, locate the unit that you want, and then select **Video** under **Add New Component**.

2. When the new video component appears, select **Edit**.

   The video editor opens to the **Basic** page.

3. In the **Component Display Name** field, enter the name that you want learners to see for this video.

   This name appears as a heading above the video in the LMS, and it identifies the video for you in Insights. If you do not enter a display name, the platform specifies "video" for you.

4. Locate the **Default Video URL** field, and then enter the location of your video. This is the URL that was created when you uploaded the video to the hosting site.

   Note: If you have created multiple versions that use different encodings or hosting services, add the URL for each video by selecting **Add URLs for additional versions** below the **Default Video URL** field. The first listed video that is compatible with the learner's computer plays.

   For the best experience for mobile users, make sure that the URL for the 360p version of the video is the first URL in the list.

   ---

5. Add the .srt transcript to the video. To do this, locate **Default Timed Transcript**, and then select one of the following options.

   - If Studio already has a transcript for this video, Studio automatically adds the transcript in the **Default Timed Transcript** field. This situation can occur when you reuse a video from an existing course. You do not have to make any changes.

   - If Studio does not have a transcript for the video, and the transcript uses the .srt format, select **Upload New Transcript** to upload the .srt transcript file from your computer.

     Note: Only use this option for transcripts in .srt format. If you want to provide a transcript in any other format, such as .pdf, see *Add a Supplemental Downloadable Transcript*.

     ---

6. Optionally, select **Advanced** to set more options for the video. For a description of each option, see *Set Advanced Options*.

7. Select **Save** to save the video component.

To test the transcript with the video, after you have saved the video, select the **Show transcript** (") icon in the video player's control bar. The transcript file scrolls while the video file plays. You can also test the transcript by selecting the **CC** icon.

9.5 Specifying Additional Video Options

When you create a video component, you can specify additional options such as download options for the video and transcript, video license options, and a start and stop time for the video.

- *Enable Video and Transcript Downloads*
- *Set Advanced Options*

9.5.1 Enable Video and Transcript Downloads

You can allow learners to download videos and transcript files that you have provided so that they can view them offline.

To enable video and transcript downloads, follow these steps.

1. In the video component, select the **Advanced** page.
2. For **Video Download Allowed**, select **True** to allow learners to download the video.
3. For **Download Transcript Allowed**, select **True** to allow learners to download an .srt or .txt video transcript.
4. Select **Save**.

To test transcript downloads for the video, select **Download transcript** in the video player's control bar. You can download either the SubRip (.srt) format or text (.txt) format.

9.5.2 Set Advanced Options

The following options appear on the **Advanced** page of the video component.

Component Display Name	The name that you want your learners to see. This is the same as the **Display Name** field on the **Basic** page.
Default Timed Transcript	This is the same as the **Default Timed Transcript** setting on the **Basic** page. You can specify the default timed transcript on either page.
Download Transcript Allowed	Specifies whether you want to allow learners to download the .srt or .txt transcript. (By default, Studio creates a .txt transcript when you upload an .srt transcript.) If you select **True**, a link to download the file appears below the video. If you want to provide a downloadable transcript in a different format as well, such as .pdf, see *Add a Supplemental Downloadable Transcript*.
Downloadable Transcript URL	The URL for a non-.srt version of the transcript file posted on the internet. Learners see a link to download the non-.srt transcript below the video. **Important:** When you add a transcript to the **Downloadable Transcript URL** field, only the transcript that you add is available for download. The .srt and .txt transcripts become unavailable. If you want to provide a downloadable transcript in addition to the .srt and .txt transcripts, edX recommends that you upload a handout for learners by using the **Upload Handout** field. For more information, see *Add a Supplemental Downloadable Transcript*.
License	Optionally, you can set the license for the video, if you want to release the video with a license different from the overall course license. • Select **All Rights Reserved** to indicate to learners that you own the copyright for the video. • Select **Creative Commons** to grant others the right to share and use the video. You must then select the Creative Commons license options that you want. The license options that you select control the copyright notice that learners see for the video. For more information, see *Course Licensing*.
Show Transcript	Specifies whether the transcript appears next to the video by default. If this is set to **False**, learners can still view transcripts by selecting the **Show Transcript** ('') icon.
Transcript Languages	The transcript files for any additional languages. For more information, see *Add a Transcript in Another Language*.
Upload Handout	Allows you to upload a handout to accompany the video, such as a PDF transcript or other handout. Learners can download the handout by selecting **Download Handout** under the video. The procedure for adding handouts is the same as the procedure for adding a supplemental transcript. For more information, see *Add a Supplemental Downloadable Transcript*.
Video Available on Web Only	If you select **True**, learners can only play this video in a web browser. If you select **False**, learners can use any compatible application to play the video, including web browsers and mobile apps.
Video Download Allowed	Specifies whether learners can download the video. If you select **True**, you must add at least one URL in the **Video File URLs** field.
Video File URLs	The URL or URLs where you posted different versions of the video. On the **Basic** tab, if you added URLs by selecting **Add URLs for additional versions** below the **Default Video URL** field , the URLs are listed in the fields next to **Video File URLs**. Every URL must end in .mp4, .mpeg, .webm, or .ogg. Learners will view the first listed video that is compatible with their computer or mobile device. For the best experience for mobile users, make sure that the URL for the 360p version of the video is the first URL in the list. To help make sure all standard browsers can play your video, we **strongly** recommend that you use the .mp4 format.
Video ID	The identifier that the video process assigns to the video. This field is the same as the **Video ID** setting on the **Basic** page. Only courses on edx.org use this field.
Video Start Time	The time you want the video to start if you do not want the entire video to play.

9.6 Specifying Additional Transcript Options

- *Edit a Video Transcript*
- *Add a Supplemental Downloadable Transcript*
- *Add a Transcript in Another Language*

9.6.1 Edit a Video Transcript

If you want to edit an existing .srt video transcript, follow these steps.

1. In Studio, open the video component for the video.

2. For an .srt transcript, locate **Default Timed Transcript**, and then select **Download Transcript for Editing**.

3. After the file downloads, open a text editor and make any changes that you want.

4. Select **Upload New Transcript** to upload the edited file.

9.6.2 Add a Supplemental Downloadable Transcript

Note: You can also use this procedure to upload a different kind of handout for learners to download, such as an image or a chart.

By default, a .txt file is created when you upload an .srt file, and learners can download either the .srt or .txt transcript when you allow transcript downloads. For more information about allowing transcript downloads, see *Enable Video and Transcript Downloads*.

In addition, you can provide a downloadable transcript in a format such as .pdf. To do this, you upload the additional transcript in the video player as a handout. Learners see an option to download the handout below the video.

To add another downloadable transcript, follow these steps.

1. Create or obtain your transcript as a .pdf or in another format.

2. In the video component, select **Advanced**.

3. Locate **Upload Handout**, and then select **Upload**.

4. In the **Upload File** dialog box, select **Choose File**.

5. In the dialog box, select the file on your computer, and then select **Open**.

6. In the **Upload File** dialog box, select **Upload**.

9.6.3 Add a Transcript in Another Language

You can provide transcripts for your video in more than one language. To do this, you work with a third-party service to obtain an .srt transcript file for each language, and then associate the .srt file with the video in Studio.

Before you add a transcript file, make sure that each file has a unique name. If you use the same transcript name more than once, only the most recently added transcript will appear for every video component that is set up to use a transcript with that name. To avoid this problem, a best practice is to name additional transcript files by appending the transcript's language to the video file name.

For example, you have two videos, named video1.mp4 and video2.mp4, and their original transcripts are named video1.srt and video2.srt. When you add Hindi transcripts for these videos, you name them video1_hi.srt and video2_hi.srt. When you add Spanish transcripts for the videos, you name them video1_es.srt and video2_es.srt.

To add a transcript to a video component, follow these steps.

1. After you obtain the .srt files for additional languages, open the video component for the video.

2. On the **Advanced** tab, scroll down to **Transcript Languages**, and then select **Add**.

3. Select the language for the transcript that you want to add.

4. Select **Upload**, browse to the .srt file for the transcript in that language, and then select **Open**.

5. In the **Upload translation** dialog box, select **Upload**.

6. Repeat steps 2 - 5 for any additional languages.

When your learners view the video, they can select the **Language menu** to select a language.
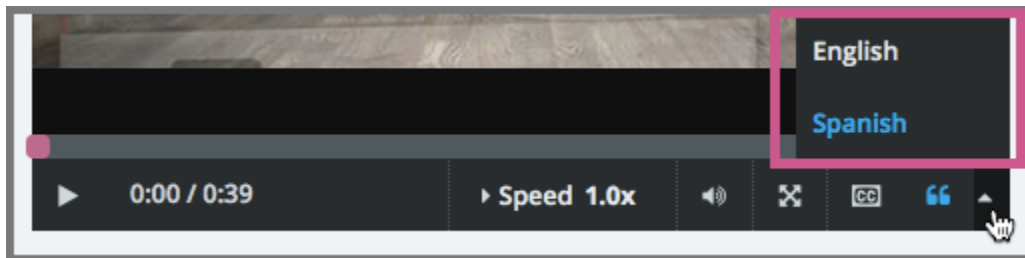
9.7 Troubleshooting Video Problems

When you use video, you might experience one of the following problems.

- If you (or your beta testers or learners) encounter an error when you view a course video, try one of the following troubleshooting methods.

    - Verify that the viewer's browser is up to date. For example, some older versions of the Mozilla Firefox browser did not play .mp4 video files. These problems do not occur in more recent browser versions.

      For more information, see Media formats supported by the HTML audio and video elements.

    - Verify that file metadata, particularly the MIME type, is correctly set on the host site. For example, when edX offered support for Internet Explorer 10 browsers, videos did not play if the MIME type was not set. The HTTP header `Content-Type` had to be set to video/mp4 for an .mp4 file.

      As an example of how you might set metadata on a video host site, the *Console User Guide* for Amazon Simple Storage Service (S3) provides information about editing object metadata.

- If two sets of captions appear when you select **CC** on the video player, YouTube and your course might both be providing captions for the video. This problem can occur when YouTube is the host service for the video and

your YouTube account settings for playback are set to always show captions. To correct this problem, select **CC** again or change your YouTube account settings.

ADDING EXERCISES AND TOOLS

Use the topics in this section to understand how to add exercises and tools to your course, including the various problem types that you can add using the *problem component*.

For information about how to develop your course content in the Studio Outline page, see *Developing Your Course*.

For information about building specific course component types, see *Adding Course Components*.

10.1 Problems, Exercises, and Tools

You can add a wide variety of different types of problems, exercises, and tools to your course outline. By default, a core set of *problem types* is available in Studio for you to include in your course. You have the option to expand the initial set of core problem types by enabling additional exercises and tools.

- *Levels of Support*
- *Enhancing Your Course with Additional Exercises and Tools*
- *Core Problem Types*
  - *Common Problem Types*
  - *Advanced*
- *Additional Exercises and Tools*
  - *Unsupported Additional Exercises and Tools*
- *Mobile-Ready Problem Types*
- *Adding Unsupported Problem Types and Exercises*

10.1.1 Levels of Support

Note: The support level definitions described in this section and the level of support designated for each exercise, problem type, or tool are applicable only to edx.org.

The level of support that edX provides for each problem, exercise, or tool varies. The levels of support are categorized as full, provisional, or no support. This table provides the definition for each level of support.

In Studio, the support level for each exercise, problem type, or tool is represented with an icon when you select **Advanced**, **Text**, or **Problem** to add a new component to your course. By default, only fully supported or provisionally

supported exercises, problem types, or tools are available for adding to your course. To add unsupported problem types and tools, see *Adding Unsupported Problem Types and Exercises*.

Level of Support	Description
Full support	Fully supported tools and features are available on edx.org, are fully tested, have user interfaces where applicable, and are documented in the official edX guides that are available on docs.edx.org.
Provisional support	Provisionally supported tools and features are available on edx.org, but might lack the robustness of functionality that your courses require. Third party tools are classified as provisionally supported because edX does not have control over the quality of the software, or of the content that can be provided using such tools. You should test provisionally supported tools thoroughly before using them in your course, especially in graded sections. Complete documentation might not be available for provisionally supported tools, or documentation might be available from sources other than the official edX guides.
Not supported	Exercises and tools with no support are not maintained by edX, and might be deprecated in the future. They are not recommended for use in courses due to non-compliance with one or more of the base requirements, such as testing, accessibility, internationalization, and documentation.

10.1.2 Enhancing Your Course with Additional Exercises and Tools

"Exercises and tools" is a general way to refer to the robust variety of content that you can integrate into an online course. Software developers use the XBlock component architecture to contribute new exercises and tools to the Open edX platform and provide new and varied options for reaching learners. Exercises enhance the core set of problem types by challenging learners to complete graded and ungraded assessments. Tools deliver a variety of other types of course content.

- To use an exercise or tool in your course beyond the core set of problem types, you must explicitly enable that exercise or tool. For more information, see *Enabling Additional Exercises and Tools*.

- After you enable an exercise or tool for use in your course, you might need to select **Advanced**, **Text**, or **Problem** on the unit page to add content of that type to your course.

The topics in this section introduce the core set of problem types and a selection of other exercises and tools that you can add to your course.

10.1.3 Core Problem Types

The problem types that you can include in any course, without taking any other steps to identify or enable additional exercises or tools, are the core problem types. When you add a problem component in Studio, the core problem types are classified as either **Common Problem Types** or **Advanced**.

- *Common Problem Types*
- *Advanced*

Common Problem Types

When you select any of the common problem types in Studio the *simple editor* opens.

- If you choose the **Blank Common Problem** option, the editor opens without providing a template or example for you to follow You can begin to add text and markdown for required and optional problem elements immediately.

- If you choose one of the following problem types, a template appears in the editor with guidance for adding all of that problem type's required elements, as well as several optional elements.

Problem Type	Description	Support
Checkbox Problem	In checkbox problems, learners select one or more options from a list of possible answers. To answer the problem correctly, a learner must select all of the options that are correct answers, and none of the options that are incorrect.	Full support; mobile-ready
Dropdown Problem	In dropdown problems, learners choose one answer from a set of possible answers, which are presented in a dropdown list after the learner selects the dropdown arrow.	Full support; mobile-ready
Multiple Choice Problem	In multiple choice problems, learners select one answer from a set of possible answers, which are visible directly below the question.	Full support; mobile-ready
Numerical Input Problem	In numerical input problems, learners enter numbers or specific and relatively simple mathematical expressions to answer a question. These problems allow only integers and a few select constants. You can specify a margin of error, and you can specify a correct answer either explicitly or by using a Python script.	Full support; mobile-ready
Text Input Problem	In text input problems, learners enter text into a response field. The response can include numbers, letters, and special characters such as punctuation marks.	Full support; mobile-ready

By adding hints, feedback, or both, you can give learners guidance and help when they work on a problem. When you choose one of the following common problem types, a template provides additional guidance for these options. All of these problem types also have full support and are mobile-ready.

- *Checkboxes with Hints and Feedback*

- *Dropdown with Hints and Feedback*

- *Multiple Choice with Hints and Feedback*

- *Numerical Input with Hints and Feedback*

- *Text Input with Hints and Feedback*

Advanced

When you select any of the advanced problem types in Studio the *advanced editor* opens.

- If you choose the **Blank Advanced Problem** option, the editor opens without providing a template or example for you to follow. You can begin to add OLX markup and the text for required and optional problem elements immediately.

- If you choose one of the following problem types, a template appears in the editor with guidance for adding all of that problem type's required elements, as well as several optional elements.

Note: Some advanced problem types are *unsupported* and are not available in the list of problem types unless you enable a setting in Studio. For more information, see *Unsupported Advanced Problem Types* and *Adding Unsupported Problem Types and Exercises*.

Type	Description	Support
Custom JavaScript Display and Grading	Custom JavaScript display and grading problems (also called custom JavaScript problems or JS input problems) allow you to create a custom problem or tool that uses JavaScript and then add the problem or tool directly into Studio.	Full support
Write-Your-Own-Grader Problem	In custom Python-evaluated input (also called "write-your-own-grader") problems, the grader uses a Python script that you create and embed in the problem to evaluate a learner's response or provide hints. These problems can be any type.	Provisional support
Math Expression Input Problems	Learners enter mathematical expressions to answer a question. These problems can include unknown variables and more complex symbolic expressions. You can specify a correct answer either explicitly or by using a Python script.	Full support; mobile-ready
Open Response Assessment	Learners receive feedback on responses that they submit and give feedback to other course participants. Open response assessments include self assessment, peer assessment, and optionally, staff assessment.	Full support

Unsupported Advanced Problem Types

The following advanced problem types are *not supported* by edX. You can enable an option to make unsupported problem types available in Studio. For more information, see *Adding Unsupported Problem Types and Exercises*.

Type	Description	Support
Circuit Schematic Builder Problem	Learners arrange circuit elements such as voltage sources, capacitors, resistors, and MOSFETs on an interactive grid. They then submit a DC, AC, or transient analysis of their circuits to the system for grading.	Not supported
Drag and Drop Problem (Deprecated)	Learners respond to a question by dragging text or objects to a specific location on an image. This version of the drag and drop problem type is deprecated and should not be added to a course. For more information about the fully supported drag and drop problem type, see *Drag and Drop Problem*.	Not supported
Image Mapped Input Problem	Learners answer prompts by selecting a defined area in an image. You define the area by including coordinates in the body of the problem.	Not supported
Molecular Structure	Learners draw molecules that follow the rules for covalent bond formation and formal charge, even if the molecules are chemically impossible, are unstable, or do not exist in living systems.	Not supported
Problem with Adaptive Hint	A problem with an adaptive hint evaluates a learner's response, then gives the learner feedback or a hint based on that response so that the learner is more likely to answer correctly on the next attempt. These problems can be text input or multiple choice problems.	Not supported

10.1.4 Additional Exercises and Tools

This table lists the fully or provisionally supported additional exercises and tools that you can add to your course.

Note: Some additional exercises and tools are *not supported* by edX. You can enable an option to make unsupported exercises and tools available in Studio. For more information, see *Unsupported Additional Exercises and Tools* and *Adding Unsupported Problem Types and Exercises*.

Note: In addition to the following exercises and tools, Open edX offers the *Notes tool*. The Notes tool allows learners to highlight and make notes about what they read in the course. This tool is not available for courses on edx.org.

Type	Description	Support
Calculator Tool	Learners can enter input that includes Greek letters, trigonometric functions, and scientific or e notation in addition to common operators. The calculator tool is available for every course through the course advanced settings. When the calculator tool is enabled, it appears on every unit page.	Provisional support
Conditional Module	You can create a conditional module to control versions of content that groups of learners see. For example, learners who answer "Yes" to a poll question then see a different block of text from the learners who answer "No" to that question.	Provisional support
Drag and Drop Problem	Learners respond to a question by dragging text or objects to a specific location on an image.	Full support; mobile-ready
External Grader	An external grader is a service that receives learner responses to a problem, processes those responses, and returns feedback and a problem grade to the edX platform. You build and deploy an external grader separately from the edX platform. An external grader is particularly useful for software programming courses where learners are asked to submit complex code.	Provisional support
Google Calendar Tool	Learners see a Google calendar embedded in your course. You can use a Google calendar to share quiz dates, office hours, or other schedules of interest to learners.	Provisional support
Google Drive Files Tool	Learners see a Google Drive file, such as a document, spreadsheet, or image, embedded in your course.	Provisional support
Iframe Tool	With the iframe tool, you can integrate ungraded exercises and tools from any Internet site into a Text component in your course.	Provisional support
LTI Component	LTI components allow you to add an external learning application or non- PDF textbook to Studio.	Full support
Oppia Exploration Tool	You can embed Oppia explorations in your course so that learners can interact with them directly in the course body.	Provisional support
Peer Instruction Tool	This type of exercise offers the experience of the Peer Instruction learning system within your online course.	Full support
Poll Tool	You can include polls in your course to gather learners' opinions on various questions. You can use the Poll Tool in Studio.	Full support
Qualtrics Survey Tool	You can import surveys that you have created in Qualtrics. The survey appears inside an iframe in your course.	Provisional support
Survey Tool	You can include surveys in your course to collect learner responses to multiple questions.	Full support
Word Cloud Tool	Word clouds arrange text that learners enter in response to a question into a colorful graphic.	Provisional support

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Unsupported Additional Exercises and Tools

The following additional exercises and tools are *not supported* by edX. You can enable an option to make unsupported exercises and tools available in Studio. For more information, see *Adding Unsupported Problem Types and Exercises*.

Type	Description	Support
Annotation Problem	Learners respond to questions about a specific block of text. The question appears above the text so that learners can think about the question as they read.	Not supported
Chemical Equation Problem	Learners enter a value that represents a chemical equation into a text box. The grader uses Python script that you create and embed in the problem to evaluate learner responses.	Not supported
Completion Tool	Learners mark sections of course content as completed. This tool helps learners track their progress through sections of the course (including ungraded activities such as reading text, watching videos, or participating in course discussions), and gives them a way to indicate to both themselves and course staff that they completed an activity.	Not supported
Full Screen Image Tool	Learners can enlarge an image in the entire browser window. This tool is useful for detailed images that are easier to view when enlarged.	Not supported
Gene Explorer Tool	The gene explorer (GeneX) simulates the transcription, splicing, processing, and translation of a small hypothetical eukaryotic gene. Learners make specific mutations in a gene sequence, and this tool calculates and displays the effects of the mutations on the mRNA and protein.	Not supported
Multiple Choice and Numerical Input Problem	Learners not only choose one answer from a set of possible options, they are also prompted to provide more specific information, if necessary.	Not supported
Molecule Viewer Tool	Learners view three-dimensional representations of molecules that you create.	Not supported
Periodic Table Tool	An interactive periodic table of the elements that shows detailed information about each element when learners move the pointer over each element.	Not supported
Poll Tool for OLX	You can run polls in your course so that your learners can share opinions on different questions. You can only add this type of poll to a course by using OLX (open learning XML). Support for this tool in Studio is not available. For more information, see the EdX Open Learning XML Guide.	Not supported
Problem Written in LaTeX	If you have a problem that is already written in LaTeX, you can use this problem type to convert your code into XML.	Not supported
Protex Protein Builder Tool	Learners create specified protein shapes by stringing together amino acids.	Not supported
Recommender Tool	RecommenderXBlock can hold a list of resources for misconception remediation, additional reading, and so on. This tool allows the course team and learners to work together to maintain the list of resources. For example, team members and learners can suggest new resources, vote for useful ones, or flag abuse and spam.	Not supported
Zooming Image Tool	Learners can view sections of an image in detail. You specify the sections in an image that can be enlarged.	Not supported

10.1.5 Mobile-Ready Problem Types

Learners can read and submit answers for the following types of problems while they use the edX mobile app.

- *Checkbox Problem*
- *Drag and Drop Problem*
- *Dropdown Problem*
- *Math Expression Input Problems*
- *Multiple Choice Problem*
- *Numerical Input Problem*
- *Text Input Problem*

Questions that have other problem types do not appear in the edX mobile app. Instead, a message appears with a link to open the applicable problem component in a web browser.

10.1.6 Adding Unsupported Problem Types and Exercises

Note: These instructions are applicable only to edx.org.

In general, you should use only problem types and exercises that are either fully or provisionally supported by edX. By default, only supported problem types and exercises are available in Studio for adding to courses.

However, in some situations, you might choose to use exercises and problem types that edX does not support.

To add unsupported problem types, exercises, and tools to your course, follow these steps.

1. In Studio, select **Settings**, then **Advanced Settings**.
2. Locate the **Add Unsupported Problems and Tools** field, and enter a value of `true`.
3. Select **Save Changes**.

After you enable this setting, unsupported problem types, exercises, and tools are available in the lists of new components that you can add to your course in Studio.

10.2 Enabling Additional Exercises and Tools

Studio includes a default set of core problem types that can be added to any course, including CAPA problems like text input, multiple choice, and math expression input. To add these problem types to a course, you select **Problem** on the unit page.

You can expand the types of content you include in your course by enabling additional exercises and tools. After you enable an exercise or tool for use with your course, when you add a component to a unit, that type of content might be listed as one of the **Advanced**, **Text**, or **Problem** options

10.2.1 Enable an Exercise or Tool for Your Course

To enable an advanced exercise or tool, follow these steps.

1. In Studio, select **Settings**, and then **Advanced Settings**.

2. Locate the **Advanced Module List** field. This field lists any exercises and tools that have been added to your course.

3. If the **Advanced Module List** field is empty, place your cursor between the brackets (`[  ]`).

   If the list already contains one or more keys, place your cursor after the first bracket (`[`).

4. Enter the key for the exercise or tool that you want to add.

5. Add quotation marks (`"  "`) before and after the key.

   If you are adding the key to a list of keys, follow the closing quotation mark with a comma character (`,`).

6. Review your entry to verify that the key is accurate and that it is surrounded by quotation marks. If there is a list of keys, they must be comma separated.

   • In this example, the key for the annotation problem tool is the only value in the list.

   ```
   ["annotatable"]
   ```

   • In this example, the key for the annotation problem tool is added at the beginning of a list of other keys.

   ```
   ["annotatable",
       "word_cloud",
       "split_test"
   ]
   ```

7. Select **Save Changes**.

   Studio checks the syntax of your entry and reformats your entry to add line feeds and indentation. A message lets you know whether your changes were saved successfully.

10.3 Annotation Problem

Note: EdX does not support this problem type.

In an annotation problem, you highlight specific text inside a larger text block and then ask questions about that text. The questions appear when learners move their cursors over the highlighted text. The questions also appear in a section below the text block, along with space for learners' responses.

Instructions   Collapse Instructions ↑

Annotation Exercise, Hour 12 (to be done after the Hour 12 Question Set has been completed). Carefully read the following text and answer the accompanying question. To see the question while you read the text, hover your mouse over the highlighted selection in the text below.

Guided Discussion   Hide Annotations

This exercise first appeared in HarvardX's CB22x: The Ancient Greek Hero course, spring 2013.

|122 And they [= the Golden Generation of humankind] are superhumans [daimones]. They exist because of the Will of Zeus. |123 They are the good, the earthbound [epi-khthonioi], the guardians of mortal humans. |124 They guard acts of justice [dikē] and they guard against wretched acts of evil. |125 Enveloped in mist, they roam everywhere throughout the earth. |126 They are givers of prosperity. And they had this as a privilege [geras], a kingly one [basilēion].

QUESTION 1 (2/2 points)

Annotation Exercise   Return to Annotation ↑

|124 They guard acts of justice [dikē] and they guard against wretched acts of evil.

Hesiodic poetry declares that heroes are protectors of justice. Is this declaration consistent with what we have read in Homeric poetry?

Type your response below:

In your response to this question, which tag below do you choose?

This declaration in Hesiodic poetry is inconsistent with Homeric poetry, since we see that heroes in the Iliad and Odyssey do in fact engage in unjust as well as just actions.

✔ This declaration in Hesiodic poetry is consistent with Homeric poetry, since there is no real contradiction here between the two kinds of poetry.

We cannot be sure whether this declaration in Hesiodic poetry is consistent or inconsistent with Homeric poetry, where the actions of heroes are not evaluated in terms of injustice or justice.

Answer: This declaration in Hesiodic poetry is consistent with Homeric poetry, since there is no real contradiction here between the two kinds of poetry.

If you answered "This declaration in Hesiodic poetry is inconsistent with Homeric poetry, since we see that heroes in the Iliad and Odyssey do in fact engage in unjust as well as just actions," you would be missing the point. The heroes in the Iliad and Odyssey are still alive when they are engaged in their actions. By contrast, the heroes of the Golden Age are not of this world when they are protecting justice. Enveloped in mist and roaming throughout the earth, the heroes of the Golden Age are pictured as otherworldly spirits. This picture corresponds to the idea of cult heroes, not to the idea of epic heroes. If you answered "We cannot be sure whether this declaration in Hesiodic poetry is consistent or inconsistent with Homeric poetry, where the actions of heroes are not evaluated in terms of injustice or justice," you would be right in saying that Homeric poetry generally avoids evaluating the actions of heroes in terms of injustice or justice (though such evaluations *do* occasionally occur even in Homeric poetry, as I have argued in my overall write-up of this Hour in the book h24h), but you would still be missing the point I already made, that the heroes of the Golden Age are in an otherworldly state of existence when they are protecting justice, by contrast with the heroes of epic as portrayed in the Iliad and Odyssey. A better answer is "This declaration in Hesiodic poetry is consistent with Homeric poetry, since there is no real contradiction here between the two kinds of poetry." Hesiodic and Homeric poetry picture heroes in different but complementary ways, and they avoid contradicting each other about the basic fact that heroes are different when they are alive and when they are dead.

- *Enable Annotation Problems*
- *Create an Annotation Problem*

10.3.1 Enable Annotation Problems

Before you can add annotation problems to your course, you must enable annotation problems in Studio.

To enable annotation problems in Studio, you add the `"annotatable"` key to the **Advanced Module List** on the **Advanced Settings** page. (Be sure to include the quotation marks around the key value.) For more information, see *Enabling Additional Exercises and Tools*.

10.3.2 Create an Annotation Problem

To create an annotation problem, you add the **Instructions** and **Guided Discussion** segments of the problem, and then the **Annotation problem** segment of the problem.

Add Instructions and Guided Discussion

To add the **Instructions** and **Guided Discussion** segments of the problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Advanced**.

2. In the list of problem types, select **Annotation**.

3. In the component that appears, select **Edit**.

4. In the component editor, replace the example code with your own code.

5. Select **Save**.

Add Annotation Problem

To add the **Annotation problem** segment of the problem, follow these steps.

1. Under the annotation component, create a new blank advanced problem component.

2. Paste the following code in the advanced problem component, replacing placeholders with your own information.

```
<problem>
    <annotationresponse>
        <annotationinput>
          <text>PLACEHOLDER: Text of annotation</text>
            <comment>PLACEHOLDER: Text of question</comment>
            <comment_prompt>PLACEHOLDER: Type your response below:</comment_prompt>
            <tag_prompt>PLACEHOLDER: In your response to this question, which tag␣
→below do you choose?</tag_prompt>
          <options>
            <option choice="incorrect">PLACEHOLDER: Incorrect answer (to make this␣
→option a correct or partially correct answer, change choice="incorrect" to choice=
→"correct" or choice="partially-correct")</option>
            <option choice="correct">PLACEHOLDER: Correct answer (to make this␣
→option an incorrect or partially correct answer, change choice="correct" to␣
→choice="incorrect" or choice="partially-correct")</option>
```

(continues on next page)

```
                    <option choice="partially-correct">PLACEHOLDER: Partially correct␣
↪answer (to make this option a correct or partially correct answer, change choice=
↪"partially-correct" to choice="correct" or choice="incorrect")
                    </option>
                </options>
            </annotationinput>
        </annotationresponse>
        <solution>
            <p>PLACEHOLDER: Detailed explanation of solution</p>
        </solution>
    </problem>
```

3. Select **Save**.

10.4 Calculator Tool

Note: EdX offers provisional support for this tool.

- *Overview*
- *Enable the Calculator Tool*

10.4.1 Overview

Learners can use the edX calculator tool to perform simple and complex calculations. Learners can enter input including numbers, operators, Greek letters, affixes, trigonometric functions, and more.

The calculator is available for every edX course, but it is not visible by default. To make the calculator visible, you must enable it in the course advanced settings.

When the calculator is visible in a course, the calculator icon appears at the bottom of every unit page.
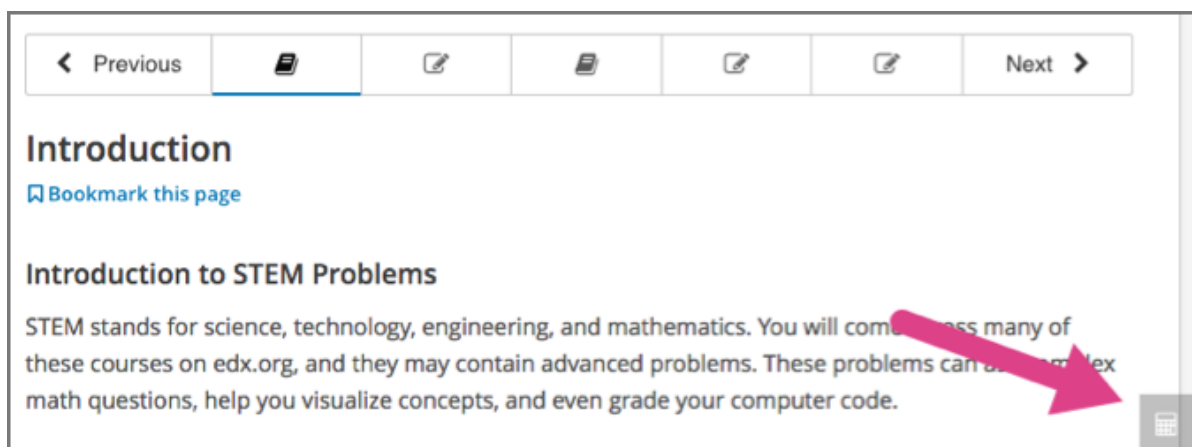
When learners select the calculator icon, the calculator opens along the lower edge of the browser window.

The calculator includes an information page that learners can use if they have questions about entering input in the calculator. Learners access the calculator's information page by selecting the `i` icon next to the input field.
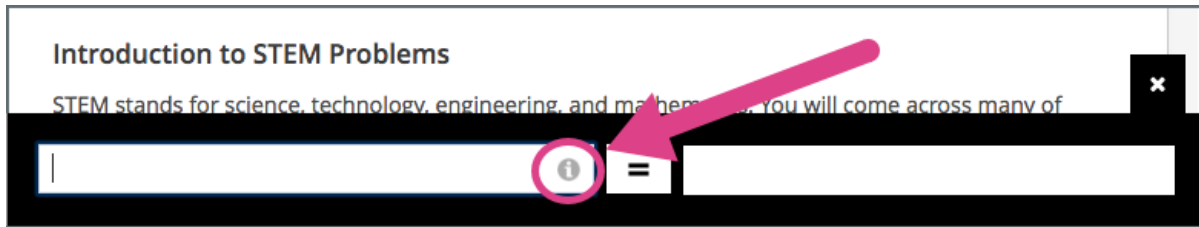
Learners close the calculator by selecting the X.

10.4.2 Enable the Calculator Tool

To enable the calculator tool, follow these steps.

1. In Studio, on the **Settings** menu, select **Advanced Settings**.

2. In the **Show Calculator** field, change `false` to `true`.

3. Select **Save Changes**.

10.5 Checkbox Problem

Note: EdX offers full support for this problem type.

The checkbox problem type is a core problem type that can be added to any course. At a minimum, checkbox problems include a question or prompt and several answer options. By adding hints, feedback, or both, you can give learners guidance and help when they work on a problem.

- *Overview*
    - *Example Checkbox Problem*
    - *Analyzing Performance on Checkbox Problems*
- *Adding a Checkbox Problem*
    - *Use the Simple Editor to Add a Checkbox Problem*
    - *Use the Advanced Editor to Add a Checkbox Problem*
- *Adding Feedback to a Checkbox Problem*
    - *Adding Feedback for Individual Options*
    - *Adding Compound Feedback*
    - *Configuring Feedback in the Simple Editor*
    - *Configuring Feedback in the Advanced Editor*
- *Adding Hints to a Checkbox Problem*
    - *Configure Hints in the Simple Editor*

For more information about the core problem types, see *Working with Problem Components*.

10.5.1 Overview

In checkbox problems, learners select one or more options from a list of possible answers. To answer the problem correctly, a learner must select all of the options that are correct answers, and none of the options that are incorrect. The course team must set up each checkbox problem to have at least one correct answer.

As a best practice, be sure that all of the answer choices are unambiguous, and avoid trick questions. Checkbox problems with ambiguity can be frustrating to learners, especially if the problems have a limited number of attempts.

Example Checkbox Problem

In the LMS, learners complete a checkbox problem by selecting the answer options that they believe are correct as well as leaving unselected the answer options that they believe are incorrect. An example of a completed checkbox problem follows.

Checkboxes

1 point possible (graded)

Learning about the benefits of preventative health care can be particularly difficult.
Check all of the options below that might be reasons why.

☐ A large amount of time passes between undertaking a preventative measure and seeing the result. ✔

☐ Non-immunized people will always fall sick.

☑ If other people are immunized, fewer people will fall sick regardless of a particular individual's choice to get immunized or not. ✔

☑ Trust in health care professionals and government officials is fragile. ✔

✖

Explanation
People who are not immunized against a disease might still not fall sick from the disease. If someone is trying to learn whether or not preventative measures against the disease have any impact, he or she might see these people and conclude (since they have remained healthy despite not being immunized) that immunizations have no effect.

| Submit | ⓘ Show Answer |

You have used 5 of 5 attempts

✖ Incorrect (0/1 point)

This problem was incorrectly answered because the learner selected only two of the three required answer options. This example also shows that the learner selected **Show Answer** to reveal the correct answer and an explanation.

To add the example problem illustrated above, in Studio you use the simple editor to enter the following text and Markdown formatting.

```
>>Learning about the benefits of preventative health care can be particularly difficult.
→||Check all of the options below that might be reasons why.<<

[x] A large amount of time passes between undertaking a preventative measure
and seeing the result.
[ ] Non-immunized people will always fall sick.
[x] If others are immunized, fewer people will fall sick regardless of a
particular individual's choice to get immunized or not.
[x] Trust in health care professionals and government officials is fragile.

[explanation]
People who are not immunized against a disease might still not fall sick
from the disease. If someone is trying to learn whether or not preventative
measures against the disease have any impact, he or she might see these
people and conclude, since they have remained healthy despite not being
```

        Chapter 10. Adding Exercises and Tools

```
immunized, that immunizations have no effect. Consequently, he or she would
tend to believe that immunization (or other preventative measures) have
fewer benefits than they actually do.
[explanation]
```

The OLX (open learning XML) markup for this example checkbox problem follows.

```
<problem>
  <choiceresponse>
    <label>Learning about the benefits of preventative health care can be
    particularly difficult.</label>
    <description>Check all of the options below that might be reasons why.</description>
    <checkboxgroup>
      <choice correct="true">A large amount of time passes between
       undertaking a preventative measure and seeing the result.</choice>
      <choice correct="false">Non-immunized people will always fall sick.</choice>
      <choice correct="true">If others are immunized, fewer people will fall
       sick regardless of a particular individual's choice to get immunized
       or not.</choice>
      <choice correct="true">Trust in health care professionals and
       government officials is fragile.</choice>
    </checkboxgroup>
    <solution>
      <div class="detailed-solution">
        <p>Explanation</p>
        <p>People who are not immunized against a disease might still not
         fall sick from the disease. If someone is trying to learn whether
         or not preventative measures against the disease have any impact,
         he or she might see these people and conclude, since they have
         remained healthy despite not being immunized, that immunizations
         have no effect. Consequently, he or she would tend to believe that
         immunization (or other preventative measures) have fewer benefits
         than they actually do.</p>
      </div>
    </solution>
  </choiceresponse>
</problem>
```

Analyzing Performance on Checkbox Problems

For the checkbox problems in your course, you can use edX Insights to review aggregated learner performance data and examine submitted answers. For more information, see Using edX Insights.

10.5.2 Adding a Checkbox Problem

You add checkbox problems in Studio by selecting the **Problem** component type and then using either the simple editor or the advanced editor to specify the prompt and the answer options.

- *Use the Simple Editor to Add a Checkbox Problem*
- *Use the Advanced Editor to Add a Checkbox Problem*

Note: You can begin work on the problem in the simple editor, and then switch to the advanced editor. However, after you save any changes you make in the advanced editor, you cannot switch back to the simple editor.

Use the Simple Editor to Add a Checkbox Problem

When you add a checkbox problem, you can choose one of these templates.

- **Checkboxes**
- **Checkboxes with Hints and Feedback**

These templates include the Markdown formatting that you use in the simple editor to add a problem without, or with, hints and feedback.

To use the *simple editor* to add a problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**.

2. From the list of **Common Problem Types**, select the type of problem you want to add. Studio adds a template for the problem to the unit.

3. Select **Edit**. The simple editor opens to a template that shows the Markdown formatting that you use for this problem type.

4. Replace the guidance provided by the template to add your own text for the question or prompt, answer options, explanation, and so on.

   To format equations, you can use MathJax. For more information, see *Using MathJax for Mathematics*.

5. Select **Settings** to provide an identifying **Display Name** and define settings for the problem. For more information, see *Defining Settings for Problem Components*.

6. Select **Save**.

Use the Advanced Editor to Add a Checkbox Problem

You can use the advanced editor to identify the elements of a checkbox problem with OLX. For more information, see *Checkbox Problem OLX Reference*.

To use the *advanced editor* to add a problem, follow these steps.

1. Follow steps 1-3 for creating the problem in the simple editor.

2. Select **Advanced Editor**. The advanced editor opens the template and shows the OLX markup that you can use for this problem type.

3. Replace the guidance provided by the template to add your own text. For example, replace the question or prompt, answer options, and explanation.

To format equations, you can use MathJax. For more information, see *Using MathJax for Mathematics*.

4. Update the OLX to add optional elements and attributes required for your problem.

5. Select **Settings** to provide an identifying **Display Name** and define settings for the problem. For more information, see *Defining Settings for Problem Components*.

6. Select **Save**.

10.5.3 Adding Feedback to a Checkbox Problem

For an overview of feedback in problems, see *Adding Feedback and Hints to a Problem*. For checkbox problems, you can add feedback for each of the answer options you provide in the problem. You can also identify different combinations of answer options that learners are likely to select, and add compound feedback for those combinations.

You can add feedback to a checkbox problem using the simple editor or the advanced editor.

Adding Feedback for Individual Options

In checkbox problems, you can provide feedback for each option that a learner can select, with distinct feedback depending on whether or not the learner selects that option. This means that there are several possible types of feedback.

- The learner selects a correct option. This type of feedback should indicate why the option is correct.

- The learner does not select a correct option. This type of feedback should indicate that the learner missed checking this option and why it is correct.

- The learner selects an incorrect option. This type of feedback should indicate that the learner incorrectly checked this option and why it is incorrect.

- The learner does not select an incorrect option. This type of feedback should reinforce why the learner correctly left this option unselected.

Adding Compound Feedback

You can configure the checkbox problem to provide compound feedback. Compound feedback is feedback given for a specific combination of options. For example, if you have three possible option in the problem, you can define specific feedback for when a learner selects each combination of possible options.

- A
- B
- C
- A, B
- B, C
- A, C
- A, B, C

For problems with more than three options, providing specific feedback for each combination can become difficult. For such problems, you might choose to define compound feedback for more likely combinations of option or for combinations of option that reflect common learner misunderstandings. If you do not define feedback for a combination that a learner selects, the learner receives feedback for the individual selections.

Configuring Feedback in the Simple Editor

You can configure individual option or compound feedback in the *simple editor*. When you create a new checkbox problem, select the template **Checkboxes with Hints and Feedback**. This template has example formatted feedback that you can replace with your own text.

Configure Feedback for Individual Options

In the simple editor, you configure individual option feedback with the following Markdown formatting.

```
[x] answer  {{ selected: Feedback when learner selects this option. },
{unselected: Feedback when the learner does not select this option.}}
```

Note: You can use S for `selected` and U for unselected.

For example, the following problem has feedback for every answer option, whether learners select a given option or leave it unselected.

```
>>Which of the following is an example of a fruit?||Select all that apply.<<

[x] apple {{ selected: You are correct that an apple is a fruit because it
is the fertilized ovary that comes from an apple tree and contains seeds. },
{ unselected: Remember that an apple is also a fruit.}}

[x] pumpkin {{ selected: You are correct that a pumpkin is a fruit because it
is the fertilized ovary of a squash plant and contains seeds.}, { unselected:
Remember that a pumpkin is also a fruit.}}

[ ] potato {{ U: You are correct that a potato is a vegetable because it is
an edible part of a plant in tuber form.}, { S: A potato is a vegetable, not
a fruit, because it does not come from the flower on a plant or tree and does
not contain seeds.}}

[x] tomato {{ S: You are correct that a tomato is a fruit because it is the
fertilized ovary of a tomato plant and contains seeds. }, { U: Many people
mistakenly think a tomato is a vegetable. However, because a tomato is the
fertilized ovary of a tomato plant and contains seeds it is classified as a
fruit.}}
```

Configure Compound Feedback

In the simple editor, you configure compound feedback after the possible options, with the following syntax.

```
{{ ((Answer Combination)) Feedback when learner selects this combination of
options.}}
```

For example, the following compound feedback is used when learners select options **A, B, and D** or **A, B, C, and D**.

```
{{ ((A B D)) An apple, pumpkin, and tomato are all fruits as they are all the
fertilized ovaries of a plant and contain seeds. }}
```

```
{{ ((A B C D)) You are correct that an apple, pumpkin, and tomato are all
fruits as they are all the fertilized ovaries of a plant and contain seeds.
However, a potato is not a fruit as it is an edible part of a plant in tuber
form and is classified as a vegetable.  }}
```

Note: If you configure individual option feedback for every answer, and you also provide compound feedback, when learners select the exact combination of answer choices defined, they only see the compound feedback. In this example, learners who select apple (A), pumpkin (B), and tomato (D) see the message "An apple, pumpkin, and tomato are all fruits as they are all the fertilized ovaries of a plant and contain seeds." They do not also see the individual feedback for selecting A, B, and D, and for leaving C unselected.

Configuring Feedback in the Advanced Editor

You can configure individual option and compound feedback in the advanced editor.

Configure Individual Option Feedback

In the advanced editor, you configure individual option feedback with the following syntax.

```
<choice correct="true">Choice label
  <choicehint selected="true">Feedback for when learner selects this
   answer.</choicehint>
  <choicehint selected="false">Feedback for when learner does not select
   this answer.</choicehint>
</choice>
```

For example, the following problem has feedback for each option, selected or unselected.

```
<problem>
  <choiceresponse>
    <label>Which of the following is an example of a fruit?</label>
    <description>Select all that apply.</description>
    <checkboxgroup>
      <choice correct="true">apple
        <choicehint selected="true">You are correct that an apple is a fruit
         because it is the fertilized ovary that comes from an apple tree and
         contains seeds.</choicehint>
        <choicehint selected="false">Remember that an apple is also a
         fruit.</choicehint>
      </choice>
      <choice correct="true">pumpkin
        <choicehint selected="true">You are correct that a pumpkin is a fruit
         because it is the fertilized ovary of a squash plant and contains
         seeds.</choicehint>
        <choicehint selected="false">Remember that a pumpkin is also a
         fruit. </choicehint>
      </choice>
      <choice correct="false">potato
```

```
          <choicehint selected="true">A potato is a vegetable, not a fruit,
           because it does not come from the flower on a plant or tree and does
           not contain seeds.</choicehint>
          <choicehint selected="false">You are correct that a potato is
           classified as a vegetable because it is an edible part of a plant in
           tuber form.</choicehint>
        </choice>
        <choice correct="true">tomato
          <choicehint selected="true">You are correct that a tomato is
           classified as a fruit because it is the fertilized ovary of a tomato
           plant and contains seeds.</choicehint>
          <choicehint selected="false">Many people mistakenly think a tomato is
           a vegetable. However, because a tomato is the fertilized ovary of a
           tomato plant and contains seeds it is classified as a fruit.</choicehint>
        </choice>
      </checkboxgroup>
    </choiceresponse>
</problem>
```

Configure Compound Feedback

In the advanced editor, you define compound feedback by adding a <compoundhint> element within the
<checkboxgroup> element.

```
    .
    .
    .
  </choice>
  <compoundhint value="Answer Combination">Feedback when learner selects
    this combination of answers.</compoundhint>
</checkboxgroup>
```

For example, the following compound feedback is used when learners select options **A, B, and D** or **A, B, C, and D**.

```
    .
    .
    .
  </choice>
  <compoundhint value="A B D">An apple, pumpkin, and tomato are all
   fruits as they all are fertilized ovaries of a plant and contain
   seeds.</compoundhint>
  <compoundhint value="A B C D">You are correct that an apple, pumpkin,
   and tomato are all fruits as they all are fertilized ovaries of a
   plant and contain seeds. However, a potato is not a fruit as it is an
   edible part of a plant in tuber form and is classified as a vegetable.
  </compoundhint>
</checkboxgroup>
```

10.5.4 Adding Hints to a Checkbox Problem

You can add hints to a checkbox problem using the simple editor or the advanced editor. For an overview of hints in problems, see *Adding Feedback and Hints to a Problem*.

Configure Hints in the Simple Editor

In the simple editor, you configure hints with the following syntax.

```
||Hint 1||
||Hint 2||
||Hint n||
```

Note: You can configure any number of hints. The learner views one hint at a time and views the next one by selecting **Hint** again.

For example, the following problem has two hints.

```
||A fruit is the fertilized ovary from a flower.||
||A fruit contains seeds of the plant.||
```

Configure Hints in the Advanced Editor

In the advanced editor, you add the <demandhint> element immediately before the closing </problem> tag, and then configure each hint using the <hint> element.

```
.
.
.
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
  <hint>Hint 3</hint>
</demandhint>
</problem>
```

For example, the following OLX for a multiple choice problem shows two hints.

```
.
.
.
</multiplechoiceresponse>
<demandhint>
  <hint>A fruit is the fertilized ovary from a flower.</hint>
  <hint>A fruit contains seeds of the plant.</hint>
</demandhint>
</problem>
```

10.5.5 Awarding Partial Credit in a Checkbox Problem

You can configure a checkbox problem to award partial credit to learners who submit an answer that is partly correct. You must use the advanced editor to configure partial credit.

For an overview of partial credit in problems, see *Awarding Partial Credit for a Problem*.

In the following example, the learner selected two of the three correct choices, and did not select any incorrect choices. The learner therefore had four out of five correct answers. Because the course team set this problem up to award partial credit for every correct answer selected and every incorrect answer left unselected (known as *every decision counts*), the learner earned 80% of the points for this problem.

You can use the following methods to award partial credit in a checkbox problem.

- *Using the Every Decision Counts Method*
- *Using the By Halves Method*

Using the Every Decision Counts Method

You can configure a checkbox problem so that every selection a learner makes for the checkbox problem is evaluated and scored. This method is known as every decision counts (EDC).

With EDC, if "n" is the number of possible options, learners earn 1/n of the total possible score for each correct option they select. Learners receive partial credit for every correct answer selected and every incorrect answer left unselected.

For example, if there are four options, every option that a learner matches is worth 25% of the total score. A learner also gains 25% for each incorrect answer that a learner does NOT select.

The following table shows how the different combinations of learner selections would score for one EDC problem whose answers are as follows.

- Correct options: A, B, D

- Incorrect options: C

Learner's Selections	Score	Explanation
A, B, D	100%	The learner matched each of the 3 correct answers for 75%, and also gained 25% for not selecting the incorrect answer.
A, B	75%	The learner matched 2 of the correct answers for 50%, and also gained 25% for not selecting the incorrect answer.
A, B, C	50%	The learner matched 2 of the correct answers for 50%, but selected the incorrect answer.
A, C	25%	The learner matched 1 of the correct answers for 25%, but selected the incorrect answer.

Configure an EDC Checkbox Problem

To configure an EDC checkbox problem, you add the `partial_credit="EDC"` attribute to the `<choiceresponse>` element in the problem OLX.

For example, the following OLX shows the checkbox problem template after it is updated to provide partial credit.

```
<problem>
  <choiceresponse partial_credit="EDC">
    <label>Which of the following is a fruit?</label>
    <description>Select all that apply.</description>
    <checkboxgroup>
      <choice correct="true">apple</choice>
      <choice correct="true">pumpkin</choice>
      <choice correct="false">potato</choice>
      <choice correct="true">tomato</choice>
    </checkboxgroup>
  </choiceresponse>
</problem>
```

Using the By Halves Method

You can configure a checkbox problem so that for every option that a learner gets wrong, either by not selecting a correct option or by selecting an incorrect option, half of the remaining points are deducted from the learner's score. This method is known as scoring by halves.

Note: By design, partial credit by halves requires the number of answer options to be more than twice the number of incorrect answers. In addition, partial credit is not given for more than two wrong answers, regardless of the total number of answer options. In other words, two wrong answers is scored at 25% only if there are at least 5 answer options. Three or more wrong answers is always scored at 0%, regardless of the number of total answer options.

Partial credit using the by halves method is calculated as follows.

- If a learner makes no errors, she receives full credit for the problem.

- If a learner makes one error, she receives 50% of the possible points, as long as there are three or more choices in the problem. If a learner makes one error and there are only two choices in the problem, no credit is given.

- If a learner makes two errors, she receives 25% of the possible points, as long as there are five or more choices in the problem. If a learner makes two errors and there are only three choices or four choices in the problem, no credit is given.

- If a learner makes three errors, she receives no credit for the problem, regardless of how many answer options there are.

The following tables illustrate partial credit score using the halves method, for problems with an increasing number of total answer options.

Number of Incorrect Answers	Number of Answer Options	Credit Given (%)
0	2	100
1	2	0
2	2	0

Number of Incorrect Answers	Number of Answer Options	Credit Given (%)
0	3	100
1	3	0
2	3	0
3	3	0

Number of Incorrect Answers	Number of Answer Options	Credit Given (%)
0	4	100
1	4	50
2	4	0
3	4	0
4	4	0

Number of Incorrect Answers	Number of Answer Options	Credit Given (%)
0	5	100
1	5	50
2	5	25
3	5	0
4	5	0
5	5	0

Number of Incorrect Answers	Number of Answer Options	Credit Given (%)
0	7	100
1	7	50
2	7	25
3	7	0
4	7	0
5	7	0

Configure a By Halves Checkbox Problem

To configure a by halves checkbox problem, you add the `partial_credit="halves"` attribute to the `<choiceresponse>` element in the problem OLX.

The following example shows a checkbox problem that provides partial credit by halves.

```
<problem>
  <choiceresponse partial_credit="halves">
    <label>Which of the following is a fruit?</label>
    <description>Select all that apply.</description>
    <checkboxgroup>
      <choice correct="true">apple</choice>
      <choice correct="true">pumpkin</choice>
      <choice correct="false">potato</choice>
      <choice correct="true">tomato</choice>
    </checkboxgroup>
  </choiceresponse>
</problem>
```

10.5.6 Checkbox Problem OLX Reference

Note: You can also set attributes and options by adding a `<script>` element. For more information, see *Using the Script Element*.

Template

```
<problem>
  <choiceresponse>
    <label>Question or prompt text</label>
    <description>Information about how to answer the question</description>
    <checkboxgroup>
      <choice correct="false">Answer option A (incorrect)</choice>
      <choice correct="true">Answer option B (correct)</choice>
      <choice correct="true">Answer option C (correct)</choice>
    </checkboxgroup>
  <solution>
    <div class="detailed-solution">
      <p>Optional header for the explanation or solution</p>
      <p>Optional explanation or solution text</p>
    </div>
  </solution>
  </choiceresponse>
  <demandhint>
    <hint>Hint 1</hint>
    <hint>Hint 2</hint>
  </demandhint>
</problem>
```

Elements

For checkbox problems, the <problem> element can include this hierarchy of child elements.

```
<choiceresponse>
    <label>
    <description>
    <checkboxgroup>
        <choice>
            <choicehint>
        <compoundhint>
    <solution>
<demandhint>
    <hint>
```

In addition, standard HTML tags can be used to format text.

<choiceresponse>

Required. Indicates that the problem is a checkbox problem.

Attributes

Attribute	Description
`partial_credit`	Optional. Specifies the type of partial credit given. EDC or `halves`.

Children

- `<label>`
- `<description>`
- `<checkboxgroup>`
- `<solution>`

`<label>`

Required. Identifies the question or prompt. You can include HTML tags within this element.

Attributes

None.

Children

None.

`<description>`

Optional. Provides clarifying information about how to answer the question. You can include HTML tags within this element.

Attributes

None.

Children

None.

`<checkboxgroup>`

Required. Indicates the beginning of the list of options.

Attributes

None.

Children

- `<choice>`
- `<compoundhint>`

`<choice>`

Required. Designates an answer option.

Attributes

Attribute	Description
`correct`	Indicates a correct or incorrect answer. • When set to `"true"`, the choice is a correct answer. At least one required. • When set to `"false"`, the choice is an incorrect answer.

Children

`<choicehint>`

`<choicehint>`

Optional. Specifies feedback for the answer.

Attributes

Attribute	Description
`selected`	Required. `true` or `false`. Indicates if the feedback is given when the answer option is selected, or when it is not selected.

Children

None.

`<compoundhint>`

Optional. Specifies feedback for a specific combination of answers.

Attributes

Attribute	Description
`value` (at least one required)	Indicates the combination of selected answers that triggers this feedback. Answers are identified by uppercase letters, in ascending alphabetical order.

Children

None.

`<solution>`

Optional. Identifies the explanation or solution for the problem, or for one of the questions in a problem that contains more than one question.

This element contains an HTML division `<div>`. The division contains one or more paragraphs `<p>` of explanatory text.

`<demandhint>`

Optional. Specifies hints for the learner. For problems that include multiple questions, the hints apply to the entire problem.

Attributes

None.

Children

`<hint>`

```
<hint>
```

Required. Specifies additional information that learners can access if needed.

Attributes

None.

Children

None.

10.5.7 Advanced Options for Checkbox Problems

Using the Script Element

You can use the `<script>` element to programmatically set attributes and options for your checkbox problems. You could use this feature to display different questions/answers depending on variable factors, like time of day, or randomly generated numbers.

Use the Advanced Editor to Configure the Script Element

You must use the *advanced editor* to configure a `<script>` element.

The contents of the `<script>` element must be enclosed in `<![CDATA[ … ]]>` markers, to indicate that the enclosed code should not be interpreted as XML.

The code in the `<script>` element is run on the server before the problem is shown to learners. Note that only Python script types are supported.

The following OLX example uses random numbers to generate different answer choices for each learner, and mathematical operators to determine each choice's correctness.

```
<problem>
    <script type="text/python">
    <![CDATA[
    random.seed(anonymous_student_id)  # Use different random numbers for each student.
    a = random.randint(1,10)
    b = random.randint(1,10)
    c = a + b

    ok0 = c % 2 == 0 # check remainder modulo 2
    text0 = "$a + $b is divisible by 2"

    ok1 = c % 3 == 0 # check remainder modulo 3
    text1 = "$a + $b is divisible by 3"

    ok2 = c % 5 == 0 # check remainder modulo 5
    text2 = "$a + $b is divisible by 5"
```

<div style="text-align: right">(continues on next page)</div>

(continued from previous page)

```
    ok3 = not any([ok0, ok1, ok2])
    text3 = "None of the above statements is true."
]]>
</script>
<choiceresponse>
  <label>Which statements about the number $a+$b are true? Select all that apply.</
→label>
    <checkboxgroup direction="vertical">
      <choice correct="$ok0">$text0 ... (should be $ok0)</choice>
      <choice correct="$ok1">$text1 ... (should be $ok1)</choice>
      <choice correct="$ok2">$text2 ... (should be $ok2)</choice>
      <choice correct="$ok3">$text3 ... (should be $ok3)</choice>
    </checkboxgroup>
  </choiceresponse>
</problem>
```

10.6 Chemical Equation Problem

Note: EdX does not support this problem type.

The chemical equation problem type allows the learner to enter text that represents a chemical equation into a text box. The system converts that text into a chemical equation below the text box. The grader evaluates the learner's response by using a Python script that you create and embed in the problem.

CHEMICAL EQUATION PROBLEM (1 point possible)

Some problems may ask for a particular chemical equation. Practice by writing out the following reaction in the box below.

$$H_2SO_4 \longrightarrow H^+ + HSO_4^-$$

H2SO4 -> H^+ + HSO4^-

$H_2SO_4 \rightarrow H^+ + HSO_4^-$

Some tips:

- Use real element symbols.
- Create subscripts by using plain text.
- Create superscripts by using a caret (^).
- Create the reaction arrow ($\longrightarrow$) by using "->".

SOLUTION

To create this equation, enter the following:

H2SO4 -> H^+ + HSO4^-

Note: You can make a calculator available to your learners on every unit page. For more information, see *Calculator Tool*.

10.6.1 Create a Chemical Equation Problem

Chemical equation problems use MathJax to create formulas. For more information about using MathJax in Studio, see *Using MathJax for Mathematics*.

To create the above chemical equation problem, follow these steps.

1. In the unit where you want to create the problem, select **Problem** under **Add New Component**, and then select the **Advanced** tab.

2. Select **Blank Advanced Problem**.

3. In the component that appears, select **Edit**.

4. In the component editor, paste the code from below.

5. Select **Save**.

Sample Chemical Equation Problem Code

```
<problem>
  <startouttext/>
  <p>Some problems may ask for a particular chemical equation. Practice by writing out␣
→the following reaction in the box below.</p>

\( \text{H}_2\text{SO}_4 \longrightarrow \text { H}^+ + \text{ HSO}_4^-\)

  <customresponse>
    <chemicalequationinput size="50" label="Enter the chemical equation"/>
    <answer type="loncapa/python">

if chemcalc.chemical_equations_equal(submission[0], 'H2SO4 -> H^+ + HSO4^-'):
    correct = ['correct']
else:
    correct = ['incorrect']

    </answer>
  </customresponse>
  <p>Some tips:</p>
  <ul>
  <li>Use real element symbols.</li>
  <li>Create subscripts by using plain text.</li>
  <li>Create superscripts by using a caret (^).</li>
  <li>Create the reaction arrow (\(\longrightarrow\)) by using "->".</li>
  </ul>

  <endouttext/>

 <solution>
 <div class="detailed-solution">
 <p>Solution</p>
 <p>To create this equation, enter the following:</p>
   <p>H2SO4 -> H^+ + HSO4^-</p>
 </div>
 </solution>
</problem>
```

10.6.2 Chemical Equation Problem XML

Template

```
<problem>
  <startouttext/>
  <p>Problem text</p>

  <customresponse>
    <chemicalequationinput size="NUMBER" label="LABEL TEXT"/>
    <answer type="loncapa/python">

if chemcalc.chemical_equations_equal(submission[0], 'TEXT REPRESENTING CHEMICAL EQUATION
↪'):
    correct = ['correct']
else:
    correct = ['incorrect']

    </answer>
  </customresponse>

  <endouttext/>

 <solution>
 <div class="detailed-solution">
 <p>Solution or Explanation Header</p>
 <p>Solution or explanation text</p>
 </div>
 </solution>
</problem>
```

Tags

- <customresponse>: Indicates that this problem has a custom response.

- <chemicalequationinput>: Specifies that the answer to this problem is a chemical equation.

- <answer type=loncapa/python>: Contains the Python script that grades the problem.

Tag: <customresponse>

Indicates that this problem has a custom response. The <customresponse> tags must surround the <chemicalequation> tags.

> Attributes

> (none)

> Children

>> - <chemicalequationinput>

>> - <answer>

Tag: <chemicalequationinput>

Indicates that the answer to this problem is a chemical equation and creates a response field where the learner enters an answer.

Attributes

Attribute	Description
size	Specifies the size of the response field, in characters.
label (required)	Contains the text of the principal question in the problem.

Children

(none)

Tag: `<answer>`

Contains the Python script that grades the problem.

Attributes

Attribute	Description
type (required)	Must be "loncapa/python".

Children

(none)

10.7 Circuit Schematic Builder Problem

Note: EdX does not support this problem type.

In circuit schematic builder problems, students can arrange circuit elements such as voltage sources, capacitors, resistors, and MOSFETs on an interactive grid. They then submit a DC, AC, or transient analysis of their circuit to the system for grading.

Lab 2

(1 point possible)

A circuit that combines two or more signals is called a *mixer*. In this lab, your goal is to build a mixer that combines the signals generated by two voltage sources, V1 and V2, where:

- V1 is a 1 kHz square wave that varies between 0V and +1V, and

- V2 is a 5 kHz sine wave that varies between -1V and +1V.

Please design a circuit that mixes V1 and V2 to produce Vout such that

$$V_{\text{out}} \approx \frac{1}{2}V_1 + \frac{1}{6}V_2.$$

Enter your circuit below, using the appropriate configuration of resistors. Please do not modify the wiring or parameters of the voltage sources -- your goal is to take the signals they generate and combine them, not to change what is generated. Run a 5ms transient analysis to verify the correct operation of your circuit. We will be checking for the transient waveform at the "output" node.
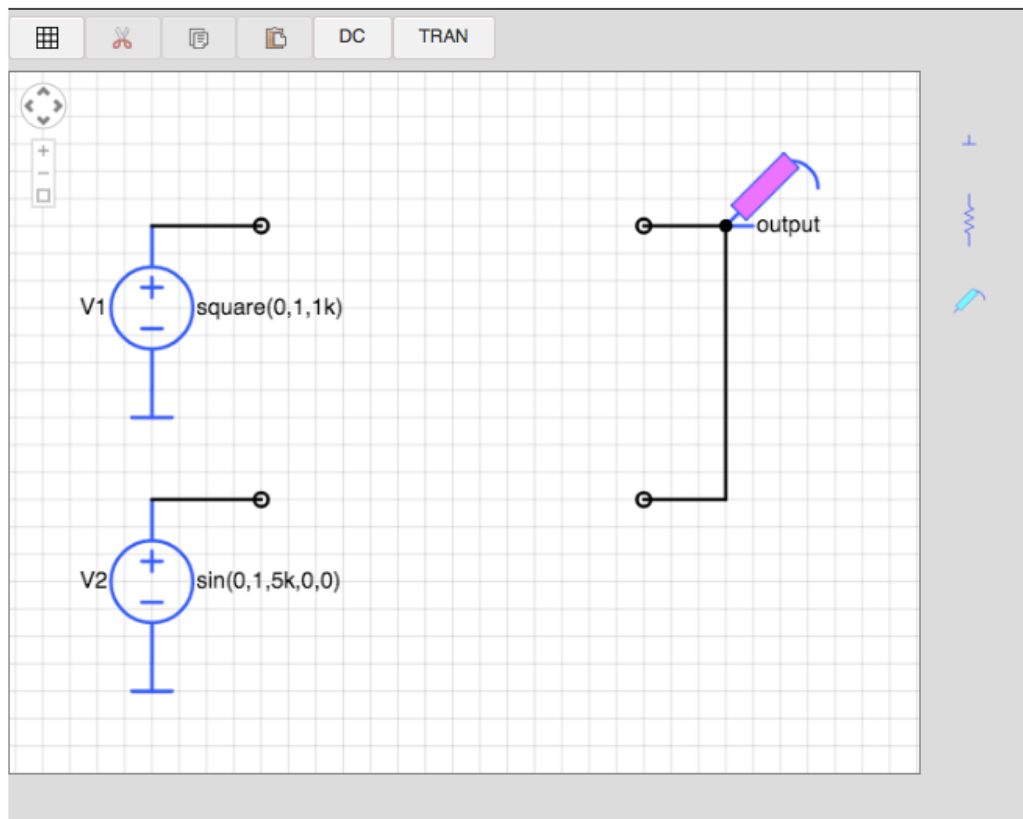
10.7.1 Create a Circuit Schematic Builder Problem

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**, and then select **Advanced**.

2. Select **Circuit Schematic Builder**.

3. In the component that appears, select **Edit**.

4. In the component editor, replace the example code with your own code.

5. Select **Save**.

Problem Code

The illustration above shows a condensed version of an actual problem from MITx's 6.002.1x. To create the entire problem, paste the following code into the advanced editor.

```
<problem>
 <p>A circuit that combines two or more signals is called a <i>mixer</i>.  In
 this lab, your goal is to build a mixer that combines the signals generated
 by two voltage sources, V1 and V2, where:</p>
  <ul style="margin-left:2em;">
    <li>
      <p>V1 is a 1 kHz square wave that varies between 0V and +1V, and</p>
    </li>
    <li>
      <p>V2 is a 5 kHz sine wave that varies between -1V and +1V.</p>
    </li>
  </ul>
 <p>Please design a circuit that mixes V1 and V2 to produce Vout such that</p>
 <center>\[V_\mathrm{out} \approx \frac{1}{2}V_1 + \frac{1}{6}V_2.\]</center>
 <p>The resulting output should be similar to that shown in Figure 1.  The
 maximum value of the output is approximately \(667mV\) and the minimum value
 is approximately \(-167mV\).</p>
 <center><img src="/static/images/circuits/Lab2B_1.png"/><br/>Figure 1.  Desired output␣
→waveform</center>
 <p>Hint: Figure 2 shows a simple resistive mixer for combining two signals.</p>
 <center><img src="/static/images/circuits/Lab2B_2.png"/><br/>Figure 2.  Simple␣
→resistive mixer</center>
  <p>Enter your circuit below, using the appropriate configuration of
  resistors. Please do not modify the wiring or parameters of the voltage
  sources -- your goal is to take the signals they generate and combine them,
  not to change what is generated. Run a 5ms transient analysis to verify the
  correct operation of your circuit. We will be checking for the transient
  waveform at the "output" node.</p>
 <schematicresponse>
   <center>
     <schematic height="500" width="650" parts="g,r,s" analyses="dc,tran" submit_
→analyses="{&quot;tran&quot;:[[&quot;output&quot;,0.00025,0.00035,0.00065,0.00075]]}"␣
→initial_value="[[&quot;v&quot;,[56,48,0],{&quot;name&quot;:&quot;V1&quot;,&quot;value&
→quot;:&quot;square(0,1,1k)&quot;,&quot;_json_&quot;:0},[&quot;2&quot;,&quot;0&quot;]],
→[&quot;g&quot;,[56,96,0],{&quot;_json_&quot;:1},[&quot;0&quot;]],[&quot;v&quot;,[56,
→128,0],{&quot;name&quot;:&quot;V2&quot;,&quot;value&quot;:&quot;sin(0,1,5k,0,0)&quot;,&
→quot;_json_&quot;:2},[&quot;1&quot;,&quot;0&quot;]],[&quot;g&quot;,[56,176,0],{&quot;_
→json_&quot;:3},[&quot;0&quot;]],[&quot;w&quot;,[56,48,88,48]],[&quot;w&quot;,[56,128,
→88,128]],[&quot;L&quot;,[224,48,3],{&quot;label&quot;:&quot;output&quot;,&quot;_json_&
→quot;:6},[&quot;output&quot;]],[&quot;w&quot;,[224,48,200,48]],[&quot;w&quot;,[224,48,
→224,128]],[&quot;w&quot;,[224,128,200,128]],[&quot;s&quot;,[224,48,0],{&quot;color&
→quot;:&quot;cyan&quot;,&quot;offset&quot;:&quot;0&quot;,&quot;_json_&quot;:10},[&quot;output&quot;]],[&quot;view&
→quot;,0,0,2,&quot;5&quot;,&quot;10&quot;,&quot;10MEG&quot;,null,&quot;100&quot;,&quot;
→5ms&quot;]]"/>
```

```
    </center>
    <answer type="loncapa/python">
# for a schematic response, submission[i] is the json representation
# of the diagram and analysis results for the i-th schematic tag

def get_tran(json,signal):
  for element in json:
    if element[0] == 'transient':
      return element[1].get(signal,[])
  return []

output = get_tran(submission[0],'output')

answer = [[0.00025, 0.666],
          [0.00035, 0.333],
          [0.00065, 0.166],
          [0.00075, -0.166]]

okay = True
if not output or output[0][1] == 'undefined': # No transient or output node floating
  okay = False
else:
  for (at,av) in answer:
    for (t,v) in output:
      if at==t and abs(av - v) &lt; 0.05*abs(av):
        # found a good match for this answer, on to the next one
        break
    else:
      print 'check',at,av
      # no submission matched answer, complain
      okay = False;
      break;

correct = ['correct' if okay else 'incorrect']

</answer>
  </schematicresponse>
  <p>When you're done or if you wish to save your work, please click CHECK.
  The checker will be verifying the voltage of the output node at several
  different times, so you'll earn a point only <i>after</i> you've performed
  the transient simulation so that the checker will have a waveform to check!</p>
  <solution>
    <div class="detailed-solution"><p>Explanation:</p>
    <p>The goal is to design a mixer circuit with characteristics of
    \(V_{out}=\frac{1}{2}\cdot V_1+\frac{1}{6}\cdot V_2\)
    You might have started to design your mixer with two resistors only as the example
→suggests.
    But working through the math, soon you'll realize that the equations return no non-
→zero value for the resistor components.
    Thus you have to change the design. The next simplest design will be to add a
→resistor \(R_3\) that connects the node Vout to ground.
    See the schematic below:</p>
```

```
   <img src="/static/images/circuits/lab2fmt.png"/>
   <p>Since we are going to use only linear elements in this circuit
   (resistors are linear), superposition will hold
   and thus one can look at the effect of each source \(V_1\) and \(V_2\)
   one at the time:</p>
 [mathjax] V_{out1} = V_1 \cdot \frac{\left(R_2 \parallel R_3\right)}
 {\left(R_2 \parallel R_3+R_1\right)}\\ V_{out2} = V_2 \cdot
 \frac{\left(R_1 \parallel R_3\right)}{\left(R_1 \parallel R_3+R_2\right)}
 \\ V_{out} = V_{out 1} + V_{out 2} \\ V_{out} = V_1 \cdot
 \frac{\left(R_2 \parallel R_3\right)}{\left(R_2\parallel R_3+R_1\right)} +
 V_2 \cdot \frac{\left(R_1 \parallel R_3\right)}{\left(R_1 \parallel R_3 +
 R_2\right)} = \frac{1}{2} \cdot V_1+\frac{1}{6} \cdot V_2 [/mathjax]
 <p>Therefore:</p>
 [mathjax] \frac{ \left(R_2 \parallel R_3 \right) }
 { \left( R_2 \parallel R_3 + R_1 \right)} =
 \frac{1}{2} \\\\\frac{\left( R_1 \parallel R_3 \right) }
 { \left(R_1 \parallel R_3 + R_2 \right)} = \frac{1}{6}  [/mathjax]
 <p>So we have to solve for the resistors given these two equations. You
 might notice that we have 2 equations and 3 unknowns, and that there is
 therefore not a unique solution. That is okay, though. We only have to
 worry if there is no solution, not if there are too many solutions. We will
 simply find one of the many possible correct answers by arbitrarily
 choosing a value for one of the variables later.</p>
 <p>The first equation simplifies to \( R_1 = R_2\parallel R_3\) and the
 second simplifies to \(R_2 = 5 \cdot R_1\parallel R_3\)
 Expanding the notation gives: </p>
 [mathjax]\frac{1}{R_1}=\frac{1}{R_2}+\frac{1}{R_3}
 \tag{*} \\\\frac{1}{R_1}+\frac{1}{R_3}=\frac{5}{R_2}  [/mathjax]
 <p>Subtracting these two equations will yield \(R_2 = 2 \cdot R_3\)
 And putting this back to the starred equation , will result in
 \(R_1 = \frac{2}{3} \cdot R_3\)
 So now we have \(R_2\) and \(R_1\) in terms of \(R_3\) with the following
 ratios:</p>
 [mathjax]R_2 = 2 \cdot R_3 \\ R_1 = \frac{2}{3} \cdot R_3 \\[/mathjax]
 <p>Since the design hadn't mentioned anything about the resistances, one can
 use a simple value of \(R_3= 3\) and find the rest accordingly:</p>
 [mathjax]R_1= 2 \\
 R_2= 6 \\
 R_3= 3 \\
 [/mathjax]
 <p>With these resistor values, doing a transient analysis shows a result which meets␣
↪the required specs of \(V_{out}\).</p>
 </div>
 </solution>
</problem>
```

10.8 Completion Tool

Note: EdX does not support this tool.

The completion tool provides learners with a way to mark sections of the course as completed. It helps learners to track their progress through sections of the course, including for ungraded activities such as reading text, watching video, or participating in course discussions.

- *Overview*
- *Enable the Completion Tool*
- *Add a Completion Component*

10.8.1 Overview

The completion tool provides learners with a way to indicate both to themselves and to the course team that they have completed an activity.

The completion tool is itself a graded component and is therefore always included on the learner **Progress** page. However, depending on whether it is used in a graded or ungraded section of the course, it appears either as a part of the learner's final grade or as a practice score, respectively.

If you use the completion tool in an ungraded section of the course, the score for completing the activity that it is associated with is listed as a practice score on the **Progress** page. Practice scores are not included in the learner's final grade for the course.

You can also use the completion tool in graded sections of the course. If you do so, a score for completing the activity is included in learners' final grades. For example, if you include a completion component in a particular unit of the course content, learners who use the component to mark the unit as complete receive 1/1 points, while learners who do not mark the unit as complete receive 0/1 points. These scores are included in learners' final grades on the **Progress** page.

Note: EdX recommends using the completion tool primarily to track progress for ungraded activities such as reading assigned texts, watching videos, or participating in course discussions.

The Completion Control

When you add a completion component to a unit, learners see a control that is labeled **Mark as complete**. In this example, the completion component follows a Text component.
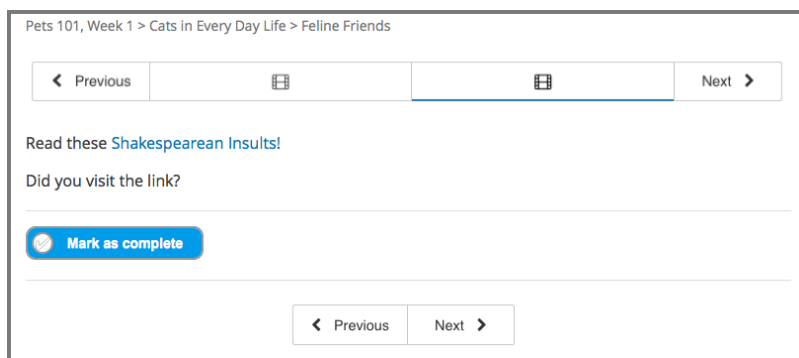
After a learner selects this control, the label changes to **Unmark**. Learners who revisit their work in a unit and want to change the completion status can select this control as many times as needed.

10.8.2 Enable the Completion Tool

Before you can add a completion component to your course, you must enable the completion tool in Studio.

To enable the completion tool in Studio, add the `"done"` key to the **Advanced Module List** on the **Advanced Settings** page, then select **Save Changes**. (Be sure to include the quotation marks around the key value.) For more information, see *Enabling Additional Exercises and Tools*.

10.8.3 Add a Completion Component

After you have enabled the completion tool in Studio, to add a completion component to a unit in a course, follow these steps.

1. In the course outline in Studio, locate the unit to which you want to add the completion component.

2. Under **Add New Component**, select **Advanced**.

3. Select **Completion**. The completion component is added to the unit.

Note: Select **Edit** in the completion component for information about the tool.

10.9 Conditional Module

Note: EdX offers provisional support for this problem type.

A conditional module controls the content that learners see after a response that they make meets a certain condition. For example, learners who answer "Yes" to a poll question see a different block of text from the learners who answered "No" to the same question.

10.9.1 Format description

The main tag of conditional module input is `conditional`.

```
<conditional> ... </conditional>
```

`conditional` can include any number of any Xmodule tags (`html`, `video`, `poll`, etc.) or `show` tags.

conditional Tag

The main container for a single instance of a conditional module. The following attributes can be specified for this tag.

```
sources - location id of required modules, separated by ';'
[message | ""] - message for case, where one or more are not passed. Here you can use
→variable {link}, which generate link to required module.

[submitted] - map to `is_submitted` module method.
(pressing RESET button makes this function to return False.)

[correct] - map to `is_correct` module method
[attempted] - map to `is_attempted` module method
[poll_answer] - map to `poll_answer` module attribute
[voted] - map to `voted` module attribute
```

show Tag

Symlink to some set of Xmodules. The following attribute can be specified for this tag.

```
sources - location id of modules, separated by ';'
```

10.9.2 Examples

Example: conditional depends on poll

```
<conditional sources="i4x://MITx/0.000x/poll_question/first_real_poll_seq_with_reset"
→poll_answer="man"
message="{link} must be answered for this to become visible.">
    <html>
        <h3>You see this because your vote value for "First question" was "man"</h3>
    </html>
</conditional>
```

Example: conditional depends on poll (use <show> tag)

```
<conditional sources="i4x://MITx/0.000x/poll_question/first_real_poll_seq_with_reset"
↪poll_answer="man"
message="{link} must be answered for this to become visible.">
    <html>
        <show sources="i4x://MITx/0.000x/problem/test_1; i4x://MITx/0.000x/Video/Avi_
↪resources; i4x://MITx/0.000x/problem/test_1"/>
    </html>
</conditional>
```

Examples of conditional depends on problem

```
<conditional sources="i4x://MITx/0.000x/problem/Conditional:lec27_Q1" attempted="True">
    <html display_name="HTML for attempted problem">You see this because "lec27_Q1" was
↪attempted.</html>
</conditional>
<conditional sources="i4x://MITx/0.000x/problem/Conditional:lec27_Q1" attempted="False">
    <html display_name="HTML for not attempted problem">You see this because "lec27_Q1"
↪was not attempted.</html>
</conditional>
```

10.10 Custom JavaScript Display and Grading Problem

Note: EdX offers full support for this problem type.

Custom JavaScript display and grading problems (also called custom JavaScript problems or JS input problems) allow you to create a custom problem or tool that uses JavaScript and then add the problem or tool directly into Studio. When you create a JS input problem, Studio embeds the problem in an inline frame (an HTML iframe element) so that your learners can interact with it in the LMS. You can grade your learners' work using JavaScript and some basic Python, and the grading is integrated into the edX grading system.

The JS input problem that you create must use HTML, JavaScript, and cascading style sheets (CSS). You can use any application creation tool, such as the Google Web Toolkit (GWT), to create your JS input problem.

Custom JavaScript Display and Grading
1/1 point (ungraded)

In these problems (also called custom JavaScript problems or JS Input problems), you add a problem or tool that uses JavaScript in Studio. Studio embeds the problem in an IFrame so that your learners can interact with it in the LMS. You can grade your learners' work using JavaScript and some basic Python, and the grading is integrated into the edX grading system.

The JS Input problem that you create must use HTML, JavaScript, and cascading style sheets (CSS). You can use any application creation tool, such as the Google Web Toolkit (GWT), to create your JS Input problem.

For more information, see Custom JavaScript Problem in *Building and Running an edX Course*.

JavaScript developers can also see Custom JavaScript Applications in the *EdX Developer's Guide*.

When you add the problem, be sure to select **Settings** to specify a **Display Name** and other values that apply. Also, be sure to specify a **title** attribute on the **jsinput** tag; this title is used for the title attribute on the generated IFrame. Generally, the title attribute on the IFrame should match the title tag of the HTML hosted within the IFrame, which is specified by the **html_file** attribute.

You can use the following example problem as a model.

This is paragraph text displayed before the IFrame.

Select an option from the list: [correct ⬍]

The currently selected answer is 'correct'.

✔

[Submit]

✔ Correct (1/1 point)

Caution:

- You cannot use a custom JavaScript problem in a component that contains more than one problem. Each custom JavaScript problem must be in its own component. See *Including Multiple Questions in One Component* for more information.

- The **Show Answer** button does not work for JS input problems. By default, the **Show Answer** option is set to **Never**. If you change this option in the problem component, a **Show Answer** button appears in the learner's view of the problem in the LMS, but the button does not work.

10.10.1 Create a Custom JavaScript Display and Grading Problem

1. Create your JavaScript application, and then upload all files associated with that application to the **Files & Uploads** page.

2. In the unit where you want to create the problem, under **Add New Component** select **Problem** , and then select **Advanced**.

3. Select **Custom JavaScript Display and Grading**.

4. In the component that appears, select **Edit**.

5. In the component editor, modify the example code according to your problem. Be sure to specify a `title` attribute on the `jsinput` tag. This title is used for the title attribute on the generated inline frame.

6. (Optional) To add a **Save** button to your problem, select **Settings**, and then set **Maximum Attempts** to a number larger than zero.

7. Select **Save**.

Note: All problems include more than one resource. If all the resources in a problem have the same protocol, host, and port, then the problem conforms to the same-origin policy (SOP). For example, the resources `http://store.company.com:81/subdirectory_1/JSInputElement.html` and `http://store.company.com:81/subdirectory_2/JSInputElement.js` have the same protocol (`http`), host (`store.company.com`), and port (`81`).

If any resources in your problem use a different protocol, host, or port, you need to bypass the SOP. For example, `https://info.company.com/JSInputElement2.html` uses a different protocol, host, and port from `http://store.company.com:81/subdirectory_1/JSInputElement.html`.

To bypass the SOP, change `sop="true"` to `sop="false"`. In the example problem code, this attribute is just before the closing `customresponse` tag.

If you bypass the same-origin policy, you require an additional file. The example problem uses the file `jschannel.js` to bypass the SOP.

For more information, see the same-origin policy page on the Mozilla Developer Network site or on Wikipedia.

JavaScript Input Example Problem Code

The following code recreates the JavaScript Input problem example shown in the overview. The example problem uses these files.

- https://files.edx.org/custom-js-example/jsinput_example.html

- https://files.edx.org/custom-js-example/jsinput_example.js

- https://files.edx.org/custom-js-example/jsinput_example.css

- https://files.edx.org/custom-js-example/jschannel.js (This file is used only because this example bypasses the SOP, as indicated by the line `sop="false"`)

```
<problem>
    <customresponse cfn="check_function">
        <script type="loncapa/python">
            <![CDATA[
            import json
            def check_function(e, ans):
```

(continues on next page)

```
            """
            "response" is a dictionary that contains two keys, "answer" and
            ""state".

            The value of "answer" is the JSON string that "getGrade" returns.
            The value of "state" is the JSON string that "getState" returns.
            Clicking either "Submit" or "Save" registers the current state.
            """
            response = json.loads(ans)

            # You can use the value of the answer key to grade:
            answer = json.loads(response["answer"])
            return answer == "correct"

            # Or you can use the value of the state key to grade:
            """
            state = json.loads(response["state"])
            return state["selectedChoice"] == "correct"
            """
        ]]>
    </script>
    <p>This is paragraph text displayed before the iframe.</p>
    <jsinput
        gradefn="JSInputDemo.getGrade"
        get_statefn="JSInputDemo.getState"
        set_statefn="JSInputDemo.setState"
        initial_state='{"selectedChoice": "incorrect1", "availableChoices":
        ["incorrect1", "correct", "incorrect2"]}'
        width="600"
        height="100"
        html_file="https://files.edx.org/custom-js-example/jsinput_example.html"
        title="Dropdown with Dynamic Text"
        sop="false"/>
    </customresponse>
</problem>
```

Note: Keep the following points in mind about this example problem.

- The jsinput_example.js file defines three JavaScript functions (**JSInputDemo.getGrade**, **JSInput-Demo.getState**, and **JSInputDemo.setState**).

- The JavaScript input problem code uses **JSInputDemo.getGrade**, **JSInputDemo.getState**, and **JSInput-Demo.setState** to grade, save, or restore a problem. These functions must be global in scope.

- **JSInputDemo.getState** and **JSInputDemo.setState** are optional. You need to define these functions only if you want to conserve the state of the problem.

- **Width** and **height** represent the dimensions of the inline frame that holds the application.

- The response is graded as correct if the `correct` option is selected in the dropdown control when the user selects **Submit**.

- Selecting **Submit** registers the problem's current state.

10.10.2 JavaScript Input Problem XML

JSInput allows problem authors to turn stand-alone HTML files into problems that can be integrated into the edX platform. Since its aim is flexibility, it can be seen as the input and client-side equivalent of **CustomResponse**.

A JSInput exercise creates an inline frame (iframe) in a static HTML page, and passes the return value of author-specified functions to the enclosing response type (generally **CustomResponse**). JSInput can also store and retrieve state.

Template

The following is the basic format of a JSInput problem.

```
<problem>
    <script type="loncapa/python">
        def all_true(exp, ans): return ans == "hi"
    </script>
    <customresponse cfn="all_true">
        <jsinput gradefn="gradefn"
            height="500"
            get_statefn="getstate"
            set_statefn="setstate"
            html_file="/static/jsinput.html"
            title="iframe Title"/>
    </customresponse>
</problem>
```

The accepted attributes are:

Attribute Name	Value Type	Required	Default
html_file	URL string	Yes	None
title	string	Yes	`Problem Remote Content`
gradefn	Function name	Yes	`gradefn`
set_statefn	Function name	No	None
get_statefn	Function name	No	None
height	Integer	No	`300`
width	Integer	No	`400`
title	String	No	None

Required Attributes

- **html_file**

  The **html_file** attribute specifies the HTML file that the iframe will point to. The HTML file must be located in the content directory.

  The iframe is created using the sandbox attribute. Although pop-ups, scripts, and pointer locks are allowed, the iframe cannot access its parent's attributes.

  The HTML file must contain a **gradefn** function that the JSInput file can access. To determine whether the **gradefn** function is accessible, in the console, make sure that **gradefn** returns the right thing. When JSInput uses the **gradefn** function, *gradefn* is called with *gradefn*.call(*obj*), where **obj** is the object-part of **gradefn**. For example, if **gradefn** is **myprog.myfn**, JSInput calls **myprog.myfun.call(myprog)**.

The HTML file has no specific requirements other than the **gradefn** function. Note that inheriting CSS or JavaScript from the parent (except for the Chrome-only **seamless** attribute, which is set to `True` by default) is not currently supported.

- **title**

  The **title** attribute specifies the title for the generated iframe. Generally, the title attribute on the iframe should match the title tag of the HTML file that is hosted within the iframe.

- **gradefn**

  The **gradefn** attribute specifies the name of the function that will be called when a user selects **Submit**, and that returns the learner's answer. Unless both the **get_statefn** and **set_statefn** attributes are also used, this answer is passed as a string to the enclosing response type. In the **customresponse** example above, this means **cfn** will be passed this answer as `ans`.

  If the **gradefn** function throws an exception when a learner attempts to submit a problem, the submission is aborted, and the learner receives a generic alert. The alert can be customized by making the exception name `Waitfor Exception`; in that case, the alert message will be the exception message.

  Important: To make sure the learner's latest answer is passed correctly, make sure that the **gradefn** function is not asynchronous. Additionally, make sure that the function returns promptly. Currently the learner has no indication that her answer is being calculated or produced.

Optional Attributes

- **set_statefn**

  Sometimes a problem author will want information about a learner's previous answers ("state") to be saved and reloaded. If the attribute **set_statefn** is used, the function given as its value will be passed the state as a string argument whenever there is a state, and the learner returns to a problem. The function has the responsibility to then use this state appropriately.

  The state that is passed is:

  - The previous output of **gradefn** (i.e., the previous answer) if **get_statefn** is not defined.
  - The previous output of **get_statefn** (see below) otherwise.

  It is the responsibility of the iframe to do proper verification of the argument that it receives via **set_statefn**.

- **get_statefn**

  Sometimes the state and the answer are quite different. For instance, a problem that involves using a JavaScript program that allows the learner to alter a molecule may grade based on the molecule's hydrophobicity, but from the hydrophobicity it might be incapable of restoring the state. In that case, a *separate* state may be stored and loaded by **set_statefn**. Note that if **get_statefn** is defined, the answer (i.e., what is passed to the enclosing response type) will be a json string with the following format:

  ```
  {
      answer: `[answer string]`
      state: `[state string]`
  }
  ```

  The enclosing response type must then parse this as json.

- **height** and **width**

The **height** and **width** attributes are straightforward: they specify the height and width of the iframe. Both are limited by the enclosing DOM elements, so for instance there is an implicit max-width of around 900.

In the future, JSInput may attempt to make these dimensions match the HTML file's dimensions (up to the aforementioned limits), but currently it defaults to 300 and 400 for **height** and **width**, respectively.

10.11 Drag and Drop Problem

Note: EdX offers full support for this problem type.

In drag and drop problems, learners respond to a question by dragging text or images to a specific location on a background image. This section explains how to use drag and drop problems in your course.

- *Overview of Drag and Drop Problems*
- *Creating a Drag and Drop Problem*
- *Understanding the Drag and Drop Editing Controls*
- *Changing the Visual Style of a Drag and Drop Problem*

Note: This drag and drop problem type is intended as a replacement for an older drag and drop problem type. This drag and drop problem type includes significant improvements and you should use it for any new course development. For more information about the previous, deprecated drag and drop problem type, see *Drag and Drop Problem (Deprecated)*.

10.11.1 Overview of Drag and Drop Problems

A drag and drop problem includes a background image and one or more items that learners can drag into target zones on the background image. You can include as many draggable items and as many target zones as you need. You can include decoy items that do not have a target, and you can include decoy targets that do not correspond to draggable items.

When learners view a drag and drop problem in the LMS, the problem includes a top section and a bottom section. Learners drag items from the top section on to the background image in the section below it.

The way that a learner selects, or grabs, an item depends on the type of browser that the learner uses. For example, a learner might click and hold on a draggable item with a mouse pointer to select it, drag the item to a target, and release the mouse pointer to drop the item on the target. A learner who accesses the problem on a mobile device with a touch screen might swipe an item from the top section into a target zone. A learner who uses a keyboard interface might use the navigation keys to select an item and then match it to a target zone.

You can configure a drag and drop problem to give learners unlimited attempts to match items to target zones or you can configure it to behave restrictively, like a test.

- In standard mode, the problem gives learners unlimited attempts to match items and it provides immediate feedback to indicate whether an item is matched correctly.

- In assessment mode, learners must match all of the draggable items to target zones and then submit the problem. The problem does not reveal whether items are matched correctly until the learner submits the problem.

For more information about assessment mode and standard mode, see *Choosing a Drag and Drop Problem Mode*.

The following image shows an example drag and drop problem.
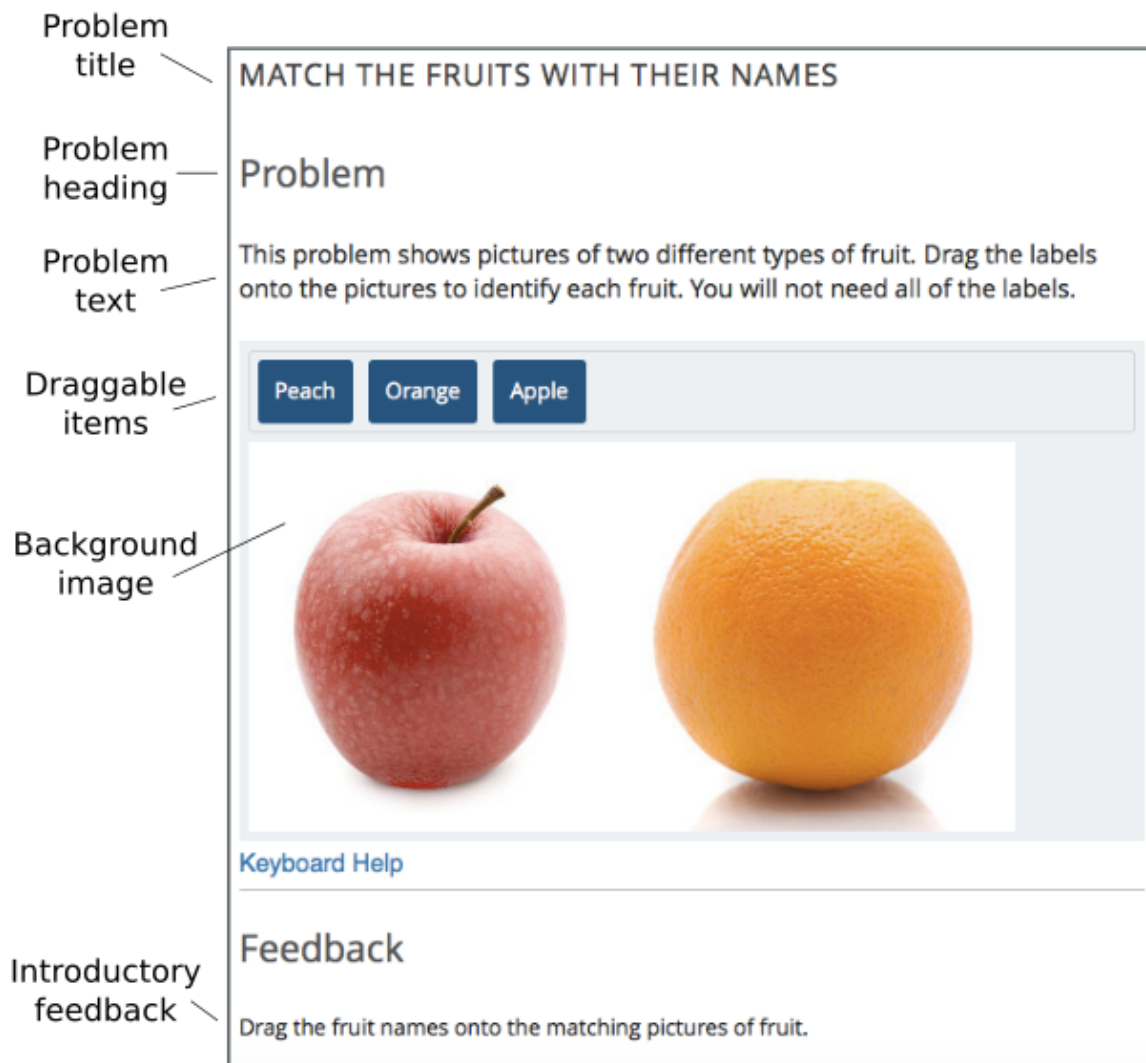
The following image shows the success feedback message that learners see when they match a draggable item with its target zone. Each draggable item has its own success feedback message.
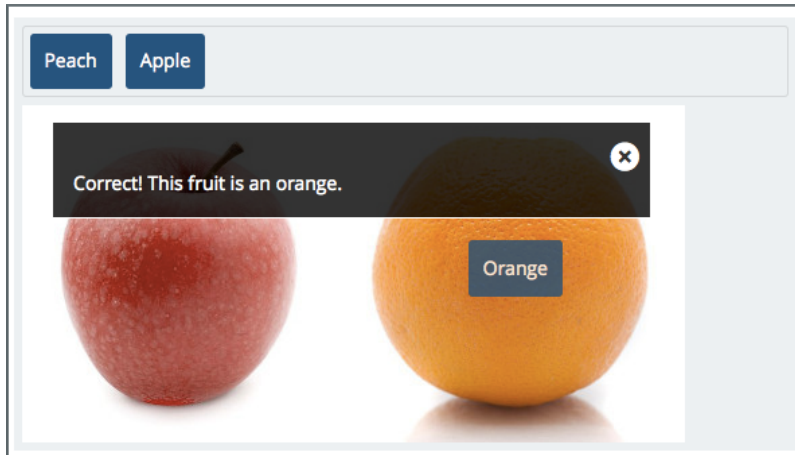
The following image shows the error feedback message that learners see when they match a draggable item with an incorrect target zone. Each draggable item has its own error feedback message.
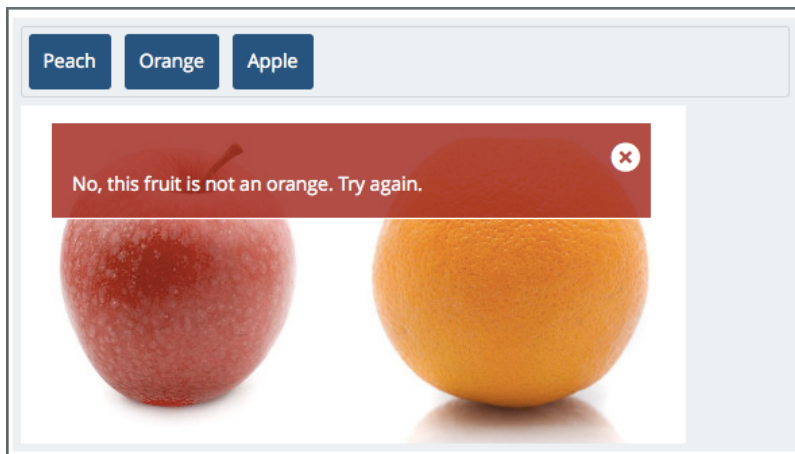
The following image shows a completed drag and drop problem. The final feedback message informs the learner that the problem is complete.
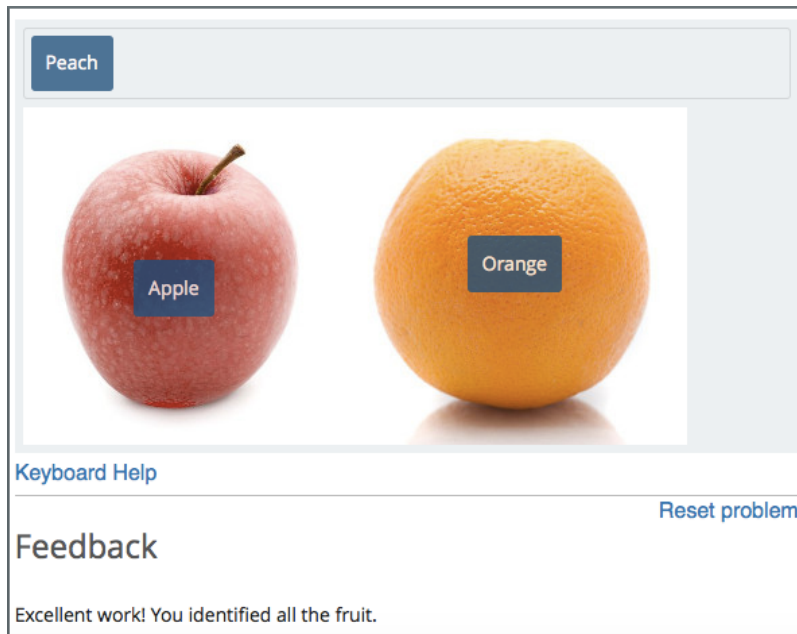
Understanding Background Images

The background image for a drag and drop problem is the surface that learners drag items onto.

A target zone is a rectangular area on the background image. You can show or hide the borders of a zone for learners. You can add titles for zones or leave the **Title** field empty. However, you must fill in the **Description** field for each zone. The description is only exposed to screen readers. The description must describe the content of the zone for visually impaired learners. For example, a zone that includes an apple might have a description that says "A round, red fruit with a stem."

A background image must fit within the course screen. The LMS automatically scales images that are too wide. If you choose a background image that is extremely large, you should consider how it appears to learners after scaling. The width of the course screen depends on the device and browsing software that a learner uses.

You define a target zone by specifying its width, height, horizontal offset (x), and vertical offset (y). Each specification is in pixels. The horizontal offset is the distance between the left side of the background image and the left side of the target zone. The vertical offset is the distance between the top of the background image and the top of the target zone.

The following image shows a background image and target zones in the drag and drop problem editing dialog box. For more information about editing drag and drop problems, see *Creating a Drag and Drop Problem*.

Note: The pixel coordinates that you use to specify the size and location of target zones are also used by common image editing software. You can open a background image in an image editing program to find the pixel coordinates of a target zone.

Understanding Draggable Items

A draggable item is a rectangle that contains either a label or an image. Learners grab draggable items from the top of a drag and drop problem and drag them to targets on the background image.

You can set the size of the rectangle for a draggable item as a percentage of the width of the problem. If you do not specify the size, the LMS sets it based on the length of the text in the label or the size of the image in it. You can set the background color and the label text color for the items in a problem.

Each draggable item can match one target zone on the background image, multiple target zones, or no target zones.

Each item must have a text label to identify it in the drag and drop problem. If you include only a text label, that label appears in the draggable item. If you include both a text label and an image for an item, the image appears as its label.

Using Draggable Items with Images

The following image shows draggable items with images. For examples of items with text, see *Overview of Drag and Drop Problems*.
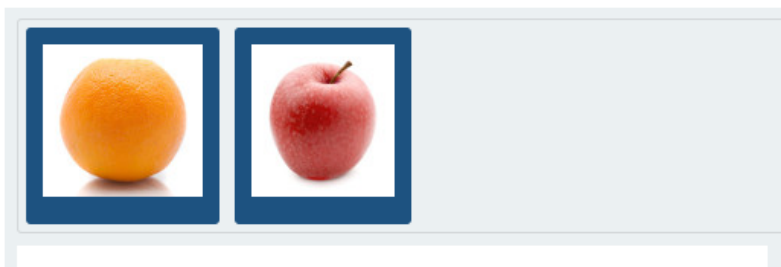
Images for draggable items have alternative image descriptions. The alternative description explains the image content in text. If a learner cannot access the visual image content, the text description helps that learner to complete the

problem.

Images for draggable items must fit within the top section of the problem. The LMS automatically scales large images to fit. If you use a large image in a draggable item, you should consider how that image appears after scaling.

Note: If an image file is unavailable, or cannot be displayed, the LMS displays the text description as the button label.

Choosing a Drag and Drop Problem Mode

You can configure drag and drop problems to allow learners to experiment with matching draggable items to target zones until all items are matched correctly, or to require that learners match all items to target zones without any input and then submit their attempts for grading. You can choose either **Standard Mode** or **Assessment Mode** to control the behavior of the problem.

- In standard mode, learners have unlimited attempts to match items and the problem provides immediate feedback to indicate whether an item is matched correctly.

- In assessment mode, learners must match all of the draggable items to target zones and then choose to submit the problem. The problem does not reveal whether items are matched correctly until the learner submits the problem. You can limit the number of attempts a learner is allowed, or allow unlimited attempts.

Using Standard Mode

Standard mode configures a drag and drop problem to give learners unlimited attempts to match draggable items with target zones until all of the items are matched to the correct targets. Each time a learner drops an item on a target zone, the problem reports whether the match is correct. If the match is not correct, the draggable item is returned to the item bank for a new attempt.

A learner completes a drag and drop problem in standard mode when all of the items are matched to target zones correctly. Learners receive the maximum score for the problem when the problem is complete.

Using Assessment Mode

Assessment mode configures a drag and drop problem to behave like a test. In assessment mode, learners must match all of the draggable items to target zones before the problem reveals whether the items are matched correctly.

Learners select **Submit** when they believe that they have completed the problem. If all items are matched correctly, the problem is complete. If any items are not matched correctly, and the maximum number of attempts has not been reached, the learner can correct items and select **Submit** again. When the learner reaches the maximum number of attempts, the problem is complete.

The score for the problem is calculated by dividing the maximum score based on the percent of draggable items that are matched correctly. If a learner attempts the problem multiple times, the score for the best attempt is the final score for the problem.

In assessment mode, you can specify the number of times that learners can submit a drag and drop problem. If you allow more than one attempt, the problem reveals which items are correctly matched and gives learners an opportunity to move items that are not correct. If you do not specify a limit, learners have unlimited attempts.

10.11.2 Creating a Drag and Drop Problem

To create a drag and drop problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Advanced**.

2. From the list of advanced components, select **Drag and Drop**.

   Studio adds the drag and drop problem to the unit.

3. Select **Edit**. The **Editing** dialog box opens.

   Configure your drag and drop problem. For detailed information about individual controls in the **Editing** dialog box, see *Understanding the Drag and Drop Editing Controls*.

   The **Editing** dialog box includes multiple screens. Configure each screen and select **Continue**. On the final screen, select **Save** to exit the configuration dialog box and save your changes.

   In particular, configure the aspects of the drag and drop problem described below.

   - Edit the problem title, problem text, introductory feedback, and final feedback for the problem. For more information about how the text in these fields appears in a drag and drop problem, see *Overview of Drag and Drop Problems*.

   - Specify a background image in the **Background URL** field. Enter the URL of a file you have added to your course or the URL of an image on the web. For more information about working with course files, see *Adding Files to a Course*. For more information about background images, see *Understanding Background Images*.

     Select **Change background** after you enter the URL for your background image.

     If you specify the URL of an image on the web, make sure that you are legally authorized to use the image and that the image is available to learners around the world.

   - Remove the target zones for the example drag and drop problem. Select **Add a zone** to add each target zone for your problem. For more information about target zones, see *Understanding Background Images*.

   - Remove the draggable items for the example drag and drop problem. Select **Add an item** to add draggable items for your problem. Select a matching target zone for each item in the **Zone** field. Add a label, success feedback text, and error feedback text. For more information about how the text in these fields appears, see *Overview of Drag and Drop Problems*. For more information about draggable items, see *Understanding Draggable Items*.

10.11.3 Understanding the Drag and Drop Editing Controls

The following table explains the controls in the **Editing** dialog box.

Control	Explanation
Problem title	The heading that appears above the drag and drop problem. For an example, see *Overview of Drag and Drop Problems*.
Show title	Controls whether the problem title appears above the problem in the LMS.
Problem mode	Controls whether the problem allows learners to experiment with matching draggable items to target zones (standard mode) or requires learners to match all items before providing feedback and optionally restricts the number of attempts (assessment mode). For more information, see *Choosing a Drag and Drop Problem Mode*.

Table 1 – continued from previous page

Control	Explanation
Maximum attempts (assessment mode only)	Controls the number of times that learners can match items to target zones and submit the problem for grading. If you do not enter a maximum number, learners have unlimited attempts. For more information, see *Choosing a Drag and Drop Problem Mode*.
Maximum score	The total number of points that learners receive for completing the problem. For more information about scores and grading, see *Establishing a Grading Policy For Your Course*.
Problem text	Text that appears above the problem in the LMS. You can use this text to provide instructions or explain the problem. For an example, see *Overview of Drag and Drop Problems*.
Show "Problem" heading	Controls whether the word **Problem** appears above the problem text.
Introductory Feedback	The text that appears in the feedback section of the problem before a learner begins.
Final Feedback	The text that appears in the feedback section of the problem after a learner matches all items to their target zones.
Background URL	The URL of the image that contains target zones for the problem. The URL can be relative to a file you add to your course or to a file on the web. For more information, see *Understanding Background Images*. You must select **Change background** when you enter a new URL in this field. If you do not select **Change background**, the new value will not be saved when you save other changes in the **Editing** dialog box.
Background description	A description of the background image. This description is used by learners who cannot access the visual image.
Display label names on the image	Controls whether the text for target zones appears on the background image in the LMS.
Display zone borders on the image	Controls whether the outlines of target zones appear on the background image in the LMS.
Zone Text	A name for a target zone. You select the name of a target zone in the configuration for draggable items.
Zone Description	Text that describes a target zone. This description is available to learners who cannot access the target zone visually.
Zone width	The horizontal size of a target zone in pixels.
Zone height	The vertical size of a target zone in pixels.
Zone X	The horizontal distance (in pixels) between the left edge of the background image and the left edge of a target zone.
Zone Y	The vertical distance (in pixels) between the top edge of the background image and the top edge of a target zone.
Zone Alignment	Controls the way that the problem aligns draggable items after learners drop them on a target zone. Available options are "left", "center", and "right".
Add a zone	Adds a set of controls for a new zone to the **Editing** dialog box.
Background color	The color that appears behind the text or image label of a draggable item. You can specify the color using a hexadecimal color code (including the # character) or any other valid CSS color specification. For more information, see the W3C CSS color specification. This is an optional configuration. If you do not set the background color, the LMS will apply the default color to your draggable items.
Text color	The color of the text label for a draggable item. You can specify the color using a hexadecimal color code (including the # character) or any other valid CSS color specification. For more information, see the W3C CSS color specification. This is an optional configuration. If you do not set the background color, the LMS will apply the default color to your text.

Table 1 – continued from previous page

Control	Explanation
Item Text	Controls the text that appears on the draggable item in the problem.
Item Zones	Controls the target zones that match the draggable item. Learners must drag the item to any one of the target zones that you select.
Item Image URL	(Optional) the URL of an image that appears on a draggable item. The image appears on the draggable item in the problem. The URL can be relative to a file you add to your course or to a file on the web.
Item Image description	Text that describes the image label for a draggable item. The description is used by learners who cannot access the visual image label.
Item Success Feedback	The text message that appears above the background image when a learner places a draggable item on its matching target zone. For an example, see *Overview of Drag and Drop Problems*. This is an optional configuration. If you do not enter a success feedback message, the LMS will not display one.
Item Error Feedback	The text message that appears above the background image when a learner places a draggable item on an incorrect matching target zone. For an example, see *Overview of Drag and Drop Problems*. This is an optional configuration. If you do not enter an error feedback message, the LMS will not display one.
Item Show advanced settings	Opens additional controls for configuring a draggable item.
Item Preferred width	The horizontal size of a draggable item as a percent of the problem width. The percent value must be a whole number between 0 and 100.
Add an item	Adds a set of controls for a new draggable item to the **Editing** dialog box.

10.11.4 Changing the Visual Style of a Drag and Drop Problem

You can change the visual appearance of drag and drop problems in your courses.

The **Background color** and **Text color** controls for the draggable items in a drag and drop problem set the appearance of items for an individual problem. You can choose colors for the background and text of items when you create or edit a drag and drop problem.

You can develop a Python programming language module and include a custom Cascading Style Sheet (CSS) file for drag and drop problems in your Open edX site. For more information, see Styling Drag and Drop Problems.

10.12 Drag and Drop Problem (Deprecated)

Note: EdX does not support this problem type.

This drag and drop problem type has been replaced by a newer drag and drop problem type. The newer drag and drop problem type includes significant improvements and you should use it for any new course development. For more information about the replacement drag and drop problem type, see *Drag and Drop Problem*.

> **Warning:**
>
> - **This deprecated drag and drop problem type is not accessible for learners with some disabilities, and it does not work correctly on mobile phones and other devices that use touch screen interfaces.** If you use this kind of problem, make sure that you include an alternative for learners who cannot access drag and drop problems, or leave these problems ungraded.

> For more information about creating accessible content, see *Accessibility Best Practices for Developing Course Content*.
>
> • The **Show Answer** button does not work for drag and drop problems. By default, the **Show Answer** option is set to **Never**. If you change this option in the problem component, a **Show Answer** button appears in the LMS, but the button does not work.

In drag and drop problems, learners respond to a question by dragging text or objects to a specific location on an image.

The following drag and drop exercise first appeared in MIT's 7.00x: Introduction to Biology - The Secret of Life course in March 2013.

You are shown one of many possible molecules. On the structure of allopurinol below, identify the functional groups that are present by dragging the functional group name listed onto the appropriate target boxes on the structure. If you want to change an answer, you have to drag off the name as well. You may need to scroll through the names of functional groups to see all options.
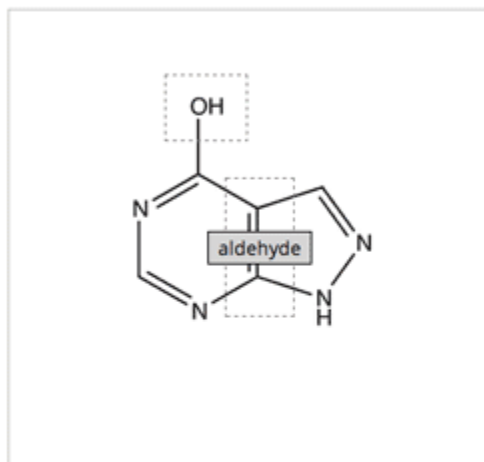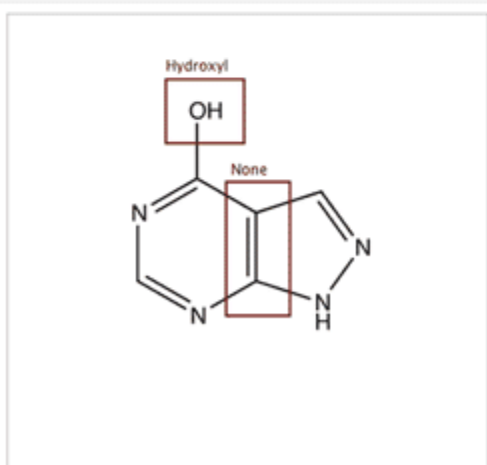
10.12.1 Adding a Drag and Drop Problem

Before you can include problems that use this deprecated problem type in your course, you must configure your course to *add unsupported problems*.

To create a drag and drop problem, you upload the image that you want learners to drag labels onto, and then create a problem component.

1. On the **Files & Uploads** page, upload your image file. For more information about uploading files, see *Adding Files to a Course*.

2. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

3. Click **Drag and Drop**.

4. In the component that appears, click **Edit**.

5. In the component editor, replace the example text with the text of your problem.

6. In the `<drag_and_drop_input>` tag, replace **https://studio.edx.org/c4x/edX/DemoX/asset/L9_buckets.png** with the URL of your image file on the **Files & Uploads** page (for example, **/static/Image.png**).

7. For at least one `<draggable>` tag, replace the text of the **label** attribute with the text of the label you want learners to drag. For example, if you want learners to drag the word "Iceland" onto your image, the new tag would resemble the following:

   `<draggable id="1" label="Iceland"/>`

8. Repeat the previous step for all the labels that you want to use. Make sure that the **id** attribute is different for each `<draggable>` tag.

9. Determine the coordinates and radius of the correct area on the image.

10. Under `correct_answer = {`, add an entry for each label, using the following format. These values are in pixels:

    `'id':  [[x coordinate, y coordinate], radius]`

    For example, if your image is 600 pixels wide and 400 pixels high, and you want your learners to drag the Iceland label to an area in the upper-left part of the image and drag a Sweden label near the lower-right part of your image, the code would resemble the following (where 2 is the ID for the Sweden label).

    ```
    correct-answer = {
            '1':    [[50, 50], 75]
            '2':    [[550, 350], 75]}
    ```

    Note: Make sure the code contains the closing curly brace (}).

    ---

11. Click **Save**.

Sample Drag and Drop Problem Code

To create the drag and drop problem that appears in the image above, you download two files from edX, upload these files to the **Files & Uploads** page, and then add the code for the problem to a problem component.

1. Download the following files from edX:

   - Allopurinol.gif

   - AllopurinolAnswer.gif

   To download both these files in a .zip archive, click http://files.edx.org/DragAndDropProblemFiles.zip.

1. Upload the Allopurinol.gif and AllopurinolAnswer.gif files to the **Files & Uploads** page.

2. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

3. Click **Drag and Drop**.

4. In the component that appears, click **Edit**.

5. In the component editor, replace the example code with the following code.

6. Click **Save**.

Problem Code:

```
<problem>
  <p> Allopurinol is a drug used to treat and prevent gout, a very painful form of
→arthritis. Once only a "rich man's disease", gout has become more and more common in
→recent decades – affecting about 3 million people in the United States alone. Deposits
→of needle-like crystals of uric acid in connective tissue or joint spaces cause the
→symptoms of swelling, stiffness and intense pain. Individuals with gout overproduce
→uric acid because they cannot eliminate it efficiently. Allopurinol treats and
→prevents gout by stopping the overproduction of uric acid through inhibition of an
→enzyme required for the synthesis of uric acid. </p>
  <p> You are shown one of many possible molecules. On the structure of allopurinol
→below, identify the functional groups that are present by dragging the functional
→group name listed onto the appropriate target boxes on the structure. If you want to
→change an answer, you have to drag off the name as well. You may need to scroll
→through the names of functional groups to see all options. </p>
  <customresponse>
    <drag_and_drop_input no_labels="true" one_per_target="true" target_outline="true"
→img="/static/Allopurinol.gif">
      <draggable can_reuse="true" label="methyl" id="1"/>
      <draggable can_reuse="true" label="hydroxyl" id="2"/>
      <draggable can_reuse="true" label="amino" id="3"/>
      <draggable can_reuse="true" label="carboxyl" id="4"/>
      <draggable can_reuse="true" label="aldehyde" id="5"/>
      <draggable can_reuse="true" label="phosphate" id="6"/>
      <draggable can_reuse="true" label="sulfhydryl" id="7"/>
      <draggable can_reuse="true" label="phenyl" id="8"/>
      <draggable can_reuse="true" label="none" id="none"/>
      <target id="0" h="53" w="66" y="55.100006103515625" x="131.5"/>
      <target id="1" h="113" w="55" y="140.10000610351562" x="181.5"/>
    </drag_and_drop_input>
    <answer type="loncapa/python">
correct_answer = [
```

```
    {'draggables': ['2'], 'targets': ['0' ], 'rule':'unordered_equal' },
    {'draggables': ['none'], 'targets': ['1' ], 'rule':'unordered_equal' }]
if draganddrop.grade(submission[0], correct_answer):
    correct = ['correct']
else:
    correct = ['incorrect']
    </answer>
  </customresponse>
  <solution>
    <img src="/static/AllopurinolAnswer.gif"/>
  </solution>
</problem>
```

10.12.2 Drag and Drop Problem XML

```
<problem>
    <customresponse>
        <p>Drag each word in the scrollbar to the bucket that matches the number of
        letters in the word.</p>
        <drag_and_drop_input img="https://studio.edx.org/c4x/edX/DemoX/asset/L9_buckets.
→png">
            <draggable id="1" label="a"/>
            <draggable id="2" label="bog"/>
            <draggable id="3" label="droll"/>
            <draggable id="4" label="oboe"/>
            <draggable id="5" label="swain"/>
            <draggable id="6" label="in"/>
            <draggable id="7" label="onyx"/>
            <draggable id="8" label="of"/>
            <draggable id="9" label="tap"/>
            <draggable id="10" label="strop"/>
            <draggable id="11" label="few"/>
        </drag_and_drop_input>
        <answer type="loncapa/python">
            correct_answer = {
                '1':      [[70, 150], 121],
                '6':      [[190, 150], 121],
                '8':      [[190, 150], 121],
                '2':      [[310, 150], 121],
                '9':      [[310, 150], 121],
                '11':     [[310, 150], 121],
                '4':      [[420, 150], 121],
                '7':      [[420, 150], 121],
                '3':      [[550, 150], 121],
                '5':      [[550, 150], 121],
                '10':     [[550, 150], 121]}
            if draganddrop.grade(submission[0], correct_answer):
                correct = ['correct']
            else:
                correct = ['incorrect']
```

```
            </answer>
        </customresponse>
</problem>
```

```
<problem>
    <customresponse>
        <p>Label the hydrogen atoms connected with the left carbon atom.</p>
        <drag_and_drop_input img="https://studio.edx.org/c4x/edX/DemoX/asset/ethglycol.
→jpg"
        target_outline="true" one_per_target="true" no_labels="true"
        label_bg_color="rgb(222, 139, 238)">
            <draggable id="1" label="Hydrogen" />
            <draggable id="2" label="Hydrogen" />
            <target id="t1_o" x="10" y="67" w="100" h="100"/>
            <target id="t2" x="133" y="3" w="70" h="70"/>
            <target id="t3" x="2" y="384" w="70" h="70"/>
            <target id="t4" x="95" y="386" w="70" h="70"/>
            <target id="t5_c" x="94" y="293" w="91" h="91"/>
            <target id="t6_c" x="328" y="294" w="91" h="91"/>
            <target id="t7" x="393" y="463" w="70" h="70"/>
            <target id="t8" x="344" y="214" w="70" h="70"/>
            <target id="t9_o" x="445" y="162" w="100" h="100"/>
            <target id="t10" x="591" y="132" w="70" h="70"/>
        </drag_and_drop_input>
        <answer type="loncapa/python">
            correct_answer = [{
                'draggables': ['1', '2'],
                'targets': ['t2', 't3', 't4' ],
                'rule':'anyof'
            }]
            if draganddrop.grade(submission[0], correct_answer):
                correct = ['correct']
            else:
                correct = ['incorrect']
        </answer>
    </customresponse>
</problem>
```

Tags

- <customresponse>: Indicates that the problem is a custom response problem.

- <drag_and_drop_input>: Indicates the custom response problem is a drag and drop problem.

- <draggable>: Specifies a single object that a learner will drag onto the base image.

- <target>: Specifies the location on the base image where a draggable must be dropped.

Tag: <drag_and_drop_input>

Attributes

Attribute	Description
img (required)	Relative path to an image that will be the base image. All draggables can be dragged onto it.
target_outline	Specifies whether an outline (gray dashed line) should be drawn around targets (if they are specified). It can be either 'true' or 'false'. If not specified, the targets do not have outlines.
one_per_target	Specify whether to allow more than one draggable to be placed onto a single target. It can be either 'true' or 'false'. If not specified, the default value is 'true'.
no_labels (required)	The default is false. In default behavior, if label is not set, label is obtained from id. If no_labels is true, labels are not automatically populated from id, and one cannot set labels and obtain only icons.

Children

- `<draggable>`

- `<target>`

Tag: `<draggable>`

Specifies a single draggable object in a drag and drop problem.

A draggable is what the user must drag out of the slider and drop onto the base image. After a drag operation, if the center of the draggable is located outside the rectangular dimensions of the image, it will be returned to the slider.

For the grader to work, each draggable must have a unique ID.

Attributes

Attribute	Description
id (required)	Unique identifier of the draggable object.
label (optional)	Text label that the user sees.
icon (optional)	For draggables that are images, the relative path to the image file.
can_reuse	The default is false. If true, the same draggable can be used multiple times.

Children

(none)

Tag: `<target>`

Specifies the location on the base image where a learner must drop a draggable item. By design, if the center of a draggable lies within the target (i.e. in the rectangle defined by [[x, y], [x + w, y + h]], it is within the target. Otherwise, it is outside.

If you specify at least one target, and a learner drops a draggable item on a location that is outside a target, the draggable item returns to the slider.

If you don't specify a target, a learner can drop a draggable item anywhere on the base image.

Attributes

Attribute	Description
id (required)	Unique identifier of the target object.
x	X-coordinate on the base image where the top left corner of the target will be positioned.
y	Y-coordinate on the base image where the top left corner of the target will be positioned.
w	Width of the target, in pixels.
h	Height of the target, in pixels.

Children

(none)

10.12.3 Targets on Draggables

Sometimes it is not enough to have targets only on the base image, and all of the draggables on these targets. If a complex problem exists where a draggable must become itself a target (or many targets), then the following extended syntax can be used.

```
...
<draggable {attribute list}>
    <target {attribute list} />
    <target {attribute list} />
    <target {attribute list} />
    ...
</draggable>
...
```

The attribute list in the tags above (`draggable` and `target`) is the same as for normal `draggable` and `target` tags. The only difference is when you will be specifying inner target position coordinates. Use the `x` and `y` attributes to set the offset of the inner target from the upper-left corner of the parent draggable (that contains the inner target).

Limitations of targets on draggables

- Currently there is a limitation to the level of nesting of targets.

  Even though you can pile up a large number of draggables on targets that themselves are on draggables, the drag and drop problem will be graded only if there is a maximum of two levels of targets. The first level are the *base* targets. They are attached to the base image. The second level are the targets defined on draggables.

- Another limitation is that the target bounds are not checked against other targets.

  You must make sure that there is no overlapping of targets. You should also ensure that targets on draggables are smaller than the actual parent draggable. Technically this is not necessary, but from the usability perspective it is desirable.

- You can have targets on draggables only in the case when there are base targets defined (base targets are attached to the base image).

  If you do not have base targets, then you can only have a single level of nesting (draggables on the base image). In this case the client side will be reporting (x,y) positions of each draggable on the base image.

10.12.4 Correct answer format

For specifying answers for targets on draggables, see *Answer format for targets on draggables*.

There are two correct answer formats: short and long.

In short form, the correct answer is mapping of `draggable_id` to `target_id`:

```
correct_answer = {'grass':      [[300, 200], 200], 'ant': [[500, 0], 200]}
correct_answer = {'name4': 't1', '7': 't2'}
```

In long form, the correct answer is list of dicts. Every dict has 3 keys: `draggables`, `targets` and `rule`. For example:

```
correct_answer = [
{
  'draggables':   ['7', '8'],
  'targets':  ['t5_c', 't6_c'],
  'rule': 'anyof'
},
{
  'draggables': ['1', '2'],
  'targets': ['t2_h', 't3_h', 't4_h', 't7_h', 't8_h', 't10_h'],
  'rule': 'anyof'
}]
```

"Draggables" is the list of draggable IDs. "Target" is the list of target IDs that draggables must be dragged to.

> **Caution:** Draggables in dicts inside the `correct_answer` list must not intersect.

Wrong (for draggable id 7):

```
correct_answer = [
{
  'draggables':   ['7', '8'],
  'targets':  ['t5_c', 't6_c'],
  'rule': 'anyof'
},
{
  'draggables': ['7', '2'],
  'targets': ['t2_h', 't3_h', 't4_h', 't7_h', 't8_h', 't10_h'],
  'rule': 'anyof'
}]
```

The values for `rule` follow.

- `exact`: Targets for draggable IDs in `user_answer` are the same as targets from the correct answer. For example, for draggables 7 and 8, the user must drag 7 to target1 and 8 to target2 if the `correct_answer` is:

  ```
  correct_answer = [
    {
    'draggables':   ['7', '8'],
    'targets':  ['tartget1', 'target2'],
    'rule': 'exact'
  }]
  ```

- `unordered_equal`: Allows draggables be dragged to targets unordered. For learners to drag 7 to target1 or target2 and 8 to target2 or target1 and 7 and 8 must be in different targets, then correct answer must be:

```
correct_answer = [
{
  'draggables':   ['7', '8'],
  'targets':  ['tartget1', 'target2'],
  'rule': 'unordered_equal'
}]
```

- `anyof`: Allows draggables to be dragged to any target. For learners to drag 7 and 8 to target1 or target2, any of these are correct with the *anyof* rule:

```
correct_answer = [
{
  'draggables':   ['7', '8'],
  'targets':  ['tartget1', 'target2'],
  'rule': 'anyof'
}]
```

If `can_reuse` is true, then you have draggables a,b,c and 10 targets. These will allow you to drag 4 a draggables to [`target1`, `target4`, `target7`, `target10`]; you do not need to write a four times. Also this will allow you to drag the b draggable to target2 or target5 for target5 and target2.:

```
correct_answer = [
    {
      'draggables': ['a'],
      'targets': ['target1',  'target4', 'target7', 'target10'],
      'rule': 'unordered_equal'
    },
    {
      'draggables': ['b'],
      'targets': ['target2', 'target5', 'target8'],
      'rule': 'anyof'
    },
    {
      'draggables': ['c'],
      'targets': ['target3', 'target6', 'target9'],
      'rule': 'unordered_equal'
    }]
```

Sometimes you want to allow learners to drag only two b draggables. In this case you should use the `anyof+number` or `unordered_equal+number` rule:

```
correct_answer = [
    {
      'draggables': ['a', 'a', 'a'],
      'targets': ['target1',  'target4', 'target7'],
      'rule': 'unordered_equal+number'
    },
    {
      'draggables': ['b', 'b'],
      'targets': ['target2', 'target5', 'target8'],
      'rule': 'anyof+number'
```

```
    },
    {
      'draggables': ['c'],
      'targets': ['target3', 'target6', 'target9'],
      'rule': 'unordered_equal'
    }]
```

When there are no multiple draggables per targets (one_per_target=``true``), for the same number of draggables, `anyof` is equal to `unordered_equal`.

If `can_reuse=true`, then you must use only the long form of the correct answer.

Answer format for targets on draggables

As with the cases described above, an answer must provide precise positioning for each draggable (on which targets it must reside). In the case when a draggable must be placed on a target that itself is on a draggable, then the answer must contain the chain of target-draggable-target.

For example, suppose we have three draggables - up, s, and p. Draggables s and p have targets on themselves. More specifically, p has three targets - 1, 2, and 3. The first requirement is that s and p are positioned on specific targets on the base image. The second requirement is that draggable up is positioned on specific targets of draggable p. Below is an excerpt from a problem:

```
<draggable id="up" icon="/static/images/images_list/lcao-mo/up.png" can_reuse="true" />

<draggable id="s" icon="/static/images/images_list/lcao-mo/orbital_single.png" label="s␣
→orbital" can_reuse="true" >
    <target id="1" x="0" y="0" w="32" h="32"/>
</draggable>

<draggable id="p" icon="/static/images/images_list/lcao-mo/orbital_triple.png" can_reuse=
→"true" label="p orbital" >
  <target id="1" x="0" y="0" w="32" h="32"/>
  <target id="2" x="34" y="0" w="32" h="32"/>
  <target id="3" x="68" y="0" w="32" h="32"/>
</draggable>

...

correct_answer = [
    {
      'draggables': ['p'],
      'targets': ['p-left-target', 'p-right-target'],
      'rule': 'unordered_equal'
    },
    {
      'draggables': ['s'],
      'targets': ['s-left-target', 's-right-target'],
      'rule': 'unordered_equal'
    },
    {
      'draggables': ['up'],
```

```
        'targets': ['p-left-target[p][1]', 'p-left-target[p][2]', 'p-right-
            target[p][2]', 'p-right-target[p][3]',],
        'rule': 'unordered_equal'
    }
]
```

Note that you must specify rules for all draggables, even if a draggable gets included in more than one chain.

10.12.5 Grading logic

1. The learner's answer and the correct answer are parsed to the same format.

```
group_id: group_draggables, group_targets, group_rule
```

`group_id` is ordinal number, for every dict in correct answer incremental `group_id` is assigned: 0, 1, 2, …

Draggables from the user answer are added to the same group_id where identical draggables from the correct answer are, for example:

```
If correct_draggables[group_0] = [t1, t2] then
user_draggables[group_0] are all draggables t1 and t2 from the user answer:
[t1] or [t1, t2] or [t1, t2, t2] etc..
```

1. For every group from the user answer, for that group's draggables, if `number` is in the group rule, set() is applied. If `number` is not in rule, set is not applied:

```
set() : [t1, t2, t3, t3] -> [t1, t2, ,t3]
```

For every group, at this step, draggables lists are equal.

1. For every group, lists of targets are compared using the rule for that group.

Set and `+number` cases

`set()` and `+number` are needed only for the case of reusable draggables. For other cases there are no equal draggables in list, so set() does nothing.

- The `set()` operation allows you to create a rule for the case of "any number of the same draggable can be dragged to targets":

```
{
  'draggables': ['draggable_1'],
  'targets': ['target3', 'target6', 'target9'],
  'rule': 'anyof'
}
```

- The `number` rule is used for the case of reusable draggables, when you want to fix number of draggable to drag. In this example only two instances of draggables_1 are allowed to be dragged:

```
{
  'draggables': ['draggable_1', 'draggable_1'],
  'targets': ['target3', 'target6', 'target9'],
```

```
  'rule': 'anyof+number'
}
```

- Note, that in using rule `exact`, one does not need `number`, because you cannot recognize from the user interface which reusable draggable is on which target. For example:

```
{
  'draggables': ['draggable_1', 'draggable_1', 'draggable_2'],
  'targets': ['target3', 'target6', 'target9'],
  'rule': 'exact'
}


Correct handling of this example is to create different rules for
draggable_1 and draggable_2.
```

- For `unordered_equal` (or `exact`) you don't need `number` if you have only the same draggable in the group, as the target length will provide the constraint for the number of draggables:

```
{
  'draggables': ['draggable_1'],
  'targets': ['target3', 'target6', 'target9'],
  'rule': 'unordered_equal'
}
```

    This means that only `draggable_1` can be dragged.

- But if you have more than one different reusable draggable in the list, you may use the `number` rule:

```
{
  'draggables': ['draggable_1', 'draggable_1', 'draggable_2'],
  'targets': ['target3', 'target6', 'target9'],
  'rule': 'unordered_equal+number'
}
```

If you do not use `number`, the draggables list will be set to [`draggable_1`, `draggable_2`].

10.13 Dropdown Problem

Note: EdX offers full support for this problem type.

The dropdown problem type is a core problem type that can be added to any course. Dropdown problems include a question or prompt and several answer options with a single correct answer. By adding hints, feedback, or both, you can give learners guidance and help when they work on a problem.

- *Overview*
    - *Example Dropdown Problem*
    - *Analyzing Performance on Dropdown Problems*

For more information about the core problem types, see *Working with Problem Components*.

10.13.1 Overview

In dropdown problems, learners select one option from a list of answer options. Unlike *multiple choice* problems, where the answer choices are always visible directly below the question, the answer options for dropdown problems do not appear until the learner selects the dropdown arrow.

Dropdown problems can only have one correct answer per question, we reccomend adding a "Both B & C" option where multiple multiple selections could be correct.

Example Dropdown Problem

In the LMS, learners select a single answer option to complete a dropdown problem. An example of a completed dropdown problem follows.

In this example, a single problem component contains multiple questions, all of them using the dropdown problem type. To add the example illustrated above, you enter the following text and Markdown formatting in the simple editor in Studio. Then, select **Settings** for the problem to define settings. To specify that each question is worth one point, leave the **Problem Weight** field empty.

```
>>What type of data is age?<<
[[Nominal, Discrete, (Continuous)]]
---
>>What type of data is age, when rounded to the nearest year?<<
[[
Nominal
(Discrete)
Continuous
]]
---
>>What type of data is life stage, such as infant, child, or adult?<<
[[(Nominal), Discrete, Continuous]]
```

Note: You separate *multiple questions* in a problem component with three hyphen (`---`) characters. You can separate the answer options with either comma (`,`) characters or new lines. Each question can ONLY have a single correct answer.

The OLX markup for this example problem follows.

```
<problem>
  <optionresponse>
    <label>What type of data is age?</label>
    <optioninput options="('Nominal','Discrete','Continuous')"
     correct="Continuous"></optioninput>
```

```
    </optionresponse>
    <optionresponse>
      <label>What type of data is age, when rounded to the nearest year?</label>
      <optioninput options="('Nominal','Discrete','Continuous')"
       correct="Discrete"></optioninput>
      </optionresponse>
    <optionresponse>
      <label>What type of data is life stage, such as infant, child, or adult?</label>
      <optioninput options="('Nominal','Discrete','Continuous')"
       correct="Nominal"></optioninput>
    </optionresponse>
</problem>
```

Analyzing Performance on Dropdown Problems

For the dropdown problems in your course, you can use edX Insights to review aggregated learner performance data and examine submitted answers. For more information, see Using edX Insights.

10.13.2 Adding a Dropdown Problem

You add dropdown problems in Studio by selecting the **Problem** component type and then using either the simple editor or the advanced editor to specify the prompt and the answer options.

- *Use the Simple Editor to Add a Dropdown Problem*
- *Use the Advanced Editor to Add a Dropdown Problem*

Note: You can begin work on the problem in the simple editor, and then switch to the advanced editor. However, after you save any changes you make in the advanced editor, you cannot switch back to the simple editor.

Use the Simple Editor to Add a Dropdown Problem

When you add a dropdown problem, you can choose one of these templates.

- **Dropdown**
- **Dropdown with Hints and Feedback**

These templates include the Markdown formatting that you use in the simple editor to add a problem without, or with, hints and feedback.

To use the *simple editor* to add a problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**.

2. From the list of **Common Problem Types**, select the type of problem you want to add. Studio adds a template for the problem to the unit.

3. Select **Edit**. The simple editor opens to a template that shows the Markdown formatting that you use for this problem type.

4. Replace the guidance provided by the template to add your own text for the question or prompt, answer options, explanation, and so on.

   To format equations, you can use MathJax. For more information, see *Using MathJax for Mathematics*.

5. Select **Settings** to provide an identifying **Display Name** and define settings for the problem. For more information, see *Defining Settings for Problem Components*.

6. Select **Save**.

Use the Advanced Editor to Add a Dropdown Problem

You can use the advanced editor to identify the elements of a dropdown problem with OLX. For more information, see *Dropdown Problem OLX Reference*.

To use the *advanced editor* to add a problem, follow these steps.

1. Follow steps 1-3 for creating the problem in the simple editor.

2. Select **Advanced Editor**. The advanced editor opens the template and shows the OLX markup that you can use for this problem type.

3. Replace the guidance provided by the template to add your own text. For example, replace the question or prompt, answer options, and explanation.

   To format equations, you can use MathJax. For more information, see *Using MathJax for Mathematics*.

4. Update the OLX to add optional elements and attributes required for your problem.

5. Select **Settings** to provide an identifying **Display Name** and define settings for the problem. For more information, see *Defining Settings for Problem Components*.

6. Select **Save**.

10.13.3 Adding Feedback to a Dropdown Problem

For an overview of feedback in problems, see *Adding Feedback and Hints to a Problem*. You can add feedback for each of the answer options you provide in the problem. Use the following guidelines when providing feedback.

- Use feedback for the incorrect answers to target common misconceptions and mistakes.

- Ensure feedback provides some guidance to the learner about how to arrive at the correct answer.

- Use feedback for the correct answer to reinforce why the answer is correct. Because learners are able to guess, ensure that feedback provides a reason why the answer is correct for learners who might have selected that answer by chance.

You can add feedback in a dropdown problem using the simple editor or the advanced editor.

Configuring Feedback in the Simple Editor

You can configure feedback in the *simple editor*. When you add a dropdown problem, select the template **Dropdown with Hints and Feedback**. This template has example feedback syntax that you can replace.

```
[[
Wrong Answer {{Feedback for learners who select this answer.}}
Wrong Answer {{Feedback for learners who select this answer.}}
(Correct Answer) {{Feedback for learners who select this answer.}}
]]
```

Note: When you include feedback, you might find it more convenient to use new lines to separate the answer options.

For example, the following problem has feedback for each possible answer.

```
>>A/an _____ is an example of a vegetable.<<

[[
  apple {{An apple is the fertilized ovary that comes from an apple tree and
    contains seeds classifying it as a fruit.}}
  pumpkin {{A pumpkin is the fertilized ovary of a squash plant and contains
    seeds classifying it as a fruit.}}
  (potato) {{A potato is an edible part of a plant in tuber form and is
    classified as a vegetable}}
  tomato {{Many people mistakenly think a tomato is a vegetable. However,
    because a tomato is the fertilized ovary of a tomato plant and contains
    seeds it is classified as a fruit.}}
]]
```

Configuring Feedback in the Advanced Editor

In the advanced editor, you configure answer feedback with the following syntax.

```
<option correct="False">Option Label
  <optionhint>Feedback for when a learner selects this incorrect answer.</optionhint>
</option>
```

For example, the following problem has feedback for each answer.

```
<problem>
  <optionresponse>
    <label>A/an _____ is an example of a vegetable.</label>
    <optioninput>
      <option correct="False">apple
        <optionhint>An apple is the fertilized ovary that comes from an
          apple tree and contains seeds classifying it as a fruit.</optionhint>
      </option>
      <option correct="False">pumpkin
        <optionhint>A pumpkin is the fertilized ovary of a squash plant and
          contains seeds classifying it as a fruit.</optionhint>
      </option>
      <option correct="True">potato
        <optionhint>A potato is an edible part of a plant in tuber form and
          is classified as a vegetable.</optionhint>
      </option>
      <option correct="False">tomato
        <optionhint>Many people mistakenly think a tomato is a vegetable.
          However, because a tomato is the fertilized ovary of a tomato plant
          and contains seeds it is classified as a fruit.</optionhint>
      </option>
    </optioninput>
```

(continues on next page)

```
    </optionresponse>
</problem>
```

Customizing Feedback Labels

By default, the feedback labels shown to learners are **Correct** and **Incorrect**. If you do not define feedback labels, learners see these terms when they submit an answer, as in the following example.

```
Incorrect:
An apple is the fertilized ovary that comes from an apple tree and contains
seeds classifying it as a fruit.
```

You can configure the problem to override the default labels. For example, you can configure a custom label for a specific wrong answer.

```
Not Quite:
Many people mistakenly think a tomato is a vegetable. However, because a
tomato is the fertilized ovary of a tomato plant and contains seeds it is
classified as a fruit.
```

Note: The default labels **Correct** and **Incorrect** display in the learner's requested language. If you provide custom labels, they display as you define them to all learners. They are not translated into different languages.

Customize Feedback Labels in the Simple Editor

In the *simple editor*, you configure custom feedback labels with the following syntax.

```
[[
Incorrect Answer {{Label:: Feedback for learners who select this answer.}}
.
.
.
]]
```

That is, you provide the label text, followed by two colon (:) characters, before the feedback text.

For example, the following feedback is configured to use a custom label.

```
[[
tomato {{Not Quite:: Many people mistakenly think a tomato is a
vegetable. However, because a tomato is the fertilized ovary of a tomato
plant and contains seeds, it is a fruit.}}
.
.
.
]]
```

Customize Feedback Labels in the Advanced Editor

In the *advanced editor*, you configure custom feedback labels with the following syntax.

```
<option correct="False">Answer
  <optionhint label="Custom Label">Feedback for learners who select this answer.</
→optionhint>
</option>
```

For example, the following feedback is configured to use a custom label.

```
<option correct="False">tomato
  <optionhint label="Not Quite">Many people mistakenly think a tomato is a
   vegetable. However, because a tomato is the fertilized ovary of a tomato
   plant and contains seeds it is classified as a fruit.</optionhint>
</option>
```

10.13.4 Adding Hints to a Dropdown Problem

You can add hints to a dropdown problem using the simple editor or the advanced editor. For an overview of hints in problems, see *Adding Feedback and Hints to a Problem*.

Configure Hints in the Simple Editor

In the simple editor, you configure hints with the following syntax.

```
||Hint 1||
||Hint 2||
||Hint n||
```

Note: You can configure any number of hints. The learner views one hint at a time and views the next one by selecting **Hint** again.

For example, the following problem has two hints.

```
||A fruit is the fertilized ovary from a flower.||
||A fruit contains seeds of the plant.||
```

Configure Hints in the Advanced Editor

In the advanced editor, you add the <demandhint> element immediately before the closing </problem> tag, and then configure each hint using the <hint> element.

```
.
.
.
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
```

```
    <hint>Hint 3</hint>
</demandhint>
</problem>
```

For example, the following OLX for a multiple choice problem shows two hints.

```
.
.
.
</multiplechoiceresponse>
<demandhint>
  <hint>A fruit is the fertilized ovary from a flower.</hint>
  <hint>A fruit contains seeds of the plant.</hint>
</demandhint>
</problem>
```

10.13.5 Dropdown Problem OLX Reference

Template

```
<problem>
  <optionresponse>
    <label>Question or prompt text</label>
    <description>Optional information about how to answer the question</description>
    <option correct="False">Option Label
      <optionhint>Feedback for when learner selects this answer.</optionhint>
    </option>
    <option correct="True">Option Label
      <optionhint>Feedback for when learner selects this answer.</optionhint>
    </option>
    <solution>
      <div class="detailed-solution">
        <p>Explanation or Solution Header</p>
        <p>Explanation or solution text</p>
      </div>
    </solution>
  </optionresponse>
  <demandhint>
    <hint>Hint 1</hint>
    <hint>Hint 2</hint>
    <hint>Hint 3</hint>
  </demandhint>
</problem>
```

Elements

For dropdown problems, the `<problem>` element can include this hierarchy of child elements.

```
<optionresponse>
    <label>
    <description>
    <optioninput>
            <option>
                <optionhint>
    <solution>
<demandhint>
    <hint>
```

In addition, standard HTML tags can be used to format text.

`<optionresponse>`

Required. Indicates that the problem is a dropdown problem.

Attributes

None.

Children

- `<label>`
- `<description>`
- `<optioninput>`
- `<solution>`

`<label>`

Required. Identifies the question or prompt. You can include HTML tags within this element.

Attributes

None.

Children

None.

<description>

Optional. Provides clarifying information about how to answer the question. You can include HTML tags within this element.

Attributes

None.

Children

None.

<optioninput>

Required. Designates an answer option.

Attributes

Attribute	Description
options	Either this attribute or a set of <option> child elements for <optioninput> is required. Accepts a comma separated list of values in the following format. options="('Answer1','Answer2','Answer3')"
correct	Used if the options attribute is set. Required. Indicates which of the answer options is correct.

Children

- <option>
- <optionhint>

<option>

Designates an answer option. Either a set of <option> child elements or the options attribute for <optioninput> is required.

Attributes

Attribute	Description
`correct`	Required. Indicates whether the answer option is correct or incorrect. When set to `"true"`, the choice is a correct answer. At least one required. When set to `"false"`, the choice is an incorrect answer.

If the <option> element is used, <optionhint> is a child of <option>.

`<optionhint>`

Optional. Specifies feedback for the answer.

Attributes

None.

Children

None.

`<solution>`

Optional. Identifies the explanation or solution for the problem, or for one of the questions in a problem that contains more than one question.

This element contains an HTML division <div>. The division contains one or more paragraphs <p> of explanatory text.

`<demandhint>`

Optional. Specifies hints for the learner. For problems that include multiple questions, the hints apply to the entire problem.

Attributes

None.

Children

<hint>

<hint>

Required. Specifies additional information that learners can access if needed.

Attributes

None.

Children

None.

10.14 External Grader

Note: EdX offers provisional support for this tool.

An external grader is a service that receives learner responses to a problem, processes those responses, and returns feedback and a problem grade to the platform. Course teams build and deploy a grader on an external platform, such as Amazon Web Services (AWS) or Azure, and then link their external grader to the platform using an interface called XQueue. XQueue is a Representational State Transfer (RESTful) interface that uses JavaScript Object Notation (JSON) objects.

For more information, see the following sections.

- *External Grader Workflow*
- *External Grader Example*
- *External Grader Problem Requirements*
- *Create an External Grader Problem in Studio*

10.14.1 External Grader Workflow

XQueue uses the following workflow for external grader problems.

1. In the learning management system (LMS), the learner either enters code or attaches a file for a problem, then selects **Submit**.

2. The LMS sends the learner's code to XQueue.

3. The external grader actively retrieves, or pulls, the code from XQueue.

4. The external grader runs the tests that you created on the code.

5. The external grader returns the grade for the submission, as well as any messaging in a JSON, to XQueue.

---

6. The XQueue delivers the results to the LMS.

7. In the LMS, the learner sees the problem results and the grade.

For the code for the XQueue interface, see the `urls.py` file in the edX XQueue repository.

10.14.2 External Grader Example

An external grader is particularly useful for software programming courses where learners are asked to submit complex code. The grader can run tests that you define on that code and return results to a learner.

For example, you define a problem that requires learners to submit Python code, and create a set of tests that an external grader can run to verify the submissions. When a learner enters Python code for the problem and selects **Submit**, the LMS sends the code to the grader for testing. If the code passes all tests, the grader returns the score and a message indicating that the solution is correct. The learner can see the message by selecting **See full output**. A message can be useful when the learner's solution is not correct and you want to return information about the failed tests, as in the following example.

```
12      for month in range(12):
13          month += 1
14          tempBalance -= lowestPayment
15          tempBalance += (annualInterestRate/12) * tempBalance
16      if tempBalance < 0.1 and tempBalance > -0.1:
17          break;
18      if tempBalance > 0:
```

✗ Incorrect

Test results

Hide output

INCORRECT

✗   Test Case 1

balance = 320000; annualInterestRate = 0.2

Your output:

Lowest Payment: 29157.51

*** ERROR: Your numerical answer was not within the error
margin of our answer.
First error found: expected 29157.09 +/- 0.2, got 29157.51. ***

Correct output:

Lowest Payment: 29157.09

10.14.3 External Grader Problem Requirements

An external grader problem in Studio must have the following requirements.

- A *GNU PG key*.

- An *XQueue name*.

- *XQueue JSON objects*.

- An *external grader* that meets platform requirements.

- An *OLX definition* for the external grader.

GPG Key

Before you can add an external grader problem, you must obtain a public GNU Privacy Guard (GPG) key. For information about how to obtain a GPG key, see the GnuPG website.

XQueue Name

The external grader problems in your course must use a specific XQueue name. You create the name for the XQueue that your course uses when you request account credentials.

To request account credentials, contact the system administrator for your instance of the Open edX platform.

Testing Your XQueue Credentials

We strongly recommend that you test your XQueue credentials when you receive them. To test your XQueue credentials, run the following commands at a command prompt. Replace the placeholder values with the values for your credentials.

```
curl -v -d "username=&password=" "https://xqueue.edx.org/xqueue/login/"
curl -v -b "sessionid=returnedbylogin"   "https://xqueue.edx.org/xqueue/get_queuelen/?
↪queue_name=your_q"

curl -v -d "username=&password=" "https://xqueue.edx.org/xqueue/login/"
curl -v -b "sessionid=returnedbylogin"   "https://xqueue.edx.org/xqueue/get_queuelen/?
↪queue_name=your_queue_name"
```

XQueue JSON Objects

Both the learner submission that XQueue sends to the grader, and the response that the grader sends to XQueue, are JSON objects.

Note: XQueue does not send the learner ID to the external grader. Your grader cannot access IDs or associate learner IDs with submissions.

Learner Submissions

The grader must receive a JSON object as a learner submission. The JSON object has the following keys.

- `xqueue_header`: A dictionary that the grader uses to identify the submission when the grader returns the submission to XQueue. Do not edit this dictionary. Return this dictionary to XQueue in the same `xqueue_header` part of the JSON object.

- `xqueue_files`: A dictionary of key/value pairs that contains a list of files that the learner submitted. In this dictionary, each key is a file name, and each value is the location of the file.

- `xqueue_body`: A dictionary that contains the actual submission as JSON.

  - `student_info`: A dictionary that contains the following information about the student in relation to this submission.

    * `anonymous_student_id`: A string that contains an anonymized identifier of the student.

---

      * `submission_time`: A string that contains a timestamp with the time of submission in `YYYYMMDDHHMMSS` format.

      * `random_seed`: If a randomization script is attached to the problem, `random_seed` is an integer that contains the seed that initializes the randomization script.

    – `student_response`: A string that contains the learner's code submission. A learner can submit code by entering a string in the LMS or by attaching a file. XQueue stores files that learners upload in `xqueue_files`.

    – `grader_payload`: An optional string that you can specify when you create the problem. For more information, see *Create an External Grader Problem in Studio*.

An example JSON object for a learner submission follows.

```
{
  "xqueue_header": {
    "submission_id": 72,
    "submission_key": "ffcd933556c926a307c45e0af5131995"
  }
  "xqueue_files": {
    "helloworld.c": "http://download.location.com/helloworld.c"
  }
  "xqueue_body":
  "{
    "student_info": {
      "anonymous_student_id": "106ecd878f4148a5cabb6bbb0979b730",
      "submission_time": "20160324104521",
      "random_seed": 334
    },
    "student_response": "def double(x):\n return 2*x\n",
    "grader_payload": "problem_2"
  }"
}
```

External Grader Responses

After the grader runs tests and records the results for a submission, the grader must return information by posting a JSON response. The JSON string contains a value that indicates the following information.

- Whether the submission was correct.

- The score for the problem.

- Any message that the tests create.

In the following example external grader response, the learner's submission was correct, the score was 1, and the tests created a brief message.

```
{
"xqueue_header": {
  Identical to what was received from the xqueue
},
"xqueue_body": {
 "correct": true,
 "score": 1,
```

```
 "msg": "<p>The code passed all tests.</p>"
}
}
```

External Grader Requirements

The course team builds and deploys the external grader.

When you build your external grader, keep the following requirements in mind.

- To communicate with XQueue, the grader must accept and return JSON objects. For more information, see *XQueue JSON Objects*.

- The external grader must actively retrieve, or pull, submissions from the XQueue through a RESTful interface at regular intervals.

  The following repositories contain examples of external graders that use pull mode.

  - xqueue_watcher

  - Stanford Online xqueue_pull_ref

- The grader must be scalable. Many learners might submit responses at one time, such as shortly before an exam is due. The grader must be able to process many submissions in a limited time, without failure or unexpected delays.

- The grader must not constantly send queries unless the grader detects that the `queuelen` value is growing. If XQueue receives too many requests from a grader, the XQueue system administrator may apply throttling to the grader.

- The grader must implement security features.

  You are responsible for the server that runs the code that learners submit. Your system must protect against learners who might submit malicious code and ensure that the external grader runs only code that is relevant to the course problems. Your specific security implementation depends on the programming language that you are using and your deployment architecture. You must ensure that malicious code will not damage your server.

- You must have a plan to immediately notify the team that operates your grader, as well as your Open edX system administrator, if the grader fails. You must also have a process to quickly identify the cause of the failure, whether the problem is with your grader or XQueue.

If you know the grader will be unavailable at a certain time for maintenance, you should *add a course update*.

- You must test the grader thoroughly before your course starts. Be sure to test incorrect code as well as correct code to ensure that the grader responds with appropriate scores and messages.

OLX Definition

To create an external grader problem in Studio, you create an Open Learning XML (OLX) definition of the problem, and then add the code to a problem component.

The OLX definition of a problem contains the following information.

- A `queuename` attribute that specifies the name of the XQueue that you created. For more information, see *XQueue Name*.

- A `<label>` element that contains the instructions for the problem.

- The type of input that the problem accepts, specified as one of two elements.

- – `<textbox>`: The learner enters code in a browser field while the learner views the course unit.

    - – `<filesubmission>`: The learner attaches and submits a code file in the unit.

- • (optional) An element that contains a JSON object that you send to the external grader. For example, you can use the `<grader_payload>` element to tell the grader which tests to run for a problem.

The following example shows the OLX definition of a problem that uses an external grader.

```
<problem>
  <coderesponse queuename="my_course_queue">
    <label>Write a program that prints "hello world".</label>
    <textbox rows="10" cols="80" mode="python" tabsize="4"/>
    <codeparam>
      <initial_display>
        # students write your program here
        print ""
      </initial_display>
      <answer_display>
        print "hello world"
      </answer_display>
      <grader_payload>
        {"output": "hello world", "max_length": 2}
      </grader_payload>
    </codeparam>
  </coderesponse>
</problem>
```

10.14.4 Create an External Grader Problem in Studio

To create a code response problem in Studio, follow these steps.

1. In the unit where you want to add the code response problem, select **Problem** under **Add New Component**.

2. In the list that opens, select the **Advanced** tab, and then select **Blank Advanced Problem**. The *advanced editor* opens.

3. In the new component, select **Edit**.

4. In the problem editor, enter the online learning XML (OLX) definition for the problem that you created.

5. Select **Save**.

6. Test the problem in the LMS.

   Note: To validate your external grader and test a problem, you must view the component in a published unit in the LMS. If you test a problem in Studio, you receive an "Error: No grader has been set up for this problem" message.

For more information about creating problems in Studio, see *Working with Problem Components*.

10.15 Full Screen Image Tool

Note: EdX does not support this problem type.

Some large images are difficult for learners to view in the courseware. The full screen image tool allows learners to enlarge the image, so they can see all the detail in context.

- *The Learner View of a Full Screen Image*
- *Create a Full Screen Image*

10.15.1 The Learner View of a Full Screen Image

The learner sees the full screen image in a unit page. When the learner moves the cursor over the image, the **Fullscreen** option appears.
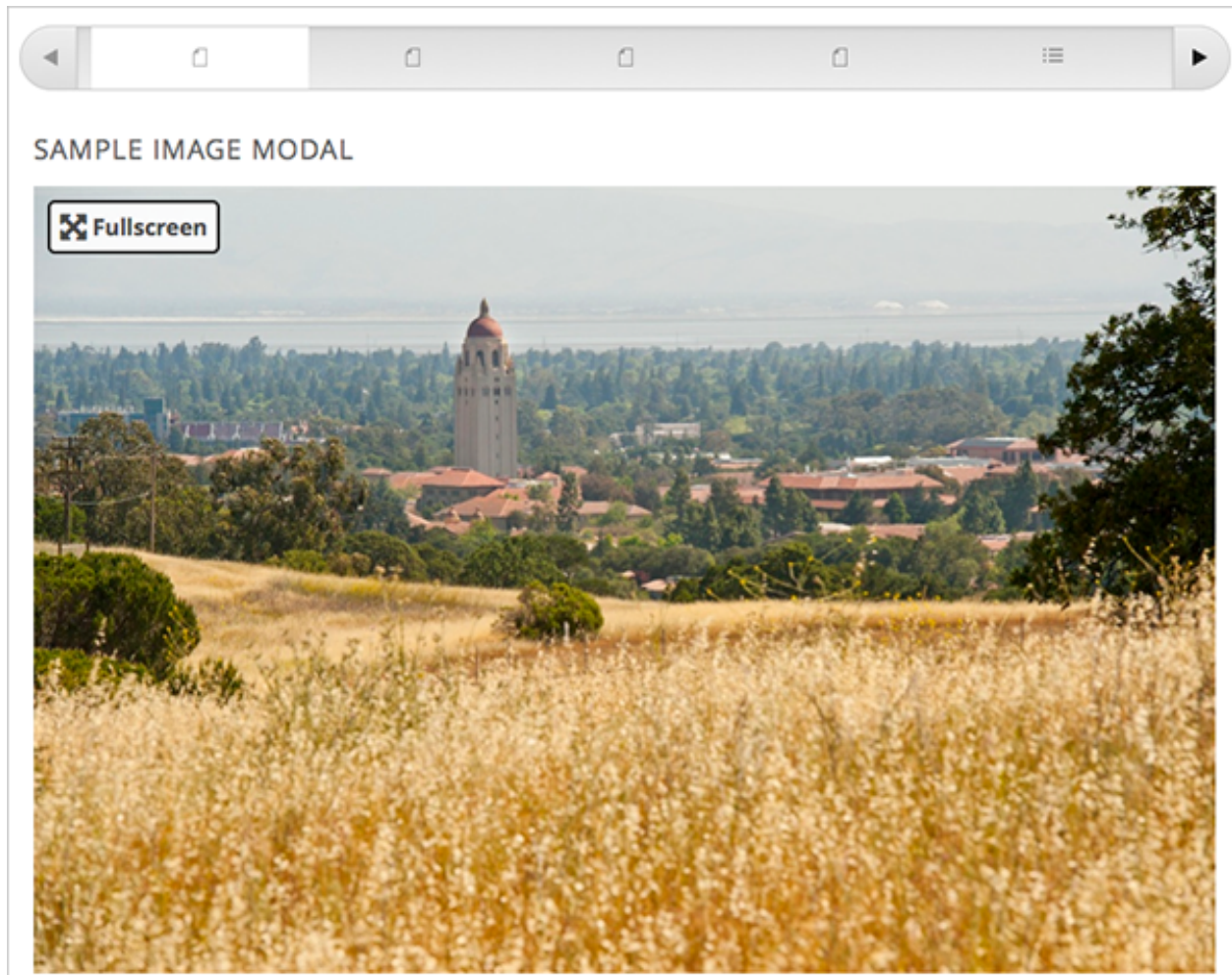
When the learner selects **Fullscreen**, the image opens and expands in the full browser window. **Close**, **Zoom In**, and **Zoom Out** options appear.
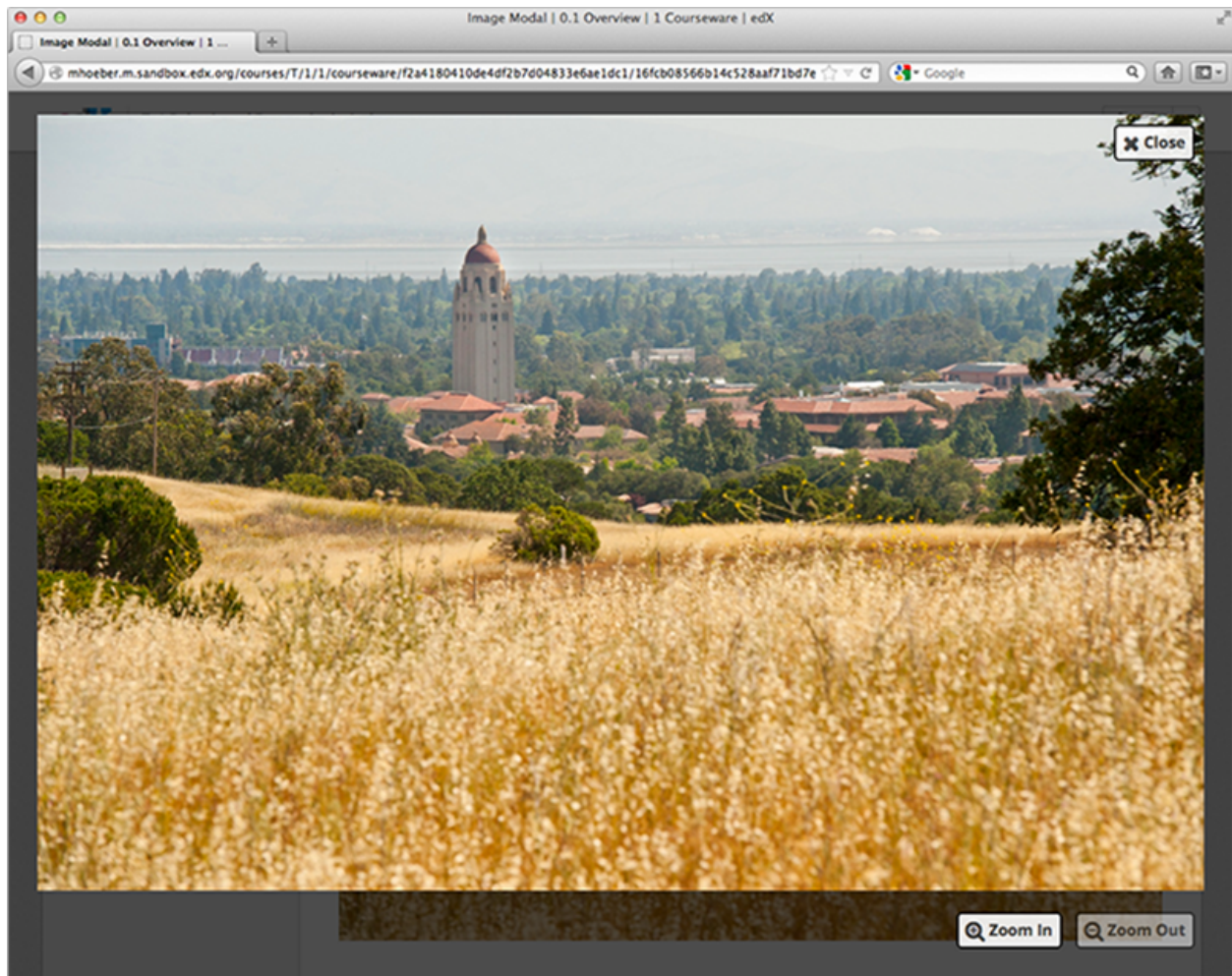
The learner can then zoom in on the image, and drag the image to view a specific part of it.
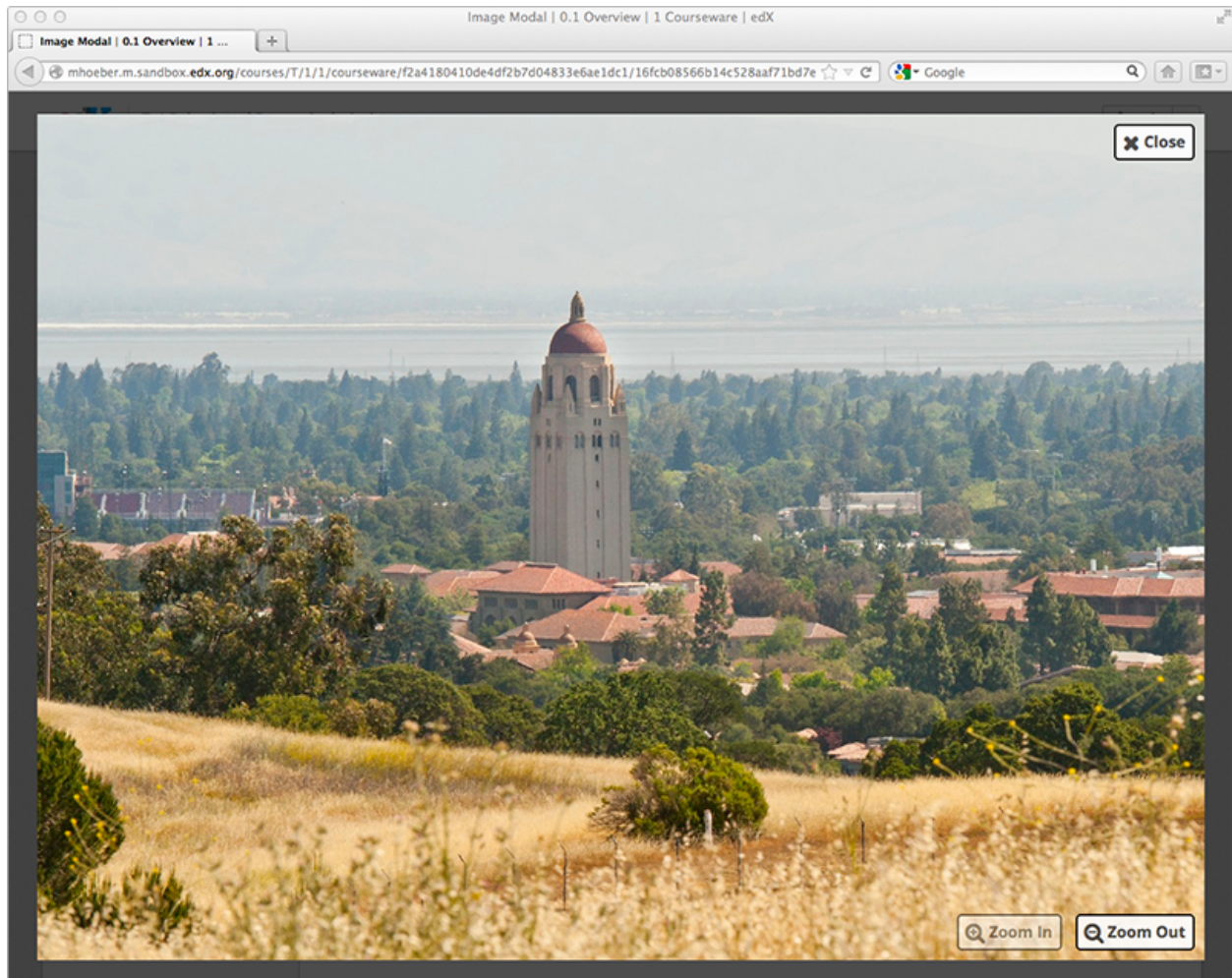
10.15.2 Create a Full Screen Image

1. Upload your image file to the **Files & Uploads** page. For more information, see *Adding Files to a Course*.

2. Under **Add New Component**, select **Text**, and then select **Full Screen Image Tool**.

3. In the new component that appears, select **Edit**.

4. In the component editor, replace the default title, remove the instructional paragraph, and add text as needed.

5. Select **HTML** from the toolbar to edit the HTML source code.

6. Scroll down in the file, and then replace the following placeholders with your own content.

   - Replace the value of the \<a\> element's `href` attribute with the path to your image. Do not change the value of the class attribute. For example:

     ```
     <a href="/static/Image1.jpg" class="modal-content">
     ```

   - Replace the value of the \<img\> element's `src` attribute with the path to your image. For example:

     ```
     <img alt="Full screen image" src="/static/Image1.jpg"/>
     ```

   - Ensure that the value of the `href` and `src` attributes are the same, and that you do not change the class attribute. Your sample code should look like the following example.

```
<h3>Sample Image Modal</h3>
<a href="/static/Image1.jpg" class="modal-content">
<img alt="Full screen image" src="/static/Image1.jpg"/>
</a>
```

Note: You can use this same HTML code in any Text component, not just those components you created as full screen images.

7. Select **Save**.

10.16 Gene Explorer Tool

Note: EdX does not support this tool.

The gene explorer (GeneX), from the biology department at UMB, simulates the transcription, splicing, processing, and translation of a small hypothetical eukaryotic gene. GeneX allows learners to make specific mutations in a gene sequence, and it then calculates and displays the effects of the mutations on the mRNA and protein.

Specifically, the gene explorer does the following:

1. Finds the promoter and terminator.

2. Reads the DNA sequence to produce the pre-mRNA.

3. Finds the splice sites.

4. Splices and tails the mRNA.

5. Finds the start codon.

6. Translates the mRNA.
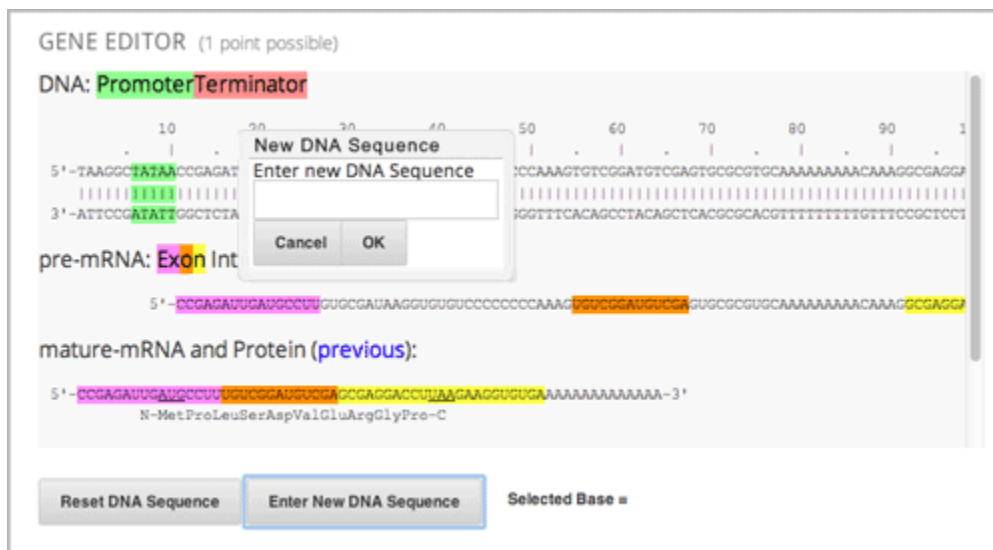
For more information about the gene explorer, see The Gene Explorer.

10.16.1 Gene Explorer Code

```
<problem>
<p>Make a single base pair substitution mutation in the gene below that results in a
→protein that is longer than the protein produced by the original gene. When you are
→satisfied with your change and its effect, click the <b>SUBMIT</b> button.</p>
<p>Note that a "single base pair substitution mutation" is when a single base is changed
→to another base; for example, changing the A at position 80 to a T. Deletions and
→insertions are not allowed.</p>
<script type="loncapa/python">
def genex_grader(expect,ans):
    if ans=="CORRECT": return True
    import json
    ans=json.loads(ans)
    return ans["genex_answer"]=="CORRECT"
</script>
<customresponse cfn="genex_grader">
<editageneinput width="818" height="1000" dna_sequence=
→"TAAGGCTATAACCGAGATTGATGCCTTGTGCGATAAGGTGTGTCCCCCCCCAAAGTGTCGGATGTCGAGTGCGCGTGCAAAAAAAAACAAAGGCGAGGACC
→" genex_dna_sequence=
→"TAAGGCTATAACCGAGATTGATGCCTTGTGCGATAAGGTGTGTCCCCCCCCAAAGTGTCGGATGTCGAGTGCGCGTGCAAAAAAAAACAAAGGCGAGGACC
→" genex_problem_number="2"/>
</customresponse>
</problem>
```

In this code:

- **width** and **height** specify the dimensions of the application, in pixels.

- **genex_dna_sequence** is the default DNA sequence that appears when the problem opens.

- **dna_sequence** contains the application's state and the learner's answer. This value must be the same as **genex_dna_sequence**.

- **genex_problem_number** specifies the number of the problem. This number is based on the five gene editor problems in the MITx 7.00x course–for example, if you want this problem to look like the second gene editor problem in the 7.00x course, you would set the **genex_problem_number** value to 2. The number must be 1, 2, 3, 4, or 5.

10.17 Google Calendar Tool

Note: EdX offers provisional support for this tool.

This topic describes how to embed Google Calendars in your course.

- *Overview*

- *Embedding a Google Calendar in Your Course*

    - *Enable the Google Calendars Tool*

    - *Make the Google Calendar Public and Obtain Its ID*

> – *Add a Google Calendar in the Course Body*
>
> • *Editing Google Calendars*

Before you make content from an external site available through your course, be sure to review the content to ensure that it is accessible to people with disabilities. For more information, see *Accessibility Best Practices for Developing Course Content*.

You can also add Google Drive files, such as documents, spreadsheets, and images, to your course. For more information, see *Google Drive Files Tool*.

Note: Google services are not available in some regions and countries. If Google services are not available in a learner's area, the learner might see an "image unavailable" message in the place of the Google Drive file or Google Calendar. EdX strongly suggests that you provide alternative resources for learners in these areas.

10.17.1 Overview

You can embed a Google Calendar in your course so that learners see the calendar in the course body. You can use a Google Calendar to share quiz dates, office hours, or other schedules of interest to learners.

10.17.2 Embedding a Google Calendar in Your Course

To embed a Google Calendar in your course, follow these steps.

> • *Enable the Google Calendars Tool*
>
> • *Make the Google Calendar Public and Obtain Its ID*
>
> • *Add a Google Calendar in the Course Body*

Enable the Google Calendars Tool

Before you can add Google Calendars to your course, you must enable the Google Calendars tool in Studio or OLX (open learning XML).

To enable the Google Calendars tool in Studio, you add the `"google-calendar"` key to the **Advanced Module List** on the **Advanced Settings** page. (Be sure to include the quotation marks around the key value.) For more information, see *Enabling Additional Exercises and Tools*.

Alternatively, you can use OLX to enable the Google Calendars tool.

Enable Google Calendars in OLX

To enable Google Calendars in your course, you edit the XML file that defines the course structure. You locate the `course` element's `advanced-modules` attribute, and add the string `google-calendar` to it.

For example, the following XML code enables Google Calendars in a course. It also enables Google Drive files.

```
<course advanced_modules="[&quot;google-document&quot;,
    &quot;google-calendar&quot;]" display_name="Sample Course"
    start="2014-01-01T00:00:00Z">
    ...
</course>
```

For more information, see OLX Course Building Blocks in the *EdX Open Learning XML Guide*.

Make the Google Calendar Public and Obtain Its ID

Before you can add a Google Calendar to your course, you must make the Calendar public and obtain its ID.

Important: The tasks described in this section rely on the use of third-party software. Because the software is subject to change by its owner, the steps provided here are intended as guidelines and not as an exact procedure.

Make the Google Calendar Public

1. Open the Google Calendar.
2. From the **Settings** menu, select **Settings**.
3. Select the **Calendars** tab.

   You might have multiple calendars on the **Calendars** tab. Find the calendar that you want to share in your course.
4. In the row for the calendar to share, in the **Sharing** column, select **Edit Settings**.
5. Select the **Share this Calendar** tab, and then select **Make this calendar public**.

1. Select **Save**.

   The **Calendar Settings** page closes, and you return to the **Calendars** tab. You continue by *obtaining the Google Calendar's ID*.

Obtain the Google Calendar ID

1. On the **Calendars** tab, select the name of the calendar.

2. Select the **Calendar Details** tab.

3. Next to the **Calendar Address** label, look to the right of the three colored **XML**, **ICAL**, and **HTML** buttons. In parentheses, you can see the calendar ID.
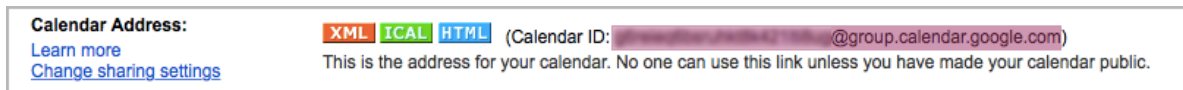
The calendar ID resembles the following text.

```
abcdefghijklmnop1234567890@group.calendar.google.com
```

Select and copy the calendar ID. You use this value to configure the Google Calendar component in your course.

Add a Google Calendar in the Course Body

To add a Google calendar in the course body, you create an advanced component in Studio or create a Google Calendar XBlock in OLX.

Add a Google Calendar Component in edX Studio

Make sure that you *enable Google Calendars* for your course before you add a Google Calendar component.

To add a Google Calendar component, follow these steps.

1. On the **Course Outline** page, open the unit where you want to add the Google Calendar component.

2. Under **Add New Component**, select **Advanced**, and then select **Google Calendar**.

   The new component is added to the unit, with the default edX Google Calendar embedded.

3. In the new component, select **Edit**.

4. In the **Display Name** field, type the name for the component.

5. In the **Public Calendar ID** field, paste the calendar ID you copied in the *Obtain the Google Calendar ID* task.

6. For the **Default View** field, select **Month**, **Week**, or **Agenda**.

   This is the initial view that your learners have of the calendar. Each learner can change his or her view.

7. Select **Save**.

You can then *Previewing Draft Content* to see how the unit with the Google Calendar will appear to learners.

Add a Google Calendar XBlock in OLX

To add a Google Calendar XBlock in OLX, create the `google-calendar` element. You can embed this element in the `vertical` element, or you can embed this element in its own file that is referenced within the vertical. For more information, see OLX Course Building Blocks in the *EdX Open Learning XML Guide*.

An example follows.

```
<google-calendar url_name="4115e717366045eaae7764b2e1f25e4c"
  calendar_id="abcdefghijklmnop1234567890@group.calendar.google.com"
  default_view="1" display_name="Class Schedule"/>
```

The value of the `calendar_id` attribute is the calendar ID that you copied in the *Obtain the Google Calendar ID* task.

Note: The edX Learning Management System sets the height and width values for Google Calendars. If you add these attributes, the LMS overrides your changes.

10.17.3 Editing Google Calendars

When you make changes to a Google Calendar that is embedded in your course, learners see the updates immediately. You make changes to calendars with the Google user interface. You do not need to edit the Google Calendar component.

10.18 Google Drive Files Tool

Note: EdX offers provisional support for this tool.

This topic describes how to embed Google Drive files, such as documents, spreadsheets, and images, in your course.

- *Overview*
- *Embedding a Google Drive File in Your Course*
    - *Enable the Google Drive Files Tool*
    - *Publish the Google Drive File and Obtain the Embed Code*
    - *Add a Google Drive File to Your Course*
- *Editing Google Drive Files*

Before you make content from an external site available through your course, be sure to review the content to ensure that it is accessible to people with disabilities. For more information, see *Accessibility Best Practices for Developing Course Content*.

You can also use *Google calendars* in the course body. For more information, see *Google Calendar Tool*.

Note: Google services are not available in some regions and countries. If Google services are not available in a learner's area, the learner might see an "image unavailable" message in the place of the Google Drive file or calendar. EdX strongly suggests that you provide alternative resources for learners in these areas.

10.18.1 Overview

You can embed a Google Drive file in your course so that learners see the file in the course body. For example, you can share a Google spreadsheet with learners.

You can embed the following types of Google Drive files.

- Google Docs (text documents)
- Google Drawings (images)
- Google Forms (forms or surveys)
- Google Slides (presentations)
- Google Sheets (spreadsheets)

10.18.2 Embedding a Google Drive File in Your Course

To embed a Google Drive file in your course, follow these steps.

- *Enable the Google Drive Files Tool*
- *Publish the Google Drive File and Obtain the Embed Code*
- *Add a Google Drive File to Your Course*

Enable the Google Drive Files Tool

Before you can add Google Drive files to your course, you must enable the Google Drive tool in Studio or OLX (open learning XML).

To enable the Google Drive tool in Studio, you add the `"google-document"` key to the **Advanced Module List** on the **Advanced Settings** page. For more information, see *Enabling Additional Exercises and Tools*.

Alternatively, you can use OLX to enable the Google Drive tool.

Enable Google Drive Files in OLX

To enable Google Drive files in your course, you edit the XML file that defines the course structure. You locate the `course` element's `advanced-modules` attribute, and add the string `google-document` to it.

For example, the following XML code enables Google Drive files in a course. It also enables Google calendars.

```
<course advanced_modules="[&quot;google-document&quot;,
    &quot;google-calendar&quot;]" display_name="Sample Course"
    start="2014-01-01T00:00:00Z">
    ...
</course>
```
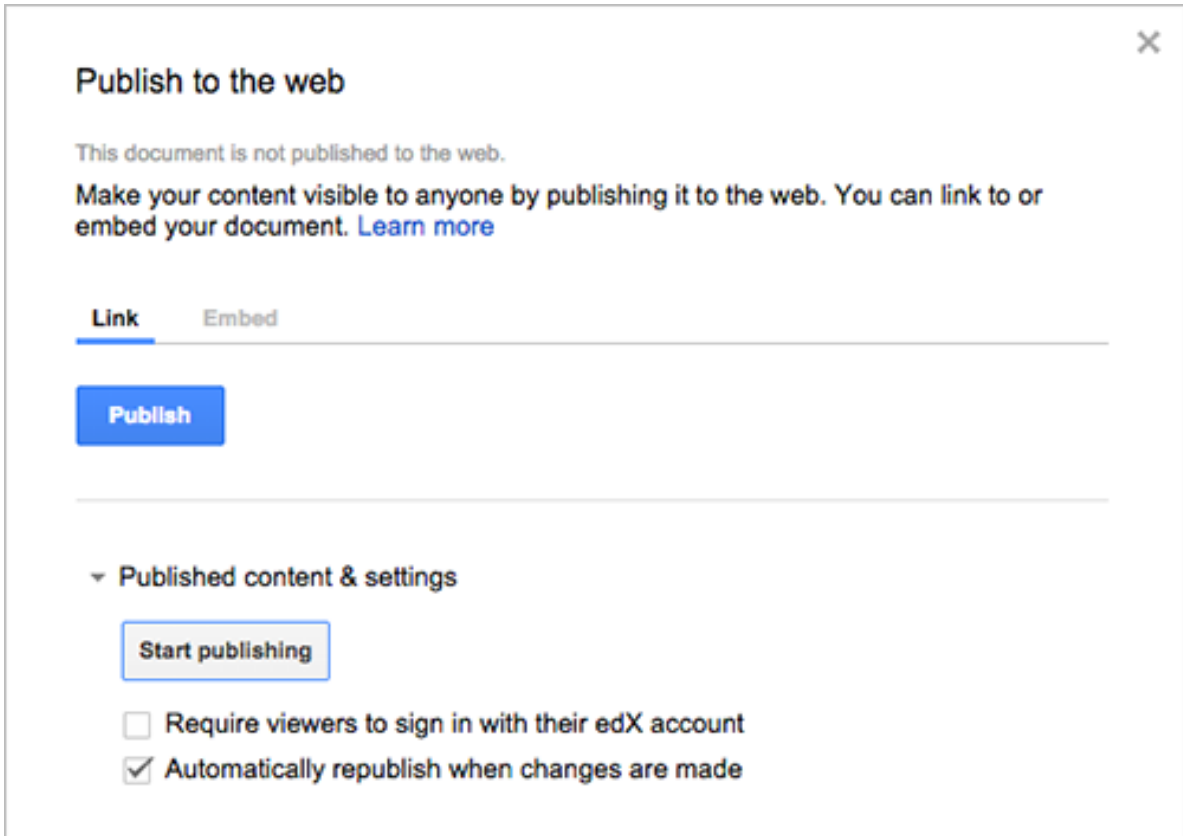
For more information, see OLX Course Building Blocks in the *EdX Open Learning XML Guide*.

Publish the Google Drive File and Obtain the Embed Code

Before you can add a Google Drive file to your course, you must publish the file to the web and obtain the embed code for the file.

Important: The task described in this section relies on the use of third-party software. Because the software is subject to change by its owner, the steps provided here are intended as guidelines and not as an exact procedure.

---

1. Open the Google Drive file.

2. From the **File** menu, select **Publish to the web**.

3. Select **Publish**, and then select **OK** to confirm the action.

4. Select the **Embed** tab.
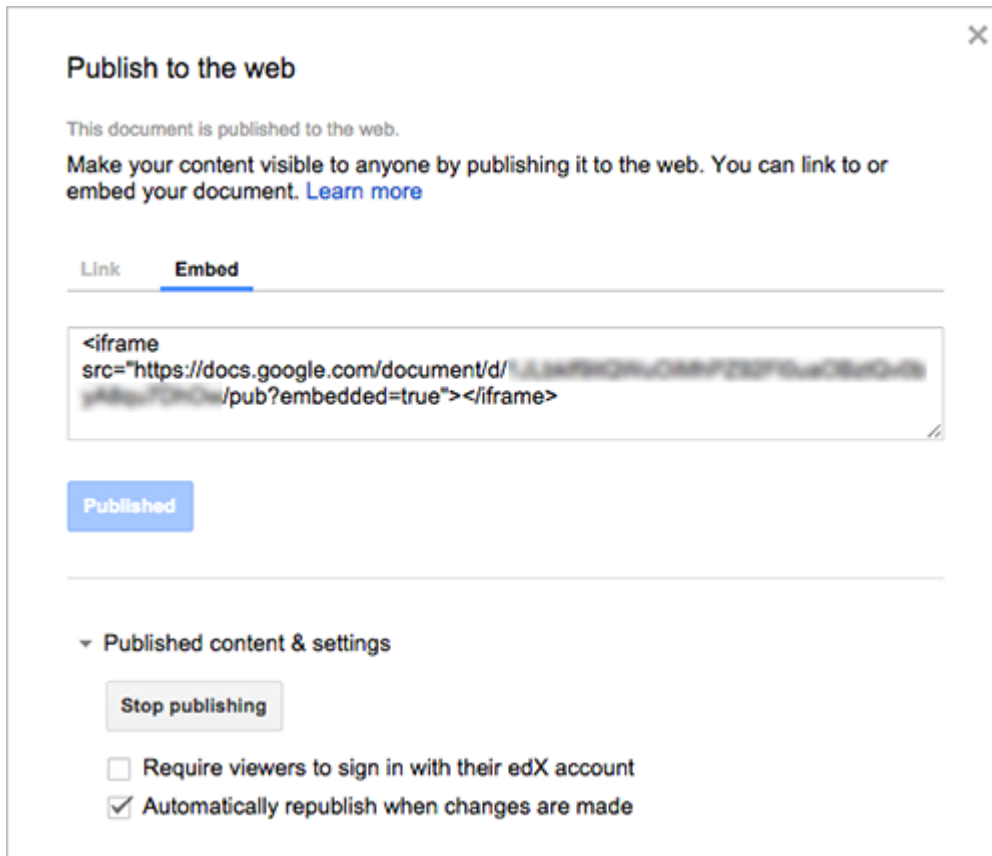
5. Copy the complete string in the **Embed** field, including the `<iframe>` tags.

Note: Google images do not have an `<iframe>` tag. To embed an image, you copy the complete `img` tag.

You use that string to configure the Google Drive file component.

Add a Google Drive File to Your Course

To add a Google Drive file in the course body, you create an advanced component in Studio or create a Google Document XBlock in OLX.

Add a Google Drive File Component in edX Studio

Ensure you *enable Google Drive files* before you add the component.

To add a Google Drive file component, follow these steps.

1. On the Course Outline page, open the unit where you want to add the Google Drive component.
2. Under **Add New Component**, select **Advanced**, and then select **Google Document**.

   The new component is added to the unit, with the default Google presentation embedded.

3. In the new component, select **Edit**.
4. In the **Display Name** field, enter the name for the component.

5. In the **Embed Code** field, paste the embed code that you copied in the *Obtain the Google Drive File Embed Code* task.

6. Select **Save**.

You can then *Previewing Draft Content* to see how the unit with the Google drive file will appear to learners.

Add a Google Drive File XBlock in OLX

To add a Google Drive file XBlock in OLX, you create the `google-document` element. You can embed the `google-document` element in the `vertical` element, or you can create the `google-document` element as a standalone file that you reference in the vertical.

For more information, see OLX Course Building Blocks in the *EdX Open Learning XML Guide*.

For example:

```
<google-document url_name="c5804436419148f68e2ee44abd396b12"
  embed_code="&lt;iframe
  frameborder=&quot;0&quot; src=&quot;https://docs.google.com/spreadsheet/pub
  ?key=0AuZ_5O2JZpH5dGVUVDNGUE05aTFNcEl2Z0ZuTUNmWUE&amp;output=html&amp;widge
  t=true&quot;&gt;&lt;/iframe&gt;" display_name="Google Document"/>
```

The value of the `embed_code` attribute is the embed code you copied in the *Obtain the Google Drive File Embed Code* task.

Note: The edX Learning Management System sets the height and width values for Google Drive files. If you add these attributes, the LMS overrides your changes.

10.18.3 Editing Google Drive Files

When you edit and save a Google Drive file that is embedded in your course, learners see the updates immediately. You make changes to files with the Google user interface. You do not need to edit the Google Document component.

10.19 Iframe Tool

Note: EdX offers provisional support for this tool.

The iframe tool allows you to integrate ungraded exercises and tools from any Internet site into the body of your course. It places an iframe inside an HTML component, and then the exercise or tool appears inside the iframe. The iframe can include your own tools or third-party tools.

EULER LINES

In the image below, drag any of the red points to a new location. As you drag the point, notice the way the point's position affects the triangle's Euler line.
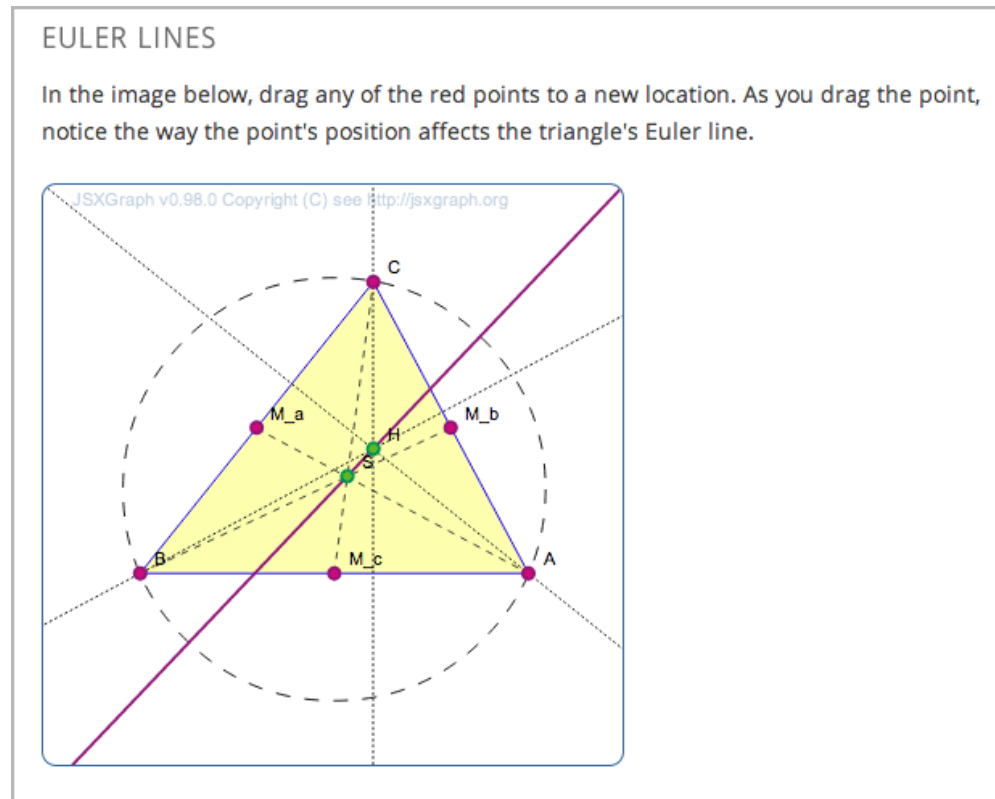
Before you make content or a tool from an external site available through your course, be sure to review the content or tool to ensure that it is accessible to people with disabilities. For example, in addition to testing the iframe components that you add to your course, you can ask third party providers to confirm that a tool is accessible, and, if available, contact your on campus accessibility support services for additional guidance. For more information, see *Accessibility Best Practices for Developing Course Content*.

Iframes are well-suited for tools that demonstrate a concept, but that are not graded or used to store student data. If you want to add a graded tool or exercise, add the tool as a *custom JavaScript problem* or an *LTI component*.

For more information about iframes, see the iframe: The Inline Frame element.

10.19.1 Create an IFrame Tool

To add an exercise or tool in an iframe, you create an iframe Text component and add the URL of the page that contains the exercise or tool to the component. You can also add text and images both before and after the iframe.

Note: The URL of the page that contains the exercise or tool must start with `https` instead of `http`. If the URL starts with `http`, work with the owner of that page to find out if an `https` version is available. Some websites do not allow their content to be embedded in iframes.

---

1. Under **Add New Component**, select **Text**, and then select **IFrame Tool**.

2. In the new component, select **Edit**.

3. In the visual editor toolbar, select **HTML**.

4. In the HTML source code editor, locate the following HTML (line 7). This HTML includes the `<iframe>` element.

```
<p><iframe src="https://studio.edx.org/c4x/edX/DemoX/asset/eulerLineDemo.html"␣
→width="402" height="402" marginwidth="0" marginheight="0" frameborder="0"␣
→scrolling="no">You need an iFrame capable browser to view this.</iframe></p>
```

5. Replace the default URL in the `src` attribute (`https://studio.edx.org/c4x/edX/DemoX/asset/`
   `eulerLineDemo.html`) with the URL of the page that contains the exercise or tool. **This URL must start**
   with https. Make sure that you do not delete the quotation marks that surround the URL.

6. Change the attributes in the iframe element to specify any other settings that you want. For more information
   about these settings, see *Iframe Settings*. You can also change the text between the opening and closing `<iframe>`
   tags. Learners see this text only when they use a browser that does not support iframes.

7. Select **OK** to close the HTML source code editor and return to the *visual editor*.

8. In the visual editor, replace the default text with your own text.

9. Select **Save**.

Iframe Settings

To specify settings for your iframe, you add, remove, or change the attributes inside the opening `<iframe>` tag. The
`<iframe>` tag **must** contain a `src` attribute and a `title` attribute. Other attributes are optional.

You can add these attributes in any order you want.

Attribute	Description
`src` (required)	Specifies the URL of the page that contains the exercise or tool, beginning with https.
`title` (required)	Describes the content or its purpose in the context of the course.
`width` and `height` (optional)	Specify the width and height of the iframe, in pixels or as a percentage. To specify the value in pixels, enter numerals. To specify a percentage, enter numerals followed by a percent sign. If you do not specify the width and height, the iframe uses the dimensions that the linked page has set. These dimensions vary by website. If you change the width and height of the iframe, the content from the linked page might be resized, or only part of the content may appear.
`marginwidth` and `marginheight` (optional)	Specify the size of the space between the edges of the iframe and your exercise or tool, in pixels.
`frameborder` (optional)	Specifies whether a border appears around your iframe. If the value is 0, no border appears. If the value is any positive number, a border appears.
`scrolling` (optional)	For an iframe that is smaller than the exercise or tool it contains, specifies whether a scrollbar appears to help users access all of the iframe's content. For example, if the content in your iframe is very tall, you can set the iframe's height to a smaller number and add a vertical scroll bar for users, as in the first image below.

For example, compare how the different settings in each of the `<iframe>` elements below affect the iframe.

```
<p><iframe src="https://studio.edx.org/c4x/edX/DemoX/asset/eulerLineDemo.html" width="442
→" height="200" marginwidth="20" marginheight="20" frameborder="1" scrolling="yes">You␣
→need an iFrame capable browser to view this.</iframe></p>
```

In the image below, drag any of the red points to a new location. As you drag the point, notice the way the point's position affects the triangle's Euler line.


```
<p><iframe src="https://studio.edx.org/c4x/edX/DemoX/asset/eulerLineDemo.html" width="550
→" height="250" marginwidth="30" marginheight="60" frameborder="1" scrolling="no">You␣
→need an iFrame capable browser to view this.</iframe></p>
```
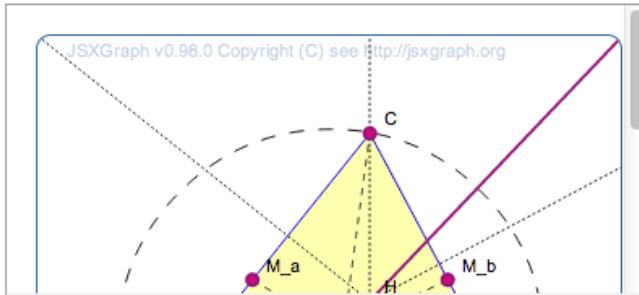
In the image below, drag any of the red points to a new location. As you drag the point, notice the way the point's position affects the triangle's Euler line.
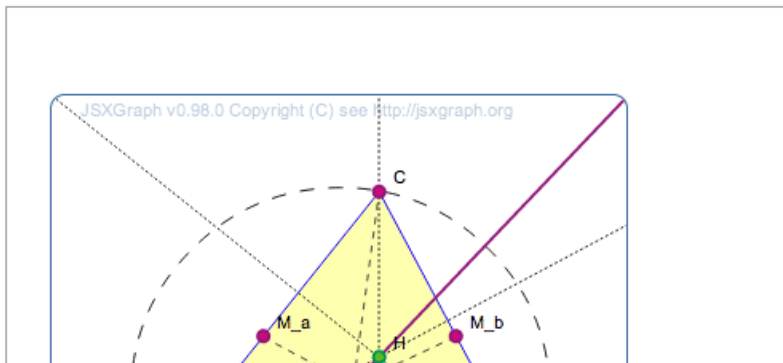
For more information about iframe attributes, see iframe: The Inline Frame element.

10.20 Image Mapped Input Problem

Note: EdX does not support this problem type.

In an image mapped input problem, also known as a "pointing on a picture" problem, students click inside a defined region in an image. You define this region by including coordinates in the body of the problem.

What country is home to the Pyramids as well as the cities of Cairo and Memphis? Click the country on the map below.

EXPLANATION

Egypt is home to not only the Pyramids, Cairo, and Memphis, but also the Sphinx and the ancient Royal Library of Alexandria.

You can specify the following types of regions.

- One rectangular region. For more information, see *Specify a Rectangular Region*.

- Multiple rectangular regions. For more information, see *Specify Multiple Rectangular Regions*.

- One non-rectangular region. For more information, see *Specify an Irregular Region*.

Note: When you create a problem that contains an image, you must include alt text for your image to make the image accessible. For more information about alt text, see *Use Best Practices for Describing Images*.

10.20.1 Create an Image Mapped Input Problem

To create an image mapped input problem, follow these steps.

1. *Collect the information that you need for the image*.

2. *Create the problem in Studio*.

Collect Image Information

To create an image mapped input problem, you need the following elements.

- The height and width of the image in pixels.

- Coordinate pairs that define the region or regions where you want learners to click.

To collect the information you need about your image, use an image editing tool such as Microsoft Paint.

Note: The coordinate pairs for all images start with (0,0) in the upper-left corner of the image and increase in value toward the lower-right corner, similar to the progression of reading English.

- To specify a rectangular region, you need two coordinate pairs: the upper-left corner and the lower-right corner.

- To specify more than one rectangle, you need the coordinate pairs for the upper-left and lower-right corners of each rectangle.

- To specify an irregular region, you need three or more coordinate pairs. Studio creates the simplest possible shape based on these coordinate pairs. You can enter the coordinate pairs in any order.

  For example, for a triangle, you need three coordinate pairs. For an octagon, you need eight coordinate pairs.

Create an Image Mapped Input Problem in Studio

1. In Studio, upload your image to the **Files & Uploads** page, and make a note of the file path for the image. For more information, see *Adding Files to a Course*.

2. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

3. Click **Image Mapped Input**.

4. In the component that appears, click **Edit**.

5. In the component editor, replace the example problem text with your own text.

6. In the `<imageinput>` element, follow these steps.

   1. Replace the example file path in the `src` attribute with the file path for your image.

   2. Include alt text for your image to make the image accessible. For more information about alt text, see *Use Best Practices for Describing Images*.

   3. Replace the example values for the `width` and `height` attributes with the dimensions for your image.

   4. Modify the example `rectangle` attribute to reflect the shape and size of the region that you want to specify. For more information, see *Specify a Rectangular Region*, *Specify Multiple Rectangular Regions*, or *Specify an Irregular Region*.

7. Click **Save**.

Specify a Rectangular Region

To specify a rectangular region, edit the `rectangle` attribute in the `<imageinput>` element.

- Specify the coordinate pair for the upper-left and lower-right corners of the rectangle, separating the x and y values with a comma.

- Surround each coordinate pair with parentheses.

- Use a hyphen to separate the coordinate pairs.

- Surround the set of coordinate pairs with quotation marks (").

For example, the following `rectangle` attribute creates one rectangle from two coordinate pairs:

`rectangle="(338,98)-(412,168)"`

Problem Code:

```
<problem>

<p>What country is home to the Pyramids as well as the cities of
Cairo and Memphis? Click the country on the map below.</p>

<imageresponse>
  <imageinput src="/static/Africa.png" width="600" height="638"
rectangle="(338,98)-(412,168)" alt="Map of Africa" />
</imageresponse>

<solution>
  <div class="detailed-solution">

    <p>Explanation</p>

    <p>Egypt is home to not only the Pyramids, Cairo, and Memphis, but also the
Sphinx and the ancient Royal Library of Alexandria.</p>

  </div>
</solution>

</problem>
```

Specify Multiple Rectangular Regions

You can specify more than one rectangular region in an image.
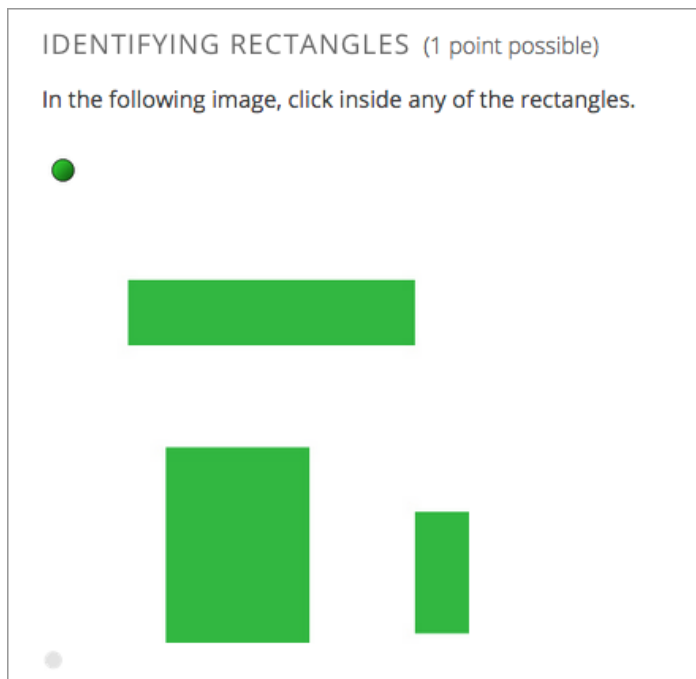
To specify multiple rectangular regions, edit the `rectangle` attribute in the `<imageinput>` element.

- Specify the coordinate pair for the upper-left and lower-right corners of each rectangle, separating the x and y values with a comma.

- Surround each coordinate pair with parentheses.

- Use a hyphen (-) to separate the coordinate pairs.

- Separate each rectangle with a semicolon (;).

- Surround the entire set of coordinates with quotation marks (").

For example, the following `rectangle` attribute creates three rectangles:

`rectangle="(62,94)-(262,137);(306,41)-(389,173);(89,211)-(187,410)"`

Problem Code:

```
<problem>

 <p>In the following image, click inside any of the rectangles.</p>

   <imageresponse>

     <imageinput src="/static/imageresponse_multipleregions.png" width="450"
       height="450" rectangle="(62,94)-(262,137);(306,41)-(389,173);(89,211)-
       (187,410)" alt="Three rectangles on a white background" />

   </imageresponse>

</problem>
```

Specify an Irregular Region

You can specify one non-rectangular region.
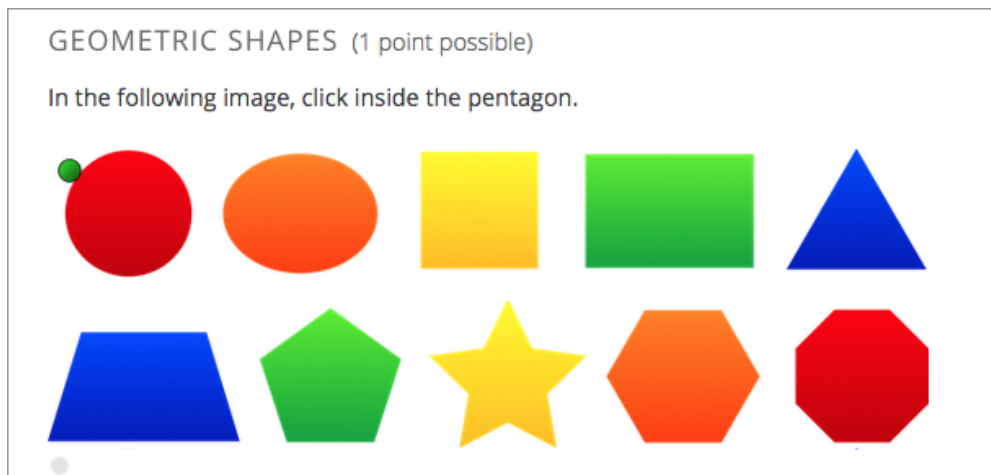
To specify an irregular region, edit the `rectangle` attribute in the `<imageinput>` element.

- Change `rectangle` to `region`.

- Specify three or more coordinate points in any order.

- Enter each coordinate pair in brackets ([]). **Do not use parentheses**.

- Separate each set of points with a comma (,) and a space.

- Enclose the whole list of coordinate points in brackets ([]).

- Surround the outer brackets with quotation marks (").

For example, the following `regions` attribute creates a pentagon.

`regions="[[219,86], [305,192], [305,381], [139,381], [139,192]]"`

Problem Code:

```
<problem>

 <p>In the following image, click inside the pentagon.</p>

 <imageresponse>

   <imageinput src="/static/imageresponse_irregularregions.jpg" width="600"
   height="204" regions="[[219,86], [305,192], [305,381], [139,381],
   [139,192]]" alt ="A series of 10 shapes including a circle, triangle,
   trapezoid, pentagon, star, and octagon" />

 </imageresponse>

</problem>
```

10.20.2 Image Mapped Input Problem XML

Template

```
<problem>

  <p>Problem text</p>

      <imageresponse>

       <imageinput src="IMAGE FILE PATH" width="NUMBER" height="NUMBER"
       rectangle="(X-AXIS,Y-AXIS)-(X-AXIS,Y-AXIS)" alt="DESCRIPTION OF
       IMAGE" />

      </imageresponse>

</problem>
```

Tags

- `<imageresponse>`: Indicates that the problem is an image mapped input problem.

- `<imageinput>`: Specifies the image file and the region in the file that the learner must click.

Tag: `<imageresponse>`

Indicates that the problem is an image mapped input problem.

> Attributes
>
> (none)
>
> Children
>
> > - `<imageinput>`

Tag: `<imageinput>`

Specifies the image file and the region in the file where learners must click.

> Attributes

Attribute	Description
`src` (required)	The URL of the image
`height` (required)	The height of the image, in pixels
`width` (required)	The width of the image, in pixels
`rectangle` (required) (or, for irregular regions, `region`)	An attribute with two or more coordinate pairs that define the region where learners should click
`alt` (required)	A description of the image, used for accessibility

> Children

(none)

10.21 LTI Component

Note: EdX offers full support for this tool.

You can integrate remote learning tools, such as applications and textbooks, into your course with the learning tools interoperability (LTI) component. The LTI component supports tools with the LTI 1.1 and LTI 1.3 specifications. Additionally, the LTI 1.3 tools can use the following LTI Advantage extensions: Deep Linking, Assignments and Grades services and Names and Roles Provisioning Service.

- *Overview*
- *Enabling LTI Components for a Course*
- *Setting up an LTI 1.1 component*
  - *Creating an LTI Passport String*
  - *Adding an LTI Passport to the Course Configuration*
  - *Adding an LTI Component to a Course Unit*
- *Setting up an LTI 1.3 component*
- *Enabling and using LTI Advantage features*
  - *Enabling LTI Assignments and Grades services*
  - *Enabling and using LTI Deep Linking*
  - *Enabling LTI Names and Roles Provisioning Service*
- *LTI Component Settings*

Before you make tools from an external site available through your course, be sure to review the tools to ensure that they are accessible to people with disabilities. For example, in addition to testing the LTI components that you add to your course, you can ask third party providers to confirm that a tool is accessible, and, if available, contact your on campus accessibility support services for additional guidance. For more information, see *Accessibility Best Practices for Developing Course Content*.

10.21.1 Overview

You can use an LTI component in several ways.

- You can add remote LTI tools that display content only, and that do not require a learner response. An example is a digital copy of a textbook in a format other than PDF.
- You can add remote LTI tools that do require a learner response. A remote LTI tool provider grades the responses.
- You can use the LTI component as a placeholder for synchronizing with a remote grading system.

For example, the following LTI component integrates a Cerego tool that learners interact with into the LMS for a course.
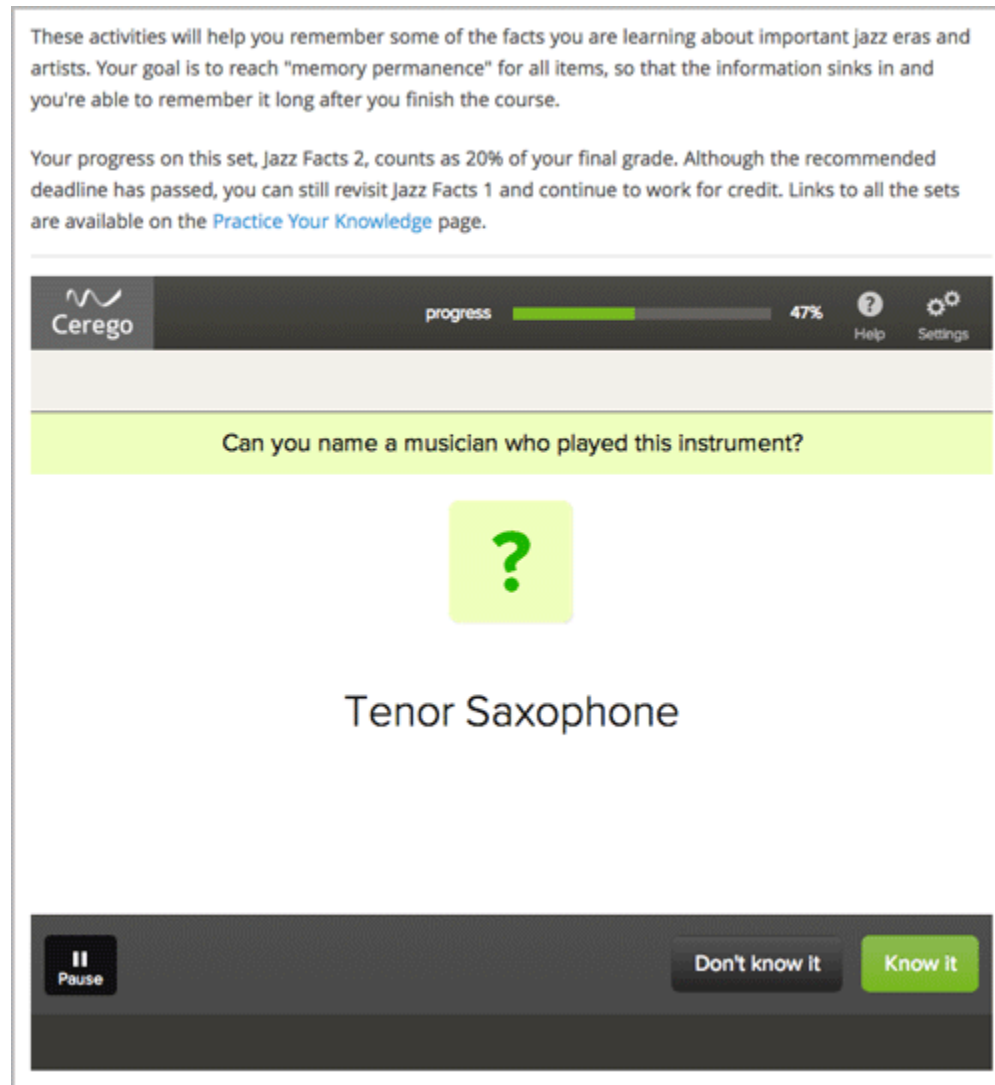
When you add an LTI component to your course, the edX Learning Management System (LMS) is the LTI tool consumer, and the external tool or content is the LTI tool provider.

Be sure to review all supplemental materials to ensure that they are accessible before making them available through your course. For more information, see *Accessibility Best Practices for Developing Course Content*.

You can also integrate content from a course into a remote learning management system such as Canvas or Blackboard.

For more information about how to use Studio as an LTI tool provider, see Using Open edX as an LTI Tool Provider.

10.21.2 Enabling LTI Components for a Course

Before you can add LTI components to your course, you must enable the LTI tool in Studio.

To enable the LTI tool in Studio, add `"lti_consumer"` to the **Advanced Module List** on the **Advanced Settings** page. For more information, see *Enabling Additional Exercises and Tools*.

Note: The `lti_consumer` module replaces a previous version of the LTI component. The name of the module for the previous LTI component is `lti` and it may appear in the **Advanced Module List** for older courses.

The `lti_consumer` module includes all of the functionality of the previous LTI component and it should be used for all new courses. Courses that include the previous LTI component will continue to work correctly, even if the `lti` module is no longer present in the **Advanced Module List**.

10.21.3 Setting up an LTI 1.1 component

Some LTI 1.1 tools require users to provide authentication credentials. If the LTI tool you are including in your course requires authentication, you must add an LTI passport for that tool to your course configuration.

An LTI passport is a string of text that contains the authentication key and shared secret for one LTI tool. A passport also contains the LTI ID for the tool. When you add an LTI component to your course, assign it a matching LTI ID so that it can use the LTI passport that it requires.

For more information about creating and registering LTI passports, see the following sections.

- *Creating an LTI Passport String*
- *Adding an LTI Passport to the Course Configuration*
- *Adding an LTI Component to a Course Unit*

Creating an LTI Passport String

Each LTI passport includes three component text strings that are separated by colon characters. The component strings are: the LTI ID, the client key, and the client secret.

- The **LTI ID** is a value that you create to refer to the remote LTI tool provider. You should create an LTI ID that you can remember easily.

  The LTI ID can contain uppercase and lowercase alphanumeric characters, as well as underscore characters (_). It can be any length. For example, you can create an LTI ID that is as simple as `test_lti_id`, or your LTI ID can be a string of numbers and letters such as `id_21441` or `book_lti_provider_from_new_york`.

- The **client key** is a sequence of characters that you obtain from the LTI tool provider. The client key is used for authentication and can contain any number of characters. For example, your client key might be `b289378-f88d-2929-ctools.school.edu`.

- The **client secret** is a sequence of characters that you obtain from the LTI tool provider. The client secret is used for authentication and can contain any number of characters. For example, your client secret can be something as simple as `secret`, or it might be a string of numbers and letters such as `23746387264` or `yt4984yr8`.

To create an LTI passport, combine the LTI ID, client key, and client secret in the following format (be sure to include the colons).

`{your_lti_id}:{client_key}:{client_secret}`

The following example LTI passports show the format of the passport string.

`test_lti_id:b289378-f88d-2929-ctools.school.edu:secret`

`id_21441:b289378-f88d-2929-ctools.school.edu:23746387264`

`book_lti_provider_from_new_york:b289378-f88d-2929-ctools.company.com:yt4984yr8`

Adding an LTI Passport to the Course Configuration

To add an LTI passport for an LTI tool to the configuration for your course, follow these steps.

1. From the Studio **Settings** menu, select **Advanced Settings**.

2. In the **LTI Passports** field, place your cursor between the brackets.

3. Enter the LTI passport string surrounded by quotation marks.

   The following example shows an LTI passport string.

   `"test_lti_id:b289378-f88d-2929-ctools.umich.edu:secret"`

   For more information about creating your key, see *Setting up an LTI 1.1 component*.

4. If you use more than one LTI provider in your course, separate each LTI passport string with commas. Make sure to surround each entry with quotation marks. The following example shows multiple LTI passports in the **LTI Passports** field.

```
[
  "test_lti_id:b289378-f88d-2929-ctools.umich.edu:secret",
  "id_21441:b289378-f88d-2929-ctools.school.edu:23746387264",
  "book_lti_provider_from_new_york:b289378-f88d-2929-ctools.company.com:yt4984yr8"
]
```

5. Select **Save Changes**.

The page refreshes automatically, reformats your entry in the **LTI Passports** field, and displays a notification that your changes have been saved.

Adding an LTI Component to a Course Unit

To add an LTI 1.1 component to a course unit, follow these steps.

1. If the LTI tool requires authentication, register the key and shared secret for the LTI tool in the configuration for your course. For more information about registering authentication credentials, see *Setting up an LTI 1.1 component*.

2. Edit the unit in which you want to add the remote LTI tool and select **Advanced** from the **Add New Component** section. Select **LTI Consumer**.

   If the **Advanced** component type is not available, make sure you have enabled LTI components. To do this, see *Enabling LTI Components for a Course*.

3. Select **Edit** in the component that appears.

4. In the **LTI Version** field, select **LTI 1.1/1.2**.

5. Configure the LTI component in the component editor. For more information about each setting, see *LTI Component Settings*.

6. Select **Save**.

To test an LTI component, use the **Preview** feature or view the live version in the LMS. For more information, see *Testing Your Course Content*.

10.21.4 Setting up an LTI 1.3 component

To add an LTI 1.3 component to a course unit, follow these steps.

1. Edit the unit in which you want to add the remote LTI tool and select **Advanced** from the **Add New Component** section. Select **LTI Consumer**.

   If the **Advanced** component type is not available, make sure you have enabled LTI components. To do this, see *Enabling LTI Components for a Course*.

2. Select **Edit** in the component that appears.

3. In the **LTI Version** field, select **LTI 1.3**.

4. Enter the LTI 1.3 settings provided from your tool. For basic LTI 1.3 tools, without LTI Advantage, you need to set the following settings:

   - **LTI 1.3 Tool Launch URL** (can also be called redirect url)

   - **LTI 1.3 OIDC URL** (can also be called login url)

   To enable *LTI Advantage* features, such as grades pass back and Deep Linking, you also need to set **LTI 1.3 Tool Public Key** with a key provided by the LTI tool. The key will look similar to this example:

   ```
   -----BEGIN PUBLIC KEY-----
   MIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEApAbQVx8FLXOflwvmV4dE
   merOO/C+syqDG7MniysYzbMm+egZ8Z3Dq0e2YuggZlRSHVtT9TpTu6BrP7GyWrhH
   7nOgCx5Rz+9g/B+KsasZ9x35bPjMeqNAu5aP3b0xgaRtnWec0h0a6T1L2xaQLuPS
   bDTJhABs0d22OYmdlMNN0+fWPmqxxAz8t7DBmjMMAmPLG4tjyEOwKCBlYCx0WELP
   Izg9bYA7MhCpHyD6+kTB51dbOA6lBbrIszCO9PBV4RD96LQWPs3YQ+DTqvPfLeTQ
   Q9XwiOe7yzsG1Ml+dkUODpZbuBk5Z9X486l36WbRWGBDWIWlsNE7M9Nl3eS42oS4
   IQIDAQAB
   -----END PUBLIC KEY-----
   ```

   You should paste the key from the tool directly into the configuration field. For more information about each setting, see *LTI Component Settings*.

5. Select **Save**.

6. The Studio page will refresh and display LTI configuration required by the tool. Copy each of those values and follow the instructions provided by the tool to set them up.

   For basic LTI 1.3 launches, the following configuration values are required (they are provided by the LTI tool being set up):

   - **Client**

   - **Deployment ID**

   - **Keyset URL**

   - **OIDC Callback URL** (some tools refer to this as launch or redirect urls).

   For LTI Advantage, you'll also need to set **OAuth Token URL** (token/login url) in the tool.

Note: LTI 1.3 launches only work with published blocks, make sure the block is published before doing a launch.

10.21.5 Enabling and using LTI Advantage features

LTI Advantage is an extension of the LTI 1.3 specification that enables additional features in LTI components. See LTI Advantage for more information.

Currently, the platform supports the following LTI Advantage extensions:

- Assignments and Grades services
- Deep Linking
- Names and Roles Provisioning Service

Enabling LTI Assignments and Grades services

The LTI Assignments and Grades service (LTI-AGS) allows LTI tools to send and manage learner grades back to the platform after an activity is completed.

To set up LTI-AGS services on a component, follow these steps.

1. Locate the unit and LTI component in which you want to enable LTI-AGS functionality.

2. Select **Edit** in the component that appears.

3. Locate the **LTI Assignment and Grades Service** setting.

4. Select the operation mode of the Assignments and Grades services. You can disable the LTI-AGS service by selecting **Disabled** or pick one of the operation modes available: *declarative* to allow only one grade per problem, or *programmatic* to let the tool create many grades. For more information about each mode, read the corresponding entry on *LTI Component Settings*.

5. Select **Save**.

Enabling and using LTI Deep Linking

The Deep Linking service (LTI-DL) allows course creators to select and configure the content displayed to learners through Open edX Studio, removing the need to use custom parameters and settings when setting up content, improving the ease of use and content authoring experience.

To set up LTI-DL services on a component, follow these steps.

1. Locate the unit and LTI component in which you want to enable LTI-DL functionality.

2. Select **Edit** in the component that appears.

3. Locate the **Deep linking** setting and set it to **True** (enabled).

4. Locate the **LTI Advantage Deep Linking Launch URL** setting.

5. Retrieve the Deep Linking Launch url from the tool you're integrating with. If it's not provided, try using the same value as in the **LTI 1.3 Tool Launch URL**.

6. Select **Save**. The Studio page will refresh and show the updated details page.

To use LTI Deep Linking, follow these steps:

1. Ensure that LTI-DL is enabled by following the steps above.

2. Locate the unit and LTI component in Studio.

3. In the LTI component page in Studio, locate the **Deep Linking Launch - Configure tool** link and select it.

4. You'll be redirected to the Tool and presented with a page to select the options.

5. Once the configuration is complete, you'll be redirected back to the Studio and the Deep Linking setup will be complete.

6. The content you selected in the tool will be presented to your students in the LMS.

Note: LTI 1.3 launches only work with published blocks, make sure the block is published before doing a Deep Link Launch.

Enabling LTI Names and Roles Provisioning Service

The Names and Roles Provisioning service (LTI-NRPS) allows tools to list and retrieve information about the learners that have access to an LTI component. The tools that support this service can retrieve a limited amount of personal information (full name, email, username) and the membership status of all the learners enrolled in the course.

To set up LTI-NRPS services on a component, follow these steps.

1. Locate the unit and LTI component in which you want to enable LTI-NRPS functionality.

2. Select **Edit** in the component that appears.

3. Locate the **Enable LTI NRPS** setting and set it to **True** (enabled).

4. Select **Save**. The LTI-NRPS will be enabled for all subsequent launches.

Note: Due to performance concerns, LTI-NRPS information is by default only available on courses with up to 1000 users. Site operators may adjust this limit using the LTI_NRPS_ACTIVE_ENROLLMENT_LIMIT setting.

10.21.6 LTI Component Settings

Setting	Description
Display Name	Specifies the name of the component. This name appears as a heading above the problem. Unique, descriptive display names help you identify problems quickly and accurately for analysis.
LTI Application Information	The description of the remote LTI application. If the application requires a username or email address, use this field to inform learners that their information will be forwarded to the external application.
LTI Version	Used to select the LTI version used for the current LTI component.
LTI ID (LTI 1.1 only)	Specifies the LTI ID for the remote LTI tool provider. This value must match the LTI ID that you entered as part of the LTI passport string for the LTI tool. For more information about LTI passports, see *Enabling LTI Components for a Course*.
LTI URL (LTI 1.1 only)	Specifies the URL of the remote LTI tool that this component launches.
LTI 1.3 Tool Launch URL (LTI 1.3 only)	Specifies the URL of the remote LTI tool that this component launches. This is sometimes called *Redirect URL* in some tools.
LTI 1.3 OIDC URL (LTI 1.3 only)	Specifies the URL of the login URL for the remote LTI tool for the authentication flow. This can also be called *Login URL* on some tools.
LTI 1.3 Tool Public Key (LTI 1.3 only)	The LTI 1.3 Tool's public key. This is a string that starts with '——BEGIN PUBLIC KEY——' and is required so that the LMS can check if the messages and launch requests received have the signature from the tool. This is not required when doing LTI 1.3 Launches without LTI Advantage.
Deep linking (LTI 1.3 only)	Toggle to enable or disable LTI Advantage Deep Linking. Select **True** if the tool supports this feature and you want to use it in this component.
LTI Advantage Deep Linking Launch URL (LTI 1.3 only)	Specifies the URL of the remote LTI tool that this component uses to perform deep linking launches. If not specified by the tool, use the same URL as in **LTI 1.3 Tool Launch URL**.
LTI Assignment and Grades Service (LTI 1.3 only)	Toggle to enable LTI Advantage Assignment and Grades services and set the grading model. Options are: • **Disabled** - LTI AGS service will be disabled. Use this for tools that don't send any grades back to the platform. • **Allow tools to submit grades only (declarative) (Default)** - the platform will enable LTI AGS and prepare a single grade container for problems to send grades back to. Use this for simple LTI problems. • **Allow tools to manage and submit grade (programmatic)** - The tool will have full control over the grading process, enabling it to create and edit one or more grade containers and manage the learner scores that will be reported to the LMS.

Custom Parameters	Sends additional parameters that are required by the remote LTI tool. The parameters that you send depend on the specific LTI tool you are using.
	Supply a key and value for each custom parameter. The key is an identifier for the parameter. Use the following format.
	`{key}={value}`
	For example, an LTI tool that displays an e-book might accept a `page` parameter to control which page the e-book opens to by default. The following example sends a `page` parameter to an LTI tool.
	`["page=144"]`

LTI Launch Target	Controls the way that the course page will open and display the remote LTI tool. Options are: • **Inline** - the LTI tool will appear directly in the course page. • **Modal** - the LTI tool will appear in a separate display window in front of the course page. The modal display window prevents learners from interacting with the course page until they dismiss the LTI tool. • **New Window** - the LTI tool will appear in a new web browser window. Depending on the configuration of the web browser, it may appear in a new tab or in a separate browser window. Learners can interact with both the course page and the LTI tool.

10.22 Math Expression Input Problems

Note: EdX offers full support for this problem type.

The math expression input problem type is a core problem type that can be added to any course. At a minimum, math expression problems include a question or prompt and a response field for a numeric answer.

- *Overview*
  - *Example Math Expression Input Problem*
  - *Analyzing Performance on Math Expression Input Problems*
- *Adding a Math Expression Input Problem*
- *Math Expression Input Problem OLX Reference*
  - *Template*
  - *Elements*

For more information about the core problem types, see *Working with Problem Components*.

10.22.1 Overview

In math expression input problems, learners enter text that represents a mathematical expression. The text is converted to a symbolic expression that appears below the response field. Unlike numerical input problems, which only allow integers and a few select constants, math expression input problems can include unknown variables and more complicated symbolic expressions.

For more information about how learners enter expressions, see learners:Math Formatting in the *EdX Learner's Guide* or Completing Mathematical and Scientific Assignments in the *Open edX Learner's Guide*.

Note: You can make a calculator tool available to your learners on every unit page. For more information, see *Calculator Tool*.

For math expression input problems, the grader uses numerical sampling to determine whether a learner's response matches the math expression that you provide, to a specified numerical tolerance. You specify the allowed variables in the expression as well as the range of values for each variable.

When you create a math expression input problem in Studio, you use MathJax to format text strings into "beautiful math." For more information about how to use MathJax in Studio, see *Using MathJax for Mathematics*.

Note: Math expression input problems currently cannot include negative numbers raised to fractional powers, such as (-1)^(1/2). Math expression input problems can include complex numbers raised to fractional powers, or positive non-complex numbers raised to fractional powers.

Example Math Expression Input Problem

In the LMS, learners enter a value into a response field to complete a math expression input problem. The following example shows a completed math expression input problem that contains two questions.

The open learning XML (OLX) markup for this example math expression input problem follows.

```
<problem>
  <formularesponse inline="1" type="cs" samples="R,omega,E,rho,L@0.1,0.1,0.1,0.1,0.1:10,
→10,10,10,10#10" answer="(rho*omega^2*L^2)/E*((11*L)/48 +(3*R)/8)">
    <label>Find a symbolic expression for the displacement of the blade mid-section, \(␣
→u_{x}(L/2) \), in terms of \(R\), \(L\), \(\rho\), \(\omega\), and \(E\).</label>
    <description>\(u_x(L/2) = \)</description>
    <responseparam type="tolerance" default="1%"/>
    <textline inline="1" math="1"/>
    <solution>
      <div class="worked-solution">
        <p><b>Obtaining the displacement at the mid-section \( u_{x}(x = L / 2)\):</b></
→p><p>According to the definition of strain,</p>
        \[ \frac {du_{x}(x)} {dx} = \epsilon_a(x).\]
        <p>Therefore, we can obtain the displacement field as</p>
        \[ u_x(x) = u_x(0) + \int_0^x \epsilon_a (x') dx' = u_x(0) + \left[ \frac{\rho \
→omega^2}{E} \left(\frac{L^2x'}{2} - \frac{(x')^3}{6} + RLx' - \frac{R(x')^2}{2} \
→right) \right]_0^x\]
        <p>Since the bar is fixed at x=0, therefore \(u_x(0)=0\). Hence we obtain</p>
        \[\Rightarrow u_x(x) = \frac{\rho\omega^2}{E} \left( \frac{L^2x}{2} - \frac{x^3}
→{6} + RLx - \frac{Rx^2}{2} \right).\]
        <p>The displacement of the bar at \(x=L/2\) is </p>
```

```
        \[u_{x}(L/2) = \frac {\rho\omega^2L^2}{E} \left( \frac {11L}{48} + \frac {3R}{8}␣
→\right).\]
        </div>
    </solution>
  </formularesponse>

  <formularesponse inline="1" type="cs" samples="R,omega,E,rho,L@0.1,0.1,0.1,0.1,0.1:10,
→10,10,10,10#10" answer="(rho*omega^2)/E*(L^3/3 + (R*L^2)/2)">
    <label>Find a symbolic expression for the blade elongation \( \delta \) in terms of \
→(R\), \(L\), \(\rho\), \(\omega\), and \(E\).</label>
    <description>\(\delta = \)</description>
    <responseparam type="tolerance" default="1%"/>
    <textline inline="1" math="1"/>
    <solution>
      <div class="worked-solution">
        \[ \delta = \frac {\rho \omega^2}{E} \left( \frac {L^3} {3} + \frac { RL^2} {2}␣
→\right) \]
        <p><b>Obtaining the total elongation of the blade  \( \delta \):</b></p>
        <p>The strain field in the bar is</p>
        \[ \epsilon_a(x) = \frac {\mathcal{N}(x)}{EA} = \frac {\rho \omega^2 \left( \
→frac {L^2 - x^2}{2} + R\left(L-x\right)\right)}{E}. \]
        <p>We can now calculate the elongation of the bar as the following.</p>
        \[ \delta = \int_0^L \epsilon_{a}(x)dx = \int_0^L \frac {\rho \omega^2}{E} \
→left( \frac {L^2 - x^2}{2} + R\left(L-x\right)\right)dx. \]
        \[ \Rightarrow \delta= \left[ \frac { \rho \omega^2}{E} \left( \frac {L^2x}{2}  -
→ \frac {x^3}{6} + RLx - \frac {Rx^2}{2} \right)\right]_0^L.\]
        \[ \Rightarrow \delta = \frac {\rho \omega^2}{E} \left( \frac {L^3}{2} - \frac{L^
→3}{6} + RL^2 - \frac {RL^2}{2} \right).\]
        \[\Rightarrow \delta= \frac {\rho \omega^2}{E} \left( \frac {L^3}{3} + \frac {RL^
→2}{2} \right). \]
      </div>
    </solution>
  </formularesponse>
</problem>
```

Analyzing Performance on Math Expression Input Problems

For the math expression input problems in your course, you can use edX Insights to review aggregated learner performance data and examine submitted answers. For more information, see Using edX Insights.

10.22.2 Adding a Math Expression Input Problem

You add math expression input problems in Studio by selecting the **Problem** component type and then using the advanced editor to specify the prompt and the acceptable answer or answers.

To create a math expression input problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**.

2. Select **Advanced**.

3. From the list of **Advanced** problem types, select **Math Expression Input**. Studio adds a template for the problem to the unit.

4. Select **Edit**. The advanced editor opens the template and shows the OLX markup that you can use for this problem type.

5. Replace the guidance provided by the template to add your own text. For example, replace the question or prompt, answer options, and solution.

6. Update the OLX to use any additional elements and attributes in your problem.

7. Select **Settings** to provide an identifying **Display Name** and define settings for the problem. For more information, see *Defining Settings for Problem Components*.

8. Select **Save**.

10.22.3 Math Expression Input Problem OLX Reference

Template

Note: The following template includes a Python script. When you add a script to a problem component, do not add to or change its internal indentation. A "jailed code" error message appears when you save the problem in Studio if the `<script>` element is indented.

```
<problem>
  <formularesponse type="ci" samples="R_1,R_2,R_3@1,2,3:3,4,5#10"  answer="$computed_
↪response">
    <label>Problem text</label>
    <responseparam type="tolerance" default="0.00001"/>
    <formulaequationinput size="20" />

<script type="loncapa/python">
computed_response = PYTHON SCRIPT
</script>

    <solution>
      <div class="detailed-solution">
        <p>Explanation or solution header</p>
        <p>Explanation or solution text</p>
      </div>
    </solution>
  </formularesponse>
</problem>
```

This template includes a placeholder value for the `samples` attribute of `samples="R_1, R_2,R_3@1,2,3:3,4,5#10"`. You enter values for this attribute in the following format: `samples="VARIABLES@LOWER_BOUNDS:UPPER_BOUNDS#NUMBER_OF_SAMPLES"`. Additional detail follows in the description of the `<formularesponse>` element.

Elements

For math expression input problems, the `<problem>` element can include this hierarchy of child elements.

```
<problem>
    <formularesponse>
        <label>
        <description>
        <formulaequationinput>
        <responseparam>
        <script>
        <solution>
```

In addition, standard HTML tags can be used to format text.

`<formularesponse>`

Required. Indicates that the problem is a math expression input problem.

The `<formularesponse>` tag is similar to the `<numericalresponse>` tag used by *numerical input* problem types, but `<formularesponse>` allows unknown variables.

Attributes

Attribute	Description
`type`	Can be `"cs"` for case sensitive, which is the default, or `"ci"` for case insensitive, so that capitalization does not matter in variable names.
`answer`	The correct answer to the problem, given as a mathematical expression.
	If you precede a variable name in the problem with a dollar sign ($), you can include a script in the problem that computes the expression in terms of that variable.
`samples`	Specifies important information about the problem in the following lists.
	• `variables`: A set of variables that learners can enter.
	• `lower_bounds`: For every defined variable, a lower bound on the numerical tests to use for that variable.
	• `upper_bounds`: For every defined variable, an upper bound on the numerical tests to use for that variable.
	• `num_samples`: The number of times to test the expression.
	Commas separate items inside each of the four individual lists. The at sign (@), colon (:), and hash tag (#) characters separate the lists. An example of the format follows.
	`"variables@lower_bounds:upper_bounds#num_samples"`
	For example, a `<formularesponse>` element that includes the `samples` attribute might look like either of the following.
	`<formularesponse samples="x,n@1,2:3,4#10">`
	`<formularesponse samples="R_1,R_2,R_3@1,2,3:3,4,5#10">`

Variable names must be at least one character long. They must start with a letter, which can be followed by letters, numbers and underscores. We strongly recommend only using one underscore, which renders to students as a subscript.

Tensor notation is also supported, as `Name_{ijk}^{123}`, where the name must start with a letter, but can otherwise contain letters or numbers, subscripts are contained in the lower braces, and superscripts are contained in the raised braces. Superscripts and subscripts must only be letters or numbers. No other underscores can appear in the name. Note that the subscript must come first, and the braces ensure that the superscripts are not confused with exponentiation.

All variable names (standard and tensor formats) may contain one or more apostrophes (primes) at the end of the variable name, for example, to indicate a derivative or new coordinate system. Note that some students may have trouble entering primes, which some browsers/operating systems automatically convert to a "smart apostrophe" (tablets are most likely to have this issue). We recommend providing a variable name that students may copy and paste to get around this problem.

The following are examples of valid variable names: `V_out`, `m_1`, `G_{ij}`, `H^{xy}`, `f'`, `x_1''`, and `H_{ij}^{12}''`.

Children

- `<label>`
- `<description>`
- `<formulaequationinput>`
- `<responseparam>`
- `<script>`
- `<solution>`

`<label>`

Required. Identifies the question or prompt. You can include HTML tags within this element.

Attributes

None.

Children

None.

`<description>`

Optional. Provides clarifying information about how to answer the question. You can include HTML tags within this element.

Attributes

None.

Children

None.

`<formulaequationinput>`

Required. Creates a response field in the LMS where learners enter a response.

Learners also see a second field below the response field that displays a typeset version of the entered response. The parser that renders a learner's plain text into typeset math is the same parser that evaluates the response for grading.

Attributes

Attribute	Description
size	Optional. Defines the width, in characters, of the response field in the LMS.

Children

None.

`<responseparam>`

Used to define an upper bound on the variance of the numerical methods used to approximate a test for equality.

Attributes

Attribute	Description
type	`"tolerance"` defines a tolerance for a number.
default	Required. A number or a percentage specifying how close the learner and grader expressions must be. If you do not include a tolerance, the expression is vulnerable to rounding errors during sampling. The result of such unavoidable errors is that the grader can mark some learner input as incorrect, even if it is algebraically equivalent.

Children

None.

`<script>`

Optional. Specifies a script that the grader uses to evaluate a learner's response. A problem behaves as if all of the code in all of the script elements were in a single script element. Specifically, any variables that are used in multiple `<script>` elements share a namespace and can be overridden.

As with all Python code, indentation matters, even though the code is embedded in XML.

Attributes

Attribute	Description
`type`	Required. Must be set to `loncapa/python`.

Children

None.

`<solution>`

Optional. Identifies the explanation or solution for the problem, or for one of the questions in a problem that contains more than one question.

This element contains an HTML division `<div>`. The division contains one or more paragraphs `<p>` of explanatory text.

10.23 Molecule Editor Tool (Deprecated)

Note: EdX does not support this tool.
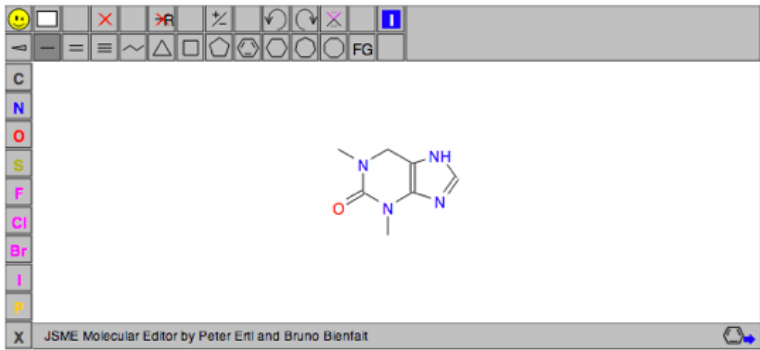
Learners can use the molecule editor to learn how to create molecules. The molecule editor allows learners to draw molecules that follow the rules for covalent bond formation and formal charge, even if the molecules are chemically impossible, are unstable, or do not exist in living systems. The molecule editor warns learners if they try to submit a structure that is chemically impossible.

The molecule editor incorporates two tools: the JSME molecule editor created by Peter Erl and Bruno Bienfait, and JSmol, a JavaScript-based molecular viewer from Jmol. (You don't need to download either of these tools–Studio uses them automatically.) For more information about the JSME molecule editor, see JSME Molecule Editor. For more information about JSmol, see JSmol.

MOLECULAR STRUCTURE (1 point possible)

A molecular structure problem lets the user use the JSME editor component to draw a new molecule or update an existing drawing and then submit their work. Answers are specified as SMILES strings.

I was trying to draw my favorite molecule, caffeine. Unfortunately, I'm not a very good biochemist. Can you correct my molecule?

Answer: C8H10N4O2

EXPLANATION

Some scholars have hypothesized that the renaissance was made possible by the introduction of coffee to Italy. Likewise scholars have linked the Enlightenment with the rise of coffee houses in England.

10.23.1 Create the Molecule Editor

To create a molecule editor, you need the following files.

- MoleculeAnswer.png
- MoleculeEditor_HTML.png
- dopamine.mol

To download all of these files in a .zip archive, go to http://files.edx.org/MoleculeEditorFiles.zip.

Note: The molecule that appears when the tool starts is a dopamine molecule. To use a different molecule, download the .mol file for that molecule from the list of molecules on the BioTopics website. Then, upload the .mol file to the **Files & Uploads** page for your course in Studio, and change "dopamine.mol" in the example code to the name of your .mol file.

To create the molecule editor that appears in the image above, you need an HTML component followed by a problem component.

1. Upload all of the files listed above to the **Files & Uploads** page in your course.

2. Create the Text component.

1. In the unit where you want to create the problem, click **Text** under **Add New Component**, and then click **Text**.

2. In the component that appears, click **Edit**.

---

3. In the component editor, paste the Text component code from below.

4. Make any changes that you want, and then click **Save**.

1. Create the problem component.

1. Under the Text component, click **Problem** under **Add New Component**, and then click **Blank Advanced Problem**.

2. In the component that appears, click **Edit**.

3. In the component editor, paste the problem component code from below.

4. Click **Save**.

Molecule Editor Code

To create the molecule editor, you need a Text component and a problem component.

Text Component Code

```
<h3>Molecule Editor</h3>
<p>The molecule editor makes creating and visualizing molecules easy. A chemistry␣
↪professor may have you build and submit a molecule as part of an exercise.</p>
<div>
<script type="text/javascript">// <![CDATA[
function toggle2(showHideDiv, switchTextDiv) {
            var ele = document.getElementById(showHideDiv);
            var text = document.getElementById(switchTextDiv);
            if(ele.style.display == "block") {
                ele.style.display = "none";
                text.innerHTML = "+ open";
                }
            else {
                ele.style.display = "block";
                text.innerHTML = "- close";
            }
        }
// ]]></script>
</div>
<div>
<style type="text/css"></style>
</div>
<div id="headerDiv">
<div id="titleText">Using the Molecule Editor<a id="myHeader" href="javascript:toggle2(
↪'myContent','myHeader');">+ open </a></div>
</div>
<div id="contentDiv">
<div id="myContent" style="display: none;">
<p>In this problem you will edit a molecule using the molecular drawing program shown␣
↪below:</p>
<img alt="" src="/static/MoleculeEditor_HTML.png" /></div>
</div>
<p> </p>
```

```
<div id="headerDiv">
<div id="titleText">Are the molecules I've drawn chemically possible?<a id=
↪"IntroductionHeader" href="javascript:toggle2('IntroductionContent','IntroductionHeader
↪');">+ open </a></div>
</div>
<div id="contentDiv">
<div id="IntroductionContent" style="display: none;">
<p>The chemical editor you are using ensures that the structures you draw are correct in
↪one very narrow sense, that they follow the rules for covalent bond formation and
↪formal charge. However, there are many structures that follow these rules that are
↪chemically impossible, unstable, do not exist in living systems, or are beyond the
↪scope of this course. The editor will let you draw them because, in contrast to the
↪rules of formal charge, these properties cannot be easily and reliably predicted from
↪structures.</p>
<p>If you submit a structure that includes atoms that are not possible or are beyond the
↪scope of this course, the software will warn you specifically about these parts of
↪your structure and you will be allowed to edit your structure and re-submit.
↪Submitting an improper structure will not count as one of your tries. In general, you
↪should try to use only the atoms most commonly cited in this course: C, H, N, O, P,
↪and S. If you want to learn about formal charge, you can play around with other atoms
↪and unusual configurations and look at the structures that result.</p>
</div>
</div>
<div id="ap_listener_added"> </div>
```

Problem Component Code

```
<problem>
<p>The dopamine molecule, as shown, cannot make ionic bonds. Edit the dopamine molecule
↪so it can make ionic bonds.</p>
<p>When you are ready, select Submit. If you need to start over, select Reset.</p>
  <script type="loncapa/python">
def check1(expect, ans):
    import json
    mol_info = json.loads(ans)["info"]
    return any(res == "Can Make Ionic Bonds" for res in mol_info)
    </script>
  <customresponse cfn="check1">
    <editamoleculeinput file="/static/dopamine.mol">
        </editamoleculeinput>
  </customresponse>
  <solution>
    <img src="/static/MoleculeAnswer.png"/>
  </solution>
</problem>
```

Problem 2

```
<problem>
<p>The dopamine molecule, as shown, cannot make strong hydrogen bonds. Edit the dopamine
↪molecule so that it can make strong hydrogen bonds.</p>
```

```
<script type="loncapa/python">
def grader_1(expect, ans):
    import json
    mol_info = json.loads(ans)["info"]
    return any(res == "Cannot Make Strong Hydrogen Bonds" for res in mol_info)
</script>
  <customresponse cfn="grader_1">
    <editmoleculeinput file="/static/dopamine.mol">
    </editmoleculeinput>
  </customresponse>
</problem>
```

Problem 3

```
<problem>
<p>The dopamine molecule has an intermediate hydrophobicity. Edit the dopamine molecule␣
→so that it is more hydrophobic.</p>
<script type="loncapa/python">
def grader_2(expect, ans):
    import json
    mol_info = json.loads(ans)["info"]

    hydrophobicity_index_str=mol_info[0]
    hydrophobicity_index=float(hydrophobicity_index_str[23:])
    return hydrophobicity_index &gt; .490
</script>
  <customresponse cfn="grader_2">
    <editmoleculeinput file="/static/dopamine.mol">
    </editmoleculeinput>
</customresponse>
</problem>
```

10.24 Molecule Viewer Tool

Note: EdX does not support this tool.

Studio offers two tools that you can use in discussions of molecules.

- With the **molecule viewer** tool, you can create three-dimensional representations of molecules for students to view.

- With the **molecule editor** problem type, you can allow students to draw their own molecules. For more information about this tool, see *Molecule Editor Tool (Deprecated)*.

Both tools use **JSmol**, a JavaScript-based molecular viewer from Jmol. (You don't need to download this tool; Studio uses it automatically.) For more information about JSmol, see JSmol.

The following image shows the molecule viewer tool in a course.
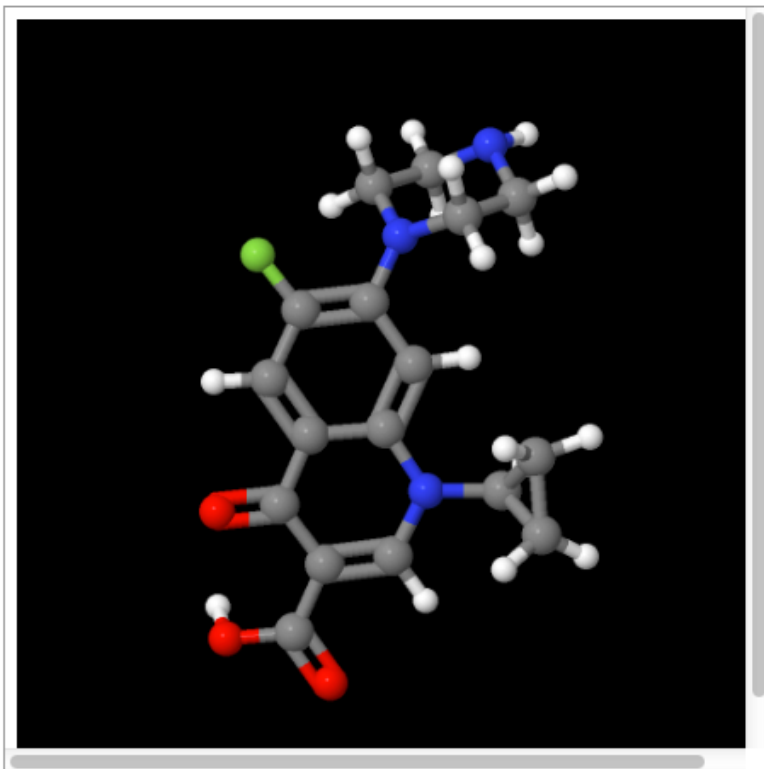
Note: To create a molecule viewer tool, you must have permission to upload files to a third-party file hosting site such as Amazon Web Services Simple Storage Service (AWS S3). When you create the molecule viewer, you'll upload a folder that contains a large number of files to the file hosting site.

10.24.1 Create the Molecule Viewer Tool

Creating a molecule viewer tool has several steps.

1. Download files from the BioTopics website and from edX.

2. Move or edit some of the files that you downloaded.

3. Upload a folder that contains all of the files that you downloaded and edited to your own file hosting site.

4. Create a Text component that contains an `iframe` element in Studio. The iframe references the files that you upload to the file hosting site.

Download Files from BioTopics and edX

1. Create or download a .mol file for the molecule that you want to show. You can download a variety of .mol files from the BioTopics website. Save the file in a place where you can easily find it.

2. Download the MoleculeViewerFiles.zip file from edX.

3. Unzip the MoleculeViewerFiles.zip file that you downloaded.

   When you unzip the file, it contains a **MoleculeViewerFiles** folder with the following folders and files.

   - data (folder)

   - j2s (folder)

   - js (folder)

   - MoleculeViewer.html (file)

Move the .mol File and Edit the MoleculeViewer.html File

1. Move the .mol file that you downloaded from BioTopics into the **data** folder that you downloaded from edX.

2. Edit the MoleculeViewer.html file:

   1. In a text editor, open the MoleculeViewer.html file.

   2. In line 19 of the MoleculeViewer.html file, change **Example.mol** to the name of your .mol file. For example, if you downloaded the Glucose.mol file, line 19 in your file will look like the following:

      ```
      script: "set antialiasDisplay; background black; load data/Glucose.mol;"
      ```

3. Save the MoleculeViewer.html file.

Upload Files to a Hosting Site

1. Make sure that your **MoleculeViewerFiles** folder contains the following folders and files.

   - data (folder): Earlier, you added a .mol file to this folder.

   - j2s (folder)

   - js (folder)

   - MoleculeViewer.html (file): Earlier, you changed line 19 in this file.

2. Upload the entire **MoleculeViewerFiles** folder to your file hosting site.

Note: Because this folder contains many files, uploading the folder may take several minutes, even over a fast connection.

Create a Component in Studio

1. In Studio, open the unit where you want to add the molecule viewer.

2. Under **Add New Component**, select **Text**, and then select **IFrame Tool**.

3. In the component editor that opens, replace the existing content with your own text.

4. In the toolbar, select **HTML**.

5. In the **HTML Source Code** box, enter the following line in the place where you want the molecule viewer to appear.

   ```
   <p><iframe name="moleculeiframe" src="https://path_to_folder/MoleculeViewerFiles/
   MoleculeViewer.html" width="500" height="500"></iframe></p>
   ```

6. Replace `path_to_folder` with the URL of your file hosting site. The revised line might look like this example.

   ```
   <p><iframe name="moleculeiframe" src="https://myfiles.example.com/
   MoleculeViewerFiles/MoleculeViewer.html" width="500" height="500"></iframe></p>
   ```

7. Select **OK** to close the **HTML Source Code** box, and then select **Save**.

8. Select **Preview** to see your component as a student would see it.

10.25 Multiple Choice Problem

Note: EdX offers full support for this problem type.

The multiple choice problem type is a core problem type that can be added to any course. At a minimum, multiple choice problems include a question or prompt and several answer options. By adding hints, feedback, or both, you can give learners guidance and help when they work on a problem.

- *Overview*
  - *Example Multiple Choice Problem*
  - *Analyzing Performance on Multiple Choice Problems*
  - *Pedagogical Considerations for Multiple Choice Questions*
- *Adding a Multiple Choice Problem*
  - *Use the Simple Editor to Add a Multiple Choice Problem*
  - *Use the Advanced Editor to Add a Multiple Choice Problem*
- *Adding Feedback to a Multiple Choice Problem*
  - *Configuring Feedback in the Simple Editor*
  - *Configuring Feedback in the Advanced Editor*
  - *Customizing Feedback Labels*
- *Adding Hints to a Multiple Choice Problem*
  - *Configure Hints in the Simple Editor*
  - *Configure Hints in the Advanced Editor*

For more information about the core problem types, see *Working with Problem Components*.

10.25.1 Overview

In multiple choice problems, learners select one option from a list of answer options. Unlike *dropdown* problems, where the answer choices do not appear until the learner selects the dropdown arrow, answer choices for multiple choice problems are immediately visible directly below the question.

Multiple choice problems can also have several advanced options, such as reordering, or shuffling, the set of answer choices for each learner. For more information about these options, see *Advanced Options for Multiple Choice Problems*.

Example Multiple Choice Problem

In the LMS, learners select a single answer option to complete a multiple choice problem. An example of a completed multiple choice problem follows.

Multiple Choice

1 point possible (graded)

This exercise first appeared in Harvard's PH278x: Human Health and Global Environmental Change course, Spring 2013

Lateral inhibition, as was first discovered in the horseshoe crab:

○ is a property of touch sensation, referring to the ability of crabs to detect nearby predators.

○ is a property of hearing, referring to the ability of crabs to detect low frequency noises.

○ is a property of vision, referring to the ability of crabs' eyes to enhance contrasts. ✔

● has to do with the ability of crabs to use sonar to detect fellow horseshoe crabs nearby. ✖

○ has to do with a weighting system in the crab's skeleton that allows it to balance in turbulent water.

Explanation

Horseshoe crabs were essential to the discovery of lateral inhibition, a property of vision present in horseshoe crabs as well as in humans that enables enhancement of contrast at edges of objects as was demonstrated in class. In 1967, Haldan Hartline received the Nobel prize for his research on vision and in particular his research investigating lateral inhibition using horseshoe crabs.

Submit You have used 2 of 3 attempts Save Show Answer

✖ Incorrect (0/1 point)

To add the example problem illustrated above, you enter the following text and Markdown formatting in the simple editor in Studio.

```
>>Lateral inhibition, as was first discovered in the horseshoe crab:<<

( ) is a property of touch sensation, referring to the ability of crabs
to detect nearby predators.
( ) is a property of hearing, referring to the ability of crabs to detect
low frequency noises.
(x) is a property of vision, referring to the ability of crabs' eyes to
enhance contrasts.
( ) has to do with the ability of crabs to use sonar to detect fellow
horseshoe crabs nearby.
( ) has to do with a weighting system in the crab's skeleton that allows
it to balance in turbulent water.

[Explanation]
Horseshoe crabs were essential to the discovery of lateral
inhibition, a property of vision present in horseshoe crabs as well as in
humans that enables enhancement of contrast at edges of objects as was
demonstrated in class. In 1967, Haldan Hartline received the Nobel prize
```

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```
for his research on vision and in particular his research investigating
lateral inhibition using horseshoe crabs.
[Explanation]
```

The open learning XML (OLX) markup for this example problem follows.

```xml
<problem>
  <multiplechoiceresponse>
    <label>Lateral inhibition, as was first discovered in the horseshoe crab:</label>
    <choicegroup type="MultipleChoice">
      <choice correct="false">is a property of touch sensation, referring to
       the ability of crabs to detect nearby predators.</choice>
      <choice correct="false">is a property of hearing, referring to the
       ability of crabs to detect low frequency noises.</choice>
      <choice correct="false">is a property of vision, referring to the
       ability of crabs' eyes to enhance contrasts.</choice>
      <choice correct="true">has to do with the ability of crabs to use
       sonar to detect fellow horseshoe crabs nearby.</choice>
      <choice correct="false">has to do with a weighting system in the
       crab's skeleton that allows it to balance in turbulent water.</choice>
    </choicegroup>
    <solution>
      <div class="detailed-solution">
        <p>Explanation</p>
        <p>Horseshoe crabs were essential to the discovery of lateral
         inhibition, a property of vision present in horseshoe crabs as well
         as humans that enables enhancement of contrast at edges of objects
         as was demonstrated in class. In 1967, Haldan Hartline received the
         Nobel prize for his research on vision and in particular his
         research investigating lateral inhibition using horseshoe crabs.</p>
      </div>
    </solution>
  </multiplechoiceresponse>
</problem>
```

Analyzing Performance on Multiple Choice Problems

For the multiple choice problems in your course, you can use edX Insights to review aggregated learner performance data and examine the submitted answers. For more information, see Using edX Insights.

Pedagogical Considerations for Multiple Choice Questions

EdX recommends the use, whenever possible, of authentic assessment rather than multiple choice questions for graded problems. The use of authentic assessment in online courses tends to lead to better learning outcomes. In addition, authentic assessment allows for infinite attempts, mastery learning, and more intellectual risk taking, which lead to substantially better learning outcomes.

Multiple choice questions do have these uses.

- Ungraded multiple choice questions can help students think about a concept in the context of knowledge transfer.

- For many subject areas, authentic assessments are either unavailable or prohibitively complex to use. In such courses, multiple choice questions can act as the only available fall back.

Fortunately, multiple choice questions are among the best studied in assessment literature. A few guidelines for the creation of such questions follow.

- Organize the set of answers logically. Use consistent phrasing for the answers, and when possible, parallel structure.

- Place as many of the words in the stem as possible, and keep the answers as concise as possible.

- The distractors should not be substantially shorter, longer, or use different structure than the correct answer. The answer options should be as consistent in structure, length, and phrasing as possible.

- Avoid using negatives (and especially double negatives) in the question and the answers.

- Test higher order thinking (comprehension and critical thinking). Avoid simple recall.

- If you specify a finite number of attempts, avoid trick questions and try to keep wording clear and unambiguous.

- Make all distractors plausible.

- Use "All of the above" and "None of the above" answer options with caution. If a learner can identify at least two correct answers, it can give away the answer with only partial comprehension.

10.25.2 Adding a Multiple Choice Problem

You add multiple choice problems in Studio by selecting the **Problem** component type and then using either the simple editor or the advanced editor to specify the prompt and the answer options.

- *Use the Simple Editor to Add a Multiple Choice Problem*
- *Use the Advanced Editor to Add a Multiple Choice Problem*

Note: You can begin work on the problem in the simple editor, and then switch to the advanced editor. However, after you save any changes you make in the advanced editor, you cannot switch back to the simple editor.

Use the Simple Editor to Add a Multiple Choice Problem

When you add a multiple choice problem, you can choose one of these templates.

- **Multiple Choice**
- **Multiple Choice with Hints and Feedback**

These templates include the Markdown formatting that you use in the *simple editor* to add a problem without, or with, hints and feedback.

To use the *simple editor* to add a problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**.

2. From the list of **Common Problem Types**, select the type of problem you want to add. Studio adds a template for the problem to the unit.

3. Select **Edit**. The simple editor opens to a template that shows the Markdown formatting that you use for this problem type.

4. Replace the guidance provided by the template to add your own text for the question or prompt, answer options, explanation, and so on.

> To format equations, you can use MathJax. For more information, see *Using MathJax for Mathematics*.

5. Select **Settings** to provide an identifying **Display Name** and define settings for the problem. For more information, see *Defining Settings for Problem Components*.

6. Select **Save**.

Use the Advanced Editor to Add a Multiple Choice Problem

You can use the *advanced editor* to identify the elements of a multiple choice problem with OLX. For more information, see *Multiple Choice Problem OLX Reference*.

To use the *advanced editor* to add a problem, follow these steps.

1. Follow steps 1-3 for creating the problem in the simple editor.

2. Select **Advanced Editor**. The advanced editor opens the template and shows the OLX markup that you can use for this problem type.

3. Replace the guidance provided by the template to add your own text. For example, replace the question or prompt, answer options, and explanation.

   To format equations, you can use MathJax. For more information, see *Using MathJax for Mathematics*.

4. Update the OLX to add optional elements and attributes required for your problem.

5. Select **Settings** to provide an identifying **Display Name** and define settings for the problem. For more information, see *Defining Settings for Problem Components*.

6. Select **Save**.

Note: On editing and saving please make sure that a multiple choice problem is encapsulated inside **<problem>** tag. The problem will render correctly in **Studio** but will fail when exported and then imported to a course. For a sample XML structure, see *Multiple Choice Problem OLX Reference*.

10.25.3 Adding Feedback to a Multiple Choice Problem

For an overview of feedback in problems, see *Adding Feedback and Hints to a Problem*. You can add feedback for each of the answer options you provide in the problem. Use the following guidelines when providing feedback.

- Add feedback to incorrect answers to target common misconceptions and mistakes.

- Ensure feedback provides some guidance to the learner about how to arrive at the correct answer.

- Add feedback for the correct answer to reinforce why the answer is correct. Because learners are able to guess, ensure that feedback provides a reason why the answer is correct for learners who might have selected that answer by chance.

You can add feedback in a multiple choice problem using the simple editor or the advanced editor.

Configuring Feedback in the Simple Editor

You can configure feedback in the *simple editor*. When you add a multiple choice problem, select the template **Multiple Choice with Hints and Feedback**. This template has example feedback syntax that you can replace.

```
( ) answer {{Feedback for learners who select this answer.}}
```

For example, the following problem has feedback for every answer option.

```
>>Which of the following is an example of a vegetable?||You can select only one option.<<

( ) apple {{An apple is the fertilized ovary that comes from an apple tree
and contains seeds classifying it as a fruit.}}
( ) pumpkin {{A pumpkin is the fertilized ovary of a squash plant and
contains seeds classifying it as a fruit.}}
(x) potato {{A potato is an edible part of a plant in tuber form and is
classified as a vegetable}}
( ) tomato {{Many people mistakenly think a tomato is a vegetable. However,
because a tomato is the fertilized ovary of a tomato plant and contains
seeds it is classified as a fruit.}}
```

Configuring Feedback in the Advanced Editor

In the advanced editor, you configure feedback with the following syntax.

```
<choice correct="false">Choice Label
  <choicehint>Feedback for when learner selects this answer.</choicehint>
</choice>
```

For example, the following problem has feedback for each answer.

```
<problem>
  <multiplechoiceresponse>
    <label>Which of the following is an example of a vegetable?</label>
    <description>You can select only one option.</description>
    <choicegroup type="MultipleChoice">
      <choice correct="false">apple
        <choicehint>An apple is the fertilized ovary that comes from an apple
         tree and contains seeds classifying it as a fruit.</choicehint>
      </choice>
      <choice correct="false">pumpkin
        <choicehint>A pumpkin is the fertilized ovary of a squash plant
         and contains seeds classifying it as a fruit.</choicehint>
      </choice>
      <choice correct="true">potato
        <choicehint>A potato is an edible part of a plant in tuber form and
         is classified as a vegetable.</choicehint>
      </choice>
      <choice correct="false">tomato
        <choicehint>Many people mistakenly think a tomato is a vegetable.
         However, because a tomato is the fertilized ovary of a tomato plant
         and contains seeds it is classified as a fruit.</choicehint>
      </choice>
```

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```
      </choicegroup>
   </multiplechoiceresponse>
</problem>
```

Customizing Feedback Labels

By default, the feedback labels shown to learners are **Correct** and **Incorrect**. If you do not define feedback labels, learners see these terms when they submit an answer, as in the following example.

```
Incorrect: A pumpkin is the fertilized ovary of a squash plant and contains
seeds classifying it as a fruit.
```

You can configure the problem to override the default labels. For example, you can configure a custom label for a specific wrong answer.

```
Not Quite: Many people mistakenly think a tomato is a vegetable. However,
because a tomato is the fertilized ovary of a tomato plant and contains seeds
it is classified as a fruit.
```

Note: The default labels **Correct** and **Incorrect** display in the learner's requested language. If you provide custom labels, they display as you define them to all learners. They are not translated into different languages.

Customize Feedback Labels in the Simple Editor

In the *simple editor*, you configure custom feedback labels with the following syntax.

```
( ) Answer {{Label:: Feedback for learners who select this answer.}}
```

That is, you provide the label text, followed by two colon (:) characters, before the feedback text.

For example, the following feedback is configured to use a custom label.

```
( ) tomato {{Not Quite:: Many people mistakenly think a tomato is a
vegetable. However, because a tomato is the fertilized ovary of a tomato
plant and contains seeds, it is a fruit.}}
```

Customize Feedback Labels in the Advanced Editor

In the *advanced editor*, you configure custom feedback labels with the following syntax.

```
<choice correct="true or false">Answer
  <choicehint label="Custom Label">Feedback for learners who select this
   answer.</choicehint>
</choice>
```

For example, the feedback for the following answer option is configured to use a custom label.

```
<choice correct="false">tomato
  <choicehint label="Not Quite">Many people mistakenly think a tomato is a
   vegetable. However, because a tomato is the fertilized ovary of a tomato
   plant and contains seeds, it is a fruit.</choicehint>
</choice>
```

10.25.4 Adding Hints to a Multiple Choice Problem

You can add hints to a multiple choice problem using the simple editor or the advanced editor. For an overview of hints in problems, see *Adding Feedback and Hints to a Problem*.

Configure Hints in the Simple Editor

In the simple editor, you configure hints with the following syntax.

```
||Hint 1||
||Hint 2||
||Hint n||
```

Note: You can configure any number of hints. The learner views one hint at a time and views the next one by selecting **Hint** again.

For example, the following problem has two hints.

```
||A fruit is the fertilized ovary from a flower.||
||A fruit contains seeds of the plant.||
```

Configure Hints in the Advanced Editor

In the advanced editor, you add the <demandhint> element immediately before the closing </problem> tag, and then configure each hint using the <hint> element.

```
.
.
.
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
  <hint>Hint 3</hint>
</demandhint>
</problem>
```

For example, the following OLX for a multiple choice problem shows two hints.

```
.
.
.
</multiplechoiceresponse>
<demandhint>
```

```
  <hint>A fruit is the fertilized ovary from a flower.</hint>
  <hint>A fruit contains seeds of the plant.</hint>
</demandhint>
</problem>
```

10.25.5 Awarding Partial Credit in a Multiple Choice Problem

You can configure a multiple choice problem so that specific incorrect answers award learners partial credit for the problem. You must use the *advanced editor* to configure partial credit.

In the following example, the learner selected a wrong answer and received partial credit.

You can specify what percentage of the points for the problem a learner receives for an incorrect answer. If you do not specify the percentage, the system uses the default of 50%.

For an overview of partial credit in problems, see *Awarding Partial Credit for a Problem*.

Configure a Multiple Choice Problem to Award Partial Credit

To configure a multiple choice problem to award partial credit for a specific answer, you add the following attributes to the problem OLX.

- Add the `partial_credit="points"` attribute to the `<multiplechoiceresponse>` element.

- For each answer that you intend to award partial credit, in the `<choice>` element set the value of the `correct` attribute to `"partial"`.

- Optionally, define the percentage of the problem score to award for each answer. Add the `point_value` attribute to the `<choice>` element, and enter its value as a decimal. For example, add `point_value="0.25"` to award 25% of the points to learners who select that answer. The percentage awarded should reflect how close the learner

---

has gotten to a full understanding of the concept. If you do not add the `point_value` attribute, the system uses the default of 50%.

For example, the following OLX shows a multiple choice problem that provides partial credit of 25% for an answer option.

```
<problem>
  <multiplechoiceresponse partial_credit="points">
    <label>Which of the following is a vegetable?</label>
    <choicegroup type="MultipleChoice">
      .
      .
      .
      <choice correct="partial" point_value="0.25">tomato </choice>
    </choicegroup>
  </multiplechoiceresponse>
</problem>
```

10.25.6 Multiple Choice Problem OLX Reference

Note: You can also set attributes and options by adding a `<script>` element. For more information, see *Using the Script Element*.

Template

```
<problem>
  <multiplechoiceresponse>
    <label>Question or prompt text</label>
    <description>Optional information about how to answer the question</description>
    <choicegroup type="MultipleChoice">
      <choice correct="false" name="a">Incorrect choice
        <choicehint>Hint for incorrect choice.</choicehint>
      </choice>
      <choice correct="true" name="b">Correct choice
        <choicehint>Hint for correct choice.</choicehint>
      </choice>
    </choicegroup>
    <solution>
      <div class="detailed-solution">
        <p>Optional header for the explanation or solution</p>
        <p>Optional explanation or solution text</p>
      </div>
    </solution>
  </multiplechoiceresponse>
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
</demandhint>
</problem>
```

Elements

For multiple choice problems, the `<problem>` element can include this hierarchy of child elements.

```
<multiplechoiceresponse>
    <label>
    <description>
    <choicegroup>
            <choice>
                <choicehint>
    <solution>
<demandhint>
    <hint>
```

In addition, standard HTML tags can be used to format text.

`<multiplechoiceresponse>`

Required. Indicates that the problem is a multiple choice problem.

Attributes

Attribute	Description
`partial_credit`	Optional. Specifies that the problem can award partial credit. If used, must be set to "`points`".

Children

- `<label>`
- `<description>`
- `<choicegroup>`
- `<solution>`

`<label>`

Required. Identifies the question or prompt. You can include HTML tags within this element.

Attributes

None.

Children

None.

`<description>`

Optional. Provides clarifying information about how to answer the question. You can include HTML tags within this element.

Attributes

None.

Children

None.

`<choicegroup>`

Required. Indicates the beginning of the list of answer options.

Attributes

Attribute	Description
`type`	Required. Must be set to `"MultipleChoice"`.

Additional attributes are available to support *advanced options*.

Children

`<choice>`

`<choice>`

Required. Lists an answer option.

Attributes

Attribute	Description
correct	Indicates a correct, incorrect, or partially correct answer. • When set to "true", the choice is a correct answer. At least one required. • When set to "false", the choice is an incorrect answer. • When set to "partial", the learner receives partial credit for selecting the answer. You can specify more than one correct or partially correct answer, but learners can select only one choice to submit as their answer.
point_value	When correct="partial", indicates the percentage, as a decimal, of the points the learner receives for selecting this option. If point_value is not specified for a partial credit answer, 50% is used by default.
name	A unique name that is used internally to refer to the choice.

Additional attributes are available to support *advanced options*.

Children

<choicehint>

<choicehint>

Optional. Specifies feedback for the answer.

Attributes

None.

Children

None.

<solution>

Optional. Identifies the explanation or solution for the problem, or for one of the questions in a problem that includes multiple questions.

This element contains an HTML division <div>. The division contains one or more paragraphs <p> of explanatory text.

`<demandhint>`

Optional. Specifies hints for the learner. For problems that include multiple questions, the hints apply to the entire problem.

Attributes

None.

Children

`<hint>`

`<hint>`

Required. Specifies additional information that learners can access if needed.

Children

None.

10.25.7 Advanced Options for Multiple Choice Problems

Multiple choice problems have several advanced options. You can change the order of answers in the problem, include explanations that appear when a learner selects a specific incorrect answer, or present a random set of choices to each learner. For more information, see the following sections.

- *Shuffle Answers in a Multiple Choice Problem*
- *Targeted Feedback in a Multiple Choice Problem*
- *Answer Pools in a Multiple Choice Problem*
- *Using the Script Element*

Shuffle Answers in a Multiple Choice Problem

Optionally, you can configure a multiple choice problem so that it shuffles the order of possible answers.

For example, one view of a problem could be as follows.

```
What Apple device competed with the portable CD player?

( ) The iPad
( ) Napster
( ) The iPod
( ) The vegetable peeler
```

Another view of the same problem, for a different learner or for the same learner on a subsequent view of the unit, could be as follows.

```
What Apple device competed with the portable CD player?

( ) The iPad
( ) The iPod
( ) The vegetable peeler
( ) Napster
```

You can also shuffle some answers, but not others. For example, you might want to include the answer "All of the above" and have it always appear at the end of the list, but shuffle the other answers.

You can configure the problem to shuffle answers using the simple editor or advanced editor. To shuffle the answers, you also edit the problem to set **Randomization** to a value other than **Never**. For more information, see *Randomization*.

Use the Simple Editor to Shuffle Answers

You can configure the problem to shuffle answers in the *simple editor*. To add shuffling to this problem, you add an exclamation point character ! between the parentheses formatting for the first answer option.

```
>>What Apple device competed with the portable CD player?<<
    (!) The iPad
    ( ) Napster
    (x) The iPod
    ( ) The vegetable peeler
```

To make the location of an answer fixed in a shuffled list, add @ between the parentheses formatting for that answer.

```
>>What Apple device competed with the portable CD player?<<
    (!) The iPad
    ( ) Napster
    (x) The iPod
    ( ) The vegetable peeler
    (@) All of the above
```

You can combine symbols within the parentheses as necessary. For example, to show the correct answer in a fixed location, you can use both x and @.

```
(x@) The iPod
```

After you complete problem setup in the simple editor, select **Edit** and then **Settings** to specify an option other than **Never** for the **Randomization** setting.

Use the Advanced Editor to Shuffle Answers

You can configure the problem to shuffle answers by editing the OLX in the *advanced editor*.

To add shuffling to a problem, you add `shuffle="true"` to the `<choicegroup>` element.

```
<problem>
  <multiplechoiceresponse>
    <label>What Apple device competed with the portable CD player?</label>
    <choicegroup type="MultipleChoice" shuffle="true">
      <choice correct="false">The iPad</choice>
      <choice correct="false">Napster</choice>
      <choice correct="true">The iPod</choice>
      <choice correct="false">The vegetable peeler</choice>
    </choicegroup>
  </multiplechoiceresponse>
</problem>
```

To make the location of an answer fixed in a shuffled list, add `fixed="true"` to the `choice` element for the answer.

```
<problem>
  <multiplechoiceresponse>
    <label>What Apple device competed with the portable CD player?</label>
    <choicegroup type="MultipleChoice" shuffle="true">

      .
      .
      .

      <choice correct="false" fixed="true">All of the above</choice>
    </choicegroup>
  </multiplechoiceresponse>
</problem>
```

Then, you select **Settings** to specify an option other than **Never** for the **Randomization** setting.

Targeted Feedback in a Multiple Choice Problem

You can configure a multiple choice problem so that explanations for specific answers are automatically shown to learners. You can use these explanations to guide learners towards the right answer. Therefore, targeted feedback is most useful for multiple choice problems for which learners are allowed multiple attempts.

Use the Advanced Editor to Configure Targeted Feedback

You configure the problem to provide targeted feedback by editing the OLX in the *advanced editor*.

- Add a `targeted-feedback` attribute to the `<multiplechoiceresponse>` element, with no value: `<multiplechoiceresponse targeted-feedback="">`.

- Add an `explanation-id` attribute with a unique value to each of the `<choice>` elements: `<choice correct="false" explanation-id="feedback1">`.

- You can use the `<solution>` element for the correct answer.

- Add a `<targetedfeedbackset>` element after the `<multiplechoiceresponse>` element.

- Within `<targetedfeedbackset>`, add one or more `<targetedfeedback>` elements.

- Within each <targetedfeedback> element, add one of the unique identifying `explanation-id` attributes to map that feedback to a specific answer choice.

- Within each <targetedfeedback> element use HTML formatting, such as <p></p> tags, to enter your explanation for the specified answer option.

For example, the OLX for a multiple choice problem follows, showing a unique ID for each answer choice. This is immediately followed by OLX that defines the targeted feedback.

```
<problem>
  <multiplechoiceresponse targeted-feedback="">
    <label>What Apple device competed with the portable CD player?</label>
    <choicegroup type="MultipleChoice">
      <choice correct="false" explanation-id="feedback1">The iPad</choice>
      <choice correct="false" explanation-id="feedback2">Napster</choice>
      <choice correct="true" explanation-id="correct">The iPod</choice>
      <choice correct="false" explanation-id="feedback3">The vegetable peeler</choice>
    </choicegroup>
    <solution explanation-id="correct">
      <div class="detailed-solution">
        <p>The iPod directly competed with portable CD players.</p>
      </div>
    </solution>
  </multiplechoiceresponse>
  <targetedfeedbackset>
    <targetedfeedback explanation-id="feedback1">
      <div class="detailed-targeted-feedback">
        <p>Targeted Feedback</p>
        <p>The iPad came out later and did not directly compete with
         portable CD players.</p>
      </div>
    </targetedfeedback>
    <targetedfeedback explanation-id="feedback2">
      <div class="detailed-targeted-feedback">
        <p>Targeted Feedback</p>
        <p>Napster was not an Apple product.</p>
      </div>
    </targetedfeedback>
    <targetedfeedback explanation-id="feedback3">
      <div class="detailed-targeted-feedback">
        <p>Targeted Feedback</p>
        <p>Vegetable peelers do not play music.</p>
      </div>
    </targetedfeedback>
  </targetedfeedbackset>
</problem>
```

Answer Pools in a Multiple Choice Problem

You can configure a multiple choice problem so that a random subset of choices are shown to each learner. For example, you can add 10 possible choices to the problem, and each learner views a set of five choices.

The answer pool must have at least one correct answer. It can have more than one correct answer. In each set of choices shown to a learner, one correct answer is included. For example, you can configure two correct answers in the set of choices. One of the two correct answers is included in each set that a learner views.

Use the Advanced Editor to Configure Answer Pools

You configure the problem to provide answer pools by editing the OLX for the problem in the *advanced editor*.

- In the <choicegroup> element, add the answer-pool attribute, with the numerical value indicating the number of answer options to show to learners. For example, <choicegroup answer-pool="4">.

- If you include more than one correct answer among the options, for each correct answer add an explanation-id attribute with a unique value to the <choice> element: <choice correct="false" explanation-id="correct1">.

- If you include more than one correct answer among the options, for each <solution> element, add an explanation-id attribute and a value that maps back to a specific correct answer. For example, <solution explanation-id="correct1">.

- Place the <solution> elements within a <solutionset> element.

Note: If the choices include only one correct answer, you do not have to use the explanation-id in either the <choice> or <solution> element. You do still use the <solutionset> element to wrap the <solution> element.

For example, for the following multiple choice problem, a learner will see four choices. In each set, one of the choices will be one of the two correct choices. The explanation shown for the correct answer is the one with the same explanation ID.

```
<problem>
  <multiplechoiceresponse>
    <label>What Apple devices let you carry your digital music library in your pocket?</
→label>
    <description>You can select only one option.</description>
    <choicegroup type="MultipleChoice" answer-pool="4">
      <choice correct="false">The iPad</choice>
      <choice correct="false">Napster</choice>
      <choice correct="true" explanation-id="iPod">The iPod</choice>
      <choice correct="false">The vegetable peeler</choice>
      <choice correct="false">The iMac</choice>
      <choice correct="true" explanation-id="iPhone">The iPhone</choice>
    </choicegroup>
    <solutionset>
      <solution explanation-id="iPod">
        <div class="detailed-solution">
          <p>Explanation</p>
          <p>The iPod is Apple's portable digital music player.</p>
        </div>
      </solution>
      <solution explanation-id="iPhone">
```

(continues on next page)

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```
        <div class="detailed-solution">
          <p>Explanation</p>
          <p>In addition to being a cell phone, the iPhone can store and play
           your digital music.</p>
        </div>
      </solution>
    </solutionset>
  </multiplechoiceresponse>
</problem>
```

Using the Script Element

You can use the <script> element to programmatically set attributes and options for your multiple choice problems. You could use this feature to display different questions/answers depending on variable factors, like time of day, or randomly generated numbers.

Use the Advanced Editor to Configure the Script Element

You must use the *advanced editor* to configure a <script> element.

The contents of the <script> element must be enclosed in <![CDATA[...]]> markers, to indicate that the enclosed code should not be interpreted as XML.

The code in the <script> element is run on the server before the problem is shown to learners. Note that only Python script types are supported.

The following OLX example uses random numbers to generate different answer choices for each learner, and mathematical operators to determine each choice's correctness.

```
<problem>
    <script type="text/python">
    <![CDATA[
    random.seed(anonymous_student_id)  # Use different random numbers for each student.
    a = random.randint(1,10)
    b = random.randint(1,10)
    c = a + b

    ok0 = c % 2 == 0 # check remainder modulo 2
    text0 = "$a + $b is even"

    ok1 = c % 2 == 1 #check remainder modulo 2
    text1 = "$a + $b is odd"
    ]]>
    </script>
    <multiplechoiceresponse>
      <label>Is $a+$b even or odd? Select the true statement.</label>
      <choicegroup type="MultipleChoice">
        <choice correct="$ok0">$text0 ... (should be $ok0)</choice>
        <choice correct="$ok1">$text1 ... (should be $ok1)</choice>
      </choicegroup>
    </multiplechoiceresponse>
</problem>
```

10.26 Multiple Choice and Numerical Input Problem

Note: EdX does not support this problem type.

You can create a problem that combines a multiple choice and numerical input problems. Students not only select a response from options that you provide, but also provide more specific information, if necessary.

Note: Currently, students can only enter numerals in the text field. Students cannot enter words or mathematical expressions, which might be confusing to students who are accustomed to other edX numerical input fields.

You can make a calculator available to your learners on every unit page. For more information, see *Calculator Tool*.

10.26.1 Create a Multiple Choice and Numerical Input Problem

To create a multiple choice and numerical input problem, follow these steps.

1. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

2. Click **Blank Advanced Problem**.

3. In the component that appears, click **Edit**.

4. In the component editor, paste the code from below.

5. Replace the example problem and response options with your own text.

6. Click **Save**.

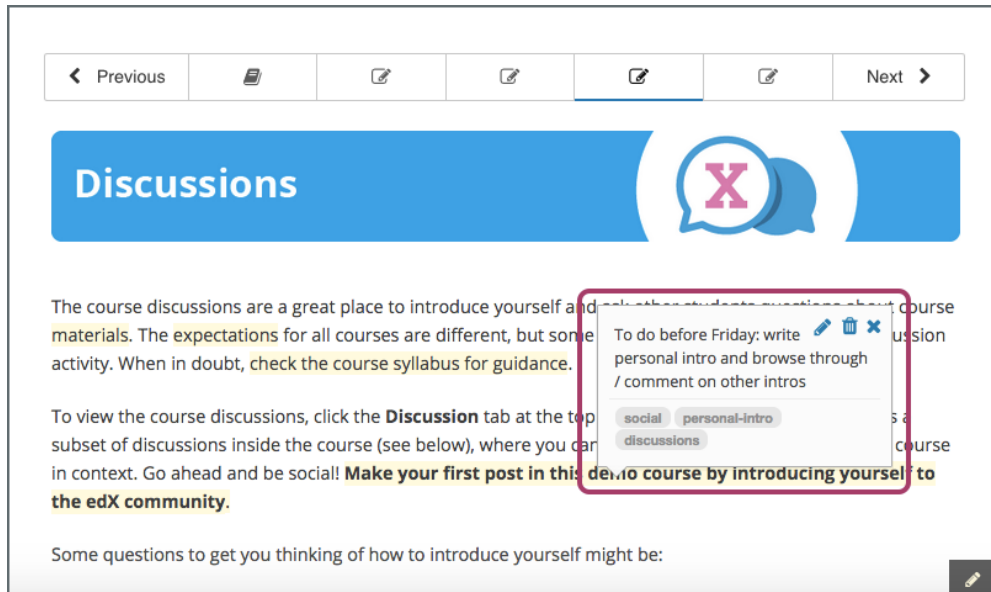### 10.26.2 Multiple Choice and Numerical Input Problem Code

```
<problem>
The numerical value of pi, rounded to two decimal places, is 3.24.
  <choicetextresponse>
    <radiotextgroup>
      <choice correct="false">True.</choice>
      <choice correct="true">False. The correct value is <numtolerance_input answer="3.14
→"/>.</choice>
    </radiotextgroup>
  </choicetextresponse>
</problem>
```
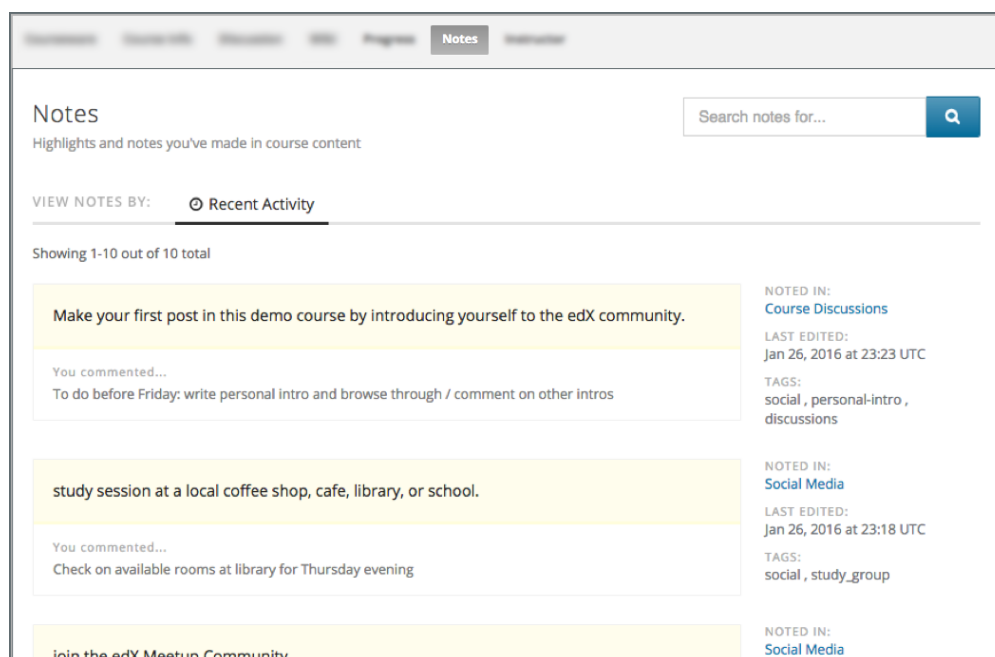
10.27 Notes Tool

Note: EdX offers full support for this tool.

The notes tool allows learners to highlight and make notes about what they read in the body of the course.

Note: The notes tool is available for text, including text in Text components. However, the tool is currently not available for discussions, exercises, video transcripts, or PDF documents.

Learners can access their notes either in the body of the course or on a **Notes** page. On the **Notes** page, a learner can see all the notes that she has made during the course. The page also contains links to the location of the notes in the course body.

You must enable the Notes tool before learners can use it. To enable the Notes tool, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.
2. Click the gear icon on the **Notes** card shown on this page.
3. From the **Configure notes** modal, select the toggle to enable or disable the notes application.
4. Select **Apply** to save your configuration changes.

For more information about the ways learners can use notes, see Taking Notes in an edX Course.

10.28 Numerical Input Problem

Note: EdX offers full support for this problem type.

The numerical input problem type is a core problem type that can be added to any course. At a minimum, numerical input problems include a question or prompt and a response field for a numeric answer. By adding hints, feedback, or both, you can give learners guidance and help when they work on a problem.

- *Overview*
  - *Example Numerical Input Problem*
  - *Analyzing Performance on Numerical Input Problems*
- *Adding a Numerical Input Problem*
  - *Use the Simple Editor to Add a Numerical Input Problem*
  - *Use the Advanced Editor to Add a Numerical Input Problem*
- *Adding a Tolerance, Multiple Correct Responses, or a Range*

For more information about the core problem types, see *Working with Problem Components*.

10.28.1 Overview

In numerical input problems, learners enter numbers or specific and relatively simple mathematical expressions to answer a question. The LMS automatically converts the answer that learners enter into a symbolic expression that appears below the response field.

Responses for numerical input problems can include integers, fractions, and constants such as pi and *g*. Responses can also include text representing common functions, such as square root (sqrt) and log base 2 (log2), as well as trigonometric functions and their inverses, such as sine (sin) and arcsine (arcsin). For these functions, learners enter text that is converted into mathematical symbols. The following example shows a response entered by a learner and the numerical expression that results.
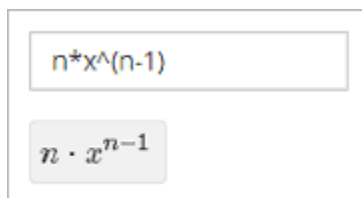
```
n*x^(n-1)
```

$$n \cdot x^{n-1}$$

For more information about how learners enter expressions, see learners:Math Formatting in the *EdX Learner's Guide* or Completing Mathematical and Scientific Assignments in the *Open edX Learner's Guide*.

Some of the options for numerical input problems include the following.

- You can specify a correct answer explicitly or use a Python script.

- You can specify a margin of error, or tolerance, for the answers to numerical input problems so that learners' responses do not have to be exact.

Note: You can make a calculator tool available to your learners on every unit page. For more information, see *Calculator Tool*.

Example Numerical Input Problem

In the LMS, learners enter a value into a response field to complete a numerical input problem. An example of a completed numerical input problem follows.

Numerical Input with Hints and Feedback
1/1 point (graded)

In what base is the decimal numeral system?

10 ✔

10

Answer
Correct: The decimal numeral system is in base ten.

Submit

You have used 1 of 5 attempts

✔ Correct (1/1 point)

To add the example problem illustrated above, in Studio you use the simple editor to enter the following text and Markdown formatting.

```
>>In what base is the decimal numeral system?<<

=10 {{The decimal numeral system is in base ten.}}
```

The open learning XML (OLX) markup for this example numerical input problem follows.

```
<problem>
  <numericalresponse answer="10">
    <label>In what base is the decimal numeral system?</label>
    <formulaequationinput/>
    <solution>
      <div class="detailed-solution">
        <p>Explanation</p>
        <p>The decimal numeral system is base ten.</p>
      </div>
```

```
    </solution>
  </numericalresponse>
</problem>
```

Analyzing Performance on Numerical Input Problems

For the numerical input problems in your course, you can use edX Insights to review aggregated learner performance data and examine submitted answers. For more information, see Using edX Insights.

10.28.2 Adding a Numerical Input Problem

You add numerical input problems in Studio by selecting the **Problem** component type and then using either the simple editor or the advanced editor to specify the prompt and the acceptable answer or answers.

> • *Use the Simple Editor to Add a Numerical Input Problem*
>
> • *Use the Advanced Editor to Add a Numerical Input Problem*

Note: You can begin work on the problem in the simple editor, and then switch to the advanced editor. However, after you save any changes you make in the advanced editor, you cannot switch back to the simple editor.

Before you add a numerical input problem, consider the following features and limitations of the simple and advanced editors.

- If your problem text contains italics, bold, or special characters, the simple editor does not support these values. Use the advanced editor to add an HTML paragraph (<p>) element and HTML formatting tags as needed.

- If your problem contains a Python script, use the advanced editor.

For example, you must use the advanced editor to define the following numerical input problem. It contains two questions, one of which relies on character formatting, and the other that uses a Python script.

The OLX for this example follows.

Note: The second question in the following example includes a Python script. When you add a script to a problem component, do not add to or change its internal indentation. A "jailed code" error message appears when you save the problem in Studio if the `<script>` element is indented.

```
<problem>
  <numericalresponse answer="9.80665">
      <p>Enter the value of the standard gravity constant <i>g</i>,
       measured in m/s<sup>2</sup>.</p>
      <label>What is the answer to the question above?</label>
      <description>Give your answer to at least two decimal places.</description>
      <responseparam type="tolerance" default="0.01" />
      <formulaequationinput />
<script type="loncapa/python">
computed_response = math.sqrt(math.fsum([math.pow(math.pi,2), math.pow(math.e,2)]))
</script>
      <solution>
          <div class="detailed-solution">
              <p>Explanation</p>
              <p>The standard gravity constant is defined to be precisely
               9.80665 m/s<sup>2</sup>. This is 9.80 to two decimal places.
               Entering 9.8 also works.</p>
          </div>
      </solution>
  </numericalresponse>

  <numericalresponse answer="$computed_response">
```

```
        <label>What is the distance in the plane between the points (pi, 0)
         and (0, e)?</label>
        <description>You can type math.</description>
        <responseparam type="tolerance" default="0.0001" />
        <formulaequationinput />
        <solution>
            <div class="detailed-solution">
                <p>Explanation</p>
                <p>By the distance formula, the distance between two points in
                 the plane is the square root of the sum of the squares of the
                 differences of each coordinate. Even though an exact numerical
                 value is checked in this case, the easiest way to enter this
                 answer is to type <code>sqrt(pi^2+e^2)</code> into the editor.
                 Other answers like <code>sqrt((pi-0)^2+(0-e)^2)</code> also
                 work.</p>
            </div>
        </solution>
    </numericalresponse>
</problem>
```

For more information about including a Python script in a problem, see *Write-Your-Own-Grader Problem*.

Use the Simple Editor to Add a Numerical Input Problem

When you add a numerical input problem, you can choose one of these templates.

- **Numerical Input**

- **Numerical Input with Hints and Feedback**

These templates include the Markdown formatting that you use in the simple editor to add a problem without, or with, hints and feedback.

To use the *simple editor* to add a problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**.

2. From the list of **Common Problem Types**, select the type of problem you want to add. Studio adds a template for the problem to the unit.

3. Select **Edit**. The simple editor opens to a template that shows the Markdown formatting that you use for this problem type.

4. Replace the guidance provided by the template to add your own text for the question or prompt, answer options, explanation, and so on.

   To format equations, you can use MathJax. For more information, see *Using MathJax for Mathematics*.

5. Select **Settings** to provide an identifying **Display Name** and define settings for the problem. For more information, see *Defining Settings for Problem Components*.

6. Select **Save**.

Use the Advanced Editor to Add a Numerical Input Problem

You can use the advanced editor to identify the elements of a numerical input problem with OLX. For more information, see *Numerical Input Problem OLX Reference*.

To use the *advanced editor* to add a problem, follow these steps.

1. Follow steps 1-3 for creating the problem in the simple editor.

2. Select **Advanced Editor**. The advanced editor opens the template and shows the OLX markup that you can use for this problem type.

3. Replace the guidance provided by the template to add your own text. For example, replace the question or prompt, answer options, and explanation.

   To format equations, you can use MathJax. For more information, see *Using MathJax for Mathematics*.

4. Update the OLX to add optional elements and attributes required for your problem.

5. Select **Settings** to provide an identifying **Display Name** and define settings for the problem. For more information, see *Defining Settings for Problem Components*.

6. Select **Save**.

10.28.3 Adding a Tolerance, Multiple Correct Responses, or a Range

To give learners the option to receive full credit for a close approximation of the correct answer, and to support a wide range of possible correct numerical answers, you can specify a tolerance for the correct answer, multiple individual correct answers, or a range of values to mark as correct for the numerical input problem type.

- *Adding a Tolerance*
- *Adding Multiple Correct Responses*
- *Specifying an Answer Range*

Adding a Tolerance

You can specify a margin of error or tolerance for learner responses. You can specify a percentage, number, or range.

Add a Tolerance in the Simple Editor

To add a tolerance in the simple editor you use the following Markdown formatting.

- To specify a number on either side of the correct answer, after the answer value add +-{number}. For example, to include a tolerance of 5, add +-5.

- To specify a percentage on either side of the correct answer, after the answer value add +-{number}%. For example, to include a 2% tolerance, add +-2%.

Add a Tolerance in the Advanced Editor

To add a tolerance in the advanced editor you include a `<responseparam>` element with a `type="tolerance"` attribute and a `default` attribute set to either a number or a percentage value.

The following example shows a problem with a decimal tolerance.

```
<problem>
  <numericalresponse answer="ANSWER (NUMBER)">
    <label>Question text</label>
    <responseparam type="tolerance" default=".02" />
    <formulaequationinput />
  </numericalresponse>
</problem>
```

The following example shows a problem with a percentage tolerance.

```
<problem>
  <numericalresponse answer="ANSWER (NUMBER)">
    <label>Question text</label>
    <responseparam type="tolerance" default="3%" />
    <formulaequationinput />
  </numericalresponse>
</problem>
```

Adding Multiple Correct Responses

You can specify more than one specific, correct response for numerical input problems. To do this, you can use the simple editor or the advanced editor.

If you specify multiple correct responses, you cannot also specify a tolerance, a range, or a text string as correct answers. For example, when you define multiple correct responses, you can specify a numeric value for each correct answer but not a tolerance, range, or text string.

Add Multiple Correct Responses in the Simple Editor

To specify additional correct responses in the simple editor, include `or=` before each additional correct response.

```
>>How many miles away from Earth is the sun?||Use scientific notation to answer.<<

= 9.3*10^7
or= 9.296*10^7
```

Add Multiple Correct Responses in the Advanced Editor

To specify an additional correct response in the advanced editor, within the `<numericalresponse>` element add the `<additional_answer />` element with an `answer=""` attribute value.

```
<problem>
  <numericalresponse answer="9.3*10^7">
    <label>How many miles away from Earth is the sun?</label>
    <description>Use scientific notation to answer.</description>
    <additional_answer answer="9.296*10^7"/>
    <formulaequationinput/>
  </numericalresponse>
</problem>
```

Specifying an Answer Range

You can specify an answer range so that any learner response within that range is marked correct. To format an answer range, you provide the starting and ending values and then separate them with a comma character (`,`). You then surround the range with bracket (`[ ]`) or parentheses characters (`( )`), or a combination of one bracket and one parenthesis.

- Use a bracket to include the number next to it in the range, as in a less than or equal to, or greater than or equal to, inequality.

- Use a parenthesis to exclude the number from the range, as in a less than or greater than inequality.

For example, to identify the correct answers as 5, 6, or 7, but not 8, specify `[5,8)`. To identify the correct answers as 6, 7, and 8, but not 5, specify `(5,8]`.

To specify a range in the simple editor, you enter the complete, formatted range after the equals sign: `=[5,8)` or `=(5,8]`.

To specify a range in the advanced editor, you enter the complete, formatted range in the `<numericalresponse>` element as the value for the `answer` attribute: `<numericalresponse answer="[5,8)">` or `<numericalresponse answer="(5,8]">`

10.28.4 Adding Feedback to a Numerical Input Problem

For an overview of feedback in problems, see *Adding Feedback and Hints to a Problem*. In numerical input problems, you can provide feedback for correct responses. If you define multiple correct responses, you can define feedback for each response.

Note: You cannot provide feedback for incorrect answers in numerical input problems.

In numerical input problems, use feedback to reinforce the process used to arrive at the correct answer.

Configure Feedback in the Simple Editor

You can configure feedback in the simple editor. When you add a numerical input problem, select the template **Numerical Input with Hints and Feedback**. This template has example formatted feedback that you can replace with your own text.

In the simple editor, you configure feedback for a numerical input problem with the following Markdown formatting.

```
=Correct Answer {{Feedback for the correct answer.}}
```

For example, the following problem has feedback for the correct answer.

```
>>What is the arithmetic mean for the following set of numbers? (1, 5, 6, 3, 5)<<

=4 {{The mean for this set of numbers is 20 / 5 which equals 4.}}
```

If you define multiple correct responses, you can define feedback for each response.

Configure Feedback in the Advanced Editor

In the advanced editor, you configure answer feedback with the following syntax.

```
<problem>
  <numericalresponse answer="Correct Answer">
    <label>Question text</label>
    <formulaequationinput />
    <correcthint>Feedback for the correct answer</correcthint>
  </numericalresponse>
</problem>
```

For example, the following problem has feedback for the correct answer.

```
<problem>
  <numericalresponse answer="4">
    <label>What is the arithmetic mean for the following set of numbers?
     (1, 5, 6, 3, 5)</label>
    <formulaequationinput />
    <correcthint>The mean for this set of numbers is 20 / 5 which equals 4.</correcthint>
  </numericalresponse>
</problem>
```

If you define multiple correct responses, you can define feedback for each response.

Customizing Feedback Labels

By default, the feedback label shown to learners is **Correct** . If you do not define a feedback label, learners see this term when they submit a correct answer, as in the following example.

```
Correct: The mean for this set of numbers is 20 / 5 which equals 4.
```

You can configure the problem to override the default label. For example, you can configure a custom label for the answer.

```
Good job: The mean for this set of numbers is 20 / 5 which equals 4.
```

Note: The default label, **Correct**, displays in the learner's requested language. If you provide a custom label, it displays as you define it to all learners. It is not translated into different languages.

Customize a Feedback Label in the Simple Editor

In the simple editor, you configure a custom feedback label with the following syntax.

```
=4 {{Label:: Feedback}}
```

That is, you provide the label text, followed by two colon (:) characters, before the feedback text.

For example, the following feedback is configured to use a custom label.

```
=4 {{Good Job:: The mean for this set of numbers is 20 / 5 which equals 4.}}
```

Customize a Feedback Label in the Advanced Editor

In the advanced editor, you configure custom feedback labels with the following syntax.

```
<correcthint label="Custom Label">Feedback</correcthint>
```

For example, the following feedback is configured to use a custom label.

```
<correcthint label="Good Job">The mean for this set of numbers is 20 / 5 which equals 4.
↪</correcthint>
```

10.28.5 Adding Hints to a Numerical Input Problem

You can add hints to a numerical input problem using the simple editor or the advanced editor. For an overview of hints in problems, see *Adding Feedback and Hints to a Problem*.

Configure Hints in the Simple Editor

In the simple editor, you configure hints with the following syntax.

```
||Hint 1||
||Hint 2||
||Hint n||
```

Note: You can configure any number of hints. The learner views one hint at a time and views the next one by selecting **Hint** again.

For example, the following problem has two hints.

```
||A fruit is the fertilized ovary from a flower.||
||A fruit contains seeds of the plant.||
```

Configure Hints in the Advanced Editor

In the advanced editor, you add the <demandhint> element immediately before the closing </problem> tag, and then configure each hint using the <hint> element.

```
.
.
.
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
  <hint>Hint 3</hint>
</demandhint>
</problem>
```

For example, the following OLX for a multiple choice problem shows two hints.

```
.
.
.
</multiplechoiceresponse>
<demandhint>
  <hint>A fruit is the fertilized ovary from a flower.</hint>
  <hint>A fruit contains seeds of the plant.</hint>
</demandhint>
</problem>
```

10.28.6 Awarding Partial Credit in a Numerical Input Problem

You can configure a numerical input problem to award partial credit to learners who submit an answer that is close or related to the correct answer. You must use the *advanced editor* to configure partial credit.

In the following example, the learner entered an answer that was close to the correct answer and received partial credit.

For an overview of partial credit in problems, see *Awarding Partial Credit for a Problem*.

You can use the following methods to award partial credit in a numerical input problem.

- *Identifying Close Answers*
- *Awarding Partial Credit for Answers in a List*

Note: You can use these methods of awarding partial credit individually or in combination.

Identifying Close Answers

You can configure a numerical input problem so that answers that are close to the correct answer receive partial credit.

To do so, you configure the tolerance for incorrect answers. Learners receive partial credit for close answers based on the tolerance. By default, the tolerance is multiplied by 2 and the following rules are applied.

- An answer within the tolerance receives 100% of the points for the problem.
- An answer within or equal to 2x of the tolerance receives 50%.
- An answer more than 2x the outside of the tolerance receives 0%.

You can optionally specify a different multiplier for the tolerance. For example, you could set the multiplier to 3. In this case, the following rules apply.

- An answer within the tolerance receives 100% of the points for the problem.
- An answer within or equal to 3x of the tolerance receives 50%.
- An answer more than 3x outside of the tolerance receives 0%.

Configure Close Answers for a Numerical Input Problem

To configure a numerical input problem to award partial credit for close answers, you add the following attributes to the problem XML.

- Add the `partial_credit="close"` attribute to the `<numericalresponse>` element.

  You can use close answers in combination with a list. Set the attribute to `partial_credit="close,list"`.

- Optionally, add the `partial_range` attribute to the `<responseparam>` element and set its value to the tolerance multiplier. If you do not set the `partial_range` attribute, 2 is used as the tolerance multiplier.

For example, the following OLX shows a numerical problem that provides partial credit for close answers.

```
<problem>
  <numericalresponse answer="9.3*10^7" partial_credit="close">
    <label>How many miles away from Earth is the sun?</label>
    <description>Use scientific notation to answer.</description>
    <formulaequationinput/>
    <responseparam type="tolerance" default="1%" partial_range="3"/>
  </numericalresponse>
</problem>
```

Awarding Partial Credit for Answers in a List

For some numerical input problems, mistakes do not help a learner arrive at the correct answer. For example, a small mistake can lead to negative instead of positive results, or to an answer that is off by a square root or numerical factor.

For these types of problems, you can configure a list of wrong answers that receive partial credit. Learners who submit answers that are on the list receive 50% of the problem's points.

Configure a List for a Numerical Input Problem

To configure a numerical input problem to award partial credit for answers in a list, you add the following attributes to the problem XML.

- Add the `partial_credit="list"` attribute to the `<numericalresponse>` element.

  You can use a list in combination with close answers. Set the attribute to `partial_credit="close,list"`.

- Add the `partial_answers` attribute to the `<responseparam>` element. Set its value to one or more answers that should earn 50% of the problem's points. Separate multiple values by a comma (,).

For example, the following XML shows the numerical problem template updated to provide partial credit for a different answer.

```
<problem>
  <numericalresponse answer="9.3*10^7" partial_credit="close">
    <label>How many miles away from Earth is the sun?</label>
    <description>Use scientific notation to answer.</description>
    <formulaequationinput />
    <responseparam partial_answers="150*10^6"/>
  </numericalresponse>
</problem>
```

10.28.7 Add Text after the Numeric Response Field

You might want to include a word, phrase, or sentence after the response field in a numerical input problem to help guide your students or resolve ambiguity.

To do this, you use the advanced editor.

In the problem, locate the `formulaequationinput` element. This element creates the response field for the problem and is a child of the `numericalresponse` element.

To add text after the response field, add the `trailing_text` attribute together with the symbol or text that you want to use inside the `formulaequationinput` element. An example problem follows with three questions that use this attribute.

Note: You can use MathJax inside the `trailing_text` attribute, as the third question in this example shows. You cannot use HTML inside this attribute.

```
<problem>
  <numericalresponse answer="12.87">
    <label>How far is 8 miles in kilometers?</label>
    <formulaequationinput trailing_text="km" />
  </numericalresponse>

  <numericalresponse answer="91">
    <label>According to the Pew Research Center's Internet and American Life
     Project, what percentage of the world's population had a cellular phone
     as of May 2013?</label>
    <formulaequationinput trailing_text="%" />
  </numericalresponse>
```

(continues on next page)

```
<numericalresponse answer="9.81">
  <label>What is the strength of Earth's gravity, to two decimal places?</label>
  <formulaequationinput trailing_text="\(m/s^{2}\)" />
</numericalresponse>
</problem>
```

10.28.8 Numerical Input Problem OLX Reference

Templates

The following templates represent problems without, and with, a Python script.

Problem with No Tolerance

```
<problem>
  <numericalresponse answer="ANSWER (NUMBER)">
    <label>Question text</label>
    <description>Optional tip</description>
    <formulaequationinput />
    <correcthint>Feedback for the correct answer.</correcthint>
    <solution>
      <div class="detailed-solution">
        <p>Explanation</p>
        <p>TEXT OF SOLUTION</p>
      </div>
    </solution>
  </numericalresponse>
</problem>
```

Answer Created Using a Script

Note: The following example includes a Python script. When you add a script to a problem component, make sure that it is not indented. A "jailed code" error message appears when you save the problem in Studio if the script element is indented.

```
<problem>
  <numericalresponse answer="$computed_response">
    <label>Question text</label>
    <description>Optional tip</description>
    <responseparam type="tolerance" default="0.0001" />
<script type="loncapa/python">
computed_response = math.sqrt(math.fsum([math.pow(math.pi,2), math.pow(math.e,2)]))
</script>
    <formulaequationinput />
    <correcthint>Feedback for the correct answer.</correcthint>
    <solution>
```

```
      <div class="detailed-solution">
        <p>Explanation</p>
        <p>TEXT OF SOLUTION</p>
      </div>
    </solution>
  </numericalresponse>
</problem>
```

Elements

For numerical input problems, the `<problem>` element can include this hierarchy of child elements.

```
<numericalresponse>
    <label>
    <description>
    <formulaequationinput>
    <additional_answer>
    <correcthint>
    <responseparam>
    <script>
    <solution>
<demandhint>
    <hint>
```

In addition, standard HTML tags can be used to format text.

`<numericalresponse>`

Required. Indicates that the problem is a numerical input problem.

The `<numericalresponse>` element is similar to the `<formularesponse>` element used by the *math expression input* problem type, but the `<numericalresponse>` element does not allow unspecified variables.

Attributes

Attribute	Description
`answer`	Required. The correct answer to the problem, given as a mathematical expression.
`partial_credit`	Optional. Specifies the type of partial credit given. `close`, `list`, or a combination of both in any order separated by a comma (,).

Note: If you include a variable name preceded with a dollar sign ($) in the problem `answer`, you can include a script in the problem that computes the expression in terms of that variable.

The grader evaluates the answer that you provide and the learner's response in the same way. The grader also automatically simplifies any numeric expressions that you or a learner provides. Answers can include simple expressions such as "0.3" and "42", or more complex expressions such as "1/3" and "sin(pi/5)".

Children

- `<label>`
- `<description>`
- `<formulaequationinput>`
- `<additional_answer>`
- `<responseparam>`
- `<correcthint>`
- `<script>`
- `<solution>`

`<label>`

Required. Identifies the question or prompt. You can include HTML tags within this element.

Attributes

None.

Children

None.

`<description>`

Optional. Provides clarifying information about how to answer the question. You can include HTML tags within this element.

Attributes

None.

Children

None.

`<formulaequationinput>`

Required. Creates a response field in the LMS where learners enter a response.

Note: Some older problems use a `<textline math="1" />` element instead of `<formulaequationinput>`. However, the `<textline math="1" />` element has been deprecated. All new problems should use the `<formulaequationinput>` element.

Attributes

Attribute	Description
`size`	Optional. Defines the width, in characters, of the response field in the LMS.
`trailing_text`	Optional. Specified text to appear immediately after the response field.

Children

None.

`<additional_answer>`

Optional. Specifies an additional correct answer for the problem. A problem can contain an unlimited number of additional answers.

Attributes

Attribute	Description
`answer`	Required. The alternative correct answer.

Children

`correcthint`

`<responseparam>`

Specifies a tolerance, or margin of error, for an answer.

Attributes

Attribute	Description
`type`	Optional. `"tolerance"` defines a tolerance for a number.
`default`	**Optional. A number or a percentage specifying a numerical or percent** tolerance.
`partial_range`	Optional. For partial credit problems of `type="close"`, a multiplier for the tolerance. Default is 2.
`partial_answers`	**Optional. For partial credit problems of `type="list"`, a comma-** separated list of values that are to receive 50% credit.

Children

None.

`<correcthint>`

Optional. Specifies feedback to appear after the learner submits the correct answer.

Attributes

Attribute	Description
`label`	Optional. The text of the custom feedback label.

Children

None.

`<script>`

Optional. Specifies a script that the grader uses to evaluate a learner's response. A problem behaves as if all of the code in all of the <script> elements were in a single <script> element. Specifically, any variables that are used in multiple <script> elements share a namespace and can be overridden.

As with all Python, indentation matters, even though the code is embedded in XML.

Attributes

Attribute	Description
type	Required. Must be set to `loncapa/python`.

Children

None.

`<solution>`

Optional. Identifies the explanation or solution for the problem, or for one of the questions in a problem that contains more than one question.

This element contains an HTML division <div>. The division contains one or more paragraphs <p> of explanatory text.

`<demandhint>`

Optional. Specifies hints for the learner. For problems that include multiple questions, the hints apply to the entire problem.

Attributes

None.

Children

<hint>

`<hint>`

Required. Specifies additional information that learners can access if needed.

Attributes

None.

Children

None.

10.29 Open Response Assessments

10.29.1 Introduction to Open Response Assessments

In open response assessments (ORA), learners submit essay responses and then go through a series of assessment steps (such as peer assessment and self assessment) to complete the assignment.

Note: Open response assessments that are visible to all learners do not respect cohorts. In other words, it is possible for learners in one cohort to be asked to grade responses for learners in another cohort. If you want to make an open response assessment divided by cohort, you must create that assessment in a course component that is defined as cohort-specific. For more information about cohorts and creating cohort-specific course content, see *Using Cohorts in Your Courses* and *Creating Cohort-Specific Course Content*.

The following topics provide conceptual information about open response assessments.

- *Elements of an Open Response Assessment*

- *How Scores for Open Response Assessments Are Calculated*

- *Best Practices for Open Response Assessments*

For information about creating and managing open response assessments, including step by step instructions, see the following sections.

- *Create an Open Response Assessment Assignment*

- *Managing Open Response Assessment Assignments*

- *Accessing Metrics for ORA Assignments*

For information about the learner experience with open response assessments, see learners:SFD_ORA in the *edX Guide for Learners*.

Elements of an Open Response Assessment

When you create an open response assessment assignment, you include several elements.

- One or more *prompts*, or questions, that learners answer.

- A *rubric*. One rubric is used to grade all the prompts in the assessment.

- One or more *assessment steps*. Assignments can include a learner training step, a peer assessment step, a self assessment step, and a staff assessment step.

Note: If you include a learner training step, you must also include a peer assessment step. The learner training step must come first, before the peer and self assessment steps. If you include a staff assessment step, it should be the final step in the assignment.

For step-by-step instructions for creating an open response assessment, see *Create an Open Response Assessment Assignment*.

Prompts

A **prompt** is the question that you want your learners to answer. You can add more than one prompt in an ORA assignment. In addition to requiring a written response, you can require or allow learners to upload an image or other type of file to accompany their written response.

Within each prompt, you can include helpful information for your learners, such as the approximate number of words or sentences that their responses should have, the types of files that they can upload, or what they can expect after they submit their responses. For more information, see *Step 2. Add Prompts*.

In the learner view of the assignment, each prompt appears above the field where learners enter their responses. For more information, see learners:Steps in an Open Response Assessment.

Rubric

Your assignment must include a **rubric**. Grading for every type of assessment in an ORA assignment (self, peer, or staff) is done by comparing each response against the same rubric. You add one rubric for each problem, regardless of the number of prompts in the problem. The person performing the assessment sees the rubric when she begins grading, and compares the submitted response to the rubric.

A rubric consists of several criteria and a set of options for each criterion.

- **Criteria**. Each criterion describes characteristics that a response should have. Examples are concepts that a response should cover, or the amount of supporting information that a response must include.

  Each criterion has a name and a prompt.

  - The **criterion name** is a one or two word summary of the criterion, such as "Content" or "Organization". This name must be unique within the assignment and cannot be changed after you release the assignment.

  - The **criterion prompt** describes how to evaluate a response based on this criterion.

- **Options**. Each criterion has a set of options, usually a range of ratings, which describe how well each response satisfies the criterion. For example a set of options might be "Fair", "Good", or "Excellent".

  Each option has a name, an explanation, and a point value.

  - The **option name** is a one or two word summary of the rating.

  - The **option explanation** consists of details that help the person performing the assessment to decide whether the response matches the rating. Make sure the explanation for each option is as specific as possible.

  - The **option point value** is the number of grade points given for this option.

Note: Different criteria in the same assignment can have different numbers of options.

You can also include criteria that do not have options, but that do include a field where learners or staff can enter feedback. For more information, see *Provide Only Comment Fields for Individual Criteria*.

In a rubric as it appears to a learner, the following elements are visible.

1. A criterion prompt

2. The names of the criterion's options

3. Descriptions for each option

4. The point value for each option
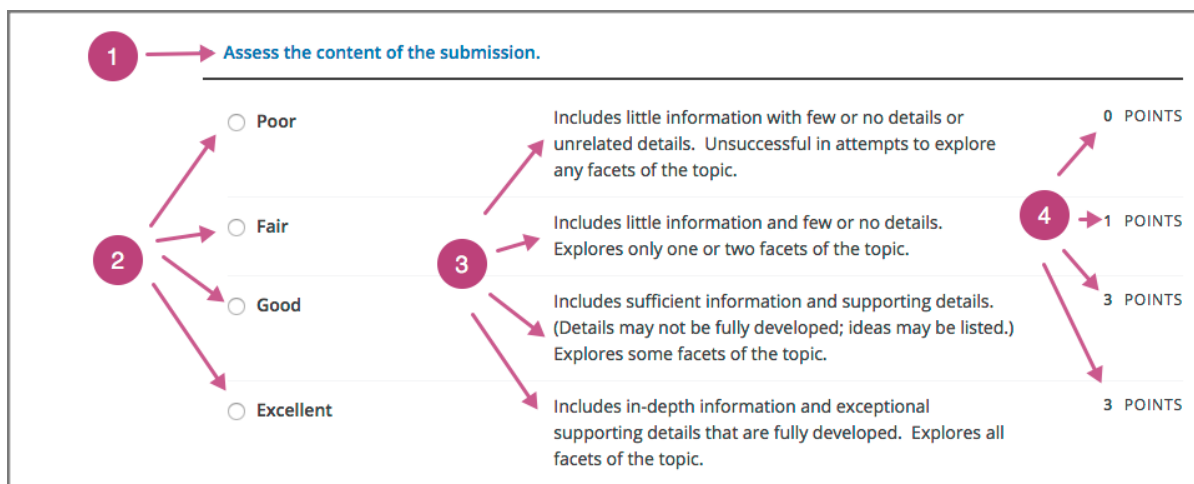
Criterion names do not display in the rubric that learners use to perform their assessments, but do appear on the page that shows the learner's final ORA assignment grade.

For information about creating a rubric, see *Step 3. Add the Rubric*.

An Example Criterion

In a rubric, one criterion and its set of options might resemble the following.

Criterion

Name: Origins

Prompt: Does this response explain the origins of the Hundred Years' War? (5 points possible)

Options

Points	Name	Explanation
0	Not at all	This response does not address the origins of the Hundred Years' War.
1	Dynastic disagreement	This response alludes to a dynastic disagreement between England and France, but doesn't reference Edward III of England and Philip VI of France.
3	Edward and Philip	This response mentions the dynastic disagreement between Edward III and Philip VI, but doesn't address the role of Salic law.
5	Salic law	This response explains the way that Salic law contributed to the dynastic disagreement between Edward III and Philip VI, leading to the Hundred Years' War.

Assessment Steps

In your assignment, you also specify the **assessment steps**. You can set the assignment to include some combination of the following steps.

- *Learner Training Step*
- *Peer Assessment Step*
- *Self Assessment Step*

> • *Staff Assessment Step*

Note: If you include a learner training step, you must also include a peer assessment step. The learner training step must come before peer or self assessment steps. If you include both peer and self assessment steps, edX recommends that you place the peer assessment before the self assessment. If you include a staff assessment step, it should be the final step in the assignment.

You can see the type and order of the assessments when you look at the assignment. In the following example, after learners submit their responses, they complete a learner training step ("Learn to Assess Responses"), complete peer assessments on other learners' responses ("Assess Peers"), and then complete a self assessment ("Assess Your Response").

Learner Training Step

Learner training steps teach learners to perform their own assessments. A learner training assessment contains one or more sample responses that you write, together with the scores that you would give the sample responses. Learners review these responses and try to score them the way that you scored them.

Note: If you include a learner training step, you must also include a peer assessment step. The learner training step must come before any peer and self assessment steps.

In a learner training assessment, the **Learn to Assess Responses** step opens immediately after a learner submits a

---

response. The learner sees one of the sample responses that you created, along with the rubric. The scores that you gave the response do not appear. The learner also sees the number of sample responses that he or she will assess.

The learner selects an option for each of the assignment's criteria, and then selects **Compare your selections with the instructor's selections**. If all of the learner's selections match the selections defined by the course team, the next sample response opens automatically.

If any of the learner's selections differ from those specified by the course team, the learner sees the response again, with a message indicating that his assessment differs from the instructor's assessment.

The learner continues to try scoring the sample response until his scoring for all criteria matches the scoring defined by the course team.

For more information, see *Learner Training*.

Peer Assessment Step

In the peer assessment step, learners review the responses of other learners in the course. For each response, they select an option for each criterion in your rubric based on the response. Learners can also provide text feedback, or comments, on each response.

If you include both peer and self assessment steps, edX recommends that you place the peer assessment before the self assessment.

For information about how peer assessments affect a learner's assignment grade, see *How Scores for Open Response Assessments Are Calculated*.

Number of Responses and Assessments

When you include a peer assessment step, you specify the number of responses that each learner must assess (**Must Grade**) and the number of peer assessments that each response must receive (**Graded By**) before the step is considered complete.

Note: Because some learners might submit a response without performing any peer assessments, some responses might not receive the required number of assessments. To increase the chance that all responses receive a sufficient number of assessments, you must set the number of responses that learners must assess to be higher than the number of assessments that each response must undergo. For example, if you require each response to receive three assessments, you could require each learner to assess five responses.

If all responses have received assessments, but some learners have not completed the required number of peer assessments, those learners can perform peer assessments on responses that have already been assessed by other learners. The learner who submitted the response sees the additional peer assessments when he sees his score. However, the additional peer assessments do not count toward the score that the response receives.

Feedback Options

By default, in peer assessment steps, learners can provide text feedback for the entire response, using a single comment field below the entire rubric. You can also add a comment field to an individual criterion or to several individual criteria. This comment field can contain up to 1000 characters.

Comment fields for individual criterion appear below the options for the criterion.

For more information, see *Step 3. Add the Rubric* and *Provide Only Comment Fields for Individual Criteria*.

Assessing Additional Responses

Learners can assess more than the required number of responses. After a learner completes the peer assessment step, the step "collapses" so that only the **Assess Peers** heading is visible.

If the learner selects the **Assess Peers** heading, the step expands again. The learner can then select **Continue Assessing Peers** to perform additional peer assessments.

Self Assessment Step

In self assessment steps, the learner sees her own response followed by the rubric. As with peer assessments, the learner evaluates the response using the rubric, selecting an option for each criterion.

If you include both peer and self assessments, edX recommends that you include the peer assessment before the self assessment.

Staff Assessment Step

In staff assessment steps, a member of the course team performs an evaluation of the learner's response. Course team members grade the response using the problem's rubric, in the same way that self and peer assessments are done, and can include comments in their assessment.

Note: If a staff assessment step is included in an assignment, learners do not receive final grades until the staff assessment step has been completed. The scores that you give learners in staff assessment steps override scores from any other assessment type in the assignment, including peer assessments that are completed after the staff assessment.

Including a staff assessment step in an ORA assignment is best for courses with smaller groups of learners. For example, in a course with cohorts, you might create an ORA assignment that has both peer assessment and staff assessment steps, and make it available only to the members of one or more specific cohorts. For the members of the remaining cohorts, you create an ORA assignment that has only the peer assessment step. For details about creating different course experiences for learners in different cohorts, see *Creating Cohort-Specific Course Content*.

For details about performing grading in staff assessment steps, see *Perform Staff Assessments in an ORA Assignment*.

How Scores for Open Response Assessments Are Calculated

In open response assessments that contain staff assessments, staff assessments can be performed more than once, and the most recent staff assessment score is equivalent to the assignment's final score. Peer and self assessment scores are not taken into account, although learners can see scores and comments from all assessments that were performed on their response.

In open response assessments that do not contain staff assessments but do contain both peer assessment and self assessments, only the peer assessment score counts toward the assignment's final score. The self assessment score is not taken into account. There is no option for weighting the peer and self assessment portions independently.

In open response assessments that include only self assessments, the assignment's final score is equivalent to the self assessment score.

Note: Given the high level of subjectivity in peer assessments, edX recommends that you make ORA assignments count towards only a small percentage of a course's final grade.

The following topics detail how the scores for peer assessments and self assessments are calculated.

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Peer Assessment Scoring

Note: If an open response assessment includes peer and self assessments but not staff assessments, only the peer assessment score counts towards the assignment's final score. The self assessment score is not taken into account.

Peer assessments are scored by criteria. A number of peer assessors rate a learner's response by each of the required criteria. The learner's score for a particular criterion is the median of all scores that each peer assessor gave that criterion. For example, if the Ideas criterion in a peer assessment receives a 10 from one learner, a 7 from a second learner, and an 8 from a third learner, the Ideas criterion's score is 8.

The learner's final score on a response is the sum of the median scores from all peer assessors for all of the required criteria.

For example, a response might have received the following scores from peer assessors.

Criterion Name	Peer 1	Peer 2	Peer 3	Median
Ideas (out of 10)	10	7	8	**8**
Content (out of 10)	7	9	8	**8**
Grammar (out of 5)	4	4	5	**4**

To calculate the final score for the response, add the median scores that were given for each criterion, as follows.

Ideas median (8/10) + Content median (8/10) + Grammar median (4/5) = final score (20/25)

Note: Remember that final scores are calculated by criteria, not by individual assessor. Therefore, the score for the response is not the median of the scores that each individual peer assessor gave the response.

For information on scores for learner submissions that you have canceled and removed from peer assessment, refer to *Remove a Learner's Response*.

Flexible Peer Grade Averaging

To reduce the change of users getting "stuck" in the waiting step, you can enable this feature to lower the requirements for a grade in the peer assessment step.

When this feature is enabled, seven days after a learner submits, the number of peer reviews required for them to recieve a grade decreases to 30% of what it previously was, rounded down to the nearest integer.

For example, let's say we have an assessment that requires learners to recieve ten (10) peer reviews to recieve a grade.

Learner A has recieved five peer reviews. This isn't enough to recieve a grade, but seven days after submitting, Flexible Peer Grading activates and reduces the required peer reviews to 30% of the original ten. Now, Learner A only needs three peer reviews. Since they have recieved at least that many, they will immediately recieve a grade.

Learner B has recieved only one peer review. This isn't enough for a grade, and seven days after submitting, Flexible Peer Grading also decreases Learner B's required peer reviews to three. Learner B then recieves a second review. This still isn't enough. As soon as they recieve their third peer review, however, they finally have enough peer reviews and immediately recieve a grade.

Note: Fexible Peer Grading will never reduce the number of required peer reviews below 1, but it will bring the number to 1. That means if a learner has not recieved any peer reviews after seven days, the very first peer review they will recieve will be the entirety of their peer grade.

Self Assessment Scoring

Note: If an open response assessment includes both peer and self assessments, the self assessment score does not count toward the final grade.

If an open response assessment includes only self assessments, the assignment's final score is equivalent to the self assessment score.

Self assessments are scored by criteria. Each learner rates herself on each criterion, using the rubric. The learner's final score on a response is the total number of earned points, out of the total possible points.

Staff Assessment Scoring

If an open response assessment includes a staff assessment step, the score that is given in the staff assessment step overrides all other scores in the assignment.

Top Responses

You can include a **Top Responses** section that shows the top scoring responses that learners have submitted for the assignment, along with the scores for those responses. The **Top Responses** section appears below the learner's score information after the learner finishes every step in the assignment.

You can allow the **Top Responses** section to show between 1 and 100 responses. Keep in mind, however, that each response might be up to 300 pixels in height in the list. (For longer responses, learners can scroll to see the entire response.) EdX recommends that you specify 20 or fewer responses to prevent the page from becoming too long.

Note: It can take up to an hour for a high-scoring response to appear in the **Top Responses** list.

If a high-scoring response is *removed from peer assessment* it is also removed from the **Top Responses** list.

For more information, see *Include Top Responses*.

Best Practices for Open Response Assessments

Open response assessments can be a powerful teaching tool, but they are more effective in some situations than in others. In general, open response assessments are best suited to open-ended or project-based assignments with subjective essay answers and discussion. For example, open response assessments work well in humanities assignments where learners are encouraged to make subjective assessments of text, images, or other contributions, but they might not be the ideal tool in chemistry assignments where there are definitively correct or incorrect answers to questions.

Note: Do not add more than one ORA component in a course unit. Multiple ORA assignments in a unit cause errors when learners submit their assessments.

EdX suggests that you follow the guidelines and best practices in the following sections when you use open response assessments in your courses.

Designing the Assignment

- Do not add more than one ORA component in a course unit. Multiple ORA assignments in a unit cause errors when learners submit their assessments.

- Do not include too many ORA assessments in your course. *Peer assessments* are hard work for learners, and having to perform too many peer assessments can have a negative impact on learners' course completion rates.

- For a manageable experience for course staff, use staff assessment steps only in assignments that are available to a limited number of learners. For example, in courses that have cohorts enabled, make the assignment containing the staff assessment step available only to members of one or more cohorts.

Grading and Rubrics

- Make sure you have a well designed and clear *rubric* for the assignment. A good rubric is very important in helping to eliminate ambiguity in the peer grading process.

- Make ORA assignments count toward only a small percentage of the final course grade, or make them ungraded.

- In graded ORA assignments, consider setting the lowest possible score to a number higher than zero, so that learners can earn some credit for the work they have done, even if their peer assessors give them low grades.

- Provide an ungraded practice ORA assignment prior to the first graded ORA assignment in the course, so that learners can understand the peer grading process and get the most out of the eventual graded ORA assignment.

- Consider using ungraded ORA assignments to generate learner interaction and feedback without affecting grades.

Peer Assessments

- Set the **Must Grade** number higher than the **Graded By** number to minimize the chance that some responses will not be peer assessed. EdX recommends a setting such as **Must Grade** = 4 and **Graded By** = 3.

- To allow enough time for peer assessments to be performed after learners have submitted their own responses, set the response due date and time at least one week before the peer assessment due date and time.

  If the response due time and peer assessment due time are too close together, and a learner submits a response just before responses are due, other learners may not have time to perform peer assessments before peer assessments are due.

- Use course discussion posts to provide guidance for peer grading of ORA assignments.

- Consider extending due dates to allow the discussion moderation team to monitor course discussions for questions about, or reactions to, peer grading, and to address issues when necessary.

  If learners raise concerns about ORA assignments in course discussions, course team members can perform actions such as *deleting a learner's history, or "state"* for a problem so that he can submit his assignment again, *overriding a learner's grade*, or *removing a learner response* from peer grading. If there are more widespread issues with peer grading, the course team can reduce the weight of the peer assessment within the final course grade or allow learners to drop the lowest graded assignment from their grades.

Asking Learners to Upload Files in Responses

In ORA assignments, you can ask your learners to upload images, .pdf files, or other types of files as a part of their responses. Other learners evaluate the responses and their accompanying files during the peer assessment. Offering the option to upload files in addition to a text response can give learners the opportunity to use tools and develop skills that are relevant to your course.

Before you decide to ask learners to upload files along with their text responses, however, be aware of the following limitations and best practices.

- During the peer assessment step, learners download the files that other learners uploaded. To reduce the potential for problems from files with malicious content, learners cannot upload files with certain file extensions. For a complete list, see *Prohibited File Extensions*.

- Course teams can only access uploaded files for one learner at a time. Uploaded file content is not included in the reports of answer submissions that are available from the instructor dashboard, and course data packages do not include any of the uploaded files.

- The cumulative size of all uploaded files must be less than 500 MB.

- Image files must be in .jpg, .gif, or .png format.

For more information, see *Specify the Response Type*.

Prohibited File Extensions

Learners cannot upload file types that have the following file name extensions as part of an open response assessment on edx.org or edX Edge. When you define a set of custom file types for learners to upload with their responses, you cannot specify these file types. The extensions on this list are selected and maintained by the development operations team at edX, and are subject to change.

This set of file name extensions is provided as the default for Open edX installations. Open edX system administrators can update this list. For more information, see Prohibiting Submission of Specified File Types.

A through I	.action, .apk, .app, .application, .bat, .bin, .cmd, .com, .command, .cpl, .csh, .dmg, .exe, .gadget, .hta, .htm, .html, .inf, .ins, .inx, .ipa, .isu
J through P	.jar, .job, .jse, .lnk., msc, .msh, .msh1, .msh2, .mshxml, .msh1xml, .msh2xml, .msi, .msp, .mst, .osx, .out, .paf, .pif, .prg, psc1, .psc2, .ps1, .ps1xml, .ps2, .ps2xml
Q through Z	.reg, .rgs, .run, .scf, .scr, .sct, .shb, .shs, .u3p, .vb, .vbe, .vbs, .vbscript, .workflow .ws, .wsc, .wsf, .wsh

10.29.2 Create an Open Response Assessment Assignment

Creating an *open response assessment (ORA) assignment* is a multi-step process. This section covers each step in detail.

- *Team Open Response Assessments*
- *Step 1. Add the Component*
- *Step 2. Add Prompts*
- *Step 3. Add the Rubric*
- *Step 4. Specify Additional Settings*

In addition, see these other topics about different aspects of open response assessments.

- Components of an open response assessment: *Introduction to Open Response Assessments*

- Viewing metrics and learner responses for released open response assessments: *Accessing Metrics for ORA Assignments*

- Actions you can take for an active ORA assignment: *Managing Open Response Assessment Assignments*

Team Open Response Assessments

Open response assessments can also be configured to work for teams (Team ORAs), allowing students to submit and be graded on a submission as a group. The process of creating and configuring Team ORAs is similar to that for individual ORAs, but deviations and notes for Teams are included in the instructions below.

Before setting up a Team Open Response Assessment, make sure that you have set up your course's Team Configuration to define the desired team-sets in the **Settings > Advanced Configuration** menu. See *Enable and Configure Teams* for help setting up team-sets.

Step 1. Add the Component

To add the open response assessment component to your course, complete these steps.

Note: Do not add more than one ORA component in a course unit. Multiple ORA assignments in a unit cause errors when learners submit their assessments.

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1. In Studio, open the unit where you want to create the open response assessment.

2. Under **Add New Component**, select **Open Response**.

3. Select one of the the Open Response Assessment templates listed.

4. In the problem component that appears, select **Edit**.

   You use this component editor to add prompts and the rubric, and to specify other settings for the open response assessment component.

5. Select **Save** each time you complete an editing session. You can continue to edit the problem until you publish the unit.

Note: After you publish an ORA assignment, you can no longer change the structure of the rubric or the point values associated with each criterion in the rubric. If you correct typographical errors in the text of the rubric, only learners who have not yet started the assignment will see the corrections. However, you can modify due dates and the weight of the ORA assignment after you publish an ORA assignment.

Step 2. Add Prompts

You can format text and add images inside an open response assessment prompt the same way you would for a Text component. For more information, see *The Visual Editor*.

To add *prompts*, or questions, to your ORA assignment, complete these steps.

1. In the open response assessment component editor, select **Prompt**.

2. Replace the example prompt with your prompt.

3. To add another prompt in the assignment, select **Add a Prompt**, and then repeat step 2.

Step 3. Add the Rubric

In this step, you add your *rubric* to provide guidance for assessing responses within the assignment. You add one rubric for each problem, regardless of the number of prompts in the problem.

Note: The most effective rubrics for peer grading are written in clear, simple language, have concrete details, and are as specific as possible. Many novice learners will find it diffidult to make the types of value judgments required by more holistic rubrics.

For each step below, replace any default text with your own text.

Note: All open response assessments include a feedback field below the rubric so that learners can provide written feedback on a peer's overall response. You can also allow or require learners to provide feedback for individual criteria. See step 4 in the following procedure for instructions. For more information, see *Feedback Options*.

To add the rubric, follow these steps.

1. In the ORA component editor, select the **Rubric** tab.

2. In the first **Criterion** section, enter the name and prompt text of your first criterion (100 character limit).

3. In the **Option** sections for this criterion, for each option that you provide for the criterion enter a name, explanation, and point value.

   To remove options, select **Remove** at the top right of the option section.

   To add more options, select **Add Option**.

4. Next to **Feedback for This Criterion**, select a value in the dropdown list.

   - If you do not want to allow feedback for this individual criterion, select **None**.

   - To require feedback for this criterion, select **Required**.

   - To allow feedback, but not require it, select **Optional**.

5. Repeat steps 2-4 to create additional criteria. To add more criteria than provided for in the template, select **Add Criterion** at the end of the list of criteria.

6. Under **Feedback for This Response**, add instructions for learners to provide overall written feedback on responses that they assess. You can leave the default text in the **Feedback Instructions** and **Default Feedback Text** fields, or replace it with your own text.

Note: After you publish an ORA assignment, you can no longer change the structure of the rubric or the point values associated with each criterion in the rubric. If you correct typographical errors in the text of the rubric, only learners

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who have not yet started the assignment will see the corrections. However, you can modify due dates and the weight of the ORA assignment after you publish an ORA assignment.

Note: If you wish to allow learners to view the rubric as they work on their response, see *Show Rubric During Response*

Provide Only Comment Fields for Individual Criteria

For an individual criterion, you can omit options, but if you do not include options, you must include the ability to add feedback comments.

To provide a comment field without options, complete these steps.

1. In the ORA component editor, select the **Rubric** tab.

2. In the **Criterion** section for the criterion that you want to only provide a comment field for, select **Remove** to remove each option.

3. Next to **Feedback for This Criterion**, select **Required** from the list.

Reuse Rubrics

If your course uses multiple Open Response Assessments with similar assessment criteria, reusing rubrics may save time and prevent having to re-author the same rubric across many ORAs.

To reuse a rubric, complete the following steps:

1. In Studio, navigate to an ORA with a completed rubric you'd like to copy.

2. In the ORA component editor, select the **Rubric** tab.

3. Expand the **Clone Rubric** section (if it is not already expanded) and copy or note the value following "Block ID for this ORA". This will allow you to uniquely identify this ORA later.

4. Navigate to (or create) an unpublished ORA where you'd like to reuse the rubric.

5. In the ORA component editor, select the **Rubric** tab and expand the **Clone Rubric** section.

6. In the "Block ID" dropdown, paste or select the ID of the ORA to copy rubric data from.

7. Click "Clone". A banner should appear saying "Rubric Successfully Cloned from Block ID: <block ID>".

Note: Cloning rubric data clears Learner Training examples. If applicable, follow the instructions at *learner training step* to add updated Learner Training examples.
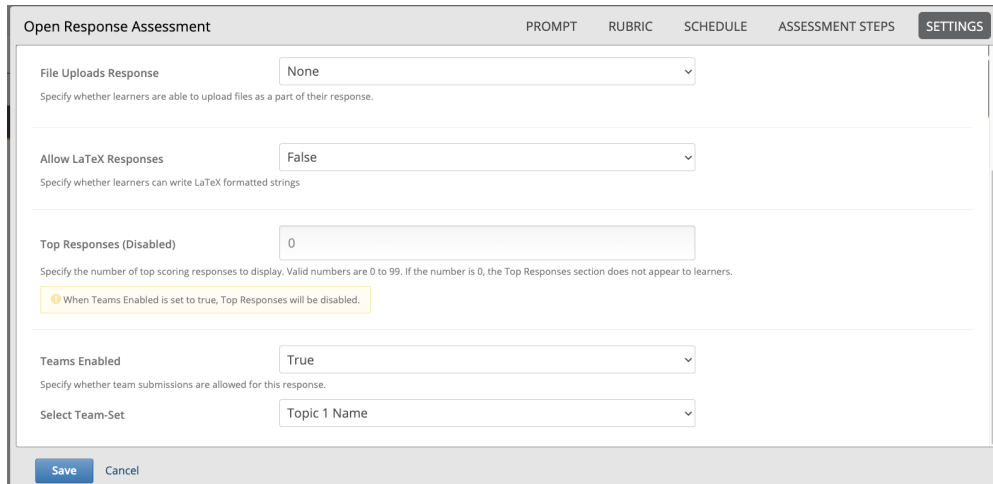

Note: When a rubric is cloned, the version of the rubric that is cloned is the currently *saved* version, not the currently *published* version. This is done to support the ability to clone from ORAs that have not yet been published.

Step 4. Specify Additional Settings

After you have added a prompt and rubric, you must specify additional settings for the assignment. These settings include the type of response that learners must submit, assignment dates, and whether learners will see a list of top scoring responses.

Team vs. Individual ORA

To make a Team ORA, set the option **Teams Enabled** to **True**. This reveals a drop down for **Selected Team-set** that defines which group of teams will be able to submit a response for this assignment.

Students can be in one team per team-set, so configuring multiple team-sets allows you to create groups for different assignments. You could, for example, create separate team-sets for Homework, Midterms, and the Final Project, each selected for the relevant Team ORAs to allow students to collaborate with different classmates for each assignment type. For more on how to configure team-sets for your course, see *Enable and Configure Teams*.

For Team ORAs, File Upload is the main intended form of response. Learners on a team can collaboratively upload and review files as part of a team response. A text response is still acceptable but can only be drafted by the one submitting member of the team.

Note: Team Open Response Assessments are designed to only be assessed by staff.

Specify a Name and Dates

Before you specify the start and due dates and times for a response, be sure that you consider these aspects of, and best practices for, the open response assessment feature. For more information, see *Best Practices for Open Response Assessments*.

- Unlike other problem types, ORA assignments are not governed by the subsection due date. You set due dates for each ORA assignment in the assignment's settings.

- The *grace period* that you can set for the course does not apply to ORA assignments. For more information about the grade period setting, see *Set the Grace Period*.

- You should allow sufficient time for peer assessments to be performed after learners have submitted their own responses. EdX recommends that you allow at least one week between the due date for responses and the due date for peer assessments. If the response due time and peer assessment due time are close together, and a learner

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submits a response just before responses are due, other learners may not have time to perform peer assessments before peer assessments are due.

- The times that you set are in Coordinated Universal Time (UTC). To verify that you have specified the times that you intend, use a time zone converter such as Time and Date Time Zone Converter.

To specify a name for the assignment as well as start and due dates for all learner responses, follow these steps.

1. In the ORA component editor, select **Settings**.

2. Next to **Display Name**, enter the name you want to give the assignment.

3. Select **Schedule** at the top of the ORA component editor.

4. Next to **Response Start Date** and **Response Start Time**, enter the date and time when you want learners to be able to begin submitting responses.

5. Next to **Response Due Date** and **Response Due Time**, enter the date and time by which all learner responses must be submitted.

Specify the Response Type

Learners can submit written responses, files, or both in their responses to the assigment. If you want learners to upload files, make sure the text of your prompt includes adequate instructions for learners to upload the required files, including the file types that learners can upload.

Note: Before you ask learners to submit files for your open response assessment, be sure to read about limitations and best practices. For more information, see *Asking Learners to Upload Files in Responses*.

If you allow or require learners to upload image files, learners must also provide a brief written description of each image for accessibility.

To specify the response type that learners must submit, follow these steps.

1. In the ORA component editor, select **Settings**.

2. For **Text Response**, select one of the following options.

   - **None**

   - **Required**

   - **Optional**

3. The **Response Editor** field allows you to select an editor that the students will use to format their responses. Select one of the following options:

   - **Simple text editor**: a simple text field without formatting options.

   - **WYSIWYG Editor**: a visual text editor that allows text formatting.

4. For **File Uploads Response**, select one of the following options.

   - **None**

   - **Required**

   - **Optional**

   If you select **Required** or **Optional**, **Allow Multiple Files** and **File Upload Types** will appear.

For **Allow Multiple Files**, select either **True** or **False**. If **Allow Multiple Files** is **True**, learners will be able to upload multiple files in their response. If you would like to restrict learner responses to a single file, set **Allow Multiple Files** to **False**.

For **File Upload Types**, select one of the following options.

- **PDF or Image Files**

- **Image Files**

- **Custom File Types**

If you select **Custom File Types**, the **File Types** field appears. Enter the file name extensions, separated by commas, of the types of files that you want learners to submit.

Note: To reduce the potential for problems from files with malicious content, learners cannot upload certain file types. For more information, see *Prohibited File Extensions*.

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5. For **Allow LaTeX Responses**, select **True** or **False**.

Allow Learners to View Rubric While Responding

By default, learners cannot see the rubric while they are working on their response. However, you may decide that it would be helpful for learners to be able to view the rubric while they work on their response so they know how they will be evaluated. To enable this functionality:

1. In the ORA component editor, select **Settings**.

2. Set **Show Rubric During Response** to **True**.

When this setting is enabled, a collapsable section will appear in the Response step, above the first prompt, that shows learners a detailed breakdown of how their response will be graded.

Note: This is the rubric you set up in *Add Rubric*. For each Criterion, learners will see all Option names, descriptions, and point values.

Include Top Responses

You can specify whether learners see a section that shows the *highest scoring responses* that were submitted for each question in the assignment. If offered, this section displays only after each learner has completed all steps in the assignment. You specify the number of highest scoring responses to show.

Note: Because each response can be up to 300 pixels in height, we recommend that you set the number of top responses lower than 20, to prevent the page from becoming too long.

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1. In the ORA component editor, select **Settings**.

2. In the **Top Responses** field, specify the number of responses that you want to appear in the **Top Responses** section below the learner's final score.

   If you do not want this section to appear, set the number to 0. The maximum number is 100.

Step 5. Select Assignment Steps

Open response assessment assignments can include learner training, peer assessment, self assessment, and staff assessment steps.

When adding an ORA problem, the component editor provides some predefined ORA problem templates with different *steps* set up in a sequence that works well for most courses. While you can change the order of the peer, self, and staff assessment steps, edX recommends that you include them in this order.

Note: If you include a learner training step, you must also include a peer assessment step. The learner training step must come before peer or self assessment steps.

If you include both peer and self assessment steps, edX recommends that you place the peer assessment before the self assessment.

If you include a staff assessment step, it should be the final step in the assignment.

For Team ORAs, Staff assessments are the only assessment step allowed, as these are not intended for peer or self assessment.

To add steps to the open response assignment, complete these actions.

1. In the ORA component editor, select the **Assessment Steps** tab.

2. Locate the following headings.

    - **Step: Learner Training**

    - **Step: Peer Assessment**

    - **Step: Self Assessment**

    - **Step: Staff Assessment**

    Select the check boxes for the steps that you want the assignment to include.

3. (optional) To change the order of the steps, drag the steps into the order that you want using the bar at the left side of the steps.

Step 6. Specify Step Settings

After you select the steps that you want, you can specify settings for those steps.

Note: If you make changes to a step, and then clear the check box for that step, the step will no longer be part of the assignment and your changes will not be saved.

For Team ORAs, Staff assessments are the only assessment step allowed, therefore no changes can be made in the step settings.

Learner Training

For the *learner training step*, you enter one or more example responses that you have created, then specify the expected option for each criterion in your rubric.

Note: You must enter your complete rubric on the **Rubric** tab before you can select options for the learner training responses. If you later change one of your criteria or any of its options, you must also update the learner training step.

To add and score learner training responses, follow these steps.

1. Under **Step: Learner Training**, select **View / Add Sample Responses**. The section will expand and display the sample responses already set up.

2. Select **Add sample reponse**.

3. In the **Response** field, enter the text of your example response.

4. Under **Response Score**, for each criterion, select the option that you want.

Peer Assessment

For the *peer assessment step*, you specify the number of responses that each learner must grade, the number of learners who must grade each response, and start and due dates. All fields are required.

To specify peer assessment settings, follow these steps.

1. Locate the **Step: Peer Assessment** heading.

2. Select **View Options & configuration** to display the step settings.

3. Next to **Must Grade**, enter the number of responses that each learner must grade.

4. Next to **Graded By**, enter the number of learners that must grade each response.

5. Next to **Enable Flexible Peer Grade Averaging**, select **True** if you want to enable *Flexible Peer Grade Averaging*.

6. Switch to the **Schedule** tab.

7. Locate the **Peer Assessment Deadlines** heading.

8. Next to **Start Date** and **Start Time**, enter the date and time when learners can begin assessing their peers' responses.

9. Next to **Due Date** and **Due Time**, enter the date and time by which all peer assessments must be completed.

   Note: The times that you set are in Coordinated Universal Time (UTC). To verify that you have specified the times that you intend, use a time zone converter such as Time and Date Time Zone Converter.

   Additionally, the course grace period setting does not apply to open response assessments. For more information about the grace period setting, see *Set the Grace Period*.

For more information about peer assessment steps, see *Peer Assessment Step*.

Self Assessment

For the *self assessment step*, you specify when the step starts and ends.

1. Locate the **Step: Self Assessment** heading and enable it.

2. Switch to the **Schedule** tab.

3. Locate the **Self Assessment Deadlines** heading.

4. Next to **Start Date** and **Start Time**, enter the date and time when learners can begin assessing their peers' responses.

5. Next to **Due Date** and **Due Time**, enter the date and time by which all peer assessments must be complete.

Note: The times that you set are in Coordinated Universal Time (UTC). To verify that you have specified the times that you intend, use a time zone converter such as Time and Date Time Zone Converter.

Additionally, the course grace period setting does not apply to open response assessments. For more information about the grace period setting, see *Set the Grace Period*.

Staff Assessment

For the *staff assessment step*, there are no additional settings to specify after you have selected the step for inclusion in the assignment.

Step 7. Test the Assignment

To test your ORA assignment, you can set up the assignment in your course, set the section or subsection date in the future, publish the unit, and ask one or more beta testers to submit responses and grade each other. The beta testers can then let you know if they found the question and the rubric easy to understand or if they had any problems with the assignment.

For more information about beta testing, see *Beta Testing a Course*.

10.29.3 Managing Open Response Assessment Assignments

After you publish an open response assessment (ORA) assignment and learners start to submit responses and perform assessments, members of the course team can take the following actions.

- *View a Specific Learner's Response and Assessments*
- *Perform Staff Assessments in an ORA Assignment*
- *Performing Staff Assessments in a Team ORA Assignment*
- *Override a Learner's Assessment Grade*
- *Overriding a Team's Assessment Grade*
- *Remove a Learner's Response*
- *Remove a Team's Response*
- *Locate a Specific Submission in an ORA Assignment*

The following topics provide additional information about open response assessments.

- *Best practices for ORA assignments*

- *Components of an ORA assignment*

- *Instructions for creating an ORA assignment*

- *Viewing metrics and learner responses for released ORA assignments*

View a Specific Learner's Response and Assessments

You can view the following information about an individual learner's open response assessment assignment.

- The text of the learner's response, including any files that the learner uploaded.

- The peer assessments that other learners performed on the learner's response, including feedback on individual criteria and on the overall response.

- The peer assessments that the learner performed on other learners' responses, including feedback on individual criteria and on the overall responses.

- The learner's self assessment.

- The learner's grade for the assignment.

- An override grade provided by course staff.

For more details about accessing information for a specific learner, and for an example that shows a learner's response with peer assessments, see *Access a Specific Learner's Information*.

To determine whether a learner has received the required number of assessments from other learners and has completed the required number of assessments for other learners, refer to the **Graded By** and **Must Grade** values that were set for the open response assessment assignment in Studio. For more information about these settings, see *Specify Step Settings*.

Access a Specific Learner's Information

In order to access information about a specific learner's assignment, you need that learner's username or email address. For more information, see *Download or View Learner Data*.

To access information about a specific learner, follow these steps.

1. View the live version of your course in the LMS, and then go to the ORA assignment.

2. Scroll to the end of the problem, and then select **Manage Individual Learners**.

3. Enter the learner's username or email address, and then select **Submit**.

   The **Manage Individual Learners** dialog box updates with expandable sections for each of the assessment steps in the assignment and other actions you can take on the learner's response. Only the types of assessment steps (self, peer, or staff) that are included in the assignment are shown.

   If the learner uploaded files along with her response, select **View the files associated with this submission** to review or download the files.

4. Select any of the section headings to expand that section.

Perform Staff Assessments in an ORA Assignment

Note: The staff grading experience has gotten a makeover! Learn about the *new ORA staff grading experience*.

When a staff assessment is included in an open response assessment assignment, course team members see a **Grade Available Responses** option at the end of the assignment in the course, and learners see a **Staff Assessment** step in their assignment. For information about the possible assessment steps in an ORA assignment, see *Assessment Steps*.

Submitting a staff assessment has the following results.

- The score that you give a learner in a staff assessment overrides scores from any other assessment type in the assignment.

- Peer assessments that are completed before or after your staff assessment have no effect on the learner's final assignment grade.

To perform a staff assessment in an assignment, follow these steps.

1. View the live version of your course in the LMS, and then go to the ORA assignment.

2. Scroll to the end of the problem, and then select **Grade Available Responses**.

   In the dialog that opens, the number of available and checked out responses is shown. Checked out responses are responses that are currently being graded by you or another course team member.

3. Select the **Staff Assessment** heading to open a response that is available for grading.

4. Perform an evaluation of the response using the problem's rubric.

5. Select **Submit assessment** to submit the assessment and close the grading dialog. Alternatively, select **Submit assessment and continue grading** to submit the assessment and immediately grade another submission.

Performing Staff Assessments in a Team ORA Assignment

Note: The staff grading experience has gotten a makeover! Learn about the *new ORA staff grading experience*.

Team-based open response assessments can only be assessed by staff. Learners will see this as a Staff Assessment step in their assignment. Course team members will see a Grade Available Responses option at the end of the assignment.

Note: Staff assessments for Team ORAs follow the same process as for individual ORAs except that the same score will be applied to all members of the submitting team.

To perform a staff assessment in a team assignment, follow the steps outlined in **Perform a Staff Assessment**. Before submitting, you will receive an alert to notify you that the grade will apply to all members of the team. Click Ok to apply the grade and close the grading dialog.

Override a Learner's Assessment Grade

For any open response assessment, whether or not a staff assessment is already included, you can override a learner's final grade for the assignment. The ability to override the final grade can be useful if, for example, a learner's submission was inappropriately or inadequately graded by peers, or if there are not enough peer reviewers to complete the required number of peer assessments.

Submitting an override assessment has the following results.

- The score that you give a learner in an override assessment overrides scores from any other assessment type in the assignment.

- Any steps that the learner did not complete for the assignment are marked as complete.

- Peer assessments that are completed before or after your staff assessment have no effect on the learner's final assignment grade.

Note: You can perform override assessments more than once on the same response, regardless of the due date of the assignment. The learner's final grade on the assessment is updated to reflect the most recent staff override assessment grade.

Once grades are frozen 30 days after the course end date, you will no longer be able to perform override assessments for learners.

Learners who receive override grades for their submissions see a **Staff Assessment** step in their assignments, where they can view the rubric and any comments provided in the staff assessments.

Perform an Override Assessment

In order to perform an override assessment for a learner, you need that learner's username or email address. For more information, see *Download or View Learner Data*.

To perform an override assessment, follow these steps.

1. View the live version of your course in the LMS, and then go to the ORA assignment.

2. Scroll to the end of the problem, then select **Manage Individual Learners**.

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3. Enter the learner's username or email, then select **Submit**.

   The **Manage Individual Learners** dialog updates with expandable sections for each of the assessment steps in the assignment and other actions you can take on the learner's response.

4. Select **Submit Assessment Grade Override**.

5. Perform an assessment of the learner's response using the problem's rubric.

6. When you have finished the assessment, select **Submit assessment**.

   The grade that you have given this learner's response becomes the learner's final grade on the assignment. Peer assessments are not taken into account in calculating the learner's final assignment grade when a staff override grade exists.

   Learners who have an override grade for their submission see a **Staff Assessment** step in their assignment, where they can view the rubric and any comments provided in the staff assessment.

Note: Override assessments can be performed more than once on the same response, regardless of the due date of the assignment. The learner's final grade on the assessment is updated to reflect the most recent staff override assessment grade.

Overriding a Team's Assessment Grade

As with individual ORAs, you can override the final grade for a Team ORA if it has previously been graded. Although only staff may grade team assignments, this ability to override a grade can be useful for fixing improperly submitted grades or amending grades after-the-fact. For individual ORAs, see *Override a Learner's Assessment Grade*.

Note: Like individual ORAs, overrides can be performed more than once on the same Team Open Response Assessment.

In order to perform an override assessment for a team, you need the edX username or edX email address of a learner on the team. For more information, see *Download or View Learner Data*.

To perform an override assessment, follow these steps:

1. View the live version of your course in the LMS and navigate to the Team ORA.

2. Scroll to the end of the problem where staff have a **Manage Team Responses** option. Select this to open the **Manage Teams** panel.

3. Enter the edX username or edX email of any member of the team and select **Submit**.

The **Manage Teams** dialog updates with the team's response, grade, and existing assessments, along with options to submit overrides and remove the submission from grading.

4. Select **Submit Team Grade Override**.

5. Perform an assessment of the team's response using the problem's rubric.

6. When you have finished the assessment, select **Submit assessment**.

   The grade given for the team's response overrides the grade for each member of the team for this assignment.

Note: Like individual ORAs, overrides can be performed more than once on the same Team Open Response Assessment up until grades freeze for the course (30 days after the course end date).

Remove a Learner's Response

In a course that contains assignments with peer assessment steps, learners might alert you to inappropriate responses that they have seen while performing peer assessments. In such a situation you can *locate* and remove the response. Doing so removes the response so that it is no longer shown to other learners for peer assessment.

Note: Removing a learner's response is an irreversible action.

When you remove a response, the response is immediately taken out of the pool of submissions available for peer assessment. If the inappropriate response has already been sent to other learners for peer assessment, it is also removed from their queues. However, if any learner has already graded the inappropriate response, it is counted as one of the submissions they have graded.

Note: After you remove an inappropriate response, you can decide whether the learner who submitted that response is allowed to submit a replacement response.

If you do not want to allow the learner to submit a replacement response, you do not need to take any additional action. The learner receives a grade of zero for the entire submission.

To allow the learner to resubmit a response for a cancelled submission, you must *delete the learner's state* for the problem.

To remove a submitted response, follow these steps.

1. Identify the learner who submitted the inappropriate response by following the steps in the *Locate a Specific Submission in an ORA Assignment* topic.

2. View the live version of your course in the LMS, and then go to the ORA assignment that contains the submission you want to remove.

3. Scroll to the end of the problem, and then select **Manage Individual Learners**.

4. Enter the learner's username or email, and then select **Submit**.

   The **Manage Individual Learners** dialog updates with expandable sections for each of the assessment steps in the assignment and other actions you can take on the learner's response.

5. Select **Remove Submission from Peer Grading**.

6. Enter a comment to explain the removal. The learner sees this comment when she views her response in the open response assessment problem.

7. Select **Remove submission**.

   The inappropriate submission is permanently removed from peer assessment. Removed submissions are also removed from the list of Top Responses if they were previously listed.

8. Optionally, delete the learner's state for the problem. This step allows the learner to submit another response. For more information, see *Delete a Learner's State for a Problem*.

When you access *this learner's information* again by selecting **Manage Individual Learners**, instead of the response, you see a note showing the date and time that the submission was removed, and the comments that you entered.

When the learner views the assignment in the course, she sees that all steps in the assignment have a status of "Cancelled". Under **Your Response**, instead of the text of their response, she sees the date and time that their response was cancelled, and the comments relating to the removal of their submission.

Remove a Team's Response

Removing a team's response is very similar to removing a single learner's response. To remove a submitted Team ORA response, follow these steps.

1. Identify a learner on the team that needs their submission removed from the staff grading workflow. If you only know the team name, use the **Teams** browser to find learners on a specific team. You can pick the username of any learner on the team by hovering over the learner avatar icons in the **Team Details** panel.

2. View the live version of your course in the LMS, and then go to the ORA assignment that contains the submission you want to remove.

3. Scroll to the end of the problem, and then select **Manage Team Responses**.

4. Enter the learner's username or email, and then select **Submit**.

   The **Manage Teams** dialog updates with expandable sections for each of the assessment steps in the assignment and other actions you can take on the team's response.

5. Select **Remove Team Submission from Grading**.

6. Enter a comment to explain the removal. The learners see this comment when they view their response in the open response assessment problem.

7. Select **Remove submission**. The selected submission is permanently removed from staff assessment.

8. Optionally, delete the team's state for the problem. This allows the team to submit another response. For more information, see *Delete a Learner's State for a Problem*. If you follow the instructions on that page and enter the username of a student on a team, the team state will be cleared.

When you access this learner's information again by selecting **Manage Team Responses**, instead of the response, you see a note showing the date and time that the submission was removed, and the comments that you entered.

When a learner on the team views the assignment in the course, they will see that all steps in the assignment have a status of "Cancelled". Under **Your Response**, instead of the text of their response, they will see the date and time that their response was cancelled, and the comments relating to the removal of their submission.

Locate a Specific Submission in an ORA Assignment

If you are alerted to an inappropriate ORA submission that you want to cancel and *remove from peer assessment*, locate the specific submission by following these steps.

1. Ask the person who reported the incident to send you a sample of text from the inappropriate response.

2. *Generate an ORA data report*.

3. Search the report for text that matches the sample text from the inappropriate response.

4. From any matching entries in the spreadsheet, locate the username of the learner who posted the submission.

5. Make a note of the username, and follow the steps to *remove a learner response from peer grading*.

10.29.4 Staff Grading for Open Response Assignments

Staff grading for Open Response Assessments (ORAs) now exists as a separate app to enable more efficient and fully-featured grading workflows. Within this ORA staff grading app, staff can easily:

- View the state of all submissions for an ORA.

- Select individual/batch submissions to review.

- Navigate between multiple submissions.

- View responses and assign grades directly in the app.

- Claim submissions for exclusive review to avoid grading conflicts.

Navigate to ORA Staff Grading

Staff can grade responses for an ORA with a staff grade step from one of 2 places:

1. The Instructor Dashboard > Open Responses. In the responses table, ORAs with staff steps show a "View and grade responses" link which directs to the new experience.

2. The Unit > ORA > Grade Available Responses button links to the new grading experience.

Note: Although the new staff grading experience replaces the old "Staff Assessment" workflows, grades can still be viewed, canceled, and overridden from the "Manage Individual/Team Responses" link in ORAs.

Submissions List View

The main view shows a table listing responses for that particular ORA. The table on the page shows the submitting user (or team, for team assignments), the submission date, grade (if graded) and grading status. The grading status shows:

- "Ungraded" when that submission has not yet received a grade.

- "Currently being graded by someone else" when another staff member is actively grading that submission.

- "You are currently grading this response" when you have claimed that submission for grading but have not yet submitted a grade.

- "Grading Completed" when that submission has received a grade.

Selecting Submissions for Review

From the submission list view, staff can select the submissions which they would like to review by checking the checkbox on the left of the submission row. After selecting one or more submissions to review, they can click "View selected responses" to begin reviewing the selected responses. Alternatively, staff can choose not to select individual responses but click "View all responses" to review all submitted responses for the ORA.

Note: The page size of the submissions list is limited so it may be necessary to move between pages by clicking the "Previous" and "Next" buttons to view or select all the responses you're interested in reviewing.

View Individual Responses

The view that opens shows one selected submission at a time. This view allows staff to review the submission's text response and uploaded files, if any. The top bar on the page shows the current submission's submitting user or team, the current submission's grading status, the grading controls, and buttons to navigate to the next/previous selected submission.

File List & File Previews

If the response contains files, a "Submission Files" list will show at the top of the page. This lists the name, file type, and size for each uploaded file. Additionally, hovering over the info icon () in the file row shows additional metadata about the uploaded file.

Some file types can be previewed directly on the page. To view files that can't be previewed in-page (any other file types not stated below) staff can download all files associated with the response as a zip file by clicking the "Download files" button in the files card to get a Zip of files and file metadata.

Note: The current file types that are supported for in-page previews are: pdf, jpg, jpeg, png, bmp, txt, gif, jfif, pjpeg, pjp, and svg.

Text Responses

If a submission also contains a text response (either plain text or rich text), the text response will also show on the page, below any uploaded files.

View the Rubric

While reviewing submission material, staff can view the rubric for the submission by clicking the "Show Rubric" button. This opens a non-editable rubric to help identify the criteria staff should use for grading.

Start Grading

When staff is ready to grade they can begin grading with the "Start grading" button. This will open an editable rubric which enables staff to select the score for a submission and provide comments.

The "Start grading" button will also "claim" the current submission for grading. This gives the staff member exclusive access to submit a grade for this submission, helping to avoid grading conflicts. A submission that has been claimed is still visible to all staff but cannot be graded by other staff until:

- The grading staff member submits the grade,

- The grading staff member releases the lock by clicking the "Stop grading" button, or

- After 8 hours elapses (whichever comes first).

While the submission is claimed for grading, staff can select the rubric options for each grading criteria and provide any required feedback before clicking "Submit grade" to submit their grade. Alternatively, if the staff member no longer wishes to grade this response they can click the "Stop grading this response" button that now appears at the top of the page.

Navigate Between Selected Submissions

At any point, staff can page between any of the previously selected responses by using the arrows on the top bar of the page. Note that any submissions currently claimed for grading remain claimed until a grade is entered or until the staff member exits the application; navigating between submissions will not release a claim on the current submission.

Override a Grade

After a submission has received a grade, it is still possible to override that grade. Staff can navigate to a previously-graded submission and click "Override grade". The workflow for submitting a grade override is similar to submitting an initial grade: select the appropriate rubric options and provide feedback before clicking "Submit override". A modal will ask to confirm if this is the intended action before overriding the grade.

Exit the Application

When done grading this set of responses, staff can return to the submission list view by clicking the X at the top right of the application bar. **This will also release the grading claim on any submissions the staff member currently has open, but ungraded.**

10.29.5 Accessing Metrics for ORA Assignments

After you release an open response assessment assignment, you can access various metrics for the assignment or for all open response assessment assignments in the course. For example, you can view the number of learners in each step of the assignment or in possible states such as "Waiting" or "Completed" within the assignment. In addition to viewing metrics for the assignment or for assignments in a course, you can also access assignment details for an individual learner, or *generate a report* containing learner and response details for ORA assignments in the course.

For information about tasks that you can perform on learner responses in an ORA assignment, including *performing a grade override assessment* or *cancelling a learner's submission*, see *Managing Open Response Assessment Assignments*.

View Statistics for All ORA Assignments in a Course

To view metrics about all of the ORA assignments in a course, follow these steps.

1. View the live version of the course.
2. Select **Instructor** to open the instructor dashboard.
3. On the instructor dashboard, select **Open Responses**.

The **Open Responses** tab of the instructor dashboard displays the following information.

- The number of course units that include an ORA assignment.
- The number of ORA assignments in the course.
- The total number of submitted responses.
- The number of learners who are in each of the training, peer, self, and staff workflow states.
- The number of learners who have received a final grade.

The **Open Responses** tab also displays the same information for each separate ORA assignment in the course, grouped by the course units that include ORA assignments.

List and manage students waiting in peer step

On ORA problems with the peer assessment step, sometimes learners might get stuck waiting peer reponses to evaluate or peer reviews from other learners indefinitely. There's a tool in the instructor dashboard that allows listing and managing those learners.

To view a list of students in the waiting step of an ORA problem in a course, follow these steps.

1. View the live version of the course.

2. Select **Instructor** to open the instructor dashboard.

3. On the instructor dashboard, select **Open Responses**.

4. In the table listing the ORA problems, locate the waiting column corresponding to the problem you want to see users waiting on.

5. If there are any students in the waiting step, the column will become clickable.

6. Select it to open the **Waiting step details** page.

The **Waiting step details** page displays some information related to the peer step configuration and a table listing users in the waiting step with the following attributes:

- Usernames

- Number of peers assessed

- Number of peer reviews received

- Time spent on the waiting step so far

- Status from staff assessment step, if available in problem

- Final grade status (waiting or overwritten).

The **Waiting step details** page also allows managing student grades through the **Manage individual learners** button near the bottom of the page, which works in the same manner as View a Specific Learner's Response and Assessments.

View Statistics for a Single ORA Assignment

To view metrics about learners in a single ORA assignment, including the number who are active in each step, follow these steps.

1. Open the ORA assignment in the course.

2. Scroll to the bottom of the assignment and select **View Assignment Statistics**.

   You see statistics for the assignment, including the total number of responses and the location ID for the assignment.

   In the **Learner Progress** section, for each assessment step in the assignment, you can see the number of learners who are currently working through (but who have not completed) that step. Only assessment types that exist in the assignment are included.

   Note: If a Staff Assessment step exists in the assignment, this step will always show 0 active learners, because no learner actions are required for that step.

   In addition to learners who are active in the assessment steps of the assignment, you can see the number of learners who are in the following states in the assignment.

- **Waiting**: Learners who have finished the requirements for a step and are waiting for their responses to be assessed by peers or staff.

- **Done**: Learners who have completed all of their required steps, and have received the required number of reviews.

- **Cancelled**: Learners who have had their responses cancelled.

In the **Dates** section below **Learner Progress**, the release and due dates for each step in the assignment are shown.

Generate a Report for ORA Assignments

To generate a report containing details of the ORA assignments in the course, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download**.

3. In the **Reports** section, select **Generate ORA Data Report**.

   A status message indicates that the ORA data report is being generated. This process might take some time to complete, but you can navigate away from this page and do other work while it runs.

   To check the progress of the report generation, reload the page in your browser and scroll down to the **Pending Tasks** section. The table shows the status of active tasks.

When the report is complete, a linked .csv file name becomes available above the **Pending Tasks** section. File names are in the format `{course_id}_ORA_data_{datetime}.csv`. The most recently generated reports appear at the top of the list.

4. To open or save the generated ORA data report, locate and select the link for the grade report you requested.

   You can open .csv files in a spreadsheet application to sort, graph, and compare data.

Interpret the ORA Data Report

The ORA data report for your course is a time-stamped .csv file that contains data for all the ORA assignments in your course. For each ORA assignment in the course, the report provides information that includes each learner's anonymized ID, response, assessments details and scores, and the final score for the assignment. For more details about each column in the report, see the following descriptions.

The .csv file contains one row of data for each response from a learner.

- The IDs in the **Submission ID** and **Item ID** columns uniquely identify the problem within the course content and the learner's submission for that problem. The **Problem Name** column is also available to help identify a problem by its display name.

- The **Username** column helps identify impacted learner submissions for further platform review if applicable.

- The **Anonymized Student ID** column lists an ID for each learner without revealing confidential, personally identifiable data such as email addresses and usernames.

- The **Date/Time Response Submitted** column displays the date and time that the learner submitted her response, in YYYY-MM-DD HH-MM-SS format.

- The **Response** column displays the content of the learner's response.

- The **Assessment Details** column displays the following details for the assessments that were performed on the response.

  – The time and date that the assessment was submitted.

  – The type of assessment: self (SE), peer (PE), staff (ST).

  – The ID of the person who performed the assessment.

  – Any text comments about the response that were included in the assessment.

- The **Assessment Scores** column lists the scores that the response received in self, peer, or staff assessments.

- The **Date/Time Final Score Given**, **Final Score Points Earned**, and the **Final Score Points Possible** columns provide details of the final score that the response received. If a response has not received enough assessments for the assignment to be considered complete, these columns show a value of "None".

- The **Feedback Statements Selected** and **Feedback on Peer Assessments** columns together show the information that learners provided in the **Provide Feedback on Peer Assessments** section of their ORA assignments. This section is available to learners only when all assessments for an assignment have been completed, and provides an optional way for learners to comment on their experience of the peer assessment process.

The **Feedback Statements Selected** column displays the text of the feedback statements (if any) that the learner selected to describe their experience of the peer assessment process. Learners can select either "These assessments were useful" or "These assessments were not useful". They can also select either or both of "I disagree with one or more of the peer assessments of my response" and "Some comments I received were inappropriate".

If a learner also provided a free-form comment in the text field below the selectable feedback statements, the text appears in the **Feedback on Peer Assessments** column.

Generate a Report for ORA File Submissions and Attachments

To generate a report containing details of the ORA assignments in the course, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download**.

3. In the **Reports** section, select **Generate ORA Submission Files Archive**.

   A status message indicates that the ORA data report is being generated. This process might take some time to complete, but you can navigate away from this page and do other work while it runs.

   To check the progress of the report generation, reload the page in your browser and scroll down to the **Pending Tasks** section. The table shows the status of active tasks.

   When the report is complete, a linked .zip file name becomes available above the **Pending Tasks** section. File names are in the format `{course_id}_submission_files_{datetime}.csv`. The most recently generated reports appear at the top of the list.

4. To open or save the generated ORA submission files archive, locate and select the link for the archive you requested.

   You can open .zip files using your computer and navigate the student's submissions from your file explorer.

Interpret the ORA Submission Files Archive

The ORA submission files archive for your course is a zipped folder that contains both a time-stamped .csv file listing out all included submissions as well as folder directories with the contents of these submissions for each ORA problem contained in your course.

This zipped directory contains a `downloads.csv` file which lists all available submissions, their location, the content of any text submissions and file IDs for any attached files included in the submission. Missing or corrupted files will be annotated with `False` in the `file_found` column of this document but will not be included in the zipped file archive.

Inside the zipped directory there's a folder for each unit that contains an ORA problem in the course named using the following format: `[section_index] Section title, [subsection_index] Subsection name, [unit_index] Unit name`. Example: `[1] First section, [2] Second subsection, [3] Unit name`.

Each of the folders mentioned above contain the text submissions for all students in .txt format along with any attached files in that submission if applicable. The filename indicates the ORA index, username (or partner ID if availabel) and prompt index for a given ORA. When responses are file uploads, the name will also include the original filename. Example: `[1] - john_doe - prompt_0.txt`.

10.30 Oppia Exploration Tool

Note: EdX offers provisional support for this tool.

Oppia is a third-party tool that you can use to create short interactive tutorials, called explorations. This topic describes how to embed Oppia explorations in your course.

- *Overview*
- *Enable the Oppia Exploration Tool*
- *Add an Oppia Exploration in Studio*

Before you make content from an external site available through your course, be sure to review the content to ensure that it is accessible to people with disabilities. For more information, see *Accessibility Best Practices for Developing Course Content*.

10.30.1 Overview

You use the Oppia exploration tool in Studio to add interactive tutoring activities, created as Oppia explorations, to your course. Oppia explorations simulate conversations with human tutors to encourage exploration and experiential learning.

Note: Oppia explorations are not assessments that can be graded. At this time, you should not add Oppia exploration components to the graded subsections of your course.

The following example shows an Oppia exploration as learners see it in the edX LMS.

For information about how to create Oppia explorations, see the Oppia User Documentation.

10.30.2 Enable the Oppia Exploration Tool
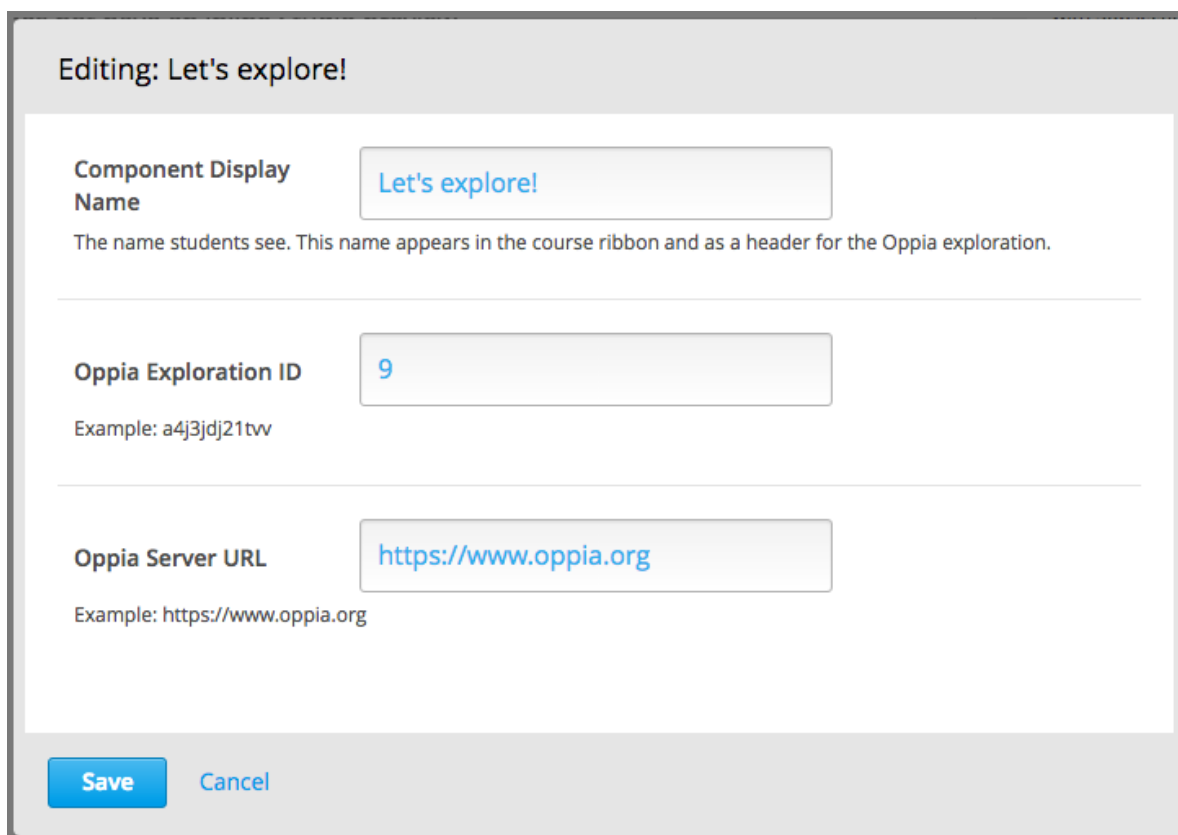
Before you can add an Oppia exploration to your course, you must enable this tool in Studio.

To enable the Oppia exploration tool in Studio, you add the `"oppia"` key to the **Advanced Module List** on the **Advanced Settings** page. (Be sure to include the quotation marks around the key value.) For more information, see *Enabling Additional Exercises and Tools*.

10.30.3 Add an Oppia Exploration in Studio

You must *enable the Oppia exploration tool* before you add a component with an exploration to your course. You must also select the Oppia exploration that you want to add, and obtain both the URL of the website that hosts that exploration and its ID.

1. On the **Course Outline** page, open the unit in an ungraded subsection where you want to add the exploration.

2. Under **Add New Component**, select **Advanced**, and then select **Oppia Exploration**. The new component is added to the unit.

3. In the new component, select **Edit**.

4. In the **Component Display Name** field, enter an identifying name for the component. In the LMS, this name appears as a heading above the exploration.

5. In the **Oppia Exploration ID** field, enter the identifier assigned to the exploration you want to add. For example, `qG6kclSxlWZn` or `gC4_ggkWar-L`.

6. In the **Oppia Server URL** field, enter the host site of the exploration you want to add. For example, `www.oppia.org`.

7. Select **Save**.

   Studio does not show the exploration on the unit page. To verify your work, select **Preview**, or publish the unit and then select **View Live**.

10.31 Peer Instruction Tool

Note: EdX offers full support for this tool.

The Peer Instruction learning system provides students with in class opportunities to discuss questions and arrive at a deeper understanding of concepts. The peer instruction tool emulates this classroom experience for the learners in an online course.

- *Assignment Overview*
    - *Designing an Online Peer Instruction Assignment*
    - *Enable the Peer Instruction Tool*
- *Adding a Peer Instruction Assignment in Studio*
    - *Upload Images (Optional)*
    - *Add a Peer Instruction Component*
    - *Add the Assignment Details*
- *Reviewing a Histogram of Learner Responses*

For more information about the Peer Instruction learning system, consult the Turn to Your Neighbor blog.

10.31.1 Assignment Overview

Assignments created with the peer instruction tool present learners with a multiple choice question, and then guide the learners through these stages of the exercise.

1. An initial response, which includes both an answer choice and a written explanation for that choice.

2. Review of responses submitted by several other course participants.

3. A final response, which also includes an answer choice and revised explanation.

Learners also receive an explanation for the correct answer choice. After 10 learners complete the assignment, class breakdown histograms show the percentage of responding learners who selected each of the answer choices, both initially and after reviewing peer responses.

Designing an Online Peer Instruction Assignment

Before you use the peer instruction tool in Studio, you design the assignment. You prepare the assignment question and its answer choices in the same way that you would for classroom students. The question and the answer choices can include text, images, or both.

For your online learners, you also prepare the following additional elements for the exercise.

- A text explanation of the correct answer choice.

- An example text explanation for each answer choice.

  These example explanations ensure that all learners, including the first few to attempt the assignment, have other responses to review in the second stage of the exercise. As the number of responses received from learners increases, the likelihood that your examples will be shown to any given learner decreases.

- The number of responses for learners to review in the second stage of the exercise.

- The logic for selecting the responses to show.

  - The random algorithm presents the specified number of responses without regard to the associated answer choices. The responses shown to a learner might include explanations for each of the answer choices, or it might include several explanations for one choice and none for another choice.

  - The simple algorithm includes an additional step to minimize repeated and missed responses for the different answer choices. Explanations are presented for as many different answer choices as possible for the number of responses specified.

After your design is complete, you use Studio to add the assignment to your course.

Note: You might consider including a Text component before the peer instruction component to describe the workflow that learners will experience in this assessment type. You might also consider including a content-specific discussion component after the peer instruction component to give learners an opportunity to continue the conversation.

For more information about how learners experience peer instruction assignments, see learners:interactive_multiple_choice in the *EdX Learner's Guide* or Explaining Multiple Choice Answers in the *Open edX Learner's Guide*.

Enable the Peer Instruction Tool

Before you can add a component to your course structure for a peer instruction assignment, you must enable the peer instruction tool for your course.

To enable the peer instruction tool in Studio, you add the `"ubcpi"` key to the **Advanced Module List** on the **Advanced Settings** page. Be sure to include quotation marks around the key value. For more information, see *Enabling Additional Exercises and Tools*.

Note: This tool was developed and contributed to the edX platform by the University of British Columbia.

10.31.2 Adding a Peer Instruction Assignment in Studio

- *Upload Images (Optional)*
- *Add a Peer Instruction Component*
- *Add the Assignment Details*

Upload Images (Optional)

If the question or an answer choice in an assignment includes an image, you *upload the image file* on the **Files & Uploads** page. The **Studio URL** for the image can then be added to the question or answer choice in the peer instruction component.

Add a Peer Instruction Component

After you *enable the peer instruction tool* for your course, you can add the component for a peer instruction assignment.

1. On the **Course Outline** page, locate the subsection where you want to add the assignment and add or open a unit.

2. Under **Add New Component**, select **Advanced**, and then select **Peer Instruction**. Studio adds the new component to the unit and uses a template to supply a sample question, answers, and so on.

3. Select **Edit**.

4. In the component editor, replace the default component display name with an identifying name. In the LMS, this name appears as a heading above the assignment.

   Unique, descriptive display names can help you identify individual assignments quickly and accurately for analysis.

5. Select **Save**, or continue on to replace the template information with the details for this assignment.

Add the Assignment Details

Before you add the details of the assignment to a peer instruction component, you *design the assignment* by preparing a question, answer choices, and other required elements. If the question or any of the answer choices includes an image, you also *upload* the image file and obtain its Studio URL so that you can add it to the assignment.

To enter all of the assignment details into the component editor, follow these steps.

1. In the new component, select **Edit**.

2. For the assignment question, enter text, add an image, or both.

   - To add text, enter the question that you want learners to consider in the **Question Text** field.

   - To add an image, follow these steps.

     1. Select **Add Image to Question**. Additional fields appear.

     2. In the **Image URL** field, paste or enter the Studio URL from the **Files & Uploads** page.

     3. Specify the **Image Position**. If your question does not include text, **Appears above** and **Appears below** have the same result.

     4. Provide a description of the image. This description should provide enough detail so that learners who cannot see the image, and who rely on screen readers to complete your course, can understand the question.

3. Select a minimum and maximum length for the written explanations your learners supply for their answer choices.

   You can change the supplied default values as needed to require explanations that are longer than 1 character, or limit explanations to less than 32,000 characters (approximately 12 pages).

4. Enter each answer choice. You can enter text, add an image, or both. For information on how to add an image, see step 2.

   The template for this component has three sample answer choices.

   - If your question has more than three answer choices, select **Add New Answer** and then enter the answer. You can include up to 10 answer choices.

   - To delete an answer choice, select the **X** next to the text field for that answer.

5. Specify which of the answer choices is the correct answer. Alternatively, you can choose to not specify a correct answer by selecting "n/a". You identify the correct answer choice by its assigned number: to indicate Answer 1 you select **Option 1**, for Answer 2 you select **Option 2**, and so on.

6. Enter a text explanation that describes why the specified answer choice is correct. This is optional if you have chosen to not specify a correct answer.

7. Configure how, and how many, peer responses to show to learners after they submit an initial response.

   - To guide selection of the responses to show, select either **Random** or **Simple**. For more information, see *Designing an Online Peer Instruction Assignment*.

   - Specify how many responses learners should be given to review. The default, **#**, shows learners the same number of responses as there are answer options.

8. Enter your example explanations. For each of the answer choices you enter in step 4, you must supply an example explanation. You identify each answer choice by its assigned number: to indicate Answer 1 you select **Option 1**, for Answer 2 you select **Option 2**, and so on.

   The template for this component includes three example explanations.

- If your question has more than three answer choices, you select **Add New Example**, and then identify the answer choice and enter the example explanation for each of the other answer choices.

- To delete an example explanation, select the **X** next to the list of numbered choices.

9. Select **Save**.

   If **Save** is not available, an edit check has detected incomplete or invalid information in the component editor. Review your entries to make sure that each field has an entry (as appropriate), and that you have provided an example explanation for each answer choice. For information about the error found, move your cursor over the question mark that appears next to **Save**.

10.31.3 Reviewing a Histogram of Learner Responses

When learners submit their final answer choices and revised explanations, the peer instruction tool displays the correct answer, if you have specified one, and its explanation (if applicable). The learner's initial answer and response, and final answer and response, follow.

As soon as 10 learners complete the assignment, the peer instruction tool displays a pair of class breakdown histograms. These histograms show how frequently learners selected each of the options, before and after they reviewed the responses submitted by other class participants.

Class Breakdown
This is a look at how your classmates answered the question during the initial and final rounds.

Answer Options

Option 1 (correct)
Air

Option 2
Soil

Option 3
Water

Initial Answer Selection

	50.0%	
25.0%		25.0%
Option 1 (correct)	Option 2	Option 3

Final Answer Selection

50.0%		
	25.0%	25.0%
Option 1 (correct)	Option 2	Option 3
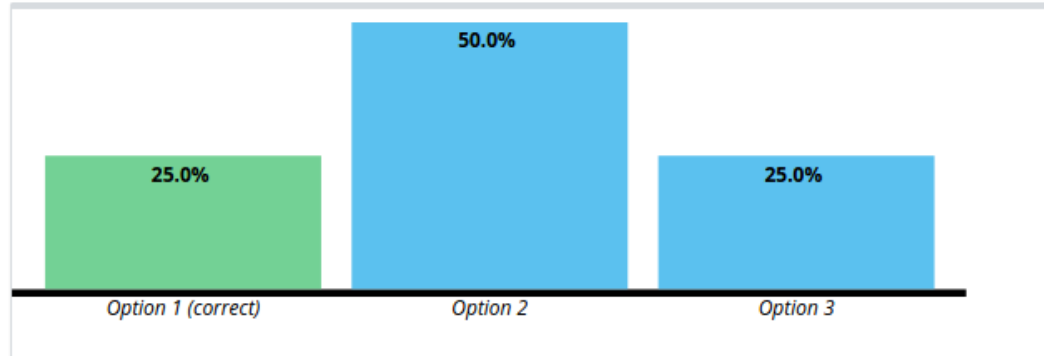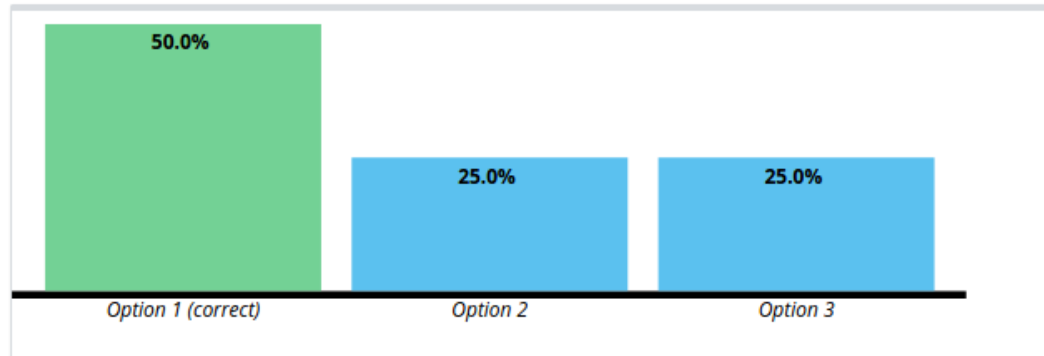
10.32 Periodic Table Tool

Note: EdX does not support this tool.

You can create an interactive periodic table of the elements to help your students learn about various elements' properties. In the table below, detailed information about each element appears as the student moves the mouse over the element.

AN INTERACTIVE REFERENCE TABLE

This interactive periodic table of the elements was first used in 3.091x: Introduction to Solid State Chemistry. The table reveals detailed information about each element as you mouse over it.

10.32.1 Create the Periodic Table Tool

To create a periodic table, you need the following files:

- Periodic-Table.js
- Periodic-Table.css
- Periodic-Table-Colors.css
- PeriodicTableHTML.txt

To download all of these files in a .zip archive, go to http://files.edx.org/PeriodicTableFiles.zip.

To create the periodic table, you need a Text component.

---

1. Upload all of the files listed above *except PeriodicTable.txt* to the **Files & Uploads** page in your course.

2. In the unit where you want to create the problem, click **Text** under **Add New Component**, and then click **Text**.

3. In the component that appears, click **Edit**.

4. In the component editor, switch to the **HTML** tab.

5. Open the PeriodicTable.txt file in any text editor.

6. Copy all of the text in the PeriodicTable.txt file, and paste it into the Text component editor. (Note that the PeriodicTableHTML.txt file contains over 6000 lines of code. Paste all of this code into the component editor.)

7. Click **Save**.

10.33 Poll Tool

Note: EdX offers full support for this tool.

This section describes how to include polls in your course.

- *Overview*
- *Enable the Poll Tool*
    - *Enable the Poll Tool in OLX*
- *Add a Poll in edX Studio*
- *Add a Poll in OLX*
    - *poll Element Attributes*
- *Editing Published Polls*
- *View Poll Results*

10.33.1 Overview

You can include polls in your course to gather learners' opinions on various questions.

For a poll, you configure one question and multiple possible answers. If you need to ask multiple questions, use the *Survey Tool*.

The following example poll has four possible answers to the question.

After learners submit their answers to the poll question, they see the poll results that have been gathered at this time, unless the poll has been configured to hide results.

10.33.2 Enable the Poll Tool

Before you can add a poll to your course, you must enable the poll tool in Studio or OLX (open learning XML).

To enable the poll tool in Studio, you add the `"poll"` key to the **Advanced Module List** on the **Advanced Settings** page. (Be sure to include the quotation marks around the key value.) For more information, see *Enabling Additional Exercises and Tools*.

Alternatively, you can use OLX to enable the poll tool.

Enable the Poll Tool in OLX

To enable polls in your course, you edit the XML file that defines the course structure.

Open the XML file for the course in the `course` directory. In the `course` element's `advanced-modules` attribute, add the string `poll`.

For example, the following XML code enables polls in a course.

```
<course advanced_modules="[&quot;survey&quot;,
    &quot;poll&quot;]" display_name="Sample Course"
```

```
    start="2015-01-01T00:00:00Z">
    ...
</course>
```
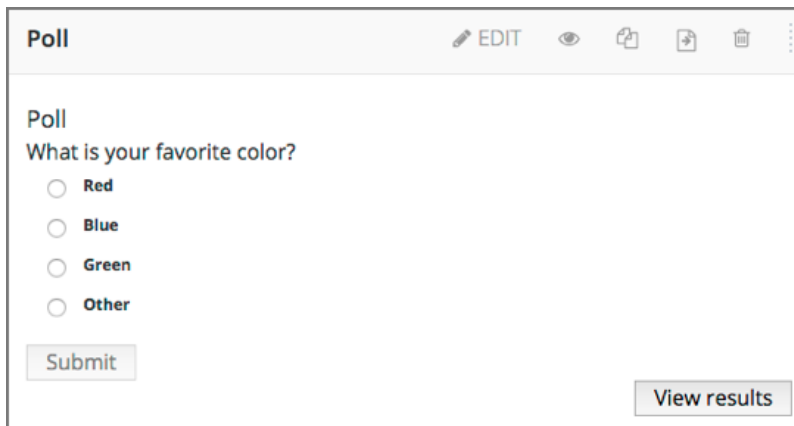
10.33.3 Add a Poll in edX Studio

You must *enable the poll* tool before you add the component.

1. On the Course Outline page, open the unit where you want to add the poll.

2. Under **Add New Component** click **Advanced**, and then select **Poll**.

   The new component is added to the unit, with a default example poll that contains several answer fields.

3. In the new component, select **Edit**.

4. In the **Display Name** field, enter the name for the component.

5. In the **Question/Prompt** field, enter text that learners see above the poll. You can use Markdown in this field.

6. In the **Feedback** field, enter text that learners see after they submit a responses. You can use Markdown in this field.

7. In the **Private Results** field, to hide poll results from learners, select **True**. If you leave the default value, **False**, learners see poll results after they submit responses.

8. In the **Maximum Submissions** field, change the value to the number of times that you want to allow learners to submit responses. Enter **0** to allow unlimited responses.

   Note: If you allow learners to submit responses more than once, you should set **Private Results** to **True**. Otherwise, learners will be able to change their responses after seeing others' responses.

   ---

9. Configure answers for the poll.

   1. In each **Answer** field, enter the answer text that learners see.

   2. You must enter either text or an image path, or both, for each answer. To enter an image, use the *Studio URL* for the image.

   3. If you use an image, you must enter useful alternative text in the **Image alternate text** field for non-sighted users.

4. To add answers, select **Add answer** at the bottom of the editor. New answers are added at the bottom of the list.

5. To change the order of answers, select the up and down buttons next to each answer.

6. To remove an answer, select **Delete** next to the answer.

10. Select **Save**.

10.33.4 Add a Poll in OLX

To add a poll XBlock in OLX, you create the `poll` element. You can embed the `poll` element in the `vertical` element, or you can create the `poll` element as a standalone file that you reference in the vertical.

The following example shows the OLX definition for a poll with four answers.

```
<poll url_name="f4ae7de0006f426aa4eed4b0b8112da5" xblock-family="xblock.v1"
  feedback="Feedback"
  display_name="Poll"
  private_results="false"
  question="What is your favorite color?"
  max_submissions="1"
  answers="[
          [&quot;R&quot;,
            {
              &quot;img&quot;: &quot;/static/image.png&quot;,
              &quot;img_alt&quot;: &quot;Alt 1&quot;,
              &quot;label&quot;: &quot;Red&quot;
            }
          ],
          [&quot;B&quot;,
            {
              &quot;img&quot;: &quot;/static/image.png&quot;,
              &quot;img_alt&quot;: &quot;Alt 2&quot;,
              &quot;label&quot;: &quot;Blue&quot;
            }
          ],
          [&quot;G&quot;,
            {
              &quot;img&quot;: &quot;/static/image.png&quot;,
              &quot;img_alt&quot;: &quot;Alt3&quot;,
              &quot;label&quot;: &quot;Green&quot;
            }
          ],
          [&quot;O&quot;,
            {
              &quot;img&quot;: &quot;/static/image.png&quot;,
              &quot;img_alt&quot;: &quot;Alt 4&quot;,
              &quot;label&quot;: &quot;Other&quot;
            }
          ]
        ]
"/>
```

poll Element Attributes

The following table describes the attributes of the `poll` element.

Attribute	Description
url_name	The unique identifier of the poll.
xblock-family	The XBlock version used. Must be `xblock.v1`.
private_results	Whether the poll results are shown to learners (`true`) or not (`false`).
display_name	The display name for the poll.
question	The prompt for the poll.
feedback	The text shown to learners after they submit a response.
max_submissions	The number of times a learner can submit poll answers. Use `0` to allow unlimited submissions. If you use a value other than 1, set `private_results` to `true`. Otherwise, learners will be able to change their responses after seeing others' responses.
answers	An array of answers in the poll. Each answer has a unique identifier, and a dictionary that defines values for the following names. • `img`, the static URL of the answer image. • `img_alt`, the alternative text for the image. • `label`, the answer text. Each answer must have a value for `img` or `label`, or both.

10.33.5 Editing Published Polls

Do not publish a poll until you have completed and tested it. You should avoid changing a poll after learners have begun to use it.
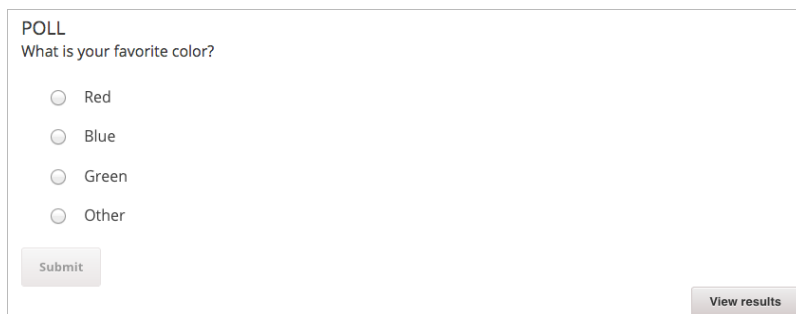
If you must edit a poll after learners have submitted answers take into account the following implications.

- If you edit the value of an answer, previous submissions are associated with the new answer value. This change can result in an inaccurate picture of the responses.

- If you change the poll so that previous submissions are invalid, by removing an answer, those submissions are deleted when learners next view the unit. Learners with invalid submissions can submit new responses.

10.33.6 View Poll Results

When you view the poll as a course staff member, you can view results of the poll inside the course.

Select **View results** in the poll.

The results of the poll are then displayed.

10.34 Poll Tool for OLX

Note: EdX does not support this tool.

You can run polls in your course so that your students can share opinions on different questions.

Note: Creating a poll requires you to export your course, edit some of your course's XML files in a text editor, and then re-import your course. We recommend that you create a backup copy of your course before you create the poll. We also recommend that you only edit the files that will contain polls in the text editor if you are very familiar with editing XML.

10.34.1 Terminology

Sections, subsections, units, and components have different names in the **Course Outline** view and in the list of files that you see after you export your course and open the .xml files for editing. The following table lists the names of these elements in the **Course Outline** view and in a list of files.

Course Outline View	File List
Section	Chapter
Subsection	Sequential
Unit	Vertical
Component	Discussion, HTML, problem, or video

For example, when you want to find a specific section in your course, you look in the **Chapter** folder when you open the list of files that your course contains. To find a unit, you look in the **Vertical** folder.

10.34.2 Create a Poll

1. In the unit where you want to create the poll, create components that contain all the content that you want *except* for the poll. Make a note of the 32-digit unit ID that appears in the **Unit Identifier** field under **Unit Location**.

2. Export your course. For information about how to do this, see *Exporting and Importing a Course*. Save the .tar.gz file that contains your course in a memorable location so that you can find it easily.

3. Locate the .tar.gz file that contains your course, and then unpack the .tar.gz file so that you can see its contents in a list of folders and files.

   - To do this on a Windows computer, you need to download a third-party program. For more information, see How to Unpack a tar File in Windows, How to Extract a Gz File, The gzip Home Page, or the Windows section of the How to Open .tar.gz Files page.

   - For information about how to do this on a Mac, see the Mac OS X section of the How to Open .tar.gz Files page.

4. In the list of folders and files, open the **Vertical** folder.

   Note: If your unit is not published, open the **Drafts** folder, and then open the **Vertical** folder in the **Drafts** folder.

   ---

5. In the **Vertical** folder, locate the .xml file that has the same name as the unit ID that you noted in step 1, and then open the file in a text editor such as Sublime 2. For example, if the unit ID is e461de7fe2b84ebeabe1a97683360d31, you open the e461de7fe2b84ebeabe1a97683360d31.xml file.

   The file contains a list of all the components in the unit, together with the URL names of the components. For example, the following file contains an Text component followed by a discussion component.

   ```
   <vertical display_name="Test Unit">
    <html url_name="b59c54e2f6fc4cf69ba3a43c49097d0b"/>
    <discussion url_name="8320c3d511484f3b96bdedfd4a44ac8b"/>
   </vertical>
   ```

6. Add the following poll code in the location where you want the poll. Change the text of the prompt to the text that you want.

```
<poll_question display_name="Poll Question">
  <p>Text of the prompt</p>
  <answer id="yes">Yes</answer>
  <answer id="no">No</answer>
</poll_question>
```

In the example above, if you wanted your poll to appear between the HTML component and the discussion component in the unit, your code would resemble the following.

```
<vertical display_name="Test Unit">
 <html url_name="b59c54e2f6fc4cf69ba3a43c49097d0b"/>
 <poll_question display_name="Poll Question">
   <p>Text of the prompt</p>
   <answer id="yes">Yes</answer>
   <answer id="no">No</answer>
 </poll_question>
 <discussion url_name="8320c3d511484f3b96bdedfd4a44ac8b"/>
</vertical>
```

7. After you add the poll code, save and close the .xml file.

8. Re-package your course as a .tar.gz file.

9. In Studio, re-import your course. You can now review the poll question and answers that you added in Studio.

Note:

- Although polls render correctly in Studio, you cannot edit them in Studio. You will need to follow the export/import process outlined above to make any edits to your polls.

- A .csv file that contains student responses to the problem is not currently available for polls. However, you can obtain the aggregate data directly in the problem.

10.34.3 Format description

The main tag of poll module input is:

```
<poll_question> ... </poll_question>
```

`poll_question` can include any number of the following tags: any xml and `answer` tag. All inner xml, except for `answer` tags, we call "question".

poll_question tag

Xmodule for creating poll functionality - voting system. The following attributes can be specified for this tag:

```
name - Name of xmodule.
[display_name| AUTOGENERATE] - Display name of xmodule. When this attribute is not␣
→defined - display name autogenerate with some hash.
[reset | False] - Can reset/revote many time (value = True/False)
```

answer tag

Define one of the possible answer for poll module. The following attributes can be specified for this tag:

```
id - unique identifier (using to identify the different answers)
```

Inner text - Display text for answer choice.

10.34.4 Example

Example of poll

```
<poll_question name="second_question" display_name="Second question">
    <h3>Age</h3>
    <p>How old are you?</p>
    <answer id="less18">&lt; 18</answer>
    <answer id="10_25">from 10 to 25</answer>
    <answer id="more25">&gt; 25</answer>
</poll_question>
```

Example of poll with unable reset functionality

```
<poll_question name="first_question_with_reset" display_name="First question with reset"
    reset="True">
    <h3>Your gender</h3>
    <p>You are man or woman?</p>
    <answer id="man">Man</answer>
    <answer id="woman">Woman</answer>
</poll_question>
```

10.35 Problem with Adaptive Hint

Note: EdX does not support this problem type.

A problem with an adaptive hint evaluates a student's response, then gives the student feedback or a hint based on that response so that the student is more likely to answer correctly on the next attempt. These problems can be text input problems or multiple choice problems.

Problem with Adaptive Hint

1 point possible (graded)

If a bat and a ball cost $1.10 together, and the bat costs $1.00 more than the ball, how much does the ball cost? Enter your answer in cents, and include only the number (that is, do not include a $ or a ¢ sign).

> 0.05   ✖

Hint: Make sure you enter your answer in cents

Submit   ⟳   ⓘ
                             Reset   Show Answer

✖ Incorrect (0/1 point)

10.35.1 Create a Problem with an Adaptive Hint

To create the problem illustrated above, follow these steps.

1. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

2. Click **Problem with Adaptive Hint**.

3. In the component that appears, click **Edit**.

4. In the component editor, replace the example code with the code below.

5. Click **Save**.

```
<problem>
    <text>
        <script type="text/python" system_path="python_lib">
  def test_str(expect, ans):
    print expect, ans
    ans = ans.strip("'")
    ans = ans.strip('"')
    return expect == ans.lower()

  def hint_fn(answer_ids, student_answers, new_cmap, old_cmap):
    aid = answer_ids[0]
    ans = str(student_answers[aid]).lower()
    print 'hint_fn called, ans=', ans
    hint = ''
    if '0.05' in ans:
       hint = 'Make sure you enter your answer in cents'

    if hint:
      hint = "&lt;font color='blue'&gt;Hint: {0}&lt;/font&gt;".format(hint)
      new_cmap.set_hint_and_mode(aid,hint,'always')
```

```
            </script>
            <p>If a bat and a ball cost $1.10 together, and the bat costs $1.00 more␣
↪than the
            ball, how much does the ball cost? Enter your answer in cents, and include␣
↪only
            the number (that is, do not include a $ or a ¢ sign).</p>
            <p>
                <customresponse cfn="test_str" expect="5">
                    <textline correct_answer="5" label="How much does the ball cost?"/>
                    <hintgroup hintfn="hint_fn"/>
                </customresponse>
            </p>
        </text>
</problem>
```

10.35.2 Problem with Adaptive Hint XML

Template

```
<problem>
  <text>
    <script type="text/python" system_path="python_lib">
def test_str(expect, ans):
  print expect, ans
  ans = ans.strip("'")
  ans = ans.strip('"')
  return expect == ans.lower()

def hint_fn(answer_ids, student_answers, new_cmap, old_cmap):
  aid = answer_ids[0]
  ans = str(student_answers[aid]).lower()
  print 'hint_fn called, ans=', ans
  hint = ''
  if 'incorrect answer 1' in ans:
    hint = 'hint for incorrect answer 1'
  elif 'incorrect answer 2' in ans:
    hint = 'hint for incorrect answer 2'

  if hint:
    hint = "&lt;font color='blue'&gt;Hint: {0}&lt;/font&gt;".format(hint)
    new_cmap.set_hint_and_mode(aid,hint,'always')
</script>
    <p>TEXT OF PROBLEM</p>
    <p>
      <customresponse cfn="test_str" expect="ANSWER">
        <textline correct_answer="answer" label="LABEL TEXT"/>
        <hintgroup hintfn="hint_fn"/>
      </customresponse>
    </p>
  </text>
```

```
</problem>
```

Note: If the hints that you supply include characters, the letters must be lowercase.

Tags

- `<text>`: Surrounds the script and text in the problem.

- `<customresponse>`: Indicates that this problem has a custom response.

- `<textline>`: Creates a response field in the LMS where the student enters a response.

- `<hintgroup>`: Specifies that the problem contains at least one hint.

Tag: `<customresponse>`

Attributes

(none)

Children

- `<textline>`

- `<hintgroup>`

Tag: `<textline>`

Attributes

Attribute	Description
label (required)	Contains the text of the problem.
size (optional)	Specifies the size, in characters, of the response field in the LMS.
hidden (optional)	If set to "true", students cannot see the response field.
correct_answer (optional)	The answer to the problem. To supply a correct_answer value that includes letters, all letters **must be lowercase**. (Students' responses to the problem are not case sensitive. They can contain both uppercase and lowercase letters.)

Children

(none)

Tag: `<hintgroup>`

Attributes

Attribute	Description
hintfn	Must be set to **hint_fn** (that is, the tag must appear as `<hintgroup hintfn="hint_fn"/>`).
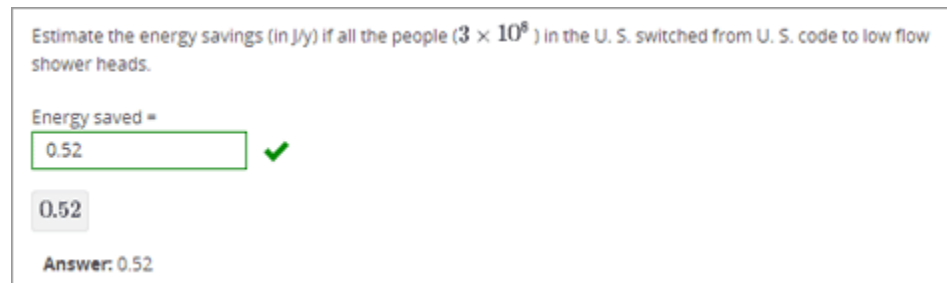
10.36 Problem Written in LaTeX

Note: EdX does not support this problem type.

> **Warning:** This problem type is a prototype, and is not supported. By default, the ability to create these problems is not enabled in Studio. You must change the advanced settings in your course before you can create problems with LaTeX. Use this problem type with caution.

If you have an problem that is already written in LaTeX, you can use this problem type to easily convert your code into XML. After you paste your code into the LaTeX editor, you make a few adjustments.

Note: If you want to use LaTeX to typeset mathematical expressions in problems that you haven't yet written, use any of the other problem templates together with MathJax. For more information about how to create mathematical expressions in Studio using MathJax, see *Using MathJax for Mathematics*.

Estimate the energy savings (in J/y) if all the people (3×10^8) in the U. S. switched from U. S. code to low flow shower heads.

Energy saved =

    0.52   ✔

    0.52

Answer: 0.52

10.36.1 Create a Problem Written in LaTeX

To create a problem written in LaTeX, follow these steps.

1. Enable the policy key in your course.

    1. In Studio, click **Settings**, and then click **Advanced Settings**.

    2. In the field for the **Enable LaTeX Compiler** policy key, change **false** to **true**.

    3. At the bottom of the page, click **Save Changes**.

2. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

3. Click **Problem Written in LaTeX**.

4. In the component editor that appears, click **Edit**.

5. In the lower left corner of the component editor, click **Launch LaTeX Source Compiler**.

6. Replace the example code with your own code. You can also upload a Latex file into the editor from your computer by clicking **Upload** in the bottom right corner.

7. In the lower left corner of the LaTeX source compiler, click **Save & Compile to edX XML**.

10.37 Protex Protein Builder Tool

Note: EdX does not support this tool.

The Protex protein builder asks students to create specified protein shapes by stringing together amino acids. In the example below, the goal protein shape is a simple line.
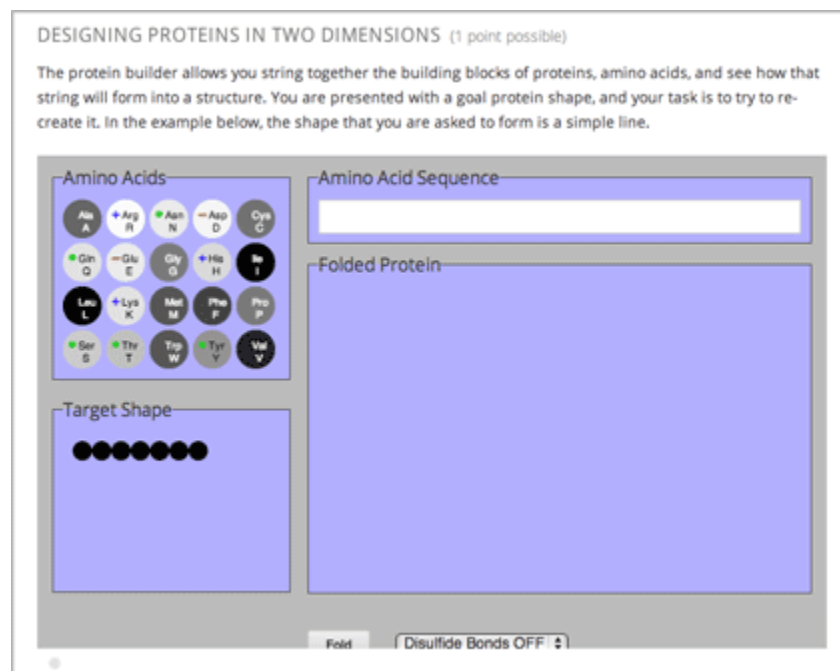
10.37.1 Create the Protein Builder Tool

To create the protein builder, follow these steps.

1. Under **Add New Component**, click **Problem**, and then click **Blank Advanced Problem**.

2. In the component that appears, click **Edit**.

3. In the component editor, paste the problem component code from the section that follows.

4. Make any changes that you want, and then click **Save**.

10.37.2 Protein Builder Tool Code

```
<problem>
    <p>The protein builder allows you string together the building blocks of proteins,
→amino acids, and see how that string will form into a structure. You are presented
→with a goal protein shape, and your task is to try to re-create it. In the example
→below, the shape that you are asked to form is a simple line.</p>
    <p>Be sure to click "Fold" to fold your protein before you click "Check".</p>

<script type="loncapa/python">
```

```
def protex_grader(expect,ans):
  import json
  ans=json.loads(ans)
  if "ERROR" in ans["protex_answer"]:
    raise ValueError("Protex did not understand your answer. Try folding the protein.")
  return ans["protex_answer"]=="CORRECT"

</script>

  <text>
    <customresponse cfn="protex_grader">
      <designprotein2dinput width="855" height="500" target_shape="W;W;W;W;W;W;W"/>
    </customresponse>
  </text>
  <solution>
    <p>
      Many protein sequences, such as the following example, fold to a straight line.You␣
↪can play around with the protein builder if you're curious.
    </p>
    <ul>
      <li>
          Stick: RRRRRRR
      </li>
    </ul>
  </solution>
</problem>
```

In this code:

- **width** and **height** specify the dimensions of the application, in pixels.

- **target_shape** lists the amino acids that, combined in the order specified, create the shape you've asked students to create. The list can only include the following letters, which correspond to the one-letter code for each amino acid. (This list appears in the upper-left corner of the protein builder.)

A	R	N	D
C	Q	E	G
H	I	L	K
M	F	P	S
T	W	Y	V

10.38 Qualtrics Survey Tool

Note: EdX offers provisional support for this tool.

You can administer Qualtrics surveys to your learners in your edX course. The Qualtrics survey appears in an iframe inside the course.

Course staff can view the overall results of the survey as well as responses from individual learners.

Note: To use a Qualtrics survey, you must have a Qualtrics license. Qualtrics licenses are available for a fee at the Qualtrics website. If you want to include a survey but you do not have a Qualtrics license, you can use the *edX survey tool* or a *Google form*.

For more information, see the following sections.

- *Add a Qualtrics Survey to Your Course*
- *View Survey Responses*

Be sure to review all supplemental materials to make sure that they are accessible before making them available through your course. For more information, see *Accessibility Best Practices for Developing Course Content*.

10.38.1 Add a Qualtrics Survey to Your Course

To add a Qualtrics survey to your course, you must *create the survey in Qualtrics*, and then *create a Text component in Studio*.

Create the Qualtrics Survey

Note: Because Qualtrics is a third-party tool, the following steps might change without notice. See the Qualtrics website for the most up-to-date Qualtrics documentation.

---

1. Using your Qualtrics account, create your survey.

2. Add the statements and options that you want the survey to include.

3. Add the **user ID** element. This element imports data from your course into Qualtrics.

    1. At the top of the page, make sure the **Edit Survey** tab is selected, and then select **Survey Flow**.

    2. In the upper left corner, select **Add a New Element Here**.

    3. Select **Embedded Data**.

    4. Under **Set Embedded Data**, replace **Enter Embedded Data Field Name Here** with uid.

    5. Select **Save Flow**.

4. At the top of the page, make sure **Edit Survey** is selected, and then select **Launch Survey**.

5. On the page that opens, select **Activate Survey** in the upper right corner.

6. On the page that opens, locate the URL that is listed under **Your Anonymous Survey Link**. You will add this URL to the Text component for your survey in Studio.

Note: If you need to find this URL in the future, open your survey in Qualtrics, and then select the **Distribute Survey** tab at the top of the page.

Create the Text Component in Studio

1. Open the unit where you want the survey to appear.

2. Under **Add New Component**, select **Text**, and then select **IFrame Tool**.

3. Select **Edit** to open the component editor, and then select **HTML** in the menu bar.

4. At the end of the instructions, locate the example iframe element, and replace the placeholder values with the values for your survey. The iframe element starts with the following text.

    `<iframe title="Euler Line Demo"`

   • In the `title` attribute, replace `Euler Line Demo` with the title of your survey.

   • In the `src` attribute, replace the placeholder URL with the URL from step 6 in *Create the Qualtrics Survey*.

   • In the `src` attribute, add the following value to the end of the URL.

    `?uid=%%USER_ID%%`

    The resulting `src` attribute resembles the following example.

```
src="https://qtrial2015az1.az1.qualtrics.com/SE/?SID=SV_9N27VuruRdNcpHT?
uid=%%USER_ID%%"
```

- Replace the values in the `width` and `height` attributes with values that allow your survey to appear the way you want it to. For example, you might change `width` to 800 and `height` to 1000.

- (Optional) If your survey might be taller than the value that you set for `height`, in the `scrolling` attribute, change the value to `yes`. If you do not change the value to `yes` and your survey is taller than the `height` value, learners cannot scroll down to respond to all the survey statements.

- Leave the other default values, and then select **OK** at the bottom of the HTML source code editor to return to the component editor.

1. In the component editor, delete all of the default instructional text, or replace it with introductory text for your Qualtrics survey.

2. Select **Save**.

10.38.2 View Survey Responses

You can view both overall survey responses and responses for individual learners.

View Overall Responses

To view your overall survey results and analyze data, open your survey on the Qualtrics website.

View Survey Responses for an Individual Learner

To view a specific learner's survey responses, you must download data both from the Insructor Dashboard and from Qualtrics, and then review the data.

Download Data from the Instructor Dashboard

1. In the LMS, select **Instructor**.

2. Select **Data Download**.

3. Under **Data Download**, select **Get Student Anonymized IDs CSV**. If you receive a prompt, specify the location where you want to save the file.

   The .csv file is saved to your computer. The file has the following name.

   `<course name>_<course number>_<year>_<term>_anon-ids.csv`

   For more information about anonymized student IDs, see *Accessing Anonymized Learner IDs*.

4. Under **Reports**, select **Download profile information as a CSV**.

5. When the profile information report appears in the list under **Reports Available for Download**, select the report to download the .csv file to your computer. The file has the following name.

   `<course name>_<course number>_<year>_<term>_student_profile_info_<date and time>.csv`

For more information about accessing learner data, see *Learner Data*.

Download Data from Qualtrics

Note: Because Qualtrics is a third-party tool, the following steps might change without notice. See the Qualtrics website for the most up-to-date Qualtrics documentation.

---

1. In Qualtrics, select the **View Results** tab.

2. On the page that opens, select **Download Data** in the upper left corner of the page.

3. On the page that opens, clear the **Compress the desired format into a .zip file before downloading** check box. Accept all the other default values.

4. Under **Format**, select the **This is a Comma Separated Values format...** link to download the .csv file.

Review the Data

To associate learners' responses with their learner profiles, open the three .csv files that you have downloaded in a program such as Microsoft Excel.

- The Qualtrics file has a **uid** column that contains each learner's anonymized ID, as well as columns that contain each learner's answers to the survey.

- The anonymized user ID file (`<course name>_<course number>_<year>_<term >_anon-ids.csv`) contains each learner's anonymized ID and the learner's edX user ID.

- The student profile data file (`<course name>_<course number>_<year>_<term>_student_profile_info_<date and time>.csv`) contains each learner's edX user ID and profile information, such as user name and real name.

To merge the data in the three spreadsheets so that you can see a learner's edX user ID, profile information, and survey responses in one place, you can use functions such as VLOOKUP in Microsoft Excel.

10.39 Randomized Content Blocks

If your course has *content libraries* enabled and you have access to a library whose content you want to use, you can reference that library to create randomized assignments for students.

To create a randomized assignment, you add one or more randomized content blocks to a course unit. For each randomized content block, specify a library from which to draw the content, and indicate the number and optionally the type of problem to randomly give each student.

The libraries that you create or have access to are listed on the **Libraries** tab on the Studio Home page. For details about content libraries, see *Working with Content Libraries*.

For details about using content library components in a course, see these topics.

- *Use Components from Libraries in a Course*
- *Enable Content Libraries*
  - *Add a Randomized Content Block to Your Course*
- *View the Matching Components in a Randomized Content Block*
- *Editing Components in Randomized Content Blocks*
- *Getting the Latest Version of Library Content*

> - *Preview the Randomized Content in Student View*
>
> - *View a Specific Student's Assigned Problems from a Randomized Content Block*
>
> - *Adjust Grades for a Problem from a Randomized Content Block*

10.39.1 Use Components from Libraries in a Course

To create randomized assignments that make use of components from content libraries, you must have at least **User** level access to the libraries that you want to use. If you do not have access to a library, members of your course team who have **Admin** access to that library can grant you access.

The libraries that you create or have access to are listed on the **Libraries** tab on the Studio Home page. For details about content libraries, see *Working with Content Libraries*.

Using components from content libraries in your course involves two steps.

1. *Enable Content Libraries*
2. *Add a Randomized Content Block to Your Course*

Note: After adding a randomized content block to your course, be aware that if components in the source library change, you must manually update the components in the course outline if you want to keep the components synchronized with the version in the library.

For details about working with randomized content blocks in your course, see these topics.

- *View the Matching Components in a Randomized Content Block*
- *Editing Components in Randomized Content Blocks*
- *Getting the Latest Version of Library Content*
- *Preview the Randomized Content in Student View*
- *View a Specific Student's Assigned Problems from a Randomized Content Block*
- *Adjust Grades for a Problem from a Randomized Content Block*

10.39.2 Enable Content Libraries

Before you can add a randomized content blocks to your course, you must enable the content library tool in Studio.

To enable the content library tool in Studio, you add the `"library_content"` key to the **Advanced Module List** on the **Advanced Settings** page. For more information, see *Enabling Additional Exercises and Tools*.

Add a Randomized Content Block to Your Course

After you *enable content libraries* you can add library content to your courses using the Randomized Content Block advanced component.

1. In Studio, open the course in which you want to add randomized problems from a content library.
2. Select **Content**, and then select **Outline**.
3. In the unit where you want to add a set of randomized problems, select **Add New Component**

4. Select **Advanced**, and then select **Randomized Content Block**.

   The randomized content block is added to your unit.

5. Select **Edit**.

6. In the randomized content block settings, specify the details of the content you want to add in this block.

   • For **Count**, enter the number of problems to display to each student.

   • For **Display Name**, enter the name that you want students to see for this block.

   • For **Library**, select the library from which you want to draw problems.

   • For **Problem Type**, from the drop down list select a specific type of problem to be drawn from the library. Select **Any Type** if you do not want to specify a particular type of problem.

   • For **Scored**, from the drop down list select **True** or **False** to indicate whether the assignment should be graded.

   Note: Grading is subject to the setting of this unit's subsection. If the subsection is not graded, selecting **True** here has no impact. If the subsection is graded, this assignment is graded, even if you have selected **False**.

   ---

7. Select **Save** when you have finished specifying the details of your randomized content block.

To view the list of components in the source library that match your filter settings, see *View the Matching Components in a Randomized Content Block*.

To view the entire contents of the library in Studio, see *View the Contents of a Library*.

10.39.3 View the Matching Components in a Randomized Content Block

In a unit that uses a randomized content block, you can view the list of all components that match the filters specified in that block.

For example, if you have specified in the randomized content block that you want to provide each student with 3 multiple choice problems, you see all the multiple choice problems that exist in the referenced library. In other words, you see every problem in the library that could potentially be provided to a student.

1. In Studio, navigate to the unit containing the randomized content block that references your library.

2. In the randomized content block, select **View**.
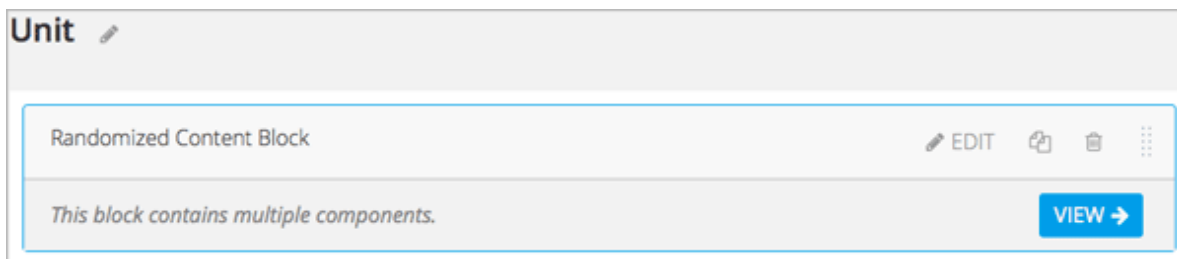
You see all components that match the specifications in the randomized content block. The text at the top of the list of components indicates how many of these components are randomly selected and provided to each student.

To view the contents of a library in Studio, see *View the Contents of a Library*.

To view the randomized content that was assigned to a specific learner, see *Specific Learner View*.

10.39.4 Editing Components in Randomized Content Blocks

In Studio, in the course unit that uses a randomized content block, you can edit each component within the randomized content block in the same way as you do for any other component in your course.

Note: Be aware that if you make changes on a component's **Editor** tab, and then you update the randomized content block with the latest version of components from a library, these changes are overwritten. Only changes to a component's **Settings** tab are retained when you update the component. For details about getting the latest versions of library content in a randomized content block, see *Getting the Latest Version of Library Content*.

The settings of a component that is supplied in a randomized content block are initially inherited from the component in the content library that it is drawn from. In the randomized content block, you can modify component settings so that they are different from the "source" component in the library.

You can also reset a component's settings to the library default. If a component's settings have been changed from the default settings in the library, a **Clear** icon is shown next to the setting field.
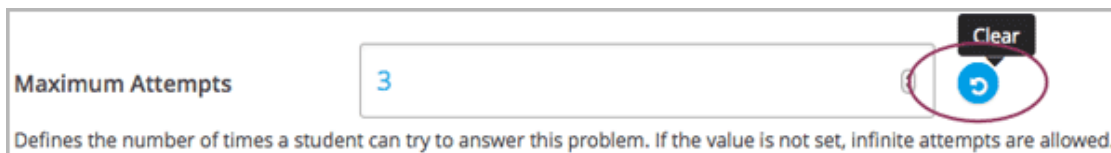
Select **Clear** to restore the library default setting for that field.

10.39.5 Getting the Latest Version of Library Content

If you modify the contents of a library that is referenced by randomized content blocks in one or more courses, those courses do not automatically use the updated content. You can bring the randomized content blocks up to date with the version in the library.

> **Warning:** Be careful when you modify problems after they have been released. Changes that you make to published problems can affect the student experience in the course, as well as analysis of course data.

> **Note:** Be aware that although you can retain changes to the settings of components in a randomized content block, changes to the **Editor** tab in components are overwritten if you update the component to the latest library version. If you do not want to bring components in the randomized content block up to date with the latest version in the library, you do not need to take any action.

- If the components in the randomized content block have not been edited in the course outline, when you next open the randomized content block in the course outline, you see a message indicating that the component is out of date in comparison with the library.
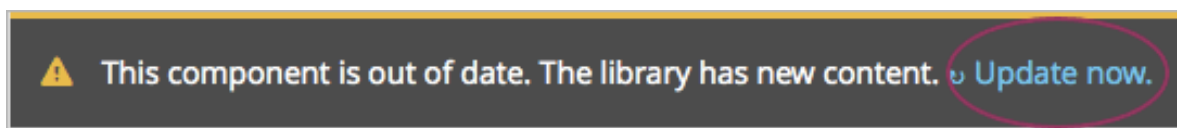
To update your randomized content block components to the latest versions in the content library, select **Update now**.

The randomized content block is brought up to date with the latest contents of the library that it references.

- If you edited only the settings of components in the randomized content block in your course so that they are different from the original version in the library, you do not lose your changes if you select **Update now**. In this case, the changes that you made in the randomized content block in the course outline are kept, but a **Clear** option becomes available next to the changed field in the component. However, any changes you made on the **Editor** page of components in a randomized content block are lost if you select **Update now** to get the latest library version.
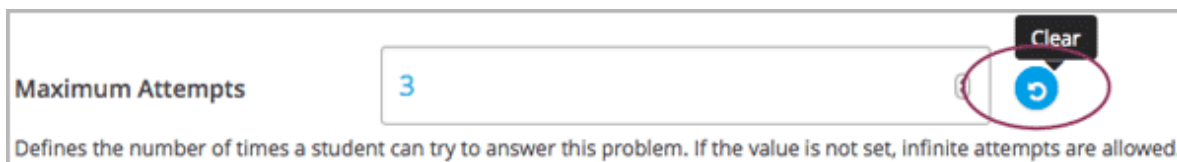
To clear any edits made in the course outline and bring your edited components up to date with the version in the library, select **Clear**.

The value in that component field is reset to the current value in the library.

10.39.6 Preview the Randomized Content in Student View

You can preview course content before a course is live or before you publish specific units, to test how content will appear to students when it is released. To view the number and type of components from a randomized content block as students would see them, follow the steps described in the *Preview a Unit* topic.

10.39.7 View a Specific Student's Assigned Problems from a Randomized Content Block

In a live course, to view the components that are assigned to a specific student from a randomized content block, follow the steps described in the *Specific Learner View* topic.

10.39.8 Adjust Grades for a Problem from a Randomized Content Block

To adjust a grade or reset the attempts for a problem that was assigned from a randomized content block, you can view the course as a specific student to see the actual problems that they were assigned.

Obtain the username or email address for the learner whose grades you want to adjust, and follow the steps described in the *Specific Learner View* topic to view the actual problems in the course that this student was assigned.

In the **Specific student** course view in the LMS for the student whose username or email you entered, locate the components from the randomized content block. Follow the steps described in *Adjust Grades for One or All Learners* to rescore the learner's submission, reset attempts, or delete the learner's state for a problem.

10.40 Recommender Tool

Note: EdX does not support this tool.

The recommender provides learners with a list of online resources related to the course content. These resources are jointly managed by course team members and the learners.

- *Overview*
- *Enable the Recommender Tool*
- *Add a Recommender*

10.40.1 Overview

The most common use of the recommender is for remediation of errors and misconceptions, followed by providing additional, more advanced resources.

For example, if a learner is working through a physics problem, the recommender could be used to show links to concepts used in the problem on Wikipedia, PhET, and OpenStax, as well as in the course itself. The recommender can help fill complex knowledge gaps and help move learners in the right direction.

Learners and course team members can complete the following tasks with the recommender.

- Add new resources.

- Edit existing resources and work jointly to improve the quality of resources (for example, give an informative resource summary).

- Manage quality by voting for high quality resources or flagging resources as spam or abuse.

Course team members can endorse useful resources or remove irrelevant entries.

If you use the recommender, you should inform learners through course content or *course updates* about the tool.

An example of a recommender in a course follows. The upper part of the figure illustrates a question in a problem set where the recommender is attached. The middle of the figure shows a list of resources and several gadgets for users to work on the resources. The bottom portion shows additional information about a given resource on mouse-over event.

Course team members should be sure to review all supplemental materials to assure that they are accessible before making them available through your course. For more information, see *Accessibility Best Practices for Developing Course Content*.

10.40.2 Enable the Recommender Tool

Before you can add a recommender component to your course, you must enable the recommender tool in Studio.

To enable the recommender tool in Studio, you add the `"recommender"` key to the **Advanced Module List** on the **Advanced Settings** page. (Be sure to include the quotation marks around the key value.) For more information, see *Enabling Additional Exercises and Tools*.

10.40.3 Add a Recommender

To add a recommender to a course, follow these steps.

1. Go to the unit in the course outline where you want to add the recommender.

2. Under **Add New Component**, select **Advanced**.

3. Select **recommender**.

4. In the component that appears, select **Edit**, and then specify settings as needed.

   • Whether to take users on an introduction tour when they see the tool the first time. If selected, the first time (and only the first time) a user sees the recommender, there will be a short guided tutorial.

   • Whether to disable the user interface functions which are under development. Because these are untested and under development, please leave these disabled unless otherwise advised by edX staff.

   • How many resources you want to show in each page of the resource list.

   • How many page icons you want to show in the pagination control (that is, the page range). The icons for pages from (current page - page range) to (current page + page range) will be shown.

5. Select **Save**.

6. Optionally, open the unit in the LMS and suggest some resources.

10.41 Staff Graded Points

Note: EdX offers provisional support for this tool.

Staff Graded Points allows you to assign scores to learners for off-platform activities or participation, at the assessment level. It provides a text component with instructions to learners, and a way for you to assign grades.

10.41.1 Create a Staff Graded Points assignment

1. Under **Add New Component** select **Staff Graded Points**

2. In Advanced Settings, specify **title** and **max_score**

3. Specify learner-facing instructions

4. After learners complete the assignment you're grading, Grade Learners **(see below.)**

Staff Graded Points settings

Attribute	Description
`Display Name` (optional)	The display name for this component.
`Instructions` (optional)	Markdown formatted instructions to the learner.
`Problem Weight` (optional)	Enter the number of points possible for this component. The default value is 1.0.

Grading Learners

While your course is running, after learners have had a chance to complete the off-platform assignment you're grading, you can assign learner grades from the LMS Instructor view of the component as follows:

1. **Export scores.** Download a grading CSV and use this as a template to assign scores for this problem. You can use track/cohort filters to limit to grading only a subset of learners.

2. **(On your own machine) Fill out grades.** Open the CSV in a spreadsheet editor and assign scores to learners via "New Points" field. Leave scores that you don't want to change blank.

3. **Import scores** Uploading the filled out CSV. Learners will immediately see their grades after import completes. Supports smaller courses - i.e. file sizes up to 4MB. *Note: [Provisionally supported: usage in large courses] To use in larger courses, break up your grade file CSV by rows, and import in separate files – or use the track & cohort filters to limit to a subset of rows. In this case, keep the header row for each file. This manual approach for larger courses is error prone, so we are making it available as a use-at-your-own-risk feature for advanced users, but don't explicitly support it.*

4. **Review result** File is uploaded, validated, scores are overwritten for non-blank rows. You'll get a readout at the bottom of the screen.

10.42 Survey Tool

Note: EdX offers full support for this tool.

This section describes how to include surveys in your course.

- *Overview*
- *Enable the Survey Tool*
    - *Enable the Survey Tool in OLX*
- *Add a Survey in edX Studio*
- *Add a Survey in OLX*
    - *survey Element Attributes*
- *Editing Published Surveys*
- *View Survey Results*

10.42.1 Overview

You can include surveys in your course to collect learner responses to multiple questions.

For a survey, you configure multiple question and multiple possible answers. The set of answers is used for each question in the survey. If you need to ask only one question, use the *Poll Tool*.

The following example survey has three questions, each with the same three possible answers.

After learners submit their answers to the survey, they see the survey results that have been gathered at this time, unless the survey has been configured to hide results.

10.42.2 Enable the Survey Tool

Before you can add a survey to your course, you must enable the survey tool in Studio or OLX (open learning XML).

To enable the survey tool in Studio, you add the `"survey"` key to the **Advanced Module List** on the **Advanced Settings** page. (Be sure to include the quotation marks around the key value.) For more information, see *Enabling Additional Exercises and Tools*.

Alternatively, you can use OLX to enable the survey tool.

Enable the Survey Tool in OLX

To enable the survey tool, you edit the XML file that defines the course structure.

Open the XML file for the course in the `course` directory. In the `course` element's `advanced-modules` attribute, add the string `survey`.

For example, the following XML code enables the survey tool.

```
<course advanced_modules="[&quot;survey&quot;,
    &quot;poll&quot;]" display_name="Sample Course"
    start="2015-01-01T00:00:00Z">
    ...
</course>
```

10.42.3 Add a Survey in edX Studio

You must *enable the survey tool* before you add the component.

1. On the Course Outline page, open the unit where you want to add the survey.

2. Under **Add New Component** click **Advanced**, and then select **Survey**.

   The new component is added to the unit, with the default survey that contains three answer fields and three questions.

3. In the new component, select **Edit**.

4. In the **Display Name** field, enter the name for the component.

5. In the **Feedback** field, enter text that learners see after they submit responses.

6. In the **Private Results** field, to hide survey results from learners, select **True**. If you leave the default value, **False**, learners see survey results after they submit responses.

7. In the **Maximum Submissions** field, to allow learners to submit responses more than once, change the value. Enter **0** to allow unlimited responses.

   Note: If you allow learners to submit responses more than once, you should set **Private Results** to **True**. Otherwise, learners will be able to change their responses after seeing others' responses.

   ---

8. Configure answers for the survey. Each answer is displayed to learners as a column, with a radio button they can select. Each answer is used for each survey question.

   1. In each **Answer** field, enter the text for the column heading that learners will see.

2. To add answers, select **Add answer** at the bottom of the editor. New answers are added at the bottom of the list.

3. The top answer in the list is displayed to learners as the left-most answer column in the survey, and the bottom answer is displayed in the right-most column. To change the order of answers, select the up and down buttons next to each answer.

4. To remove an answer, select **Delete** next to the answer.

9. Configure questions for the survey. Each question is displayed to learners in the left-most column.

   1. You must enter either text or an image path, or both, for each question. To enter an image, use the *Studio URL* for the image.

   2. The survey template contains three questions. To add questions, select **Add question** at the bottom of the editor. New questions are added at the bottom of the list.

   3. If you use an image, you must enter useful alternative text in the **Image alternate text** field for non-sighted users.

   4. Questions are displayed to learners as rows in the order you configure them. To change the order of questions, select the up and down buttons next to each question.

   5. To remove a question, select **Delete** next to the question.

10. Select **Save**.

10.42.4 Add a Survey in OLX

To add a survey XBlock in OLX, you create the `survey` element. You can embed the `survey` element in the `vertical` element, or you can create the `survey` element as a stand-alone file that you reference in the vertical.

The following example shows the OLX definition for a survey with two questions.

```
<survey
  url_name="unique identifier for the survey"
  xblock-family="xblock.v1"
  questions="[
            [&quot;unique code for question 1&quot;,
              {
                &quot;img&quot;: &quot;Static URL to image&quot;,
                &quot;img_alt&quot;: &quot;Alternative text for image&quot;,
                &quot;label&quot;: &quot;Text of question 1&quot;
              }
            ],
            [&quot;unique code for question 2&quot;,
              {
                &quot;img&quot;: &quot;Static URL to image&quot;,
                &quot;img_alt&quot;: &quot;Alternative text for image&quot;,
                &quot;label&quot;: &quot;Text of question 2&quot;
              }
            ]
          ]"
  feedback="Feedback displayed to learner after submission"
  private_results="false"
  block_name="Display name for survey"
  max_submissions="1"
```

```
  answers="[
          [
            &quot;Unique identifier for answer 1&quot;,
            &quot;Answer text&quot;
          ],
          [
            &quot;Unique identifier for answer 2&quot;,
            &quot;Answer text&quot;
          ]
        ]"
/>
```

survey Element Attributes

The following table describes the attribute of the `survey` element.

Attribute	Description
`url_name`	The unique identifier of the survey.
`xblock-family`	The XBlock version used. Must be `xblock.v1`.
`questions`	An array of questions in the survey. Each question has a unique identifier, and a dictionary that defines values for the following names. • `img`, the static URL of the question image. • `img_alt`, the alternative text for the image. • `label`, the question text. Each question must have a value for `img` or `label`, or both.
`answers`	An array of answers in the survey. Each answer has a unique identifier, and a dictionary that defines values for the following names. • `img`, the static URL of the answer image. • `img_alt`, the alternative text for the image. • `label`, the answer text. Each answer must have a value for `img` or `label`, or both.
`feedback`	The text shown to learners after they submit a response.
`private_results`	Whether the survey results are shown to learners (`true`) or not (`false`).
`block_name`	The display name for the survey.
`max_submissions`	The number of times a learner can submit survey answers. Use `0` to allow unlimited submissions. If you use a value other than 1, set `private_results` to `true`. Otherwise, learners will be able to change their responses after seeing others' responses.

10.42.5 Editing Published Surveys

Do not publish a survey until you have completed and tested it. You should avoid changing a survey after learners have begun using it.

If you must edit a survey after learners have submitted answers, take into account the following implications.

- If you edit the value of a question or answer, previous submissions are associated with the new question or answer value. This change can result in an inaccurate picture of the responses.

- If you change the survey so that previous submissions are invalid, by removing a question or answer, those submissions are deleted when learners next view the unit. Learners with invalid submissions are permitted to submit new responses.

10.42.6 View Survey Results

When you view the survey as a course staff member, you can view results of the survey inside the course.

Select **View results** in the survey.

The results of the survey are then displayed.

10.43 Text Input Problem

Note: EdX offers full support for this problem type.

The text input problem type is a core problem type that can be added to any course. At a minimum, text input problems include a question or prompt and a response field for free form answer text. By adding hints, feedback, or both, you can give learners guidance and help when they work on a problem.

- *Overview*
  - *Example Text Input Problem*
  - *Analyzing Performance on Text Input Problems*
- *Adding a Text Input Problem*
  - *Use the Simple Editor to Add a Text Input Problem*
  - *Use the Advanced Editor to Add a Text Input Problem*

For more information about the core problem types, see *Working with Problem Components*.

10.43.1 Overview

In text input problems, learners enter text into a response field. The response can include numbers, letters, and special characters such as punctuation marks. Because the text that the learner enters must match the instructor's specified answer exactly, including spelling and punctuation, edX recommends that you specify more than one correct answer for text input problems to allow for differences in capitalization and typographical errors.

Example Text Input Problem

In the LMS, learners enter a value into a response field to complete a text input problem. An example of a completed text input problem follows.

To add the example problem illustrated above, in Studio you use the simple editor to enter the following text and Markdown formatting.

```
>>What was the first post-secondary school in China to allow both male and female␣
↪students?||Answer with a name from the modern period.<<

= Nanjing University
or= National Central University
or= Nanjing Higher Normal Institute
or= Nanking University

[explanation]
Nanjing University first admitted female students in 1920.
[explanation]
```

The OLX (open learning XML) markup for this example text input problem follows.

```xml
<problem>
  <stringresponse answer="Nanjing University" type="ci">
    <label>What was the first post-secondary school in China to allow both
     male and female students?</label>
    <description>Answer with a name from the modern period.</description>
    <additional_answer answer="National Central University"/>
    <additional_answer answer="Nanjing Higher Normal Institute"/>
    <additional_answer answer="Nanking University"/>
    <textline size="20"/>
```

```
  <solution>
    <div class="detailed-solution">
      <p>Explanation</p>
      <p>Nanjing University first admitted female students in 1920.</p>
    </div>
  </solution>
</stringresponse>
</problem>
```

Analyzing Performance on Text Input Problems

For the text input problems in your course, you can use edX Insights to review aggregated learner performance data and examine submitted answers. For more information, see Using edX Insights.

10.43.2 Adding a Text Input Problem

You add text input problems in Studio by selecting the **Problem** component type and then using either the simple editor or the advanced editor to specify the prompt and the acceptable answer or answers.

- *Use the Simple Editor to Add a Text Input Problem*

- *Use the Advanced Editor to Add a Text Input Problem*

Note: You can begin work on the problem in the simple editor, and then switch to the advanced editor. However, after you save any changes you make in the advanced editor, you cannot switch back to the simple editor.

Use the Simple Editor to Add a Text Input Problem

When you add a text input problem, you can choose one of these templates.

- **Text Input**

- **Text Input with Hints and Feedback**

These templates include the Markdown formatting that you use in the simple editor to add a problem without, or with, hints and feedback.

To use the *simple editor* to add a problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**.

2. From the list of **Common Problem Types**, select the type of problem you want to add. Studio adds a template for the problem to the unit.

3. Select **Edit**. The simple editor opens to a template that shows the Markdown formatting that you use for this problem type.

4. Replace the guidance provided by the template to add your own text for the question or prompt, answer options, explanation, and so on.

   To format equations, you can use MathJax. For more information, see *Using MathJax for Mathematics*.

5. Select **Settings** to provide an identifying **Display Name** and define settings for the problem. For more information, see *Defining Settings for Problem Components*.

6. Select **Save**.

Use the Advanced Editor to Add a Text Input Problem

You can use the advanced editor to identify the elements of a text input problem with OLX. For more information, see *Text Input Problem XML Reference*.

To use the *advanced editor* to add a problem, follow these steps.

1. Follow steps 1-3 for creating the problem in the simple editor.

2. Select **Advanced Editor**. The advanced editor opens the template and shows the OLX markup that you can use for this problem type.

3. Replace the guidance provided by the template to add your own text. For example, replace the question or prompt, answer options, and explanation.

   To format equations, you can use MathJax. For more information, see *Using MathJax for Mathematics*.

4. Update the OLX to add optional elements and attributes required for your problem.

5. Select **Settings** to provide an identifying **Display Name** and define settings for the problem. For more information, see *Defining Settings for Problem Components*.

6. Select **Save**.

10.43.3 Adding Multiple Correct Responses

You can specify more than one correct response for text input problems. For example, instead of requiring learners to enter an answer of "Dr. Martin Luther King, Junior" exactly, you can also allow answers of "Martin Luther King, Jr." "Doctor Martin Luther King," and other variations. To do this, you can use the simple editor or the advanced editor.

Add Multiple Correct Responses in the Simple Editor

To specify additional correct responses in the simple editor, include `or=` before each additional correct response.

```
>>What African-American led the United States civil rights movement during the 1960s?<<
=Dr. Martin Luther King, Jr.
or=Dr. Martin Luther King, Junior
or=Martin Luther King, Jr.
or=Martin Luther King
```

Add Multiple Correct Responses in the Advanced Editor

To specify an additional correct response in the advanced editor, within the `<stringresponse>` element add the `<additional_answer />` element with an `answer=""` attribute value.

```
<problem>
  <stringresponse answer="Dr. Martin Luther King, Jr." type="ci" >
    <label>What African-American led the United States civil rights movement during the␣
→1960s?</label>
    <additional_answer answer="Dr. Martin Luther King, Junior"/>
```

(continues on next page)

```
    <additional_answer answer="Martin Luther King, Jr."/>
    <additional_answer answer="Martin Luther King"/>
    <textline size="30"/>
  </stringresponse>
</problem>
```

10.43.4 Adding Feedback to a Text Input Problem

For an overview of feedback in problems, see *Adding Feedback and Hints to a Problem*. In text input problems, you can provide feedback for the correct answer or for a specified incorrect answer. Use feedback on incorrect answers as an opportunity to address common learner misconceptions. Feedback for text input questions should also provide guidance to the learner on how to arrive at the correct answer.

If you define multiple correct responses for the question, you can define feedback for each response.

Configure Feedback in the Simple Editor

You can configure feedback in the simple editor. When you add a text input problem, select the template **Text Input with Hints and Feedback**. This template has example formatted feedback that you can replace with your own text.

In the simple editor, you configure feedback for a text input problem with the following Markdown formatting.

```
=Correct Answer {{Feedback for learners who enter this answer.}}
not=Incorrect Answer {{Feedback for learners who enter this answer.}}
```

For example, the following problem has feedback for the correct answer and two common incorrect answers.

```
>>What is the largest state in the U.S. in terms of land area?<<

=Alaska {{Alaska is the largest state in the U.S. in terms of not only land
area, but also total area and water area. Alaska is 576,400 square miles,
more than double the land area of the second largest state, Texas.}}

not=Texas {{While many people think Texas is the largest state in terms of
land area, it is actually the second largest and contains 261,797 square
miles.}}

not=California {{California is the third largest state and contains 155,959
square miles.}}
```

Configure Feedback in the Advanced Editor

In the advanced editor, you configure answer feedback with the following syntax.

```
<problem>
  <stringresponse answer="Correct Answer" type="ci">
    <label>Question text</label>
    <correcthint>Feedback for the correct answer</correcthint>
    <stringequalhint answer="Incorrect Answer">Hint for the incorrect answer</
→stringequalhint>
```

```
      <textline size="20"/>
   </stringresponse>
</problem>
```

For example, the following problem has feedback for the correct answer and two common incorrect answers.

```
<problem>
  <stringresponse answer="Alaska" type="ci">
    <label>What is the largest state in the U.S. in terms of land area?</label>
    <correcthint>Alaska is the largest state in the U.S. in terms of not
     only land area, but also total area and water area. Alaska is 576,400
     square miles, more than double the land area of the second largest
     state, Texas.</correcthint>
    <stringequalhint answer="Texas">While many people think Texas is the
     largest state in terms of land area, it is actually the second
     largest and contains 261,797 square miles.</stringequalhint>
    <stringequalhint answer="California">California is the third largest
     state and contains 155,959 square miles.</stringequalhint>
    <textline size="20"/>
  </stringresponse>
</problem>
```

Customizing Feedback Labels

By default, the feedback labels shown to learners are **Correct** and **Incorrect**. If you do not define feedback labels, learners see these terms when they submit an answer, as in the following example.

```
Incorrect: California is the third largest state and contains 155,959 square
miles.
```

You can configure the problem to override the default labels. For example, you can configure a custom label for a specific wrong answer.

```
Close but wrong: California is the third largest state and contains 155,959
square miles.
```

Note: The default labels **Correct** and **Incorrect** display in the learner's requested language. If you provide custom labels, they display as you define them to all learners. They are not translated into different languages.

Customize a Feedback Label in the Simple Editor

In the simple editor, you configure custom feedback labels with the following syntax.

```
not=Answer {{Label:: Feedback}}
```

That is, you provide the label text, followed by two colon (:) characters, before the feedback text.

For example, the following feedback is configured to use a custom label.

```
not=Texas {{Close but wrong:: While many people think Texas is the largest
state in terms of land area, it is actually the second largest of the 50 U.S.
states, containing 261,797 square miles.}}
```

Customize a Feedback Label in the Advanced Editor

In the advanced editor, you configure custom feedback labels with the following syntax.

```
<correcthint label="Custom Label">Feedback</correcthint>
<stringequalhint answer="Incorrect Answer" label="Custom Label">Feedback</
→stringequalhint>
```

For example, the following feedback is configured to use custom labels.

```
<correcthint label="Right you are">Alaska is the largest state in the U.S.
 in terms of not only land area, but also total area and water area. Alaska
 is 576,400 square miles, more than double the land area of the second
 largest state, Texas.</correcthint>
<stringequalhint answer="Texas" label="Close but wrong">While many people
 think Texas is the largest state in terms of land area, it is actually the
 second largest of the 50 U.S. states containing 261,797 square miles.</stringequalhint>
```

10.43.5 Adding Hints to a Text Input Problem

You can add hints to a text input problem using the simple editor or the advanced editor. For an overview of hints in problems, see *Adding Feedback and Hints to a Problem*.

Configure Hints in the Simple Editor

In the simple editor, you configure hints with the following syntax.

```
||Hint 1||
||Hint 2||
||Hint n||
```

Note: You can configure any number of hints. The learner views one hint at a time and views the next one by selecting **Hint** again.

For example, the following problem has two hints.

```
||A fruit is the fertilized ovary from a flower.||
||A fruit contains seeds of the plant.||
```

Configure Hints in the Advanced Editor

In the advanced editor, you add the `<demandhint>` element immediately before the closing `</problem>` tag, and then configure each hint using the `<hint>` element.

```
.
.
.
<demandhint>
   <hint>Hint 1</hint>
   <hint>Hint 2</hint>
   <hint>Hint 3</hint>
</demandhint>
</problem>
```

For example, the following OLX for a multiple choice problem shows two hints.

```
.
.
.
</multiplechoiceresponse>
<demandhint>
   <hint>A fruit is the fertilized ovary from a flower.</hint>
   <hint>A fruit contains seeds of the plant.</hint>
</demandhint>
</problem>
```

10.43.6 Adding Text after the Response Field

You might want to include a word, phrase, or sentence after the response field in a text input problem to help guide your learners or resolve ambiguity.

Pre-Civil War Education
1 point possible (graded)

What Pennsylvania school was founded in 1854 to provide educational opportunities for African-Americans?

Institute

To do this, you use the advanced editor.

In the problem, locate the `textline` element. This element creates the response field for the problem and is a child of the `stringresponse` element. An example follows.

```
<problem>
  <stringresponse answer="Ashmun" type="ci">
    <label>What Pennsylvania school was founded in 1854 to provide
     educational opportunities for African-Americans?</label>
    <textline size="20"/>
  </stringresponse>
</problem>
```

To add text after the response field, add the `trailing_text` attribute together with the text that you want to use inside the `textline` element.

```
<problem>
  <stringresponse answer="Ashmun" type="ci">
    <label>What Pennsylvania school was founded in 1854 to provide
     educational opportunities for African-Americans?</label>
    <textline size="20" trailing_text="Institute"/>
  </stringresponse>
</problem>
```

10.43.7 Case Sensitivity and Text Input Problems

By default, text input problems do not require a case sensitive response. You can change this default to require a case sensitive answer.

To make a text input response case sensitive, you use the advanced editor.

In the advanced editor, the `stringresponse` element has a `type` attribute. By default, the value for this attribute is set to `ci`, for "case insensitive". An example follows.

```
<problem>
  <stringresponse answer="Paris" type="ci">
  .
  .
  .
  </stringresponse>
</problem>
```

Learners who submit an answer of either "Paris" or "paris" are scored as correct.

To make the response case sensitive, change the value of the `type` attribute to `cs`.

```
<problem>
  <stringresponse answer="Paris" type="cs">
  .
  .
  .
  </stringresponse>
</problem>
```

Learners who submit an answer of "Paris" are scored as correct, but learners who submit an answer of "PARIS" are scored as incorrect.

10.43.8 Response Field Length in Text Input Problems

By default, the response field for text input problems is 20 characters long.

You should preview the unit to ensure that the length of the response input field accommodates the correct answer, and provides extra space for possible incorrect answers.

If the default response field is not long enough, you can change it using the advanced editor.

In the advanced editor, the `textline` element has a `size` attribute. By default, the value for this attribute is set to `20`. An example follows.

```
<problem>
  <stringresponse answer="Democratic Republic of the Congo" type="ci">
    .
    .
    .
    <textline size="20"/>
  </stringresponse>
</problem>
```

To change the response field length, change the value of the `size` attribute.

```
<problem>
  <stringresponse answer="Democratic Republic of the Congo" type="ci">
    .
    .
    .
    <textline size="40" />
  </stringresponse>
</problem>
```

10.43.9 Allowing Regular Expressions as Answers for Text Input Problems

You can configure a text input problem to allow a regular expression as an answer. Allowing learners to answer with a regular expression can minimize the number of distinct correct responses that you need to define for the problem: if a learner responds with the correct answer formed as a plural instead of a singular noun, or a verb in the past tense instead of the present tense, the answer is marked as correct.

To do this, you use the advanced editor.

In the advanced editor, the `stringresponse` element has a `type` attribute. You can set the value for this attribute to `regexp`, with or without also including `ci` or `cs` for a case insensitive or case sensitive answer. An example follows.

```
<problem>
  <stringresponse answer="string pattern" type="regexp ci">
    .
    .
    .
  </stringresponse>
</problem>
```

The regular expression that the learner enters must contain, in whole or in part, the answer that you specify.

In this example, learners who submit an answer of "string pattern", "String Patterns", "string patterned", or "STRING PATTERNING" are all scored as correct, but learners who submit an answer of "Strings Pattern" or "string patern" are scored as incorrect.

10.43.10 Text Input Problem XML Reference

Template

```xml
<problem>
  <stringresponse answer="Correct answer 1" type="ci regexp">
    <label>Question text</label>
    <description>Optional tip</description>
    <correcthint>Provides feedback when learners submit the correct
     response.</correcthint>
    <additional_answer answer="Correct answer 2"/>
    <additional_answer answer="Correct answer 3"/>
    <stringequalhint answer="Incorrect answer 1">Provides feedback when
     learners submit the specified incorrect response.</stringequalhint>
    <stringequalhint answer="Incorrect answer 2">Provides feedback when
     learners submit the specified incorrect response.</stringequalhint>
    <textline size="20" />
  </stringresponse>
  <demandhint>
    <hint>The first text string to display when learners request a hint.</hint>
    <hint>The second text string to display when learners request a hint.</hint>
  </demandhint>
</problem>
```

Elements

For text input problems, the `<problem>` element can include this hierarchy of child elements.

```xml
<stringresponse>
    <label>
    <description>
    <additional_answer>
    <correcthint>
    <stringequalhint>
    <textline>
    <solution>
<demandhint>
    <hint>
```

In addition, standard HTML tags can be used to format text.

`<stringresponse>`

Required. Indicates that the problem is a text input problem.

Attributes

Attribute	Description
`answer` (required)	Specifies the correct answer. Note that if you do not also add the `type` attribute and set it to `regexp`, the learner's answer must match the value for this attribute exactly.
`type` (optional)	Specifies whether the problem requires a case sensitive response and if it allows regular expressions. - If `type="ci"`, the problem is not case sensitive. - If `type="cs"`, the problem is case sensitive. - If `type="regexp"`, the problem allows regular expressions. You can also combine these values in a space separated list. For example, `<stringresponse type="regexp cs">` specifies that the problem allows regular expressions and is case sensitive.

Children

- `<label>`
- `<description>`
- `<textline>`
- `<additional_answer>`
- `<correcthint>`
- `<stringequalhint>`
- `<solution>`

`<label>`

Required. Identifies the question or prompt. You can include HTML tags within this element.

Attributes

None.

Children

None.

`<description>`

Optional. Provides clarifying information about how to answer the question. You can include HTML tags within this element.

Attributes

None.

Children

None.

`<textline>`

Required. Creates a response field in the LMS where the learner enters a text string.

Attributes

Attribute	Description
`size`	Optional. Specifies the size, in characters, of the response field in the LMS. Defaults to 20.
`hidden`	Optional. If set to "true", learners cannot see the response field.
`correct_answer`	Optional. Lists the correct answer to the problem.
`trailing_text`	Optional. Specifies text to appear immediately after the response field.

Children

None.

`<additional_answer>`

Optional. Specifies an additional correct answer for the problem. A problem can contain an unlimited number of additional answers.

Attributes

Attribute	Description
`answer`	Required. The text of the alternative correct answer.

Children

`<correcthint>`

`<correcthint>`

Optional. Specifies feedback to appear after the learner submits a correct answer.

Attributes

Attribute	Description
`label`	Optional. The text of the custom feedback label.

Children

None.

`<stringequalhint>`

Optional. Specifies feedback to appear after the learner submits an incorrect answer.

Attributes

Attribute	Description
`answer`	Required. The text of the incorrect answer.
`label`	Optional. The text of the custom feedback label.

Children

None.

`<solution>`

Optional. Identifies the explanation or solution for the problem, or for one of the questions in a problem that contains more than one question.

This element contains an HTML division `<div>`. The division contains one or more paragraphs `<p>` of explanatory text.

`<demandhint>`

Optional. Specifies hints for the learner. For problems that include multiple questions, the hints apply to the entire problem.

Attributes

None.

Children

`<hint>`

`<hint>`

Required. Specifies additional information that learners can access if needed.

Attributes

None.

Children

None.

10.43.11 Deprecated Hinting Method

The following example shows the XML format with the `<hintgroup>` element that you could use in the past to configure hints for text input problems. Problems using this XML format will continue to work in the edX Platform. However, edX recommends that you use the new way of configuring hints documented above.

```
<problem>
  <stringresponse answer="Correct answer 1" type="ci regexp">
    <label>Question text</label>
    <additional_answer>Correct answer 2</additional_answer>
    <additional_answer>Correct answer 3</additional_answer>
    <textline size="20" />
  <hintgroup>
    <stringhint answer="Incorrect answer A" type="ci" name="hintA" />
      <hintpart on="hintA">
        <startouttext />Text of hint for incorrect answer A<endouttext />
      </hintpart >
    <stringhint answer="Incorrect answer B" type="ci" name="hintB" />
      <hintpart on="hintB">
        <startouttext />Text of hint for incorrect answer B<endouttext />
      </hintpart >
    <stringhint answer="Incorrect answer C" type="ci" name="hintC" />
```

```
      <hintpart on="hintC">
        <startouttext />Text of hint for incorrect answer C<endouttext />
      </hintpart >
  </hintgroup>
  </stringresponse>
  <solution>
    <div class="detailed-solution">
    <p>Explanation or Solution Header</p>
    <p>Explanation or solution text</p>
    </div>
  </solution>
</problem>
```

10.44 Word Cloud Tool

Note: EdX offers provisional support for this tool.

In a word cloud, learners enter words into a field in response to a question or prompt. The words that all of the learners enter then appear instantly as a colorful graphic, with the most popular responses appearing largest. The graphic becomes larger as more learners answer. Learners can see how their peers answered as well as contribute their thoughts to the group.

For example, the following word cloud was created from learners' responses to a question about why they think addressing climate change is difficult.

- *Enable the Word Cloud Tool*
- *Create a Word Cloud*

10.44.1 Enable the Word Cloud Tool

Before you can add a word cloud to your course, you must enable the word cloud tool.

To enable the word cloud tool in Studio, you add the `"word_cloud"` key to the **Advanced Module List** on the **Advanced Settings** page. (Be sure to include the quotation marks around the key value.) For more information, see *Enabling Additional Exercises and Tools*.

10.44.2 Create a Word Cloud

To create a word cloud, follow these steps.

1. In the unit where you want to create the problem, select **Advanced** under **Add New Component**.

2. In the list of problem types, select **Word Cloud**.

3. In the component that appears, select **Edit**.

4. In the component editor, specify these settings.

   - **Display Name**: This name appears as a heading above the problem. Replace the default display name with a specific title or name for your word cloud. For example, "Why is climate change so difficult to address?"

     Unique, descriptive display names help you and your learners to identify assignments quickly and accurately as you navigate through the course.

   - **Inputs**: The number of text boxes provided for learners to enter words, phrases, or sentences.

   - **Instructions**: Instructions that give learners specific information about how to contribute to this word cloud. For example, "In each the provided text boxes, enter a word or phrase to describe why you think it has been so difficult to make progress in addressing climate change."

     These instructions appear below the display name for the word cloud. It is important to provide clear instructions, especially for learners who have accessibility requirements.

   - **Maximum Words**: The maximum number of words that the generated word cloud displays. If learners enter 300 different words but the maximum is set to 250, only the 250 most commonly entered words appear in the word cloud.

   - **Show Percents**: Select `True` or `False`. If this option is set to `True`, after learners have contributed to a word cloud, the frequency that each of their own contributed words has been entered is shown as a percentage of all words entered.

5. Select **Save**.

10.45 Write-Your-Own-Grader Problem

Note: EdX offers provisional support for this problem type.

This section provides information about writing your own grader directly in a problem component.

- *Overview*
- *Create a Custom Python-Evaluated Input Problem in Studio*
- *Script Tag Format*

10.45.1 Overview

In custom Python-evaluated input (also called "write-your-own-grader" problems), the grader uses a Python script that you create and embed in the problem to evaluate a learner's response or provide hints. These problems can be any type. *Numerical input* and *text input* problems are the most common write-your-own-grader problems.

Custom Python-evaluated input problems can include the following advanced problem types.

- *Chemical Equation Problem*

- *Custom JavaScript Display and Grading Problem*

- *Gene Explorer Tool*

- *Molecule Editor Tool (Deprecated)*

- *Protex Protein Builder Tool*

10.45.2 Create a Custom Python-Evaluated Input Problem in Studio

1. In the unit where you want to create the problem, select **Problem** under **Add New Component**, and then select the **Advanced** tab.

2. Select **Custom Python-Evaluated Input**.

3. In the component that appears, select **Edit**.

4. In the component editor, edit the problem in *Script Tag Format*.

5. Select **Save**.

10.45.3 Script Tag Format

The script tag format encloses a Python script that contains a "check function" in a `<script>` tag, and adds the `cfn` attribute of the `<customresponse>` tag to reference that function.

This section contains the following information about using the `<script>` tag.

- *The `check` Function*

- *Example with the Script Tag*

- *Example of the `check` Function Returning a Dictionary*

- *Script Tag Attributes*

- *Create a Custom Python-Evaluated Input Problem in Script Tag Format*

- *Award Partial Credit*

- *Create a Randomized Custom Python-Evaluated Input Problem*

The check Function

The check function in a `<script>` tag accepts two arguments.

- `expect` is the value of the `expect` attribute of `<customresponse>`. If `expect` is not provided as an argument, the function must have another way to determine if the answer is correct.

- `answer` is one of the following two options.

    - The value of the answer the learner provided, if the problem only has one response field.

    - An ordered list of answers the learner provided, if the problem has multiple response fields.

The check function can return any of the following values to indicate whether the learner's answer is correct.

- `True`: Indicates that the learner answered correctly for all response fields.

- `False`: Indicates that the learner answered incorrectly. All response fields are marked as incorrect.

- `"Partial"`: Indicates that the learner's answer was partially correct. By default, the learner receives 50% of the points for the problem. For more information, see *Award Half Credit*.

- A dictionary of the form `{ 'ok': True, 'msg': 'Message' }`. If the dictionary's value for `ok` is set to `True`, all response fields are marked correct. If it is set to `False`, all response fields are marked incorrect. If it is set to `"Partial"`, the learner receives 50% of the problem points. The `msg` is displayed below all response fields, and it can contain XHTML markup.

- A dictionary of the form

```
{ 'overall_message': 'Overall message',
    'input_list': [
        { 'ok': True, 'msg': 'Feedback for input 1'},
        { 'ok': False, 'msg': 'Feedback for input 2'},
        { 'ok': 'Partial', 'msg': 'Feedback for input 3'}
        ... ] }
```

The last form is useful for responses that contain multiple response fields. It allows you to provide feedback for each response field individually, as well as a message that applies to the entire response.

Example with the Script Tag

In the following example, `<customresponse>` tags reference the `test_add_to_ten` and `test_add` functions that are in the `<script>` tag.

Important: Python honors indentation. Within the `<script>` tag, the `def check_func(expect, ans):` line must have no indentation.

```
<problem>

<script type="loncapa/python">

def test_add(expect, ans):
    try:
        a1=int(ans[0])
        a2=int(ans[1])
        return (a1+a2) == int(expect)
```

(continues on next page)

```
    except ValueError:
        return False

def test_add_to_ten(expect, ans):
    return test_add(10, ans)

</script>

<p>Enter two integers that sum to 10. </p>
<customresponse cfn="test_add_to_ten">
  <textline size="10"/><br/>
  <textline size="10"/>
</customresponse>

<p>Enter two integers that sum to 20: </p>
<customresponse cfn="test_add" expect="20">
  <textline size="40" correct_answer="11" label="Integer #1"/><br/>
  <textline size="40" correct_answer="9" label="Integer #2"/>
</customresponse>

<solution>
  <div class="detailed-solution">
    <p>Explanation</p>
    <p>Any set of integers on the line \(y = 10 - x\) and \(y = 20 - x\)
       satisfies these constraints.</p>
    <p>You can also add images within the solution clause, like so:</p>
    <img src="/static/images/placeholder-image.png"/>
  </div>
</solution>

</problem>
```

Example of the `check` Function Returning a Dictionary

The following example shows a `check` function that returns a dictionary.

```
def check(expect, answer_given):
    check1 = (int(answer_given[0]) == 1)
    check2 = (int(answer_given[1]) == 2)
    check3 = (int(answer_given[2]) == 3)
    return {'overall_message': 'Overall message',
            'input_list': [
                { 'ok': check1, 'msg': 'Feedback 1'},
                { 'ok': check2, 'msg': 'Feedback 2'},
                { 'ok': check3, 'msg': 'Feedback 3'} ] }
```

The function checks that the user entered 1 for the first input, 2 for the second input, and 3 for the third input. It provides feedback messages for each individual input, as well as a message displayed below the entire problem.

Script Tag Attributes

The following table explains the important attributes and values in the preceding example.

`<script type="loncapa/ python">`	Indicates that the problem contains a Python script.
`<customresponse cfn="test_add_to_ten">`	Indicates that the function `test_add_to_ten` is called when the learner checks the answers for this problem.
`<customresponse cfn="test_add" expect="20">`	Indicates that the function `test_add` is called when the learner checks the answers for this problem and that the expected answer is `20`.
`<textline size="10" cor- rect_answer="3"/>`	This tag includes the `size`, `correct_answer`, and `label` attributes. The `correct_answer` attribute is optional.

Create a Custom Python-Evaluated Input Problem in Script Tag Format

To create a custom Python-evaluated input problem using a `<script>` tag, follow these steps.

1. In the component editor, modify the example as needed.

2. Select **Save**.

Problem Code:

```
<problem>
<p>This question has two parts.</p>

<script type="loncapa/python">

def test_add(expect, ans):
    try:
        a1=int(ans[0])
        a2=int(ans[1])
        return (a1+a2) == int(expect)
    except ValueError:
        return False

def test_add_to_ten(expect, ans):
    return test_add(10, ans)

</script>

<p>Part 1: Enter two integers that sum to 10. </p>
<customresponse cfn="test_add_to_ten">
        <textline size="10" correct_answer="3" label="Integer #1"/><br/>
        <textline size="10" correct_answer="7" label="Integer #2"/>
</customresponse>

<p>Part 2: Enter two integers that sum to 20. </p>
<customresponse cfn="test_add" expect="20">
        <textline size="10" label="Integer #1"/><br/>
```

```
        <textline size="10" label="Integer #2"/>
</customresponse>

<solution>
    <div class="detailed-solution">
        <p>Explanation</p>
        <p>For part 1, any two numbers of the form <i>n</i> and <i>10-n</i>,
        where <i>n</i> is any integer, will work. One possible answer would
        be the pair 0 and 10.</p>
        <p>For part 2, any two numbers of the form <i>n</i> and <i>20-n</i>, where <i>n</
→i> is any integer, will work. One possible answer would be the pair 1 and 19</p>
    </div>
</solution>
</problem>
```

Templates

The following template includes answers that appear when the learner selects **Show Answer**.

```
<problem>

<script type="loncapa/python">
def test_add(expect,ans):
  a1=float(ans[0])
  a2=float(ans[1])
  return (a1+a2)== float(expect)
</script>

<p>Problem text</p>
<customresponse cfn="test_add" expect="20">
        <textline size="10" correct_answer="11" label="Integer #1"/><br/>
        <textline size="10" correct_answer="9" label="Integer #2"/>
</customresponse>

    <solution>
        <div class="detailed-solution">
          <p>Solution or Explanation Heading</p>
          <p>Solution or explanation text</p>
        </div>
    </solution>
</problem>
```

The following template does not return answers when the learner selects **Show Answer**. If your problem does not include answers for the learner to see, make sure to set **Show Answer** to **Never** in the problem component.

```
<problem>

<script type="loncapa/python">
def test_add(expect,ans):
  a1=float(ans[0])
  a2=float(ans[1])
  return (a1+a2)== float(expect)
</script>
```

```
<p>Enter two real numbers that sum to 20: </p>
<customresponse cfn="test_add" expect="20">
        <textline size="10"  label="Integer #1"/><br/>
        <textline size="10"  label="Integer #2"/>
</customresponse>

    <solution>
        <div class="detailed-solution">
          <p>Solution or Explanation Heading</p>
          <p>Solution or explanation text</p>
        </div>
    </solution>
</problem>
```

Award Partial Credit

You can configure a custom Python-evaluated input problem so that learners who give a partially correct answer receive partial credit for the problem. You can award 50% of the points for the problem, or you can award a different percentage of points. For more information, see the following sections.

- *Award Half Credit*
- *Award a Percentage of Credit*

Award Half Credit

You can configure a problem to award 50% of the possible points. To provide a learner with a more granular score, see *Award a Percentage of Credit*.

The check function must return the value "Partial" in one of the following ways.

- Return the value "Partial" directly.

- Return the value "Partial" in the dictionary that is returned, in the following form.

  `{ 'ok':  'Partial', 'msg':  'Message' }`

- Return the value "Partial" as part of the input list for multi-part problems.

```
{ 'overall_message': 'Overall message',
    'input_list': [
        { 'ok': True, 'msg': 'Feedback for input 1'},
        { 'ok': False, 'msg': 'Feedback for input 2'},
        { 'ok': 'Partial', 'msg': 'Feedback for input 3'}
        ... ] }
```

With all of these options, True awards learners with 100% of the available points for the problem, 'Partial' with 50%, and False with 0%.

For more information about check function return values, see *The check Function*.

Award a Percentage of Credit

You can configure a problem to return a percent value as a grade. This method provides greater flexibility in assigning the learner a score than *awarding half credit*.

In the following example, the learner's score equals the answer divided by 100.

The following code shows the configuration of this problem.

```
<problem>
<p>In the following problem, the learner receives a score that equals the
   answer / 100. If the learner's answer is greater than 100 or less than 0,
   the score equals 0.</p>

<script type="loncapa/python">

def give_partial_credit(expect, ans):
  ans = float(ans)
  if ans &gt; 100 or ans &lt; 0:
      # Assign a score of zero if the answer is less than zero or over 100.
      ans = 0
  grade = ans/100
  return {
      'input_list': [
          { 'ok': True, 'msg': 'Your grade is ' + str(ans) + '%', 'grade_decimal':grade},
      ]
  }
</script>

<p>Enter a number beween 0 and 100.</p>
<customresponse cfn="give_partial_credit">
  <textline points="100" size="40" label="Ans1"/><br/>
</customresponse>
</problem>
```

This example illustrates the following points.

- The `points` attribute of the `<customresponse>` element specifies that the question is worth 100 points.

- The `give_partial_credit` function checks that the answer is between 0 and 100, and if so divides the learner's answer by 100 to determine the grade.

- The `input_list` that is returned specifies that:

  - The answer is acceptable and can receive partial or full credit, with the item `'ok': True`.

- The learner receives the message `Your grade is` followed by the percent grade, with the item `'msg':`
  `'Your grade is ' + str(ans) + '%'.`

- The grade assigned is the learner's answer divided by 100, with the item `'grade_decimal':grade`.

You can enhance and apply this example for your own partial credit problems.

Create a Randomized Custom Python-Evaluated Input Problem

You can create a custom Python-evaluated input problem that randomizes variables in the Python code.

Note: In the problem settings, you must set the **Randomization** value to something other than **Never** to have Python variables randomized. See *Randomization* for more information.

The following example demonstrates using randomization with a Python-evaluated input problem.

Note: This example uses the method `random.randint` to generate random numbers. You can use any standard Python library for this purpose.

```
<problem>
  <p>Some problems in the course will utilize randomized parameters.
    For such problems, after you check your answer you will have the option
    of resetting the question, which reconstructs the problem with a new
    set of parameters.</p>
<script type="loncapa/python">
x1 = random.randint(0, 100)
x2 = random.randint(0, 100)
y = x1+x2
</script>
<p>Let (x_1 = $x1) and (x_2 = $x2). What is the value of (x_1+x_2)?</p>
<numericalresponse answer="$y">
  <responseparam type="tolerance" default="0.01%" name="tol"
    description="Numerical Tolerance"/>
  <textline size="10"/>
</numericalresponse>
<solution>
  <p><b>Explanation:</b></p>
</solution>
</problem>
```

10.46 Zooming Image Tool

Note: EdX does not support this tool.

If you present information to your learners using very large or very detailed images, learners might not be able to clearly see all the information in the image. Use the zooming image tool to provide learners with the ability to zoom in to and enlarge selected areas of your image.
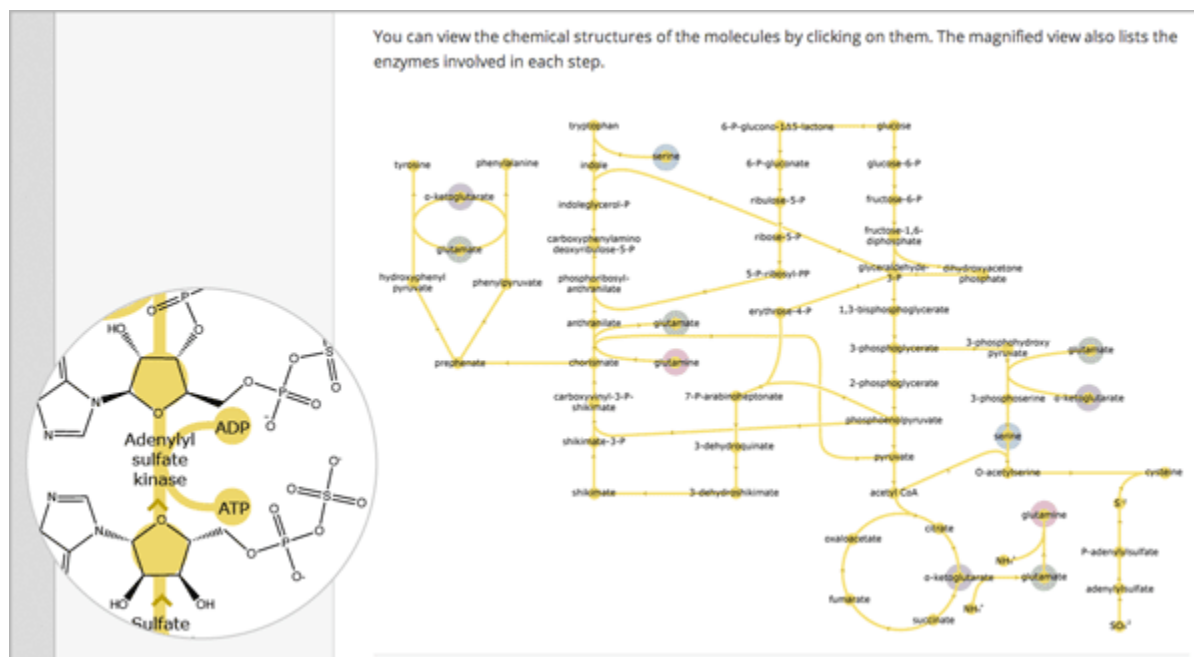
10.46.1 Components of a Zooming Image Tool

To create a zooming image tool, you need the following files.

- The image that you want learners to see when they access the unit.

- The image that appears in the magnified area when a learner selects the regular image. This image can be larger than the regular image.

- The `jquery.loupeAndLightbox.js` JavaScript file from `http://files.edx.org/jqueryloupeAndLightbox.js`.

10.46.2 Create a Zooming Image Tool

1. Download the `jquery.loupeAndLightbox.js` file by right-clicking the following link, and then selecting the option to save or download the linked file.

   http://files.edx.org/jqueryloupeAndLightbox.js

2. In Studio, select **Content** and then select **Files & Uploads** to upload your regular-sized image file, your small image file, and the `jquery.loupeAndLightbox.js` file. For more information about uploading files for your course, see *Adding Files to a Course*.

3. Add a zooming image tool to your course. In the course outline in Studio, select **Add New Component**, select **Text**, and then select **Zooming Image Tool**.

4. In the new component that appears, select **Edit**.

5. In the component editor, replace the default problem text with your own text.

6. Select **HTML** from the toolbar to edit the HTML source code.

7. Scroll down in the file, and then replace the following placeholders with your own content.

   - Replace the following file name and path with the name and path of the image that you want to appear magnified when the user hovers over the regular image.

> https://studio.edx.org/c4x/edX/DemoX/asset/pathways_detail_01.png

> For example, your file name and path might be /static/Image1.jpg.

- Replace the following file name and path with the name and path of the image that you want to appear when the page opens.

> https://studio.edx.org/c4x/edX/DemoX/asset/pathways_overview_01.png

> > For example, your file name and path might be /static/Image2.jpg.

- Replace the following name and file path with the name and path of the JavaScript file that you downloaded from files.edx.org.

> https://studio.edx.org/c4x/edX/DemoX/asset/jquery.loupeAndLightbox.js

> Because you uploaded the jquery.loupeAndLightbox.js file to the **Files & Uploads** page, your file name and path is /static/jquery.loupeAndLightbox.js.

- (Optional) If you want the magnified area to be larger or smaller, change the width and height values from 350 to larger or smaller numbers. For example, you can change both numbers to 450. Or, if you want a horizontal oval instead of a circle, you can change the width value to a number such as 500 and the height value to a number such as 150.

The HTML in your zooming image tool might resemble the following.

8. Select **Save**.
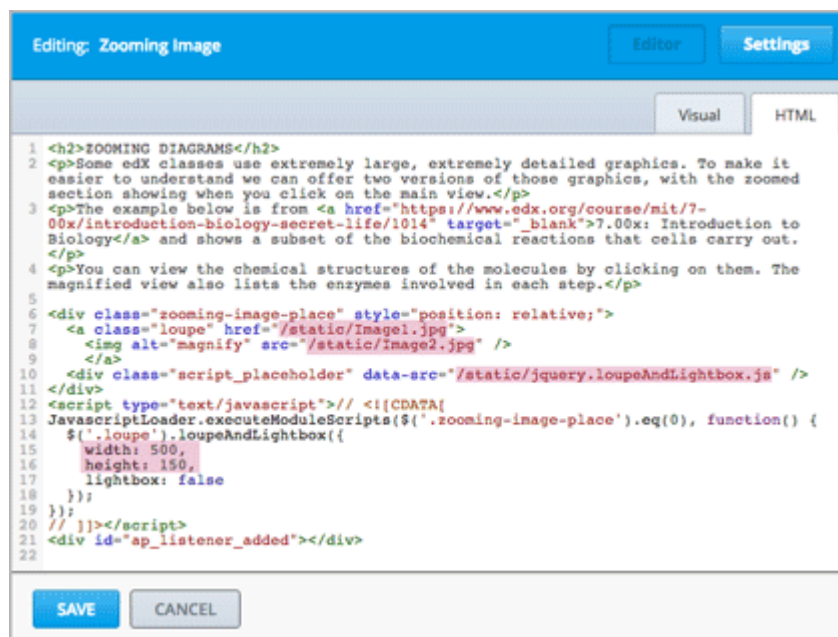
10.47 Using MathJax for Mathematics

To produce clear and professional-looking symbols and equations in web browser, edX uses MathJax. MathJax automatically formats the mathematical symbols and equations that you enter in Text and problem components using LaTeX notation into beautiful math.

This topic provides some pointers to get you started. Many resources for learning and using MathJax are available online, including the official MathJax Documentation . A tutorial is available on the Mathematics meta stack exchange. Additional documentation, with a testing tool, is available on the Tree of Math site.

A MathJax equation can appear with other text in the paragraph (inline format) or on its own dedicated line (display format).

For inline equations, you can do either of the following.

- Surround your MathJax expression with backslash and parentheses characters.

  ```
  \( equation \)
  ```

- Surround your MathJax expression with `[mathjaxinline]` tags. Note that these tags use brackets (`[ ]`).

  ```
  [mathjaxinline] equation [/mathjaxinline]
  ```

For display equations, you can do either of the following.

- Surround your MathJax expression with backslash and bracket characters.

  ```
  \[ equation \]
  ```

- Surround your MathJax expression with `[mathjax]` tags. Note that these tags use brackets(`[ ]`)

  ```
  [mathjax] equation [/mathjax]
  ```

10.47.1 Adding MathJax to Text Components

In the Text component editor, you can use MathJax in both visual view and HTML view.

HTML component editor: Visual view

HTML component editor: HTML view

Studio: Unit page

10.47.2 Adding MathJax to Problem Components

In the problem component editor, you can use MathJax in either the simple editor or advanced editor.

In the example that follows, note that the Einstein equation in the explanation is enclosed in backslashes and parentheses, so it appears inline with the text. The Navier-Stokes equation is enclosed in backslashes and brackets, so it appears on its own line (display).

Editing: Multiple Choice

H1   :=   :=   ABC   123   ☑   Advanced Editor   ?

This nonsensical question is for demonstration purposes only.

Which of the following equations is the most complex?
( ) \(E = m c^2 \)
( ) \(A = \pi r^2 \)
(x) \(\rho \left(\frac{\partial \bf v}{\partial t} + \bf{ v \cdot \nabla v} \right) = - \nabla p + \mu \nabla^2 \bf{v + f } \)
( ) \(V = I R \)

[explanation]
Although a true understanding of Einstein's equation \(E = m c^2 \) relating mass and energy requires years of study, the Navier-Stokes equation \[\rho \left(\frac{\partial \bf v}{\partial t} + \bf{ v \cdot \nabla v} \right) = - \nabla p + \mu \nabla^2 \bf{v + f } \] is computationally more complex (and frequently gives students nightmares).
[explanation]

SAVE   CANCEL

Problem component editor: Simple Editor

Editing: Multiple Choice

```
1  <problem>
2  <p>This nonsensical question is for demonstration
   purposes only.</p>
3
4  <p>Which of the following equations is the most
   complex?</p>
5  <multiplechoiceresponse>
6    <choicegroup type="MultipleChoice">
7      <choice correct="false">\( E = m c^2 \)</choice>
8      <choice correct="false">\( A = \pi r^2 \)</choice>
9      <choice correct="true">\( \rho \left(
   \frac{\partial \bf v}{\partial t} + \bf{ v \cdot
   \nabla v} \right) = - \nabla p + \mu \nabla^2 \bf{v +
   f } \)</choice>
10     <choice correct="false">\( V = I R \)</choice>
11   </choicegroup>
12 </multiplechoiceresponse>
13
14 <p>      </p>
15 <h2>Explanation</h2>
16 <p>Although a true understanding of Einstein's
   equation \( E = m c^2 \) relating mass and energy
   requires years of study, the Navier-Stokes equation \[
   \rho \left( \frac{\partial \bf v}{\partial t} + \bf{ v
   \cdot \nabla v} \right) = - \nabla p + \mu \nabla^2
   \bf{v + f } \] is computationally more complex (and
   frequently gives students nightmares).</p>
17
18 </problem>
```

SAVE   CANCEL

Problem component editor: Advanced Editor

Edit   Delete

MULTIPLE CHOICE   (1 point possible)

This nonsensical question is for demonstration purposes only.

Which of the following equations is the most complex?

○ $E = mc^2$

○ $A = \pi r^2$

○ $\rho\left(\frac{\partial \mathbf{v}}{\partial t} + \mathbf{v} \cdot \nabla\mathbf{v}\right) = -\nabla p + \mu\nabla^2\mathbf{v} + \mathbf{f}$

○ $V = IR$

EXPLANATION

Although a true understanding of Einstein's equation $E = mc^2$ relating mass and energy requires years of study, the Navier-Stokes equation

$$\rho\left(\frac{\partial \mathbf{v}}{\partial t} + \mathbf{v} \cdot \nabla\mathbf{v}\right) = -\nabla p + \mu\nabla^2\mathbf{v} + \mathbf{f}$$

is computationally more complex (and frequently gives students nightmares).

Studio: Unit page

MULTIPLE CHOICE (1 point possible)

This nonsensical question is for demonstration purposes only.

Which of the following equations is the most complex?

○ $E = mc^2$
○ $A = \pi r^2$
○ $\rho\left(\frac{\partial \mathbf{v}}{\partial t} + \mathbf{v} \cdot \nabla\mathbf{v}\right) = -\nabla p + \mu\nabla^2\mathbf{v} + \mathbf{f}$
○ $V = IR$

EXPLANATION

Although a true understanding of Einstein's equation $E = mc^2$ relating mass and energy requires years of study, the Navier-Stokes equation

$$\rho\left(\frac{\partial \mathbf{v}}{\partial t} + \mathbf{v} \cdot \nabla\mathbf{v}\right) = -\nabla p + \mu\nabla^2\mathbf{v} + \mathbf{f}$$

is computationally more complex (and frequently gives students nightmares).

LMS

ADDING COURSE ASSETS

Use the topics in this section to learn about managing assets in your course.

For information on how to develop your course content in the Studio Outline, see *Developing Your Course*.

11.1 Adding Files to a Course

Adding files, such as images, that you can use in your course has the following steps.
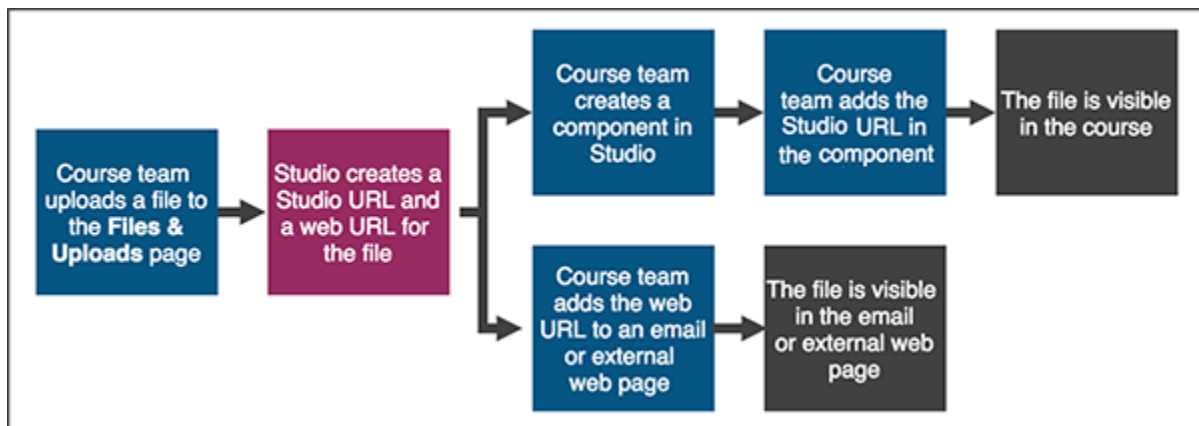
1. The course team uploads a file on the **Files & Uploads** page in Studio.

2. Studio generates two URLs for the file.

    • The Studio URL is used to add the file inside the course, such as in a component or on a page.

    • The web URL is used to add the file outside the course, such as in an email message or external web page.

3. The course team adds a link to the file inside or outside the course.

    • To add the file inside the course, the course team adds the Studio URL in the course content, such as in a component or on a page.

    • To add the file outside the course, the course team adds the web URL in an email message or external web page.

4. The file is visible in the course, email, or external web page.

For more information, see the following topics.

- *The Files & Uploads Page*

- *File Size*

- *Upload Files*

- *Find an Uploaded File*

- *Sort Files*

- *Filter Files*

- *Use an Uploaded File Inside or Outside the Course*

- *Lock a File*

- *Delete a File*

11.1.1 The Files & Uploads Page

You manage most files for your course, including image files, on the **Files & Uploads** page. This page lists the files that you upload, along with the following information about the files.

- The file name.

- A preview of the file (if the file is an image) or an icon that represents the file.

Note: If you do not want to see a preview of your files, select the **Hide File Preview** checkbox in the left pane. To show a preview again, clear this checkbox.

- The file type.

- The date the file was added.

- The URLs that you use to make your files visible in your course or on the internet.

- An indication of whether the file is *locked*.

This page also includes a **Search** option to help you find specific files. For more information, see *Find an Uploaded File*.

Note: For textbooks or for course handouts that you want to make available in the sidebar of the **Course** page, see *Textbooks* or *Add a Course Handout*.

11.1.2 File Size

The maximum size for each file is 10 MB. We recommend that you use standard compression tools to reduce PDF and image file sizes before you add the files to your course.

You can upload multiple files at a time.

If you have very large audio files or large data sets to share with your students, do not use the **Files & Uploads** page to add these files to your course. Instead, use another hosting service to host these files.

11.1.3 Upload Files

Note: Ensure that you obtain copyright permissions for files and images you upload to your course, and that you cite sources appropriately.

To upload one or more files, follow these steps.

1. Create or locate the files on your computer.

   Note: When Studio generates URLs for an uploaded file, the file name becomes part of the URL and is visible to students when they access the file. Avoid using file names that contain information that you do not want to share about the file contents, such as "Answerkey.pdf".

2. On the **Content** menu, select **Files & Uploads**.

3. On the **Files & Uploads** page, drag your file or files into the **Drag and Drop** area.

   Note: If you upload a file that has the same name as an existing course file, the original file is overwritten without warning.

The **Files & Uploads** page refreshes to show the uploaded file or files.

To upload additional files, drag more files into the **Drag and Drop** area of the page.

11.1.4 Find an Uploaded File

The **Files & Uploads** page lists up to 50 files at one time. If your course has more than 50 files, additional files are listed on other pages.

To find a file on the **Files & Uploads** page, you can use the **Search** option, or you can view the page that lists the file.

- To use the **Search** option, enter one of the following search terms in the **Search** field, and then select the magnifying glass icon.

  - The full file name.

  - The file name extension, or file type.

  - Part of the file name. You can also enter multiple parts of a file name.

  For example, if the file is named FirstCourseImage.jpg, you can enter any of the following search terms in the **Search** field.

  - `FirstCourseImage.jpg`

  - `.jpg`

  - `First Image`

  - `First .jpg`

- To view the page that lists the file, select **Previous** or **Next** to view the previous or next page, or select the number of the page that you want to view.

You can also sort files by name, type, or date added, or filter files by type. For more information, see *Sort Files* or *Filter Files*.

11.1.5 Sort Files

On the **Files & Uploads** page, you can sort your files by name, type, or date added. To sort by one of these columns, select the name of the column. For example, to sort your files by type, select the **Type** column name.

The arrow or arrows to the right of the column name indicate the column sort order. Files are sorted by the column that has one arrow. The direction of the arrow indicates whether the order is ascending or descending.

To change between ascending and descending order, select the column name again.

11.1.6 Filter Files

You can filter the list of files by type so that only a selected type of file is visible. The list remains in the current sort order.

You can filter by the following file types.

Type	Possible File Name Extensions
Audio	.aac, .mpeg, .mp3, .ogg, .wav
Code	.css, .html, .json, .php, .sql
Documents	.pdf, .txt, Microsoft Office and Open Office documents, presentations, spreadsheets
Images	.gif, .ico, .jpg, .jpeg, .png, .tif, .tiff
Other	Files not included in the other types, such .sjson

To filter the list of files by type, follow these steps.

1. On the **Files & Uploads** page, locate **Filter by File Type**.

2. In the list, select the checkboxes for the types of file that you want.

The list refreshes to show only the type or types of file you selected. You can sort the resulting list by name, type, and date added.

To reset the list and view files of all types, clear all checkboxes.

11.1.7 Use an Uploaded File Inside or Outside the Course

When you upload a file, Studio assigns a Studio URL and a web URL to the file. The **Copy URLs** column on the **Files & Uploads** page lists these URLs. To use an uploaded file, you add a link to the Studio URL or the web URL in your content.

Note: If you do not want to allow access to a file from outside your course, you can lock the file so that only learners who are signed in and enrolled in your course can access the file. For more information, see *Lock a File*.

Add a File or Image Inside the Course

To add a file or image inside the course, such as to a component, a course update, or a course handout, follow these steps.

1. On the **Files & Uploads** page, select the **Studio** option in the **Copy URLs** column.

   The **Studio** option text briefly changes to **Copied**.

2. In the component or other content, paste the Studio URL.

For more information, see *Add an Image to a Text Component*.

Add a File or Image Outside the Course

To add a file or image outside the course, such as to a bulk email message that you send from the LMS, follow these steps.

1. On the **Files & Uploads** page, select the **Web** option in the **Copy URLs** column.

   The **Web** option text briefly changes to **Copied**.

2. In the external content, paste the web URL.

Note: Be sure that you do not use the Studio URL in an email message. For more information about sending email messages, see *Send an Email Message to Course Participants*.

11.1.8 Lock a File

By default, anyone can access a file you upload if they know the web URL, even if they are not enrolled in your course. You can prevent outside access to a file by locking the file. When you lock a file, the web URL only allows learners who are enrolled in your course and signed in to access the file.

To lock a file, select the lock icon in the row for the file.

11.1.9 Delete a File

To delete a file, select the delete icon in the row for file, and then select **Permanently delete** in the confirmation dialog box.

Warning: After you delete a file, any links to the file from inside or outside the course are broken. You must update links to files that you delete.

11.2 Adding Course Updates and Handouts

You can create course updates and handouts in Studio.

Course updates are communications, especially a welcome message, that learners see at the top of the **Course** page when they enter the course. A welcome message is an important way of making each learner feel personally welcomed to the course, and of providing orienting information that helps learners succeed with the course.

After learners have read the welcome message, they can dismiss the message. The message is automatically dismissed seven days after the learner first views it if the learner doesn't actively dismiss it first. Learners can access the dismissed message and any other updates from the **Updates** link in the sidebar on the **Course** page.

Handouts are links to files that you upload in Studio, for example, a PDF version of the course syllabus, or an article that you want learners to read. Learners see the list of course handouts under **Handouts** in the sidebar.

Section Contents

- *Add a Course Update*

- *Add a Course Handout*

11.2.1 Add a Course Update

You create course updates in Studio. On entering the course, learners see the update that has the latest date chronologically (including dates in the future) on their **Course** page.

Note: Learners can dismiss the update that displays on their **Course** page after they have read it. When learners have dismissed a message, they can access the dismissed message and any other updates from the **Updates** link in the sidebar on the **Course** page.

On the **Updates** page in Studio, you see the list of updates sorted in the order that they were created (most recent at the top of the list). If you create a new update, learners do not see the update on the **Course** page unless it has the latest chronological date of all existing updates.

To add a course update, follow these steps.

1. In Studio, select **Updates** from the **Content** menu.

2. Select **New Update**.

3. Create your update in the text editor that opens.

    - Enter text for the update, using HTML tags for formatting. This editor is like the *raw HTML editor* in Text components. The course update editor does not have a *visual editor*.

      Note: To make sure that your announcements are accessible, if you use headings inside an announcement, make sure that you use only level 6 headings (<h6>). The structure of the course **Course** page uses heading levels 1-5.

      If you copy text from another source and paste it into the text editor, proofread the result carefully. Some applications automatically change quotation marks and apostrophes from the "straight" version to the "smart" or "curly" version. The editor requires "straight" quotation marks and apostrophes.

    - Specify a date for this update. By default, today's date is already entered. You can change the date using the calendar tool, or by entering some other valid date.

      Note: Learners do not see the update on the **Course** page unless it has the latest chronological date of all existing updates.

      ---

4. Select **Post**.

    Your new update becomes available to learners immediately. If the update has the latest chronological date, it is shown to learners on the **Course** page, otherwise the update appears on the **Updates** page.

1. Optionally, choose whether to send a notification about your update to the edX mobile app.

- Learners can choose to turn off notifications for individual courses or for all courses. The **Course** page continues to show updates.

- Updates appear on the **Course** page, even if you do not send notifications.

11.2.2 Add a Course Handout

To add a course handout, you *upload a file in Studio*, then add an entry to an HTML-formatted list of handouts, specifying the URL to your uploaded file and providing a handout title.

You can open the Studio **Files & Uploads** page in another browser window to make this process easier.

To add a course handout, follow these steps.

1. In Studio, select **Updates** from the **Content** menu.

   On the **Updates** page, you see a **Course Updates** panel and a **Course Handouts** panel.
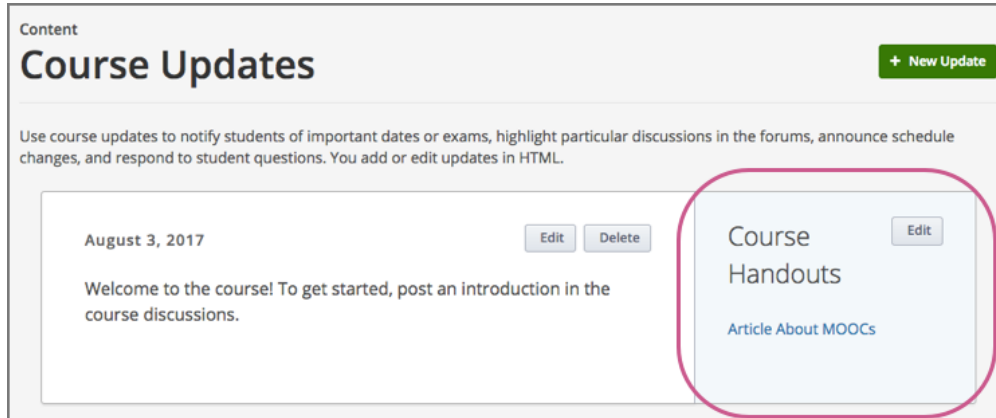
2. In the **Course Handouts** panel, select **Edit**.

3. In the editor that opens, use HTML formatting to add a link to your uploaded file and a title for the handout. If there are no existing handouts, by default an empty ordered list tag is provided.

   An example using paragraph tags rather than a list, follows.

```
<p><a href="/static/Syllabus_Fall2017.pdf" target="_blank">Syllabus</a></p>
<p><a href="/static/Glossary_v3.pdf" target="_blank">Glossary</a></p>
```

4. Select **Save**.

11.3 Managing the Pages in Your Course

This topic describes the applications and resources that your course experience has enabled outside of the core content experience and how you can modify these tools to fit your course needs.

- *Working with the Default Pages*
- *Enabling Additional Applications & Resources*
    - *Enabling the Notes Application*
    - *Enabling the Teams Application*
    - *Enabling the Wiki Application*
    - *Enabling the Calculator Resource*
    - *Adding Custom Page Resources*

11.3.1 Working with the Default Pages

By default, every new course has the following key areas enabled:

•   Course

•   Progress

•   Date

•   Discussion

In the learner experience, these will be shown in the primary navigation bar at the top of every page, consistently in this order for all courses.
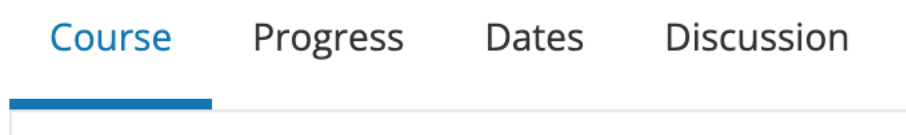
As a course team member with the **Staff** or **Admin** role, you also see the Instructor option in the navigation bar, shown at the end of the list of pages. Learners do not see the Instructor option.

Note: The progress page can be disabled and thus hidden from the learner experience, though this is not commonly done and is not recommended. The information on the Progress page is critical for motivating learners, particularly in courses that include graded subsections, but also for courses that include only ungraded exercises. Before choosing to hide the Progress page for your course, consider the possible effect on learner engagement.

11.3.2 Enabling Additional Applications & Resources

Additional applications and resources can be enabled depending on your course needs, including:

•   Notes

•   Teams

•   Wiki

•   Calculator

•   Textbooks

•   Custom Pages

Enabling the Notes Application

The notes application can be optionally enabled to allow learners to easily create organized text notes for any text, problem, or video transcript content within a course. These notes are then centrally stored for review in the Notes area of the course

To disable or enable the Notes application, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.

2. Click the gear icon on the **Notes** card shown on this page.

3. From the **Configure notes** modal, select the toggle to enable or disable the notes application.

4. Select **Apply** to save your configuration changes.

Enabling the Teams Application

When you create a course, the teams application can be optionally enabled to provide a mechanism for instructor and learner-driven team formation or assignment.

To disable or enable the Teams application, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.

2. Click the gear icon on the **Teams** card shown on this page.

3. From the **Configure teams** modal, select the toggle to enable or disable the teams application.

4. Select **Apply** to save your configuration changes.

Additional configuration for the Teams application can be found at *11.3.3.3 Configuring the Teams application*

Enabling the Wiki Application

When you create a course, a wiki can be optionally enabled to create and share resources that can be edited and updated by any course team member or learner.

To disable or enable the Wiki application, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.

2. Click the gear icon on the **Wiki** card shown on this page.

3. From the **Configure Wiki** modal, select the toggle to enable or disable the wiki.

4. Select **Apply** to save your configuration changes.

When you disable the wiki application in your course, any existing articles remain in the edX- wide wiki, but the Wiki page is removed from your course pages.

Additional details for configuring the wiki application can be found at *11.3.3.2 Configuring the wiki application*.

Enabling the Calculator Resource

Courses can optionally render a calculator resource that helps learners use an in-platform tool for mathematical operations and computations.

To disable or enable the Calculator resource, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.

2. Click the gear icon on the **Calculator** card shown on this page.

3. From the **Configure calculator** modal, select the toggle to enable or disable the calculator.

4. Select **Apply** to save your configuration changes.

Adding Custom Page Resources

You can customize your course by adding pages. Each page that you add appears in the navigation bar for your course. When you add a page, you also add its content using an HTML editor. The following example shows the navigation bar for a course that has added a custom page named Syllabus.

<table>
<tr><td>Course</td><td>Progress</td><td>Dates</td><td>Discussion</td><td>Calendar</td><td>Instructor</td></tr>
</table>
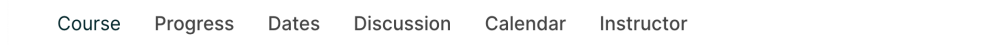
When you add a page, you can specify whether it and its content are visible only to course team members who have the Admin or Staff role, or to all enrolled learners as well as the course team. For more information about assigning course team roles, see *Planning Course Staff*.

If you add a custom page to a course after its start date, and have specified that the page should be visible to learners, the page is visible in the LMS as soon as you save your work.

As a best practice, be sure the following aspects of your page design are ready before you add a page in Studio.

- The content for the page, which can include HTML markup.

- The name of the page.

- The audience for the page (everyone, or course team members with the Admin or Staff roles only).

To add a custom page and its content to your course, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.

2. Select the **Custom Pages** card on this page.

3. Click **New Page**, which prompts the system to add a page named **Empty** to the end of the list.

4. In the row for the new page, select **Edit**. The *visual editor* opens.

5. Enter the content for your page.

   To add HTML tags to your content, select HTML to open the *the raw HTML editor*. For more information about entering content, see *Options for Editing Text Components*.

   Note: If you copy text from another source and paste it into the visual editor, be sure to proofread the result carefully. Some applications automatically change quotation marks and apostrophes from the "straight" version to the "smart" or "curly" version. The raw HTML editor requires "straight" quotation marks and apostrophes.

   ---

6. To rename the page, select Settings, and then enter a Display Name. The display name is the label that course participants use in the course navigation bar.

---

7. To hide the page from learners, select **Settings**, and then select true for **Hide Page from Learners**. By default, pages are visible to learners.

8. Select **Save**.

The new page is immediately available to the specified audience if the course has started.

For details on reordering course pages, see additional detail in *11.3.4. Reordering and Deleting Custom Pages*.

Enabling the Textbooks Resources

You can add textbooks in PDF format to your course using the Textbooks resource area. Each textbook that you add is displayed to learners as a page, or tab, in the course navigation bar.

Note: Do not use image files (for example, .png files) as textbooks for your course, because they are not accessible to learners who use screen readers. For more information, review *Creating Accessible PDF Documents*.

To add a textbook resource to your course, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.

2. Select the **Textbooks** card on this page.

3. Select either **Add your first textbook** or **New Textbook**.

4. On the page that opens, enter the **Textbook Name**.

5. Enter the **Chapter Name**.

6. Next to **Chapter Asset**, select **Upload PDF** to upload a PDF from your computer, and then follow the prompts to upload your file.

7. To add more chapters, select **Add a Chapter** and repeat steps 5 and 6.

8. Select **Save**.

Note: When you add a textbook to your course, Studio automatically adds each PDF file that you upload to the Files & Uploads page. EdX recommends that you upload a separate PDF for each chapter of your textbook. When learners open the textbook page in the course, they can navigate the textbook by chapter.

You can delete a custom textbook from your course using the delete icon shown on each textbook from the Textbooks Studio page. It is also possible to delete a specific chapter from a textbook when editing a textbook using the close icon to the right of each listed chapter.

Note: After you delete your textbook on the Textbooks page, edX strongly recommends that you *lock* or *delete* the PDF files for the textbook on the Files & Uploads page to avoid copyright issues.

11.3.3 Configuring Applications & Resources

As a best practice, you should avoid changing the visibility of your course pages after the course starts. For example, your course includes the Wiki page when it starts. A learner adds a page to the course wiki, and adds a browser bookmark to that page. If you later hide the Wiki page, the learner's browser bookmark will continue to provide access to the entire course wiki.

Included below are detailed instructions for the configuration of applications and resources that have additional settings and options.

Configuring the Discussions application

There are several configuration options available to the Discussions application. Many basic configuration options are provided within Studio's Pages & Resources area, and moderation capabilities are available to instructors, moderators, and community TAs directly from the Discussions application. Included below are details about both the configuration options and management tools.

To change how the discussion experience is configured, follow these steps:

1. In **Studio**, from the Content menu select **Pages & Resources**.

2. Click the gear icon on the **Discussion** card shown on this page.

3. From the **Configure discussion** modal, adjust any of the configuration settings as described below to fit your course needs.

4. Select **Apply** to save your configuration changes.

The discussion configuration experience is comprised of two steps: provider selection and provider configuration. By default, courses are created with the edX discussion experience and its default configuration. Other providers and configuration options can be selected to fit the needs of courses.

Step 1: Provider Selection

In this step, educators can select to use the default edX discussion experience or LTI based integrations with other providers. Below the grid of available providers is a table summarizing the features each integration provides.

Step 2: Configuration Options

Each provider supports its own set of features depending on the discussion features they support. The edX discussion application has various settings and controls that are described below. All integrations use LTI 1.1 configuration, and may additionally support platform settings from the list below. Any special instructions or details specific to a given provider are described in this step as well.

Anonymous Posting

If this setting is enabled, learners can create posts that are anonymous to all users.

Allow Anonymous Discussion Posts to Peers

When enabled learners will be able to post anonymously to other peers but all posts will be visible to course staff.

General Discussion Topics

It is possible to include general topics not associated with the course content structure. All courses have an initial general topic by default to start that can be renamed.

Discussion Blackout Dates

Course teams can specify one or multiple times during which the discussion forums are not available for new content additions. This can be helpful during exam periods or other course time periods.

Configuring the Wiki application

For instructions on how to enable the wiki application see *11.3.2.3 Enabling the Wiki Application*.

You can control access to the wiki in various ways: by changing access to the wiki as a whole, by changing the read/write permissions settings of articles within the wiki, or by locking articles.

To change access to the course wiki, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.

2. Click the gear icon on the **Wiki** card shown on this page.

3. From the **Configure** wiki modal, check or uncheck the toggle of the **Enable public wiki access** setting.

4. Select **Apply** to save your configuration changes.

The **Enable public wiki** access wiki setting is disabled by default, meaning that only course team members and enrolled learners can see the course wiki. If you enable this setting, then any registered edX user can access the course wiki, even if they are not enrolled in your course. However, public users would have to explicitly navigate to your wiki via the edX-wide wiki structure, or a link that has been provided to them.

Configuring the Teams application

Additional management and configuration of the teams application can be done through the main Team application tab in the learner experience, and is detailed in *12.4.1 Using the Teams application*.

11.3.4 Reordering and Deleting Custom Pages

For instructions on how to add custom pages see *11.3.2.5 Adding Custom Page Resources*.

You can reorder the custom pages in your course in the same way that you *reorganize the course outline*: you drag a page to a different location in the list of pages and drop it there.

Note: All default course pages (Course, Progress, Dates, Discussion) and optional course applications (Notes, Teams, Wiki) appear in the navigation before any configured custom page resources. If you have configured any textbook resources, these are listed after custom pages.

To reorder the pages, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.

2. Select the **Custom Pages** card on this page.

3. On the list of pages, each page that you can move includes a Drag to reorder icon.

4. Move your pointer over the Drag to reorder icon for the page. Your pointer changes to a four-headed arrow.

5. Click and drag the page to the new location, and then release.

You can also delete a custom page from your course using the delete icon shown on each custom page from the **Custom Pages** Studio page. If you delete a page after the course start date, note that the visibility of the page in the learner experience changes immediately.

11.4 Textbooks

You can add textbooks in PDF format to your course.

Note: Do not use image files (for example, .png files) as textbooks for your course, because they are not accessible to learners who use screen readers. For more information, review *Creating Accessible PDF Documents*.

Each textbook that you add is displayed to learners as a page, or tab, in the course navigation bar. EdX recommends that you upload a separate PDF for each chapter of your textbook.

When learners open the textbook page in the course, they can navigate the textbook by chapter.

11.4.1 Add a Textbook

Note: When you add a textbook to your course, Studio automatically adds each PDF file that you upload to the **Files & Uploads** page.

---

1. Prepare PDFs of your textbook on your computer.

2. On the **Content** menu, select **Textbooks**.

3. Select either **Add your first textbook** or **New Textbook**.

4. On the page that opens, enter the **Textbook Name**.

5. Enter the **Chapter Name**.

6. Next to **Chapter Asset**, select **Upload PDF** to upload a PDF from your computer, and then follow the prompts to upload your file.

7. To add more chapters, select **Add a Chapter** and repeat steps 5 and 6.

8. Select **Save**.

11.4.2 Delete a Textbook

Note: This method deletes the entire textbook. To delete an individual chapter, see *Delete a Chapter*.

---

1. On the **Content** menu, select **Textbooks**.

2. On the **Textbooks** page, hover the cursor over the textbook that you want to delete, and then select the trash can icon.

3. In the confirmation dialog box, select **Delete**.

Note: When you add a textbook to your course, Studio adds each PDF file that you upload to the **Files & Uploads** page. After you delete your textbook on the **Textbooks** page, edX strongly recommends that you *lock* or *delete* the PDF files for the textbook on the **Files & Uploads** page to avoid copyright issues.

11.4.3 Delete a Chapter

1. On the **Content** menu, select **Textbooks**.

2. On the **Textbooks** page, hover the cursor over the textbook that contains the chapter that you want to delete, and then select **Edit**.

3. On the textbook editing page, locate the chapter that you want to delete, and then select the X icon next to that chapter.

Note: When you add a textbook to your course, Studio adds each PDF file that you upload to the **Files & Uploads** page. After you delete a chapter on the **Textbooks** page, edX strongly recommends that you *lock* or *delete* the PDF file for the chapter on the **Files & Uploads** page to avoid copyright issues.

11.5 Using the Course Wiki

Wikis provide a way for the course team and learners to access, share, and collaboratively edit information both about, and for, your course.

- *About the Course Wiki*
- *Managing the Course Wiki*
- *Showing or Hiding the Wiki*
- *Controlling Access to the Wiki*
- *Setting Permissions for Wiki Articles*
- *Seeding the Wiki*
- *Adding a Wiki Article*
- *Editing a Wiki Article*
- *Searching for Wiki Articles*
- *Managing Versions of Wiki Articles*
- *Locking a Wiki Article*
- *Deleting a Wiki Article*

11.5.1 About the Course Wiki

Courses can optionally configure a wiki application and set it up for appropriate use in your course. If you have specific expectations for how the wiki should be used, communicate these expectations to your learners and staff. You can *seed the wiki* with specific content and provide a skeleton structure and some exemplars. At the beginning of the course, explain how you want the course wiki to be used, and provide clear instructions and guidelines for its use.

Common uses for the course wiki might include the following activities.

  • Sharing answers to course FAQs and collecting new FAQs.

  • Sharing editable course information, such as download and installation instructions for software required for the course

  • Providing shared access to learner-created resources, perhaps as part of a collaborative exercise.

  • Sharing errata for the course.

  • Collecting suggestions for future runs of the course.

As learners and course team members create and edit wiki articles, they contribute to a repository of information about your course that can be immediately useful to other learners, or useful for you and your course team as you develop other courses or future runs of the same course.

The wiki for each course is a "child" wiki of the edX-wide wiki. From within any course wiki, select the top level **Wiki** link in the breadcrumb trail at the top of the page to visit the edX-wide wiki.

11.5.2 Managing the Course Wiki

Keep these points in mind as you design the wiki for your course.

  • Be clear about the purpose for the wiki or for different parts of the wiki. For example, are some parts of the wiki only for disseminating information? If that is the case, then make sure that only your course team has write access for those articles.

  • Decide whether some parts of the wiki are intended for learner collaboration or learner input. Make sure that learners are able to create and edit wiki articles in those sections, and use text to clearly indicate to learners that these pages can be edited.

  • Think about the different tasks that will be performed by people in different roles. Typically you want your course team to have some privileges that learners do not have. For example, course team members can delete wiki articles, but learners cannot.

Members of the course team can perform these tasks to manage the wiki.

  • *Show or Hide the Wiki*

  • *Control Wiki Access*

  • *Seed the Wiki*

  • *Lock a Wiki Article*

  • *Delete a Wiki Article*

  • *Purge a Wiki Article*

  • *Restore a Deleted Wiki Article*

All users, including learners, can perform the following tasks, depending on the permissions that you set for an article.

  • *Add a Wiki Article*

  • *Edit a Wiki Article*

- *Manage Versions of a Wiki Article*
- *Search for Wiki Articles*

11.5.3 Showing or Hiding the Wiki

To disable or enable the Wiki application, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.

2. Click the gear icon on the **Wiki** card shown on this page.

3. From the **Configure wiki** modal, select the toggle to enable or disable the **wiki**.

4. Select **Apply** to save your configuration changes.

When you hide the wiki in your course, any existing articles remain in the edX- wide wiki, but the Wiki page is removed from your course pages.

11.5.4 Controlling Access to the Wiki

You can control access to the wiki in various ways: by changing access to the wiki as a whole, by changing the read/write permissions settings of articles within the wiki, or by locking articles.

To change access to the course wiki, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.

2. Click the gear icon on the **Wiki** card shown on this page.

3. From the **Configure wiki** modal, check or uncheck the toggle of the **Enable public wiki access** setting.

4. Select **Apply** to save your configuration changes.

The **Enable public wiki access** wiki setting is disabled by default, meaning that only course team members and enrolled learners can see the course wiki. If you enable this setting, then any registered edX user can access the course wiki, even if they are not enrolled in your course. However, public users would have to explicitly navigate to your wiki via the edX-wide wiki structure, or a link that has been provided to them.

To modify viewing or editing permissions for specific groups of users by article, see *Setting Permissions for Wiki Articles*.

To lock an article and prevent further editing, see *Locking a Wiki Article*.

11.5.5 Setting Permissions for Wiki Articles

To prevent certain groups of users from being able to add or edit articles, you need to modify the read/write permissions for articles. For example, as a member of the course team, you likely want to prevent learners from creating wiki articles at the top level, so you should remove write access to course- level wiki articles for most users. (Top-level wiki articles are children of the edX-wide wiki, and cannot be found within the course wiki).

To modify the permissions for wiki articles, follow these steps.

1. View the live version of your course.

2. Select **Wiki**.

3. Navigate to the article whose permissions you are modifying, and then select **Settings**.

4. In the **Permissions** section of the **Settings** page, select or clear the checkboxes for read or write access for **Group** or **Other**.

5. At the bottom of the page, select the **Save changes** button for the **Permissions** section.

Note that there are two different **Save changes** buttons, one near the top of the page for the **Notifications** section, and one at the bottom of the page for the **Permissions** section. If you are modifying permissions, make sure you select the **Save changes** button at the bottom of the page for your changes to be saved.

Groups Used in Wiki Permissions

Each course has the following groups.

- Beta Testers (by default there are no beta testers until you add them)

- Admins (by default, the course author is always in this group)

- Staff (these are course team members)

You add users to these groups in the LMS by selecting **Instructor** and then **Membership**.

The permissions for the **Others** group apply to users who are not in the three course groups, including learners.

11.5.6 Seeding the Wiki

To ensure that learners get the most out of your course wiki, design the wiki space before the course starts by seeding the course wiki with articles that give it the desired structure.

For example, you could create wiki articles to mirror the course outline. At the top level, you could provide a course outline, FAQs, and links to the main articles for each section. In the child articles for each section, you could provide information specific to the units and components in that section, and a page for learners to share their feedback and experiences.

This section describes how you can contribute to the course wiki.

11.5.7 Adding a Wiki Article

When you add an article to the wiki, be aware of what level you are currently viewing, to make sure that you add your new article to the correct level in the course wiki.

To move down a level in the wiki, select **See all children**; to move up, select the appropriate level in the wiki breadcrumb trail links at the top of the page.

Add Articles at the Same Level

To add a wiki article at your current level, follow these steps. If you do not have permissions to add an article, when you select **Add Article**, a message indicates "Permission Denied" .

1. In your course, select **Wiki**.

2. Navigate to the level where you want to add a new article.

3. Select the **Add Article** button near the top right of the page.

4. On the new article page, add a title for the page, and optionally a few keywords to create a "slug" that provides a more specific location identifier for your article.

5. Add contents to the article. You can enter plain text and use Markdown syntax to add formatting. For help with Markdown syntax, select the link to the cheat sheet at the upper right corner of the **Contents** field.

6. When you have finished entering content for your wiki article, select **Create Article**.

Add Articles Below the Current Level

To add a child article to your current article, follow these steps. If you do not have permissions to add an article, when you select **Add Article**, a message indicates "Permission Denied" .

1. In your course, select **Wiki**.

2. Navigate to the level above where you want to add the new child article.

3. Select **See all children**.

4. Select the **Add Article** button under the wiki title.

5. On the new article page, add a title for the page, and optionally a few keywords to create a "slug" that provides a more specific location identifier for your article.

6. Add contents to the article. You can enter plain text and use Markdown syntax to add formatting. For help with Markdown syntax, select the link to the cheat sheet at the upper right corner of the **Contents** field.

7. When you have finished entering content for your wiki article, select **Create Article**.

11.5.8 Editing a Wiki Article

If you have permissions to edit an article, you see an **Edit** button and icon to the right of the article content.

To make changes to a wiki article, follow these steps.

1. In your course, select **Wiki**.

2. Navigate to the article you want to edit.

3. Select **Edit**.

4. Make your changes. For help with Markdown syntax, select the link to the cheat sheet at the upper right corner of the **Contents** field.

5. In the **Summary** field at the bottom left, below the **Contents** field, enter a short description of the changes you made. This description appears in the **Changes** list, and helps other users of the wiki understand what changes you made to the article.

6. When you have finished making edits, select **Save changes**.

11.5.9 Searching for Wiki Articles

A **Filter** field is available only if any level of the wiki contains multiple articles.

Enter a text string in the **Filter** field to find a list of all articles with that text string in their titles.

11.5.10 Managing Versions of Wiki Articles

The wiki includes a change history for each article. You can view each past version of the article, roll back to a selected earlier version of the article, or merge the current version of the article with a selected earlier version.

View a List of Previous Versions of a Wiki Article

1. In your course, select **Wiki**.

2. Navigate to the wiki article for which you want to see the change history.

3. Select **Changes**. Previously saved versions of the current article are listed, with the most recent at the top.

View a Previous Version of a Wiki Article

1. On the **Changes** page for your wiki, select the revision of the article that you want to view.

2. Select **Preview this revision** to see the article as it appeared after the revision was made.

See Line by Line Changes in a Previous Version

1. On the **Changes** page for your wiki, select the revision of the article that you want to view.

2. Select the linked date, time, and author information to see the line-by-line changes made in that revision. Text that is highlighted in red has been replaced by the text that is highlighted in green below it.

Replace a Current Version with a Previous Version

1. On the **Changes** page for your wiki, select the revision of the article that you want to roll back to.

2. Select **Switch to selected version** to replace the current version with the selected one.

Combine a Current Version with a Previous Version

1. On the **Changes** page for your wiki, select the revision of the article that you want to merge with the current version.

2. Select **Merge selected with current** to combine the current and the selected versions.

11.5.11 Locking a Wiki Article

Locking a wiki article prevents further changes from being made to it. To lock a wiki article either after you create it, or after you make specific edits, follow these steps.

1. View the live version of your course.

2. Select **Wiki**.

3. Navigate to the article you want to lock, and then select **Settings**.

4. In the **Permissions** section of the **Settings** page, select the **Lock article** checkbox.

5. At the bottom of the page, select the **Save changes** button for the **Permissions** section.

11.5.12 Deleting a Wiki Article

Only course team members can delete articles. In addition, you can only delete an article if you have permissions to edit that article. If you have the required permissions, you see a **Delete article** button at the bottom of the **Edit** page.

To delete an article, follow these steps.

1. View the live version of your course.

2. Select **Wiki**.

3. Navigate to the article you want to delete, and then select **Edit**.

4. Select **Delete article**.

5. On the deletion confirmation page, select **Yes, I am sure**.

6. Optionally, also select the **Purge** checkbox. For details, see *Purging a Wiki Article*.

7. Select **Delete article** to confirm the deletion.

Purging a Wiki Article

When you delete and purge an article, it is completely removed from the wiki, with no option to undo the deletion. Select this option only if you are sure you will not want to restore the content.

To purge an article as you delete it, select the **Purge** checkbox on the deletion confirmation page.

Restoring a Deleted Wiki Article

Articles that have been deleted but not purged can be restored. A link to the article remains visible at the level at which it was created.

To restore a deleted article, select the link to the article and select **Restore**.

TWELVE

USING ENHANCED CAPABILITIES IN YOUR COURSE

Use the topics in this section to learn about options for enhancing your course experience for learners.

For information on how to develop your course content in the Studio Outline, see *Developing Your Course*.

12.1 Including Learner Cohorts

12.1.1 Using Cohorts in Your Courses

This section provides an introduction to using cohorts to divide the learners in your course into smaller groups.

> - *Overview*
> - *Options for Assigning Learners to Cohorts*

For more information about setting up and managing cohorts, see the following topics.

- *Enabling and Configuring the Cohorts Feature*
- *Setting Up Discussions in Courses with Cohorts*
- *Managing Divided Discussion Topics*

For information about discussions in general, see *Creating Course Discussions*.

For information about offering different content to different cohorts of learners, see *Offering Different Content to Learners Based on Cohort*.

Overview

To create smaller communities in your course, or to design different course experiences for different groups of learners, you can *set up cohorts* in your course.

To use cohorts in your course, you define a set of cohorts that are either random or that reflect some characteristic of the communities of learners in your course. Then, you decide on a strategy for *assigning learners to these cohorts*.

With learners divided into smaller groups based on cohort, you can give learners a course experience that is specific to the cohort that they belong to. You can divide discussion topics by cohort so that learners only interact with other members of the same cohort. You can create course content in such a way that learners in different cohorts are offered different variations of assignments or exams.

Note:

- Every learner must be assigned to a cohort. This ensures that every learner has the ability to read and contribute to course discussion topics.

- Each learner can be in one and only one cohort.

To provide learners with a consistent experience throughout the course run, do not change cohort configuration or a learner's cohort assignment after your course begins.

Options for Assigning Learners to Cohorts

Learners are assigned to cohorts either *automatically* or *manually*, depending on the types of cohorts that you create.

Manual cohorts do not have learners assigned to them unless you manually add learners. Automatic cohorts have learners randomly assigned to them if learners do not belong to any cohort by the time they access the course content (including the course **Discussion** page or content-specific discussion topics, if discussion topics are divided). If you have not created any automated cohorts by the time learners access course content, a default automated cohort is created and used for automatic assignment, so that no learner in the course is without a cohort.

Determine the basic strategy that you will use to create cohorts. Typically, your purpose in including the cohort feature determines which assignment option you use for your course.

An *automated assignment strategy* means that you create cohorts to which learners are assigned automatically and randomly. Automated assignment works well if, for example, you are creating cohorts simply to create small groups of learners. Automated assignment means that learners are assigned randomly to cohorts as they access course content and divided discussion topics. The cohorts that result from automated random assignment are likely to be more equal in size.

A *manual assignment strategy* means that learners are assigned only to the cohorts you have created when you or your course team manually adds them. A manual assignment strategy makes sense if you want to create cohorts based on some characteristic of your learners. For example, if you want alumni from your institution to have a particular course experience, you can create an alumni cohort and manually assign learners who you know are alumni to that cohort.

You can use a *hybrid assignment method* by creating a combination of automated and manual cohorts.

Note: You can add learners manually to any cohort, whether it was created as an automated cohort or a manual cohort.

Note: Although you can change the assignment method of a cohort at any time after you create it, you should have a cohort assignment strategy in mind as you design your course, and only make changes to cohorts while the course is running if absolutely necessary. Be aware of the implications of changing cohort configuration while your course is running. For more information, see *Altering Cohort Configuration in a Running Course*. In general, to provide learners with a consistent experience throughout the course run, do not change cohort configuration or a learner's cohort assignment after your course begins.

For use cases and examples of the strategies for assigning learners to cohorts, see the following topics.

- *Automated Assignment: Making MOOC Discussions Manageable*

- *Manual Assignment: Grouping by Common Characteristics*

- *Hybrid Assignment: Accommodating Small Groups Within a Course*

- *Ensuring That All Learners Are Assigned: The Default Cohort*

Automated Assignment: Making MOOC Discussions Manageable

In very large courses, the number of posts that are made to course discussion topics can make for a daunting amount of daily reading. In such courses, dividing the enrollees into separate cohorts makes the volume of posts, responses, and comments by the members of each cohort more manageable, and is more likely to foster community feeling.

If you use the automated assignment strategy, you create several "auto" (automated) cohorts. Learners are automatically and randomly assigned to one of the auto cohorts when they first view any course content on the **Course** or **Discussion** page. In this way, each learner who engages with the course content or its discussion community is assigned to a cohort. No learner who participates in these ways remains unassigned.

The following guidelines are based on the experiences of MOOC teams that have used cohorts in this way. They are suggested to help you determine how many automated cohorts to define for your course.

- Each cohort should be large enough to inspire lively participation and diverse points of view, but small enough to allow a sense of community to develop. Cohorts formed by random assignment tend to be successful if they include between 200 and 500 members.

- For every 10,000 learners who enroll, approximately 200 to 400 learners remain active in the discussions throughout the course run.

- Divide the estimated total enrollment of the course run by 10,000.

- Use the result as the number of automated cohorts to create.

For example, two days before it starts, a course has an enrollment of 80,000 learners. To create small communities within the discussions, the course team enables cohorts and then creates eight automated cohorts. As learners visit the **Discussion** page or view the course content, they are randomly assigned to one of the eight cohorts. In divided discussion topics, learners read and respond only to contributions made by other members of the same cohort.

For more information, see *Implementing an Automated Assignment Strategy*.

Manual Assignment: Grouping by Common Characteristics

In SPOCs and other courses with small- to medium-sized enrollments, known existing commonalities can be used to identify cohorts. An example is a course that enrolls learners from different companies or with different educational backgrounds, or members of alumni or parent groups. When learners are assigned to cohorts on the basis of a characteristic that they share, they can privately discuss applications for what they are learning and explore resources and ideas that are of particular interest.

To implement this assignment strategy, you identify the "real-world" cohorts that your learners already belong to. You enable cohorts and then create manual cohorts to represent each of the real-world cohorts. You then manually assign each enrolled learner to a cohort. Every learner in your course, including those who enroll after the course starts, must be assigned to a cohort.

Note: To ensure that every learner is assigned to a cohort, you can set up a single automated cohort, as described for the *hybrid assignment strategy*. If you do not create an automated cohort, the system automatically creates a *default cohort* and assigns learners to it if necessary.

For more information, see *Implementing a Manual Assignment Strategy*.

Hybrid Assignment: Accommodating Small Groups Within a Course

For some courses, the manual assignment strategy is not feasible to execute, and the automated assignment strategy does not accommodate existing cohorts in the student body. The enrollment might be too large to complete manual assignments effectively, or only some of the learners might have strong defining characteristics among an otherwise diverse student body. For these courses, you can use a hybrid of the two strategies to implement cohorts.

An example is a course that enrolls members of an alumni association. The alumni want an opportunity to have private interactions, so manual assignment of those learners to a cohort makes sense. For other learners in the class, manual assignment is not needed: you can create one or more automated cohorts for the remaining learners in the course.

Before you implement the hybrid strategy, you identify the characteristics that define existing cohorts in the student body. You also decide whether you want the remaining learners in the course to be divided into their own, similarly-sized cohorts, or if you want them all to be in just one other cohort.

After you enable cohorts, you create a manual cohort for each learner group that you identified. You manually assign learners who belong to each group to the corresponding cohort. You also set up automated cohorts for the other learners in the course, or rely on the default automated cohort. Any learners who are not assigned to a manual cohort are automatically assigned to one of the automated cohorts or to the default cohort when they first view any course content, including the course **Discussion** page or content-specific discussion topics. For best results when you use this strategy, you should complete all manual cohort assignments before the course starts and before learners begin viewing course content and discussion topics.

For more information, see *Implementing an Automated Assignment Strategy* and *Implementing a Manual Assignment Strategy*.

Ensuring That All Learners Are Assigned: The Default Cohort

If you enable cohorts in your course, all learners must be assigned to a cohort. To ensure that there are no learners in the course without a cohort, the system automatically creates a default cohort and assigns learners to it if necessary.

The default cohort is created only if you have not created at least one automated assignment cohort in your course by the time that the first learner accesses your course content. Learners who have not been manually assigned to a cohort when they access the course content are automatically assigned to the default cohort.

Learners who are in the default cohort see a cohort name of "Default Group" in discussion posts. If you want learners to see a different name for the default cohort, you can change its name. For details about renaming cohorts, see *Rename a Cohort*.
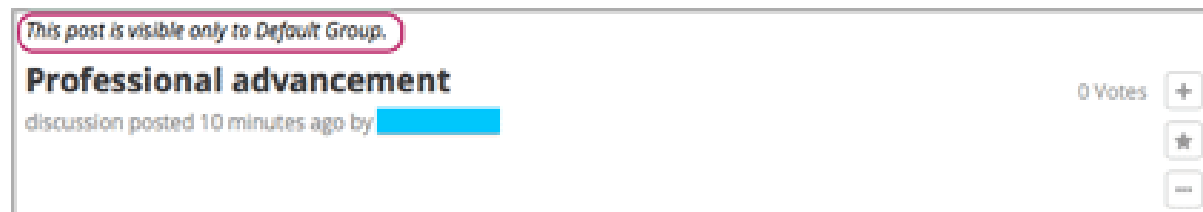
You can check the *learner profile information report* for your course to see if any learners are assigned to the default cohort, and change their cohort assignments. Note, however, that in divided discussion topics learners can only see posts by members of their currently assigned cohort: when a learner is reassigned, posts that he previously saw will seem to have "disappeared". To avoid negatively affecting the learner experience, any cohort assignment changes should be done as early in the course run as possible, so that learners' views of discussion posts and contributions remain consistent over time.

12.1.2 Enabling and Configuring the Cohorts Feature

This section provides information about setting up cohorts in your course.

- *Overview*
- *Implementing an Automated Assignment Strategy*
- *Implementing a Manual Assignment Strategy*
- *Enabling Cohorts in your Course*
- *Adding Cohorts*
- *Assign Learners to Cohorts Manually*
- *Assign Learners to Cohorts by Uploading a .csv File*
- *Altering Cohort Configuration in a Running Course*
- *Change Learner Cohort Assignments*
- *Rename a Cohort*
- *Changing the Assignment Method of a Cohort*
- *Disable Cohorts in Your Course*

Overview

To use cohorts in your course, you must select a strategy for assigning your learners to cohorts: automated assignment, manual assignment, or a hybrid approach. For more information, see *Options for Assigning Learners to Cohorts*.

Note: Although you can change the assignment method for cohorts at any time, you should have a strategy in mind as you design your course, and only make changes to cohorts while the course is running if absolutely necessary.

You must also decide whether course-wide and content-specific discussion topics should be divided by cohort or unified for all learners.

After you decide on a cohort strategy for your course, complete these configuration steps (as applicable).

1. *Enable cohorts*.

2. Determine the method you want to use to assign learners to cohorts.

   - *Implement an automated assignment strategy*

   - *Implement a manual assignment strategy* and *manually assign enrolled learners* to the cohorts that you create

   - *Use a combination of automated and manual assignment*

3. Optionally, identify the discussion topics that you want to be divided by cohort.

   For information about divided discussions, see *About Divided Discussion Topics*.

You complete these procedures on the **Cohorts** and **Discussions** tabs on the Instructor Dashboard.

Note: On the **Cohorts** tab, the number of learners shown next to each cohort name in the **Select a cohort** list includes only learners who are enrolled in the course. The number does not include preassigned learners who either do not yet

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have an edX account or are not enrolled in your course.

For an optimal learner experience, you should make sure that configuration of the cohort feature is as complete as possible before the start date of your course. If you need to make changes to the way you have configured cohorts while your course is running, be aware of the implications of your changes. For more information, see *Altering Cohort Configuration in a Running Course*.

Implementing an Automated Assignment Strategy

To implement an automated assignment strategy of learners to cohorts, you *enable the cohort feature* for your course, and *create cohorts* that have the **Automatic** *assignment method*. To add learners to these cohorts, you do not need to take any action: the system automatically and randomly assigns learners to the available automatic cohorts when they first access any course content or divided discussions. Learners who access the **Course** page or other course pages such as a **Textbook** page do not receive a cohort assignment until they view course content or divided discussions.

Note: You can *add learners manually* to any cohort, whether it was created as an automated cohort or a manual cohort.

For a scenario using an automated assignment strategy, see *Automated Assignment: Making MOOC Discussions Manageable*. For a scenario using a combination of automated and manual assignment to cohorts, see *Hybrid Assignment: Accommodating Small Groups Within a Course*.

Automated Cohorts

The first time a learner views course content on the **Course** or **Discussion** page, if she is not already assigned to a cohort, she is randomly assigned to one of the automated cohorts. If no automated cohorts exist, the system creates a *default cohort* and assigns the learner to this cohort.

Note: The default cohort is created to ensure that every learner is assigned to a cohort. To avoid having to re-assign learners from the default cohort to other cohorts, make sure you create the automated cohorts that you want before the course starts.

Implementing a Manual Assignment Strategy

To implement a manual assignment strategy of learners to cohorts, you *enable the cohort feature* for your course, and *create cohorts* that have the **Manual** *assignment method*. Then, you manually assign enrolled learners to the appropriate cohorts.

Note: It is not a requirement that learners have enrolled in your course or registered on edx.org for you to add them to a cohort. For learners who have not yet created an edx.org account, you must provide a valid email address. For learners who have an edx.org account but have not yet enrolled in your course, you can provide either a valid email address or a recognized edx.org username.

Manual assignments should be as complete as possible before your course starts. If learners enroll after your course starts, you should assign new learners to cohorts as soon as possible. If you need to make changes to the way you have configured cohorts while your course is running, see *Altering Cohort Configuration in a Running Course*.

For a scenario using a manual assignment strategy, see *Manual Assignment: Grouping by Common Characteristics*. For a scenario using a combination of automated and manual assignment to cohorts, see *Hybrid Assignment: Accommodating Small Groups Within a Course*.

Enabling Cohorts in your Course

To enable cohorts in your course, follow these steps.

1. In the LMS, select **Instructor**, then select **Cohorts**.

2. Select **Enable Cohorts**.

You can now *add cohorts* to your course.

> **Warning:** Be very careful in deciding to enable the cohort feature in a live course, because doing so affects the course experience for learners. Learners might no longer have access to course and discussion topics that were previously visible to them.
>
> If you must make changes to cohort configuration while your course is running, be sure you understand the consequences of doing so. For details, see *Altering Cohort Configuration in a Running Course*.

Adding Cohorts

After you enable the cohorts feature for your course, you can add cohorts. To add a cohort to your course, follow these steps.

1. In the LMS, select **Instructor**, then select **Cohorts**.

2. Click **Add Cohort**.

3. Enter a name for the cohort.

   > **Note:** Learners can see the name of the cohort they are assigned to. The message "This post is visible only to {cohort name}" appears with each post in discussion topics that are divided by cohort. See *Read the Group Indicator in Posts*.

4. Specify whether learners are automatically or manually assigned to this cohort.

5. Optionally, select **Select a Content Group** to associate the cohort with a *content group*. For information about creating cohort-specific course content by associating cohorts with content groups, see *Creating Cohort-Specific Course Content*.

6. Select **Save**.

Continue implementing your cohort strategy by creating additional cohorts as applicable, and specifying the assignment method for each cohort.

Note: By the time your course starts, you must have at least one cohort in your course that is automatically assigned. If you have not created at least one automated assignment cohort in the course by the time that the first learner accesses your course content or a divided discussion topic, edX creates a default cohort to which learners are automatically assigned.

For details about adding learners to a cohort by uploading a .csv file, see *Assign Learners to Cohorts by Uploading a .csv File*.

For a report that includes the cohort assignment for every enrolled learner, review the learner profile information for your course. See *Download or View Learner Data*.

Note: You cannot delete cohorts, but you can change their names or the way in which learners are assigned to them. If you need to make changes to the way you have configured cohorts while your course is running, see *Altering Cohort Configuration in a Running Course*.

Assign Learners to Cohorts Manually

If you have implemented a manual assignment strategy for cohorts in your course, make sure your manual assignments are as complete as possible before your course starts. If learners enroll after your course starts, you should assign new learners to cohorts as soon as possible.

Note: Making changes to cohort assignments after the course starts can affect the course experience for learners. Learners might no longer have access to course and discussion topics that were previously visible to them. For more information, see *Altering Cohort Configuration in a Running Course*.

To manually assign learners to cohorts in your course, follow these steps.

1. View the live version of your course. For example, in Studio click **View Live**.

2. Select **Instructor**, then select **Cohorts**.

3. Scroll to the **Cohort Management** section at the bottom.

4. From the **Select a cohort** list, select the cohort to which you want to manually assign learners.

5. On the **Manage Learners** tab, under **Add learners to this cohort** enter the username or email address of a single learner, or enter multiple usernames or addresses separated by commas or new lines. You can copy data from a .csv file of email addresses or usernames, and paste it into this field.

   Note: It is not a requirement that learners have enrolled in your course or registered on edx.org for you to manually add them to a cohort. For learners who have not yet created an edx.org account, you must provide a valid email address. For learners who have an edx.org account but have not yet enrolled in your course, you can provide either a valid email address or a recognized edx.org username.

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6. Select **Add Learners**.

   Learners you added who have edX accounts are assigned to the selected cohorts. A confirmation message indicates the number of learners who were successfully added to the cohort.

   Learners you added who do not yet have edX accounts are listed as "Preassigned" to the cohort. When preassigned learners enroll in the course, they are automatically added to the cohort.

   If some learners that you listed could not be added to cohorts, an error message lists the email addresses or usernames of learners who could not be added to the cohort.

Note: Because learners can belong to only one cohort, adding a learner to a cohort moves them from any cohort they were previously assigned to. The confirmation message indicates the number of learners who were moved from their previous cohort assignment as a result of your adding them to the current cohort.

For a report that includes cohort assignments for your course, review the learner profile information for your course. See *Download or View Learner Data*.

Assign Learners to Cohorts by Uploading a .csv File

Uploading a .csv file containing a list of learners and the cohorts that you want to assign them to is another way of assigning learners to cohorts manually. For details about the other manual assignment method, see *Assign Learners to Cohorts Manually*.

Any assignments to cohorts that you specify in the .csv files you upload will overwrite or change existing cohort assignments. The configuration of your cohorts should be complete and stable before your course begins. You should complete manual cohort assignments as soon as possible after any learner enrolls, especially for enrollments that occur after your course has started. To understand the effects of changing cohort assignments after your course has started, see *Altering Cohort Configuration in a Running Course*.

Note: Be aware that the contents of the .csv file are processed row by row, from top to bottom, and each row is treated independently. If the same learner is assigned to different cohorts in different rows in the spreadsheet, the last assignment to be performed is that learner's final assignment.

> For example, if in your .csv file Learner A is first assigned to Cohort 1, then later in the spreadsheet is assigned to Cohort 2, the end result of your .csv upload is that Learner A is assigned to Cohort 2. However, the upload results file will include Learner A twice in the "Learners Added" count: once when they are added to Cohort 1, and again when they are added to Cohort 2. Before submitting a file for upload, check it carefully for duplicated learners and other errors.

> If the same learner is assigned to a cohort that they already belong to, they are not included in the count of "Learners Added".

The requirements for the .csv file are summarized in this table.

Requirement	Notes
Valid .csv file	The file must be a properly formatted comma-separated values file: • The file extension is .csv. • Every row must have the same number of commas, whether or not there are values in each cell.
File size	The file size of .csv files for upload is limited to a maximum of 2MB.
UTF-8 encoded	You must save the file with UTF-8 encoding so that Unicode characters display correctly. See *Creating a Unicode-encoded .csv File*.
Header row	You must include a header row, with column names that exactly match those specified in "Columns" below.
One or two columns identifying learners	You must include at least one column identifying learners: either "email" or "username", or both. To preassign learners who do not yet have edX accounts, you must provide their email addresses in an "email" column. If both the username and an email address are provided for a learner, the email address has precedence. In other words, if an email address is present, an incorrect or unrecognized username is ignored.
One column identifying the cohort	You must include one column named "cohort" to identify the cohort to which you are assigning each learner. The specified cohorts must already exist in Studio.
	Columns with headings other than "email", "username" and "cohort" are ignored.

To manually add learners to cohorts by uploading a .csv file, follow these steps.

Note: To add learners who do not yet have edX accounts to cohorts using a .csv file upload, you must provide their email addresses in a column with the heading "email". Learners without edX accounts are "preassigned" to cohorts; they are not included in the count of learners "added" to cohorts.

1. View the live version of your course. For example, in Studio, select **View Live**.

2. Select **Instructor**, then select **Cohorts**.

3. From the **Select a cohort** list, select the cohort to which you are adding students.

4. Select **Assign students to cohorts by uploading a CSV file**, then select **Browse** to navigate to the .csv file you want to upload.

5. Select **Upload File and Assign Students**. A status message is displayed above the **Browse** button.

6. Verify your upload results on the **Data Download** page.

   Under **Reports Available for Download**, locate the link to a .csv file with "cohort_results" and the date and time of your upload in the filename. The list of available reports is sorted chronologically, with the most recently generated files at the top.

The results file provides the following information:

Column	Description
Cohort	The name of the cohort to which you are assigning learners.
Exists	Whether the cohort was found in the system. TRUE/FALSE. If the cohort was not found (value is FALSE), no action is taken for learners who you assigned to that cohort in the .csv file.
Learners Added	The number of learners added to the cohort during the row by row processing of the .csv file. This number does not include learners who are not enrolled in the course.
Learners Not Found	A list of the usernames of learners that could not be matched and who were therefore not added to the cohort.
Invalid Email Addresses	A list of email addresses that were not valid. These learners could not be added to the cohort.
Preassigned Learners	The email addresses of learners who do not yet have an edX account but who you have preassigned to a cohort using their email addresses. These learners are not included in the count of "Learners Added". When these preassigned learners create an edX account and enroll in your course, they are automatically added to the cohorts that you preassigned them to.

For a report that includes the cohort assignment for every enrolled learner, review the learner profile information for your course. See *Download or View Learner Data*.

Creating a Unicode-encoded .csv File

Make sure the .csv files that you upload are encoded as UTF-8, so that any Unicode characters are correctly saved and displayed.

Note: Some spreadsheet applications (for example, MS Excel) do not allow you to specify encoding when you save a spreadsheet as a .csv file. To ensure that you are able to create a .csv file that is UTF-8 encoded, use a spreadsheet application such as Google Sheets, LibreOffice, or Apache OpenOffice.

Altering Cohort Configuration in a Running Course

The configuration of cohorts should be complete and stable before your course begins. Manual cohort assignments should be completed as soon as possible after any learner enrolls, including any enrollments that occur while your course is running.

If you decide that you must alter cohort configuration after your course starts and activity in the course discussion begins, be sure that you understand the consequences of these actions.

- *Change Learner Cohort Assignments*
- *Rename a Cohort*
- *Delete a Cohort*
- *Changing the Assignment Method of a Cohort*
- *Disable Cohorts in Your Course*

Change Learner Cohort Assignments

After your course starts and learners begin to contribute to the course discussion, each post that they add is visible either to everyone or to the members of a single cohort. When you change the cohort that a learner is assigned to, there are three results.

- The learner continues to see the posts that are visible to everyone.
- The learner sees the posts that are visible to his new cohort.
- The learner no longer sees the posts that are visible only to his original cohort.

The visibility of a post and its responses and comments does not change, even if the cohort assignment of its author changes. To a learner, it can seem that posts have "disappeared".

To verify the cohort assignments for your learners, download the *student profile report* for your course. If changes are needed, you can *assign learners* to different cohorts manually in the LMS by selecting **Instructor** and then **Cohorts**, or *upload cohort assignment changes* in a .csv file.

Rename a Cohort

You can change the name of any cohort, including the system-created default cohort.

To rename a cohort, follow these steps.

1. View the live version of your course. For example, in Studio select **View Live**.
2. Select **Instructor**, then select **Cohorts**.
3. From the **Select a cohort** list, select the cohort whose name you want to change.
4. On the **Settings** tab, in the **Cohort Name** field, enter a new name for the cohort.
5. Select **Save**. The name for the cohort is updated throughout the LMS and the course, including learner-visible views.

Delete a Cohort

You cannot delete cohorts. However, you can *rename a cohort*, *change its assignment method*, or move learners to other cohorts.

If you decide that you must alter cohort configuration after your course starts and learners begin viewing the course and the discussion topics, be sure that you understand the consequences of these actions. For more details, see *Altering Cohort Configuration in a Running Course*.

Changing the Assignment Method of a Cohort

Although you can change the assignment method of a cohort at any time after you create it, you should have a strategy in mind as you design your course, and only make changes to cohorts while the course is running if absolutely necessary. Be aware of the implications of changing cohort configuration while your course is running. For more information, see *Options for Assigning Learners to Cohorts* and *Altering Cohort Configuration in a Running Course*.

Note: When your course starts, you must have at least one cohort in your course that has automatic assignment. If you have not created at least one automated assignment cohort in the course by the time that the first learner accesses your course content, edX creates a default cohort to which learners are automatically assigned. If the *default group* is the only automated assignment cohort in your course, you cannot change its assignment method to **Manual**.

To change the assignment method of a cohort, follow these steps.

1. View the live version of your course. For example, in Studio select **View Live**.

2. Select **Instructor**, then select **Cohorts**.

3. From the **Select a cohort** list, select the cohort whose assignment method you want to change.

4. On the **Settings** tab, the current assignment method is selected. Change the assignment method by selecting the other option, either **Automatic** or **Manual**.

5. Select **Save**.

   The cohort assignment method is updated.

Note: Changing the cohort assignment method has no effect on learners who are already assigned to this and other cohorts. Learners who access the course after you make this change are assigned to cohorts based on the new assignment method of this cohort combined with the assignment methods of all other cohorts.

Disable Cohorts in Your Course

> **Warning:** Be very careful in deciding to disable the cohort feature if you previously had it enabled in a live course, because doing so affects the course experience for learners. Course materials and discussion posts that were shared only with members of particular cohorts are now visible to all learners in the course.
>
> If you must make changes to the way you have configured cohorts while your course is running, be sure you understand the consequences of doing so. For details, see *Altering Cohort Configuration in a Running Course*.

To disable cohorts in your course, follow these steps.

1. In the LMS, select **Instructor**, then select **Cohorts**.

---

2. Clear the **Enable Cohorts** option.

All course content and discussion posts that were previously divided by cohort immediately become visible to all students.

12.1.3 Creating Cohort-Specific Course Content

This section provides information about setting up content for specific cohorts.

- *Overview*
- *Example: Cohort-Specific Course Content*
- *Content Groups*
- *Create Content Groups*
- *Specify Content as Available Only to Particular Content Groups*
- *Associate Cohorts with Content Groups*
- *Viewing Cohort-Specific Course Content*
- *View Usage of a Content Group*
- *Delete Content Groups*

Overview

If you have *enabled cohorts* in your course, you can create different course experiences for learners in different cohorts.

You can design your course so that some learners are given different content than others. You do this by creating *content groups* in Studio, and restricting access to specific components in your course to one or more content groups. Then, if you associate one or more cohorts with a content group, only the learners in cohorts associated with that content group can see course content that you have designated for it.

For more details about content groups, see *Content Groups*. For an example of cohort-specific course content, see *Example: Cohort-Specific Course Content*.

Complete these steps to create cohort-specific content in your course.

In Studio

1. *Enable cohorts in your course*.
2. *Create content groups*.
3. *Specify components or units as available only to particular content groups*.

In the LMS

1. *Assign learners to cohorts*.
2. *Associate one or more cohorts with a content group*.
3. *Preview cohort-specific course content*.

Example: Cohort-Specific Course Content

Suppose that you create two *cohorts* in your course: University Alumni and Current University Students. Learners who are not in either of these cohorts are automatically placed into a third cohort, the default cohort, when they access the **Course** or **Discussion** tabs in the course. For more information about enabling cohorts in your course and assigning students to cohorts, see *Enabling and Configuring the Cohorts Feature*.

You intend all learners to have substantially the same course experience, with the exception that only learners in the two university-related cohorts will receive content that is specific to your university and therefore only of interest to them.

At the end of every section, you intend to include a video message from various university officials, including the university president and the dean of your college. These videos will be shown only to learners in the university and alumni cohorts. Also at the end of each section, you intend to include a quiz to test knowledge of the concepts taught in that section. The quiz will be shown to all learners enrolled in the course.

To achieve this, on the **Group Configurations** page in Studio you create one content group called "University-Specific Content". In the Instructor Dashboard, on the **Cohorts** tab, you associate both the "University Alumni" and the "Current University Students" cohorts with the "University-Specific Content" content group.

Then, in your course outline, you change the access settings for the video component at the end of each section so that it is access is available only to the "University-Specific Content" content group. You do not need to edit the access settings of the quiz component, because if no content group is specified in a component's access settings, that component is available to all learners.

As a final step, you preview the course in the LMS to ensure that learners see the content that is intended for them. You confirm that when you view the course in the role of **Student** (in other words, any learner not in a content group), you see a quiz at the end of each section, but do not see the university-related videos. When you view the course as a learner in the "University-Specific Content" group, you see a university-related video as well as the quiz at the end of each section.

Content Groups

Content groups are virtual groupings of learners who will see a particular set of course content. You can use content groups to designate specific course content as available to particular *cohorts* of learners.

You create content groups in Studio, and in your course outline you use the **Access Settings** to designate whether a component is selectively available only to one or more content groups. Any course components that do not have an explicit restricted access setting are available to all learners, regardless of their cohort.

Content groups do not have an actual impact on the availability of a course component until you associate them with one or more cohorts. If you have designated certain course content as restricted to a content group, and in addition have associated that content group with one or more cohorts, then only learners in those cohorts will see the designated content.

For an example of using content groups to create cohort-specific course content, see *Example: Cohort-Specific Course Content*.

Create Content Groups

To create a content group, follow these steps.

1. In Studio, select **Settings**, then select **Group Configurations**.

2. On the **Group Configurations** page, select **New content group**.

Settings

Group Configurations

Content Groups

You have not created any content groups yet.　**+ Add your first content group**
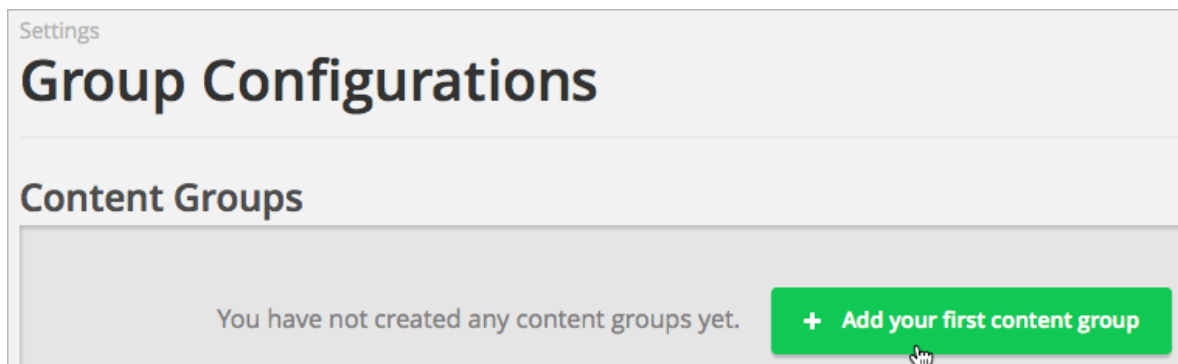
3. Enter a meaningful name for the content group, then select **Create**. The page refreshes to show the name of your new content group.

4. Repeat this step to create as many content groups as you want.

After you create a content group, you can work with your course outline to specify which components are available to specific content groups. For details, see *Specify Content as Available Only to Particular Content Groups*.

You associate each content group with one or more cohorts in the LMS, on the instructor dashboard. For details, see *Associate Cohorts with Content Groups*.

Specify Content as Available Only to Particular Content Groups

In Studio, you can modify the settings of units or components to give access only to learners who are in cohorts associated with particular content groups. You cannot specify entire subsections or sections for restricted access by particular content groups.

You do not need to edit the access settings of units or components that are intended for all learners. Units or components that you do not restrict access to are available to all learners enrolled in your course, regardless of the cohort that they belong to.

Note: If a unit has group access restrictions set, all of its child components inherit these group access restrictions unless you explicitly set different group access restrictions for individual child components.

For details about how to modify unit access settings, see *Set Access Restrictions For a Unit*.

For details about how to modify component access settings, see *Set Access Restrictions for a Component*.

For details about previewing your course to ensure that learners in a cohort correctly see the content intended for them, see *View Usage of a Content Group* and *Viewing Cohort-Specific Course Content*.

Note: In addition to access settings for content groups, a learner's ability to see a course component also depends on whether it is marked as visible to staff only, whether the unit is published, and the course's release date. For details about testing course content in general, see *Testing Your Course Content*.

Associate Cohorts with Content Groups

After you create a content group, you can associate it with one or more cohorts with which you want to share the same special content.

Note: A content group can be associated with more than one cohort; a cohort cannot be associated with more than one content group.

To associate a cohort with a content group, follow these steps:

1. In the LMS, select **Instructor**, then select **Cohorts**.

2. From the cohorts drop down list, select the cohort to which you want to associate your content group.

3. Select the **Settings** tab for the selected cohort.

4. Under **Associated Content Group**, choose the **Select a Content Group** option.

5. From the content group drop down list, select the content group that you want your cohort to be associated with.

Cohort Name *

University Alumni

Cohort Assignment Method

○ Automatic

◉ Manual

Associated Content Group

○ No Content Group

◉ Select a Content Group [University-Specific Content ⬍]

[**Save**] Cancel

6. Select **Save**.

   You have now associated your content group with a cohort. Any course content that you *designate as available to that content group* is available to learners in the associated cohort or cohorts.

You can associate additional cohorts with the same or a different content group by repeating steps 3 to 7.

For an example of using content groups to create cohort-specific course content, see *Example: Cohort-Specific Course Content*.

Viewing Cohort-Specific Course Content

After you restrict access to units or components to particular content groups, you can view your course content as a member of a content group to ensure that members of each group correctly see the content intended for them.

Note: In addition to access settings for content groups, a learner's ability to see a unit or component also depends on whether it is marked as visible to staff only, whether the unit is published, and the component's release date. For details about viewing course content in various publishing states, see *Viewing Published and Released Content* and *Previewing Draft Content*.

Depending on whether you want to view published content or unpublished content, you choose either **View Live** or **Preview** from the course outline in Studio. You can then experience the course content as a learner in a particular group would, by selecting the **View this course as** option for a learner in the desired content group, as described in *Viewing Course Content Based on Roles*.

For details about testing course content, see *Testing Your Course Content*.

View Usage of a Content Group

To view the components or units that have been made available to learners in each of the content groups in your course, follow these steps.

1. In Studio, select **Settings**, then select **Group Configurations**.

2. On the **Group Configurations** page, locate the content group for which you want to view the usage.

   The content group's box displays the number of locations (units or components) that are designated for learners in cohorts associated with that content group.

3. Click the content group name to view the names of units and components that that are specified as available to learners in the group.

4. Click a linked location name to go to that unit in the course outline, where you can change the group access settings for the unit or component.

For details about previewing your course to ensure that learners in a cohort correctly see the content intended for them, see *Viewing Cohort-Specific Course Content*.

Delete Content Groups

Note: You can delete a content group only if it is not in use in any course unit. To delete a content group that is currently in use, you must first remove it from any course unit visibility settings that use the content group. For information about seeing which units use a content group, see *View Usage of a Content Group*.

---

1. In Studio, select **Settings**, then select **Group Configurations**.

2. On the **Group Configurations** page, locate the content group that you want to delete.

3. Move your cursor over the content group's box, then select the **Delete** icon.

4. In the confirmation message, select **Delete** again to confirm the deletion.

12.1.4 Setting up Discussions in Courses with Cohorts

In courses that use cohorts, in addition to *discussion topics* that are by default shared by all learners, you can create divided discussion topics, within which learners interact only with other members of their cohort.

For information about divided discussions, see *About Divided Discussion Topics*.

For information about managing and moderating discussions, see *Managing Divided Discussion Topics* and *Moderating Discussions*.

12.2 Offering Different Content to Different Learner Groups

You can design your course so that some learners are given different content than others, based on the group that they belong to. Learners can be grouped either by *cohort*, or by the *enrollment track* that learners join for your course.

This section provides information about offering differentiated content in your course.

> - *Offering Different Content to Learners Based on Their Enrollment Track*
> - *Offering Different Content to Learners Based on Cohort*

For information about dividing discussion topics in your course so that only learners in the same groups interact with each other, see *About Divided Discussion Topics*.

Note: You can also use experiment groups to compare the performance of groups of learners who are offered different content. For details, see *Overview of Content Experiments*.

12.2.1 Offering Different Content to Learners Based on Their Enrollment Track

If your course has more than one enrollment track, you can provide different content to learners in each of the enrollment tracks.

For example, you might provide the same course content to all learners except that for the midterm and final exams, learners who are in a non-certificate track and learners who are in a certificate track are given different exams.

For information about creating differentiated content based on enrollment track, see Enrollment Track Specific Course-ware Overview.

12.2.2 Offering Different Content to Learners Based on Cohort

If you have enabled cohorts in your course, you can associate one or more cohorts with a *content group*. You can then design your course so that particular content is available only to learners in a specific content group.

For example, you might intend all learners in your course to have substantially the same course experience, except that you want to show learners who are either current students or alumni of your university a special video in several sections. You already have your university's current students in one cohort and alumni in another cohort. By associating both of these cohorts with the same content group, and restricting access to the special university-related video to only this content group, you can provide a customized course experience.

For information about creating differentiated content using cohorts, see *Using Cohorts in Your Courses* and *Creating Cohort-Specific Course Content*.

12.3 Including Teams

12.3.1 Using Teams in Your Courses

This section provides information about setting up teams in your courses.

- *Teams Overview*
- *Enable and Configure Teams*
- *Create a Team*
- *Search for a Team*
- *Edit a Team*
- *Remove a Learner from a Team*
- *Delete a Team*
- *Managing Teams via CSV Upload*
    - *Initial Setup*
    - *Membership CSV File Schema*
    - *Managing Teams*
    - *Examples*
    - *Error Conditions*

For information about managing teams in your courses, see the following topics.

- *Managing Team Discussions*
- *The Learner's Experience of Teams*
- *Managing Teams via CSV Upload*

Teams Overview

Using teams in your course is an effective way for learners to interact and collaborate on small group projects or activities. You define the structure of teams in your course by defining "team-sets", groups of teams based around a specific topic or assignment. Each learner can belong to one team per team-set, so you can set up a team-set where learners can join a team to discuss a certain course topic, or set up a team-set where learners can join a team to work on a group assignment.

You can also configure "instructor-managed" team-sets. This is a setting which allows course staff much greater control of course teams. In instructor-managed team-sets, instructors create and control the membership of all teams. More information on instructor-managed team-sets and instructions on how to set them up are contained later in this document. To make controlling course team memberships across teams and team-sets easier, there is a CSV upload tool that allows course staff to add and remove learners from teams across team-sets in bulk. More information on this tool can be found in the section *Managing Teams via CSV Upload*

When a team is created, it is given an name and description to identify it. A primary communication language can optionally be specified and a primary country that members identify with. Team characteristics might serve as the basis for attracting new members, resulting in small groups of learners with similar interests and goals who will work together on projects or activities within the same topic area.

Teams are most effective when learners have a clear reason for joining a team, and a clear outcome to achieve with fellow team members. For example, you might create an assignment that consists of a group project or activity, and ask learners to join teams of their choice within a specific team-set to complete the assignment. Team members can use discussions within the team to communicate and collaborate on the assignment. If you want only to provide a way for learners to connect socially, consider using discussions within the course rather than teams. For more information about using discussions, see *Running Course Discussions*.

Enable and Configure Teams

To disable or enable the Teams application, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.

2. Click the gear icon on the **Teams** card shown on this page.

3. From the **Configure teams** modal, select the toggle to enable or disable the **teams application**.

4. Select **Apply** to save your configuration changes.

Note: The **Teams** page in the LMS becomes available only after you have specified at least one team topic.

There are several configuration options available to the Teams application. Many basic configuration options are provided within Studio's Pages & Resources area, and course management capabilities are available to instructors directly from the Teams application. Included below are details about both the configuration options and management tools.

To change access to the course team configuration options, follow these steps.

1. In Studio, from the **Content** menu select **Pages & Resources**.

2. Click the gear icon on the **Teams** card shown on this page.

3. From the Configure team modal, adjust any of the configuration settings as described below to fit your course needs.

4. Select **Apply** to save your configuration changes.

Default Team Size

This specifies the maximum number of learners that can join a team, a default value for all teams in your course. This default value can be overridden for a specific team group as well. This value has a hard limit and cannot exceed 500, but in practice, this should be significantly lower. Teams should rarely have many learners in them at all. If you have a use case where a large number of users need to be in a team, consider using discussions rather than teams.

Team Groups:

Each team group is a grouping for multiple learner teams. To start, each of these team groups must be given a unique name, and optionally a description can also be set.

These names and descriptions are visible to learners in the Teams application as shown in the visual below.

Note: EdX recommends that you do not delete topics once your course is running, and if learners might have already joined teams within topics. If you delete a topic from the **Teams Configuration** policy key, that topic is no longer visible in the LMS, and learners will not be able to leave teams associated with the deleted topic.

Types of Team Groups

There are several types of team group that can be created, each of which behaves differently for both instructors and learners.

- **Open** sets up a team group where learner can create, join, leave, and see all teams within the group

- **Public managed** allows only course staff to control team creation and membership. Learners can see other teams but cannot join or leave their team.

- **Private managed** allows only course staff to control team creation and membership. Additionally, learners can only see the teams they are members of, unlike other options that give them visibility into other teams. This type is helpful in particular if team assignments are being used in a course.

Note: If you do not see all team group type options, check with your platform administrator to see if the relevant teams application features have been enabled.

Team Group Size Override

Separate from the team maximum size setting, it is possible to override the specific team size for a given team group, allowing you to adjust team sizes to fit your course needs.

Create a Team

Although learners in your course may be able create their own teams in open team-sets, you can seed open team-sets with a few teams to give learners some ideas for their own teams.

For instructor-managed team-sets, you can also create teams in bulk, using the CSV upload tool. See *Managing Teams via CSV Upload*

Course team members who have the **Staff**, **Admin**, **Discussion Admin**, or **Discussion Moderator** role can create new teams within team-sets. **Community TAs** and learners in the course can also create teams, although learners can create a new team only in open team-sets and only if they do not already belong to a team in that team-set.

To create a team, follow these steps.

1. From the **Teams** page in the LMS, select **Browse**, then select the team-set in which you want to create a team.

2. At the bottom of the list of teams within the team-set, select the **create a new team in this team-set** link.
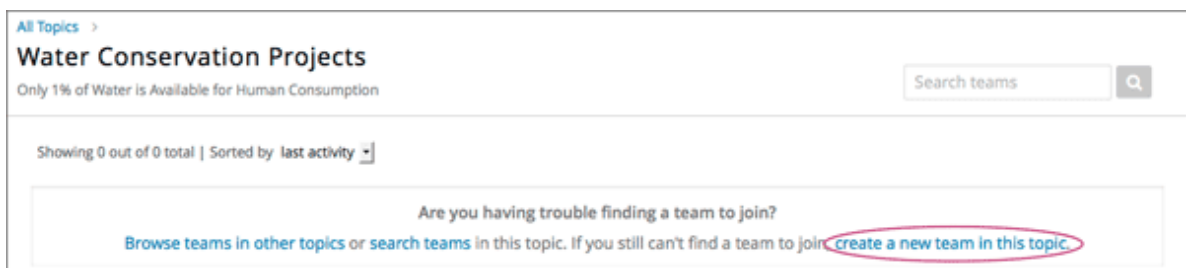
3. On the **Create a New Team** page, add a name and description for the team.

   In the description, include details about the proposed project or activity to help learners to decide whether they want to join this team.

4. Optionally, add some characteristics for your team. You can specify a language that members would primarily use to communicate with each other, and a country that members would primarily identify with. Keep in mind that if your team details make the team membership seem too selective, learners might be discouraged from joining.

5. When you have finished entering details for the team, select **Create**.

   Your new team is added to the list of teams under your selected team-set.

Search for a Team

Use the search field to find a team within a team-set.

Note: Partial words are not supported for searching teams.

To get a list of teams whose names, descriptions, or characteristics match your search keywords, follow these steps.

1. From the **Teams** page in the LMS, select **Browse**, then select the team-set in which you want to find a team.

2. In the search field, enter one or more keywords to search for, then press **Enter** or select the search icon.

   Teams within the team-set that match your search are displayed.

To clear the existing search term, select the **X** next to the search field, or select all the text within the field and enter text to replace it.

Edit a Team

Course team members who have the **Staff**, **Admin**, **Discussion Admin**, or **Discussion Moderator** role can edit any of a team's details, including removing members from a team. **Community TAs** can also edit teams. For more details about removing team members, see *Remove a Learner from a Team*.

To edit a team's details, follow these steps.

Note: Before making significant changes to a team, communicate with team members so that they are aware of the changes and their impacts.

---

1. In the LMS, select the **Teams** tab.

2. On the **Teams** page, select **Browse** to show all team-sets.

3. Select the arrow button for the team-set to show all teams in that team-set.

4. Locate the team that you want to edit. To find the team, you can search using keywords or sort teams by last activity or open slots.

5. Select **View** for the team that you want to edit.

6. Select **Edit Team**.

7. Make your changes, then select **Update**. The team's details are updated.

Remove a Learner from a Team

Course team members who have the **Staff**, **Admin**, **Discussion Admin**, or **Discussion Moderator** role can remove members from a team. **Community TAs** can also remove learners from a team. You might want to remove a learner from a team and make the spot on the team available to other learners if, for example, a learner joined a team but is not participating, or if a learner has unenrolled from the course without leaving the team.

For instructor-managed team-sets, you can also remove learners from teams using the CSV upload tool. See *Managing Teams via CSV Upload*

Note: Before making significant changes to a team, communicate with team members so that they are aware of the changes you will make, and their impacts.

To remove a learner from a team, follow these steps.

1. In the LMS, select the **Teams** tab.

2. On the **Teams** page, select **Browse** to show all team-sets.

3. Select the arrow button for the team-set to show all teams in that team-set.

4. Locate the team that you want to edit. To find the team, you can search using keywords or sort teams by last activity or open slots.

5. Select **View** for the team from which you want to remove a learner.

6. Select **Edit Team**.

7. On the **Instructor Tools** bar, select **Edit Membership**.

8. On the team's **Membership** page, select **Remove** next to the name of the learner who you want to remove from the team.

9. In the confirmation message, select **Remove**.

    The team member you removed no longer appears on the **Membership** page.

10. Repeat steps 8 and 9 to remove additional members.

    The team members you removed no longer appear on the **Membership** page, and the count of team members is updated wherever it appears on team pages.

Delete a Team

Course team members who have the **Staff**, **Admin**, **Discussion Admin**, or **Discussion Moderator** role can delete teams. **Community TAs** can also delete teams. you might need to manage the teams in your course, including deleting teams that remain empty or where members are experiencing abusive situations.

When you delete a team, all learners are removed from the team membership. Neither learners nor course team members can access discussions from deleted teams.

Note: Deleting a team removes it permanently from the course, and cannot be undone.

To delete a team, follow these steps.

1. In the LMS, select the **Teams** tab.

2. On the **Teams** page, select **Browse** to show all team-sets.

3. Select the arrow button for the team-set to show all teams in that team-set.

4. Locate the team that you want to delete. To find the team, you can search using keywords or sort teams by last activity or open slots.

5. Select **View** for the team that you want to delete, then select **Edit Team**.

6. On the **Instructor Tools** bar, select **Delete Team**.

7. In the confirmation message, select **Delete**.

   You return to the team-set page, where you receive a confirmation that the team has been successfully deleted. The team no longer appears in the teams list within its team-set. Learners who were previously members of this team no longer belong to a team.

Managing Teams via CSV Upload

Initial Setup

There are cases where an instructor may want to manage team membership within a course (e.g. assigning groups for team assignments). To do this, an instructor must configure a team-set as `public_managed` or `private_managed` by following the Teams Configuration guide.

When this condition is met, an instructor can navigate to the **Teams** tab where the **Manage** sub-tab will now be available alongside the **My Team** and **Browse** sub-tabs. Clicking the **Manage** tab opens the **Manage** page where team membership can be viewed and modified.

Course   Progress   Discussion   Wiki   **Teams**

Teams

See all teams you belong to and all public teams in your cou
same topic as you are.

My Teams   Browse   **Manage**

View Current Team Memberships

Click to download a comma-separated values (CSV

Download Memberships

Assign Team Memberships

Click to upload a comma-separated values (CSV) fi

Choose File   No file chosen

Upload Memberships

Membership CSV File Schema

Team membership assignments are done through a CSV file upload. The membership CSV is formatted as follows:

```
user,            mode,             <team-set>,             <team-set>,             <...>
<user-identifier>, <enrollment-mode>, <team-name-or-empty>, <team-name-or-empty>, <...>
<user-identifier>, <enrollment-mode>, <team-name-or-empty>, <team-name-or-empty>, <...>
<...>
```

The **header row** contains the headers "`user`", "`mode`", and an entry for each team-set within a course. For example, a course with 2 team-sets (`discussion-teams` and `case-studies`) would start like this:

```
user, mode, discussion-teams, case-studies
```

Each additional row is a **user row** and has a `user-identifier` (which, in priority order, is the `student-key`, `edx-username`, or `edx-email`), enrollment mode (one of `audit`, `verified`, or `masters`), and the `team` assignment for the matchin team-set in the header row. For example, here are 8 students assigned across different teams in the 2 team-sets:

```
user,            mode,     discussion-teams, case-studies
alice,           verified, Team 1,           Team A
bob@example.com, verified, Team 1,           Team B
mitx_39181873,   verified, Team 1,           Team C
derek,           verified, Team 2,           Team A
edith,           verified, Team 2,           Team B
felicia,         verified, Team 2,           Team C
garrett,         verified, ,                 Team C
hannah,          masters,  Team A,           Team 1
```

Note that since teams are only unique within a team-set, the "Team A" that hannah is a member of for the "discussion-teams" team-set is different from the "Team A" in "case-studies" that alice and derek are assigned to.

Managing Teams

Note: Prerequisites: at least one managed team-set configured for course

From the **Teams > Manage** page, an instructor can use a CSV file, formatted per the schema above, to manage team memberships.

An instructor should first get current memberships by going to the **View Current Team Memberships** section and clicking the *Download Memberships* button. This downloads a membership CSV file showing all enrolled students and configured team-sets for the course.

Staff can then modify this document (as below) before browsing to the file and uploading it in the **Assign Team Memberships** section.

Actions

A **user can be added or moved** to a `team` by adding the `team-name` in the appropriate `team-set` column. If the team does not already exist within the team-set a **new team will be created**.

Note: `team-name` and `team-set` * **are case sensitive.** *

A **user can be removed** from a team by removing the `team-name` from the appropriate `team-set` column, leaving the entry empty.

Note: team-sets cannot be created from within the Manage tab. They must be created by following the Teams Configuration instructions.

Users and team-sets that are **not included** in the uploaded CSV are **not altered**.

Examples

Initial Setup

Remus Lupin is setting up his course, Defense Against the Dark Arts and wants to assign groups for his students to write about different dark creatures and curses. Following the Teams Configuration instructions, he sets up two managed team-sets, `dark-creatures` and `curses`.

Next, he goes to the **Teams > Manage** page and clicks *Download Memberships* to get the following membership CSV:

```
user,      mode,       dark-creatures,  curses
harry,     verified,                ,
ron,       audit,                   ,
luna,      verified,                ,
draco,     verified,                ,
hermione,  masters,                 ,
cho,       masters,                 ,
```

Lupin splits his students into several teams, making sure to not put `masters` and non-masters students on the same team, and edits the CSV accordingly:

```
user,      mode,       dark-creatures,  curses
harry,     verified,   Dragons,         Mimble Wimble
ron,       audit,      Dragons,         Morsmordre
luna,      verified,   Werewolves,      Morsmordre
draco,     verified,   Werewolves,      Mimble Wimble
hermione,  masters,    Basiliks,        Expulso
cho,       masters,    Basiliks,        Expulso
```

In the *Assign Team Memberships* section, Lupin browses to his updated membership CSV and clicks *Upload Memberships*. The new teams are created and his students are assigned to the corresponding teams: Harry and Ron are assigned to the "Dragons" team for the `dark-creatures` team-set. Harry is assigned to the "Mimble Wimble" team in the `curses` team-set, while Ron is on the "Morsmorde" team, and so on.

Later, Lupin goes back to the **Teams > Manage** page to download new memberships and finds that Fred and George joined the class after the initial team assignments.

```
user,      mode,       dark-creatures,  curses
harry,     verified,   Dragons,         Mimble Wimble
ron,       audit,      Dragons,         Morsmordre
luna,      verified,   Werewolves,      Morsmordre
draco,     verified,   Werewolves,      Mimble Wimble
hermione,  masters,    Basiliks,        Expulso
cho,       masters,    Basiliks,        Expulso
fred,      audit,      ,
george,    audit,      ,
```

He decides he wants to add them to the "Werewolves" and "Dragons" teams for the `dark-creatures` team-set but wants them on a new "Confringo" team for `curses`.

```
user,      mode,       dark-creatures,  curses
harry,     verified,   Dragons,         Mimble Wimble
ron,       audit,      Dragons,         Morsmordre
luna,      verified,   Werewolves,      Morsmordre
draco,     verified,   Werewolves,      Mimble Wimble
hermione,  masters,    Basiliks,        Expulso
cho,       masters,    Basiliks,        Expulso
fred,      audit,      Werewolves,      Confringo
george,    audit,      Dragons,         Confringo
```

Uploading this updated CSV, the new "Confringo" team is created and Fred and George have been assigned to their respective teams.

Error Conditions

Header must contain column 'user' / Header must contain column 'mode'

The CSV is improperly formatted: the first row must contain the headers "user" and "mode", in that order (see Membership CSV File Schema).

Teamset with id [ID] is duplicated

A team-set cannot be listed more than once in the header of the CSV file. Remove the duplicated column and confirm desired team mappings before re-uploading.

Teamset with id [ID] does not exist

Team-sets must be configured in Teams Configuration before teams can be assigned. Teams, however, can be created directly from the Membership CSV.

Team(s) [team] don't have matching teamsets

The team was entered in a column without a team-set, often caused by a column number mismatch or stray comma. Correct the typo and re-upload.

Username [name] listed more than once in file

Users within a file should be unique. Remove the duplicate row and confirm desired team mappings before re-uploading.

User name/email/external key: [ID] does not exist

The ID in the "user" column (which could be a username, email, or external key) did not map to a user in our records. Correct any typos and re-upload.

User [username] is not enrolled in this course

Users must be enrolled to be assigned to teams in a course. Remove or enroll the unenrolled user before re-uploading.

User [username] enrollment mismatch

The user "mode" specified in the CSV file does not match the user's actual enrollment mode. Downloading memberships should automatically populate the correct enrollment modes for each enrolled user. Alternatively, correct the user's enrollment mode making sure that team assignments do not mix masters and non-masters enrollment modes and re-upload.

Team [team] cannot have Master's track users mixed with users in other tracks.

FERPA protections prohibit `masters` and non-masters (`audit` and `verified`) enrolled students from being on the same team.

If the team already exists, the enrollment mode of the first member assigned to that team sets the team's protection level. For example, if the first member assigned to a team is a non-master's student, masters students cannot join. If this team will be newly created through the CSV upload, the team makeup must be exclusively `masters` or non-masters students to pass validation. Edit team mappings to create designated teams for `masters` and non-masters students and re-upload.

New membership for team [team] would exceed max size of [max-size]

Team-sets have a `max-team-size` configured in Teams Configuration. The newly proposed team memberships would exceed the capacity of the given teams. Increase the team-set size or redistribute users to different/more teams and re-upload.

12.3.2 The Learner's Experience of Teams

After you have *enabled teams* and created topics in your course, learners can begin browsing topics and joining teams. Teams are formed within topics. Each learner can belong to only one team.

- *Browsing Teams by Topic*
- *Joining, Creating, or Leaving a Team*
- *Participating in Team Discussions*

Browsing Teams by Topic

On the **Teams** page in the LMS, learners in your course can browse topics to find a subject that they are interested in collaborating on. Learners can sort topics alphabetically by name, or by the number of teams in a topic.
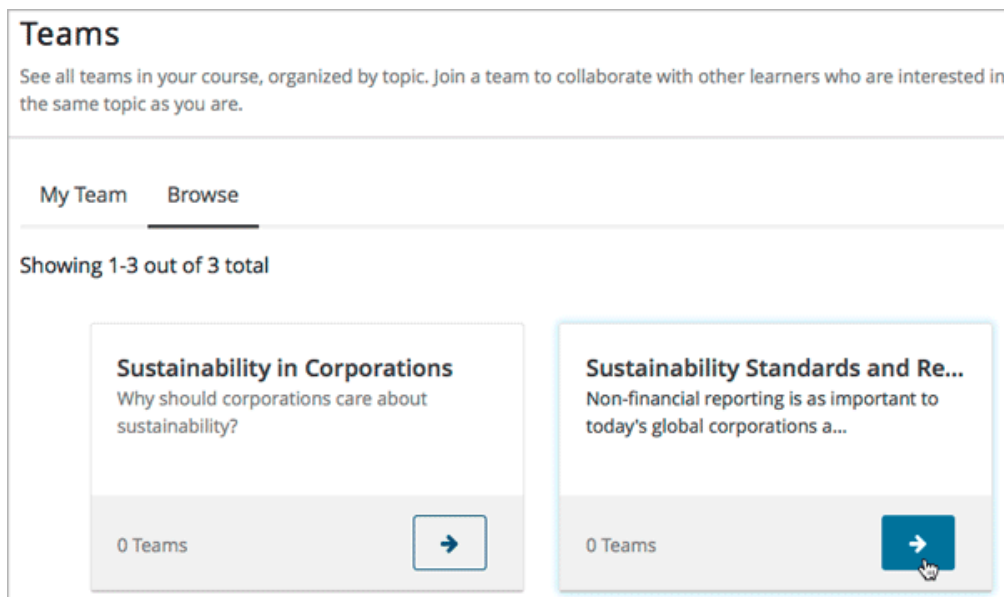
Within each topic, learners can view existing teams. The overview for each team shows the team's name and description, the number of members and available spots, and the elapsed time since the last activity in the team.

To find teams, learners can sort teams by the most recent activity or by the most open spots. They can also use keywords to search for teams that might match their interests, language, or country.

When learners locate a team that they might be interested in joining, they can select **View** on the team overview to view team details.
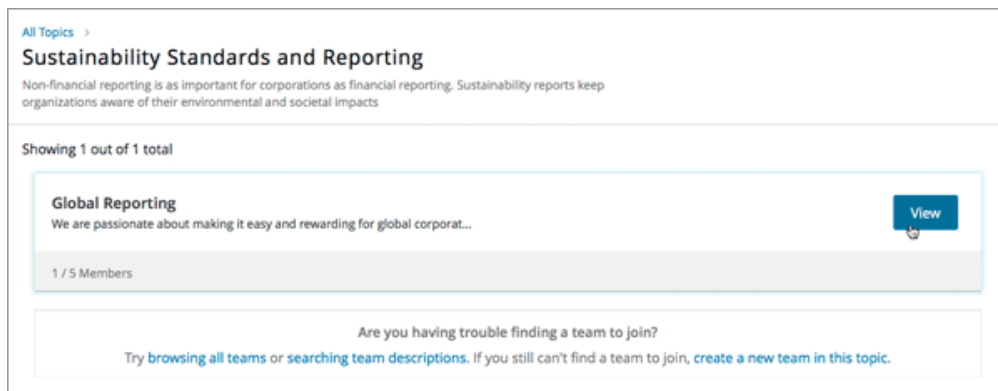
On each team's details page, learners can view the team's name and description, as well as any optional characteristics that were specified, such as a primary language of communication and a country that members primarily identify with. While they are browsing teams, learners can read any team's discussion posts, but they cannot add posts to a team's discussion forum unless they join that team.

Joining, Creating, or Leaving a Team

When learners find a team that they want to join, they select **Join Team** and are immediately added to the team membership.

Note: Learners can belong to only one team. If a learner already belongs to a team, the **Join Team** button is not available when they view other teams. To join a new team, learners must first leave their existing team.

Learners can create their own teams if they cannot find a team they want to join. Under the list of existing teams in a topic, learners select **create a new team in this topic**. This link is available only to learners who do not already belong to a team.
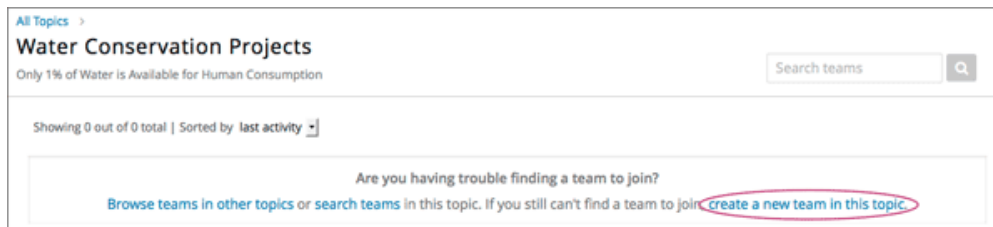
Learners specify a name and description for their team, and optionally specify a country and language that team members identify with. A learner who creates a team automatically becomes a member of the new team.

Note: EdX recommends that you encourage learners to join existing teams before they create new teams.

Note: Because course staff who have the role of Admin, Discussion Moderator, or Discussion Admin can create multiple teams, these course staff are not automatically added to teams that they create. This is also true for learners who have the community TA role.

At any time, learners can leave teams that they have joined, although you should emphasize to learners that they should try not to change teams after any team projects or activities have started. Learners who leave a team will also be unable to continue contributing to discussion threads in the team that they have left.

Participating in Team Discussions

Only members of a team (or anyone with a discussion administrator, discussion moderator, or community TA role) can post to a team's discussion forum. Any learner in your course can view team discussions without being a member, but they cannot add posts to a team's discussion unless they also belong to that team.

Note: Team discussions are not divided by cohort. Learners who are in the same team but who belong to different cohorts can view and participate in their team discusssions without regard to the cohort they belong to.

For information about course discussions and managing discussions, see *Creating Course Discussions* and *Guidance for Discussion Moderators*.

12.3.3 Managing Team Discussions

EdX recommends that you designate course staff and optionally student teaching assistants (TAs) to moderate team discussions. The same discussion administration roles for managing course discussions on the **Discussions** page apply to discussion administration for team discussions. Course team members and student TAs who already have discussion moderation roles for course discussions on the **Discussions** page can perform the same roles for discussions in teams.

For information about discussion administration roles, see *Assigning Discussion Moderation Roles*. For information about managing discussions, see *Running Course Discussions*.

> • *Ability to Post in Team Discussions*
>
> • *Ability to Edit or Delete Posts*

Ability to Post in Team Discussions

Members of the team, discussion community TAs, and course staff with the roles of Discussion Admin or Discussion Moderator can post to a team's discussion. Team members can edit their own posts, reply to posts and comments, follow and flag posts, and so on.

Posts made by discussion community TAs are marked with a **Community TA** label in the discussion navigation pane, and those made by discussion moderators or discussion admins are marked with a **Staff** label.

Ability to Edit or Delete Posts

Discussion moderators, discussion admins, and community TAs can perform the following actions in team discussions, without being a member of the team.

- Review, edit, or delete messages

- Pin, close, or reopen posts

- Endorse responses

Responses and comments made by community TAs have a **Community TA** label.

Responses and comments made by discussion moderators or discussion administrators have a **Staff** label.

12.4 Creating Content Experiments

12.4.1 Overview of Content Experiments

This section provides an introduction to using content experiments.

> • *Overview*
>
> • *Courses with Multiple Content Experiments*

For more information, see *Configure Your Course for Content Experiments* and *Add Content Experiments to Your Course*.

Overview

You use content experiments to show different course content to different groups of learners. Also known as "A/B tests" or "split tests", content experiments enable you to research and compare the performance of learners in different groups to gain insight into the relative effectiveness of your course content.

If your course uses content experiments, the grade report that you generate from the instructor dashboard includes a column identifying the experiment group that each learner has been assigned to. For more information, see *Interpreting the Grade Report*.

For information about analyzing events from content experiments, see Testing Events for Content Experiments in the *EdX Research Guide*.

Important: Due to an issue in the edX mobile apps, content experiments do not display correctly in the mobile apps. Blocks created with Content Experiment components display in the mobile app with a "Group ID" label.

Courses with Multiple Content Experiments

You can run multiple content experiments in your course. You can set up each experiment to use the same groups of learners, or you can set up each experiment to be independent and use a different grouping.

Important: If your course has multiple experiments, it is critical that you decide in advance if the experiments share the same groups of learners or if each experiment has its own unique grouping. If two experiments share the same grouping, then any learner that is in Group A for the first experiment will also be in Group A for the second one. If you want the experiments to be independent, then the experiments must use different groupings so that learners are randomly assigned for each experiment.

To determine the available groupings of learners, you set up group configurations *using Studio* or *using XML*.

You then select which group configuration to use when you add a content experiment *using Studio* or *using XML*.

12.4.2 Configure Your Course for Content Experiments

This section provides instructions for configuring your course to use *content experiments*.

- *Enable Content Experiments*
- *Overview of Group Configurations*
- *Set up Group Configurations in edX Studio*
- *Guidelines for Modifying Group Configurations*
- *Set Up Group Configuration for OLX Courses*

Enable Content Experiments

To enable content experiments in your course, you add `split_test` to the **Advanced Module List** in Advanced Settings.

Note: `split_test` is the internal edX Platform name for a content experiment.

---

1. From the **Settings** menu, select **Advanced Settings**.

2. On the **Advanced Settings** page, locate **Advanced Module List**.

3. In the **Advanced Module List** field, add `"split_test"`. Be sure that you include the double quotation marks.

   If you have multiple values, ensure that they are separated by commas (`,`).

   For example, the text in the **Advanced Module List** field may resemble the following:

   ```
   [
     "lti_consumer",
     "word_cloud",
     "split_test"
   ]
   ```

4. Select **Save Changes**.

Overview of Group Configurations

Before you can create *content experiments*, you must specify at least one group configuration for your course.

A group configuration defines how many groups of learners are in an experiment. You can have any number of group configurations in your course. When you create a content experiment, you select the group configuration to use.

For example, you might want to run two different content experiments at different times during your course. In one content experiment, learners either see a video or complete a reading assignment. You can then include problems so that you can see which group learned the material more completely. For this content experiment, you need a group configuration that assigns your learners to two experiment groups.

In the other content experiment, you can present the same question using four different types of problems. For this content experiment, you need a group configuration that assigns your learners to four experiment groups.

Assigning Learners to Experiment Groups

The edX Platform assigns learners to each experiment group in a group configuration.

Experiment group assignments have the following characteristics.

- Dynamic

  The edX Platform assigns a learner to an experiment group the first time he or she views a content experiment that uses the group configuration.

- Random

  You cannot control which learners are assigned to which experiment group.

- Evenly distributed

The edX Platform keeps track of the size of experiment groups, and assigns new learners to groups evenly. For example, if you have two experiment groups in a configuration, each group includes 50% of the learners in the course; if you have four experiment groups, each group includes 25% of the learners.

- Permanent

Learners remain in their assigned experiment groups regardless of how many content experiments you set up that use the same group configuration.

Set up Group Configurations in edX Studio

Note: You must *enable content experiments* before you can set up group configurations.

To set up group configurations, on the **Settings** menu, select **Group Configurations**. The **Group Configurations** page opens.

From this page you can *create*, *edit*, and *delete* group configurations. You can also *view content experiments that use a group configuration*.

Create a Group Configuration

You can create a group configuration at any time.

1. On the **Group Configurations** page, under **Experiment Groups**, select **New Experiment Group**. The following page opens:

2. Enter a name in the **Group Configuration Name** field. Use a meaningful name, because you will select from group configuration names when you create content experiments. Learners do not see the group configuration name.

3. Optionally, enter a description for the new group configuration.

4. By default, a new configuration already contains two groups. Modify the groups or add and delete groups as needed. A group configuration must have at least one group.

   - Modify group names as needed. You see group names in the unit page in Studio, but group names are not visible to learners.

   - Select **Add another group** to include another group as part of the configuration.

   - Select the **X** to the right of an existing group to remove it from the configuration. A group configuration must have at least one group.

5. Select **Create** to save the new group configuration.

The group configuration is then listed in the page. You can see the number of groups that the configuration contains, as well as whether the configuration is in use in the course:

Edit a Group Configuration

Important: You can change the name of a group configuration at any time. However, before you modify any other characteristics of a group configuration that is currently used in a running course, review *Guidelines for Modifying Group Configurations*.

1. On the **Group Configurations** page, hover over the group configuration and select **Edit**.
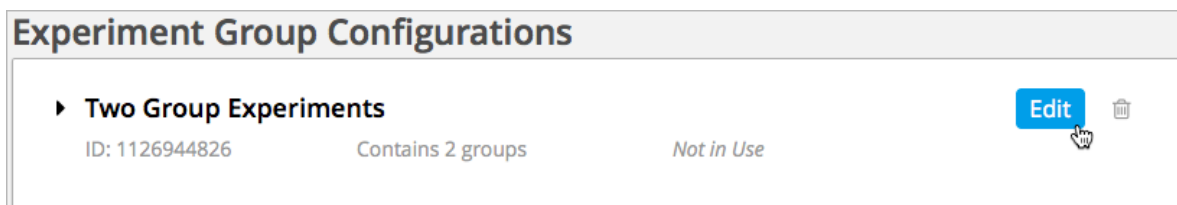
The following page opens:

2. On the **Edit a Group Configuration** page modify the name and description as needed.

3. Modify groups in the configuration as needed. See *Create a Group Configuration* for details.

4. Select **Save** to save your changes.

Delete a Group Configuration

Note: You can only delete a group configuration that is not currently used in a content experiment. You cannot delete a group configuration that is used in a content experiment.

1. On the **Group Configurations** page, hover over the group configuration and select the Delete icon.
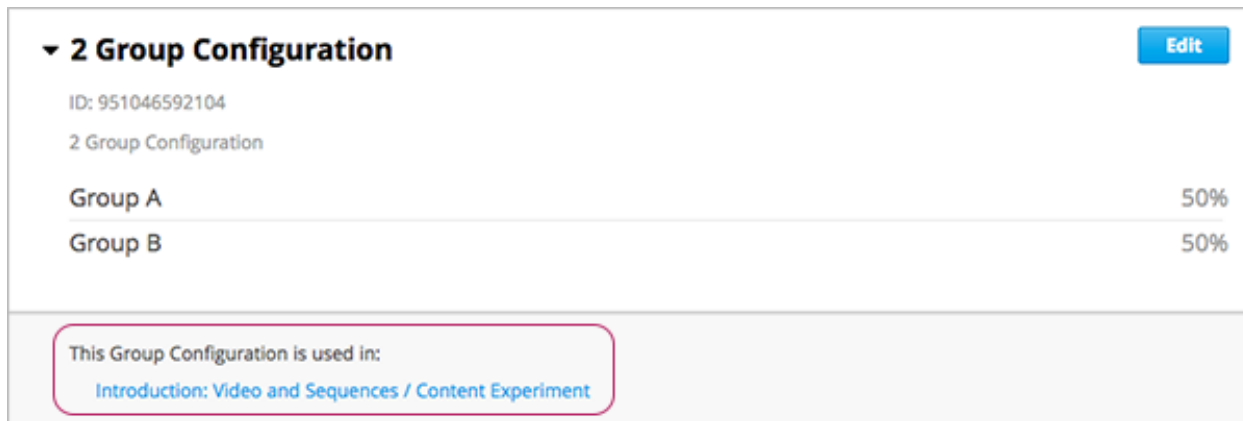
2. When prompted to confirm the deletion, select **Delete**.

View Experiments that Use a Group Configuration

You can view the content experiments that use each of your group configurations.

On the **Group Configurations** page, select the name of a group to see its details. You see links to the content experiments that use this group configuration.
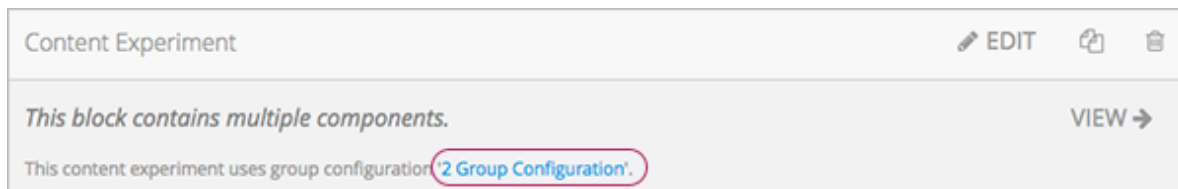
Select a link to go to the unit that contains the content experiment.

View a Group Configuration from an Experiment

When working with a content experiment, you can view details about the group configuration used by that experiment in two ways.

- In a unit that contains a content experiment, in the content experiment block, select the name of the group configuration.
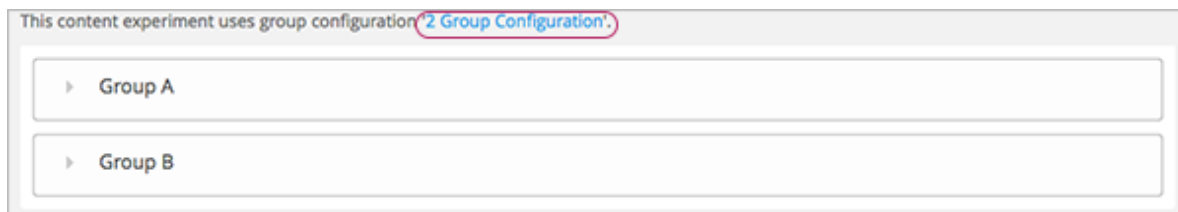
- At the top of the content experiment page, select the name of the group configuration.

In both cases, the group configuration opens.

You can use the link in the group configuration to return to the unit that contains the content experiment.

Guidelines for Modifying Group Configurations

Review these guidelines if you must modify a group configuration after a course starts. These guidelines apply for courses built in Studio or using OLX (open learning XML).

Modifying a Group Configuration

After the course starts, **do not**:

- Delete group configurations.
- Change the `id` value of a group configuration.

Modifying Experiment Groups

After the course starts, **do not** change the `id` value of an experiment group.

You can change experiment group names at any time.

Removing Experiment Groups from Group Configurations

After a course in which you are running a content experiment has started, learners in a specific experiment group might have difficulties with the content or with the course experience. In this situation, you can remove the experiment group from the group configuration. Content that was specified for that experiment group is then no longer visible to learners.

Learners in the removed experiment group are reassigned evenly to one of the other experiment groups in the group configuration. Any problems that these learners completed in the removed experiment group content do not count toward their grades. The learners must begin the problem set again and complete all the problems in the experiment group content to which they are reassigned.

Removing an experiment group affects event data for the course. Ensure that researchers who are evaluating your course results are aware of the experiment group that you removed and the date on which you removed it.

Set Up Group Configuration for OLX Courses

You define group configurations in the `policy.json` file in the `policies` directory of an OLX (open learning XML) course.

To specify group configurations, you modify the value for the `user_partitions` policy key.

Note: `user_partitions` is the internal edX Platform name for group configurations.

The value for `user_partitions` is a JSON collection of group configurations, each of which defines the experiment groups of learners.

Note: Use names for group configurations that are meaningful. You select from the list of group configuration names when you add a content experiment.

See the following examples for more information.

Example: One Group Configuration

The following code shows an example JSON object that defines a group configuration with two learner segments.

```
"user_partitions": [{"id": 0,
                "name": "Name of the group configuration",
                "description": "Description of the group configuration.",
                "version": 1,
                "groups": [{"id": 0,
                            "name": "Group 1",
                            "version": 1},
                           {"id": 1,
                            "name": "Group 2",
                            "version": 1}]
                }
              ]
```

In this example:

- The `"id": 0` identifies the group configuration. For XML courses, the value is referenced in the `user_partition` attribute of the `<split_test>` element in the content experiment file.

- The `groups` array identifies the experiment groups to which learners are randomly assigned. For XML courses, each group `id` value is referenced in the `group_id_to_child` attribute of the `<split_test>` element.

Example: Multiple Group Configurations

The following code shows an example JSON object that defines two group configurations. The first group configuration divides learners into two experiment groups, and the second divides learners into three experiment groups.

```
"user_partitions": [{"id": 0,
                "name": "Name of Group Configuration 1",
                "description": "Description of Group Configuration 1.",
                "version": 1,
```

```
                "groups": [{"id": 0,
                            "name": "Group 1",
                            "version": 1},
                           {"id": 1,
                            "name": "Group 2",
                            "version": 1}]}
            {"id": 1,
             "name": "Name of Group Configuration 2",
             "description": "Description of Group Configuration 2.",
             "version": 1,
             "groups": [{"id": 0,
                            "name": "Group 1",
                            "version": 1},
                           {"id": 1,
                            "name": "Group 2",
                            "version": 1}
                           {"id": 2,
                            "name": "Group 3",
                            "version": 1}
                           ]}
         ]
```

Note: As this example shows, each group configuration is independent. Group IDs and names must be unique within a group configuration, but not across all group configurations in your course.

12.4.3 Add Content Experiments to Your Course

This section provides instructions for adding content experiments to your course.

- *Before Adding Content Experiments*
- *Add a Content Experiment in Studio*
- *Add a Content Experiment in OLX*

Before Adding Content Experiments

Before you add content experiments to your course, ensure that you have completed the following tasks.

- *Enable Content Experiments*
- *Set up Group Configurations in edX Studio*

Add a Content Experiment in Studio

You can add a content experiment in a unit or container page. In Studio, you create and view content for all groups in the content experiment in a container page for the experiment, as shown in *Create Content for Groups in the Content Experiment*.

When a learner views a unit with the content experiment, she has no indication there is a content experiment in the unit, and the content experiment display name is not shown. She sees only the content that you configure for the group she is assigned to. To the learner, the unit with the content experiment is no different than any other unit.

To configure a content experiment in Studio, you perform the following tasks.

> - *Create a Content Experiment*
> - *Create Content for Groups in the Content Experiment*
> - *Change the Group Configuration for a Content Experiment*

After you configure a content experiment, you can change its group configuration. For more information, see *Change the Group Configuration for a Content Experiment*.

You can move a content experiment from its current location to a different location in the course outline. For information, see *Reorganizing Components*.

Create a Content Experiment

Note: Do not create new content experiments by duplicating configured content experiments. Duplicating content experiments after you have configured them is not supported.

---
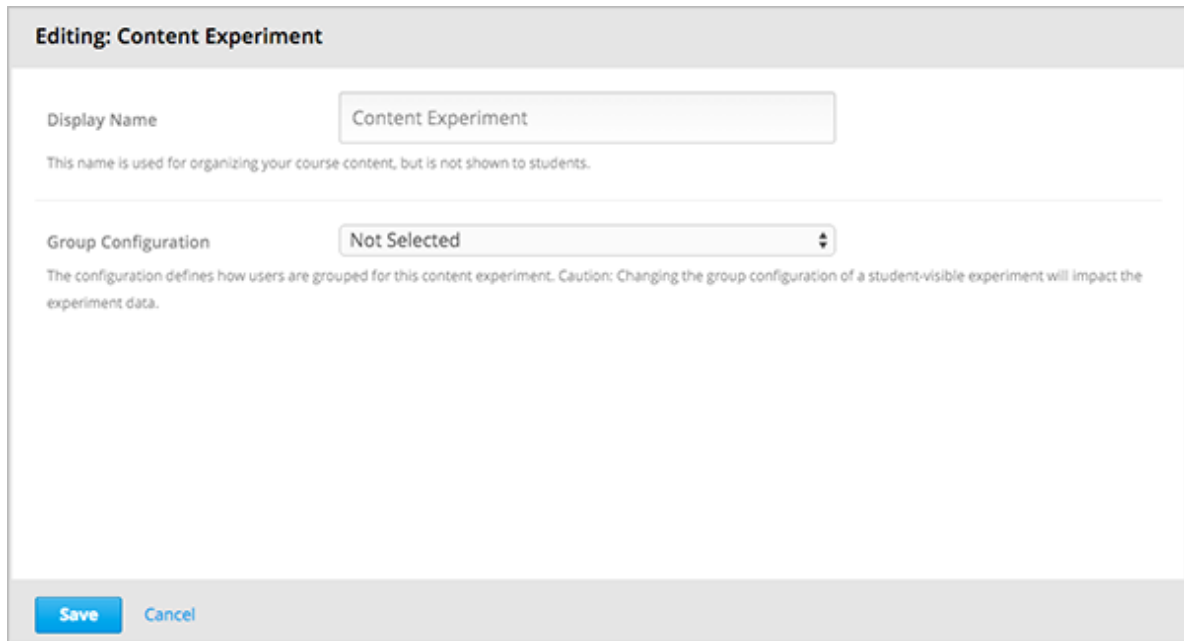
1. On the unit page, under **Add New Component**, select **Advanced**.

2. Select **Content Experiment**.

   A new content experiment is added to the unit.
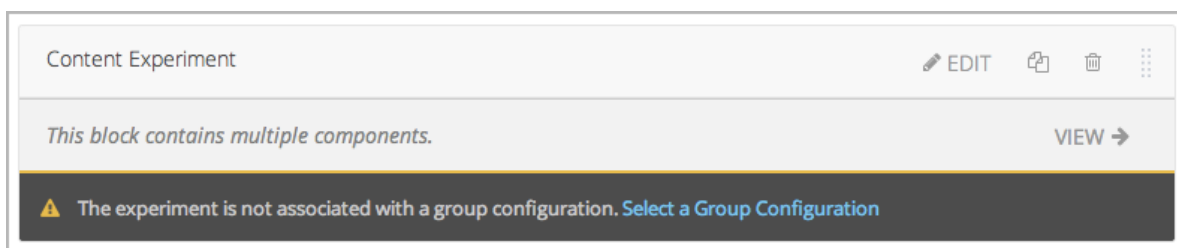
   The content experiment includes a container for each group that is defined in the group configuration you selected. You create content for each experiment group as you do any other component. For more information, see *Developing Course Components*.

3. Select either **Select a Group Configuration** or **Edit** to open the content experiment component.

---

4. For **Group Configuration**, select a group configuration.

5. In the **Display Name** field, enter the name of the component. The display name is only used in Studio; learners do not see this value.

6. Select **Save**.

The content experiment is displayed as a component that contains other components. For more information, see *Components that Contain Other Components*.

You can now create content for the groups in the experiment.

Create Content for Groups in the Content Experiment

After you select a group configuration, in the content experiment component, select **View**.

The content experiment page that opens automatically includes a container for each group that is defined in the group configuration you selected. For example, if you select a group configuration that defines two groups, Group A and Group B, you see the following page.
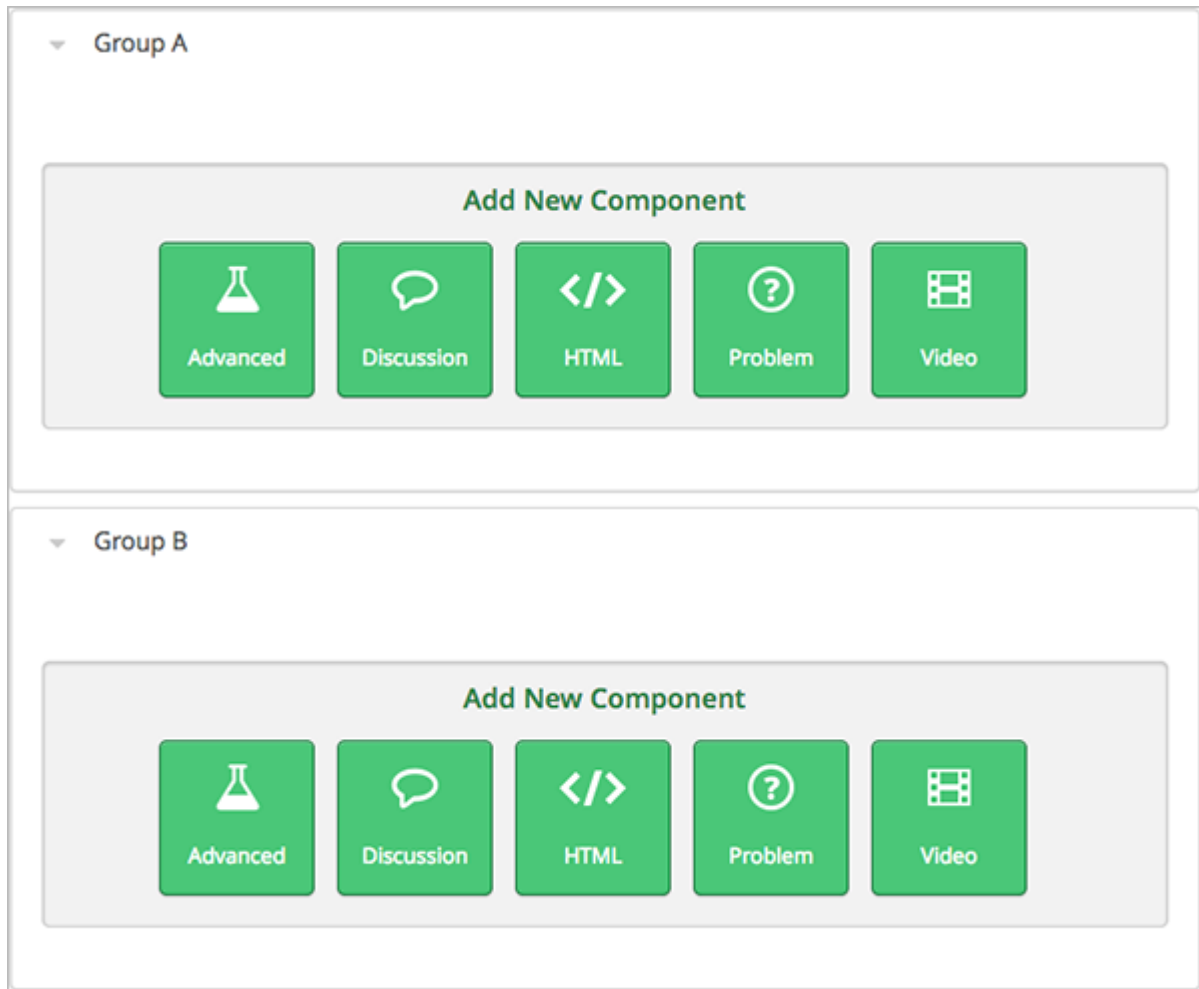
You add content for both groups as needed, just as you would add content to any container page. For more information, see *Components that Contain Other Components*.

For example, you can add a Text component and a video to Group A.

Note: It is valid, and can be useful, to have no content for a group in a content experiment. For example, if one group has a video and another group has no content, you can analyze the effect of the video on learner performance.

Change the Group Configuration for a Content Experiment

You can change the group configuration for a content experiment. When you change the group configuration, you edit the content for any additional groups in the group configuration. You can use the components from the previous groups, as well as create new components.

> **Warning:** Changing the group configuration of a learner-visible content experiment will affect the experiment data.

1. Open the unit that contains the content experiment.

2. In the content experiment component, select **Edit**.

3. Select a different group configuration.

4. Select **Save**.

5. You must now add components to the new groups in the experiment. Select **View** to open the content experiment.

   You see that groups for the new configuration are empty, and any components that you had added to groups in the previous configuration are now moved to a section called **Inactive Groups**.
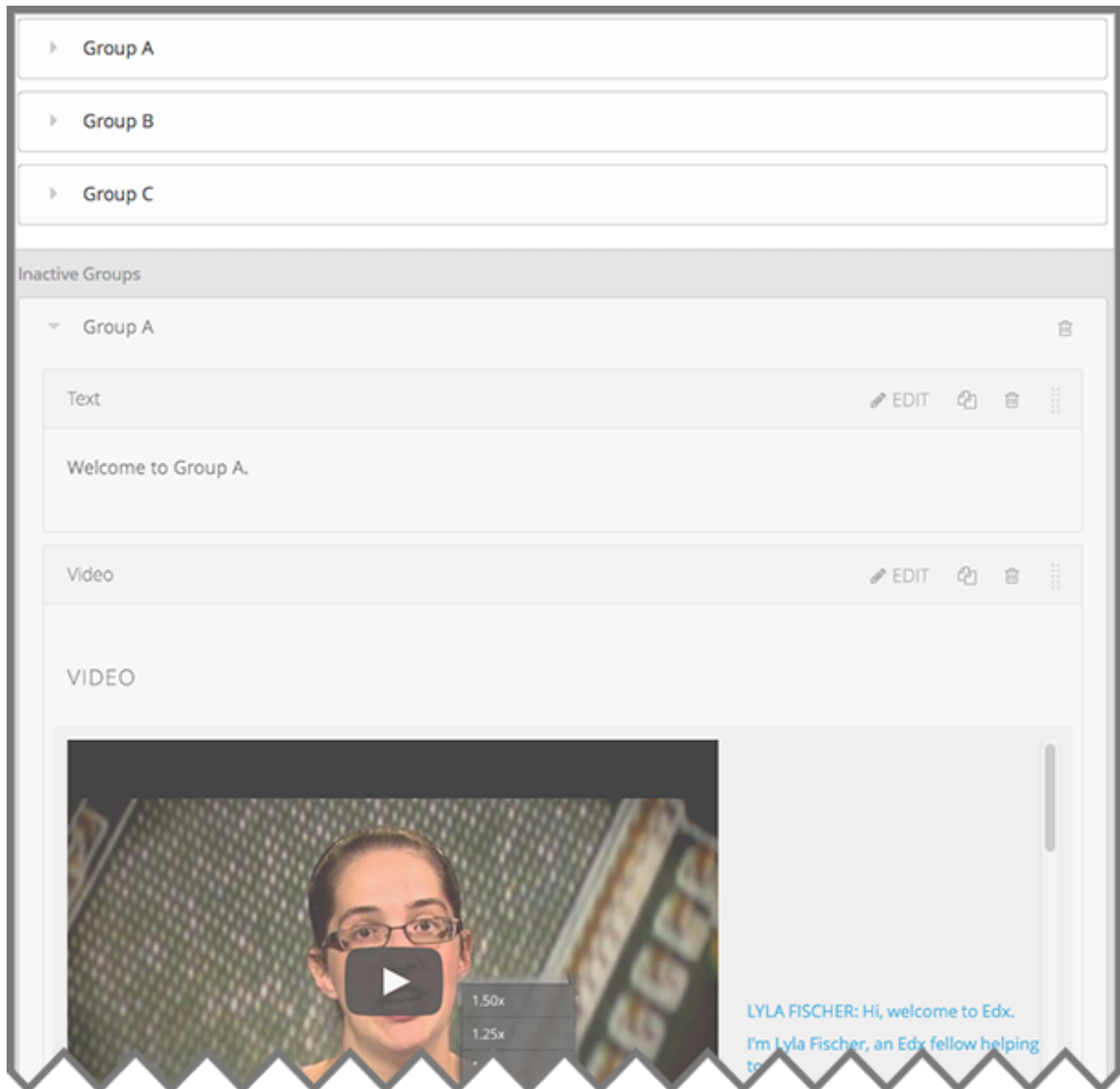
6. Drag and drop components from the **Inactive Groups** section into the new groups. You can also create new components in the new groups.

Add a Content Experiment in OLX

You work with multiple XML files to configure a content experiment. This section steps through the files involved in a content experiment that shows different content to two different groups of learners.

Define the Content Experiment in the Sequential File

You reference a content experiment in the file for the subsection, or sequential, in the `sequential` directory. For example:

```
...
<vertical url_name="name for the unit that contains the A/B test" display_name="A/B Test␣
␣Unit">
    <split_test url_name="name of A/B test file in the split_test folder"/>
</vertical>
.....
```

The `<split_test>` element's `url_name` value references the name of the content experiment file in the `split_test` directory.

> **Caution:** You can only define a content experiment in a unit, or vertical, in which different collections of components are associated with different experiment groups. You cannot define a content experiment at a subsection (sequential) or section (chapter) level and have different units or subsections associated with different groups.

Define the Experiment Content in the Split Test File

After you define the content experiment in the sequential file, you define the course content you want to test in the file in the `split_test` directory. This is the file referenced in the `<split_test>` element in the sequential file, as shown above.

In the content experiment file, you add elements for the experiment content. For this example, you add two `<vertical>` elements to compare the two different sets of content.

```
<split_test url_name="AB_Test.xml" display_name="A/B Test" user_partition_id="0"
            group_id_to_child='{"0": "i4x://path-to-course/vertical/group_a",
                                "1": "i4x://path-to-course/vertical/group_b"}'>
    <vertical url_name="group_a" display_name="Group A">
        <html>Welcome to group A.</html>
        <video url_name="group_a_video"/>
    </vertical>
    <vertical url_name="group_b" display_name="Group B">
        <html>Welcome to group B.</html>
        <problem display_name="Checkboxes">
            <p>A checkboxes problem presents checkbox buttons for learner input.
               Learners can select more than one option presented.</p>
            <choiceresponse>
                <checkboxgroup label="Select the answer that matches">
                    <choice correct="true">correct</choice>
                    <choice correct="false">incorrect</choice>
                    <choice correct="true">correct</choice>
                </checkboxgroup>
            </choiceresponse>
        </problem>
    </vertical>
</split_test>
```

In this example:

- The `user_partition_id` value references the ID of the experiment defined in the `policy.json` file.

- The `group_id_to_child` value references the IDs of the groups defined in the `policy.json` file and maps the group IDs to specific content.

  For example, the value for group `0`, `i4x://path-to- course/vertical/group_a`, maps to the `<vertical>` element with the `url_name` equal to `group_a`. Therefore, learners in group 0 see the content in that vertical.

For information about the `policy.json` file, see *Set Up Group Configuration for OLX Courses*.

12.4.4 Test Content Experiments

You should test content experiments in your course before the course starts, to ensure that content is delivered to experiment groups as you intended.

When you view a unit that contains a content experiment in the LMS Staff view, you can select one of the experiment groups from a drop-down list. The unit page then shows the content as the selected group of learners sees it.

For example, in the following image, Group 0 is selected, and the HTML component and video that is part of Group 0 is displayed.
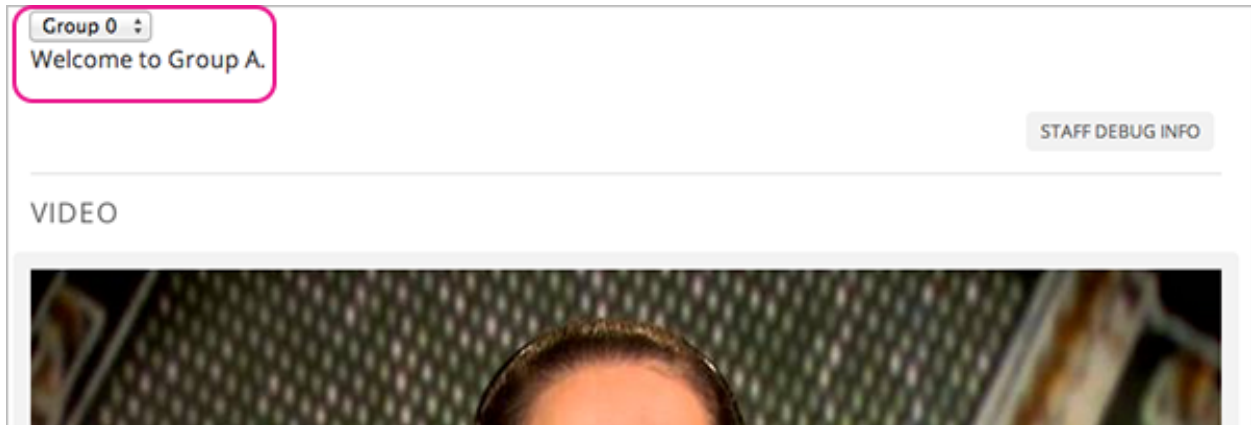
You can change the experiment group selection to view the content that a different experiment group of learners sees.
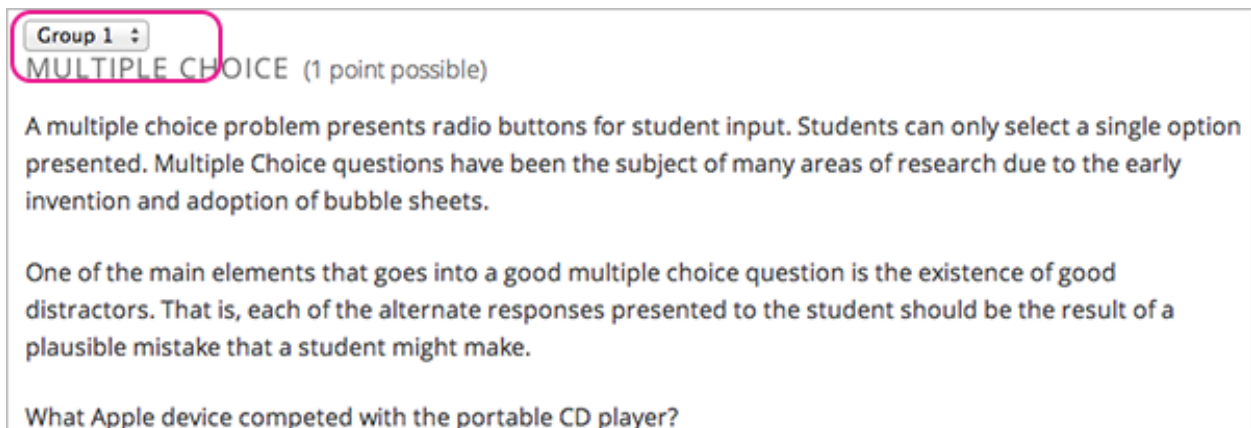
Note: The example course content in this section uses content experiment terminology ("Welcome to Group A", for example) to make the functionality clear. Typically, you would not use terminology in course content that would make learners aware of the experiment.

12.5 Offering Timed Exams

This topic describes how to add and manage timed exams in your course.

- *Overview*
- *Enable Timed Exams*
- *Set a Subsection to be Timed*
- *Grant Learners More Time for a Timed or Proctored Exam*
- *Resuming an Exam in an Error State*
- *Allow Learners to Retake a Timed or Proctored Exam*
- *Hide a Timed Exam After Its Due Date*

12.5.1 Overview

You can configure a *subsection* in your course so that learners have a set amount of time to complete and submit all problems in that subsection.

Although you can configure an ungraded subsection to be timed, typically you set a time limit on graded subsections, such as for mid-term or final exams.

When learners take a timed exam, a timer on the exam page counts down and provides alerts as the time limit approaches. When no time remains, learners can no longer access additional exam content, or submit additional responses to the subsection. All problems that were completed are graded. No points are awarded for unsubmitted problems.

Course teams can grant individual learners more time to complete problems in the subsection, but only if learners request additional time **before** starting a timed exam.

Note: Learners cannot complete timed exams using the edX mobile app.

To better understand the learner's experience of timed exams, see learners:taking_timed_exams in the *edX Learner's Guide* or Taking a Timed Exam in the *Open edX Learner's Guide*.

12.5.2 Enable Timed Exams

Timed exams are automatically enabled in your course. If you want to disable timed exams, you should go to each subsection that is set to be a "timed" exam, and set it to "none".

Note: The **Enable Timed Exams** field is now deprecated in the **Advanced Settings** page. If you want to access the field, you'll need to click on the "Show Deprecated Settings" button on the **Advanced Settings** page.

12.5.3 Set a Subsection to be Timed

Ensure that you have enabled timed exams in the course. Then follow these steps.

1. Add and *develop a subsection* as you would any other subsection.

2. Select the **Configure** icon for the subsection.
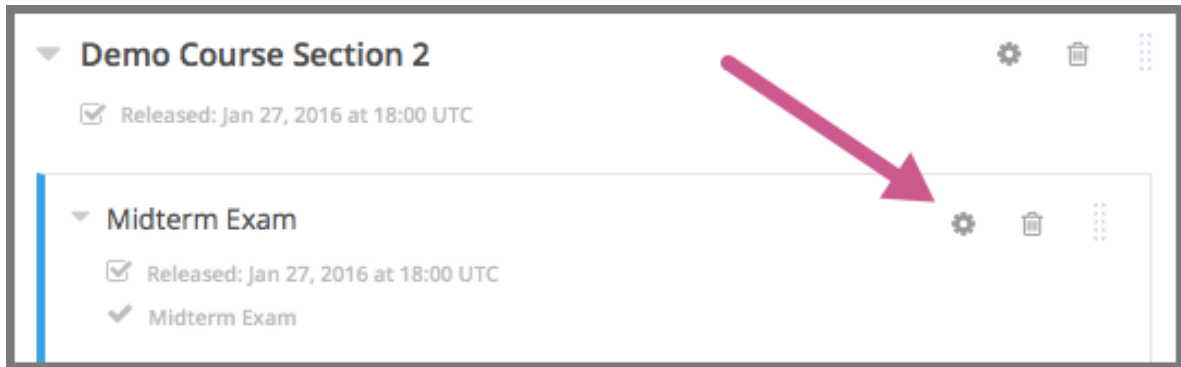
   The **Settings** dialog box opens to the **Basic** tab.

3. In the **Grading** section, set the *assignment type and due date* for the subsection.

4. Select the **Advanced** tab.

   If the **Settings** dialog box does not contain the **Advanced** tab, timed exams might not be enabled for your Open edX site. Enabling timed exams for an Open edX site is a task that is usually performed by a system administrator. For more information, see Enabling Timed Exams in *Installing, Configuring, and Running the Open edX Platform*.

5. In the **Set as a Special Exam** section, select **Timed**.

6. In the **Time Allotted** field, enter the length of time that you want learners to have to complete the problems in the subsection. Enter the time as HH:MM, where HH is hours and MM is minutes.

7. Select **Save**.

12.5.4 Grant Learners More Time for a Timed or Proctored Exam

---

Note: The course grace period setting does not apply to timed or proctored exams. For more information about the grace period setting, see *Set the Grace Period*.

From the instructor dashboard, a course team member can grant learners extra time to complete a timed or proctored exam.

1. View the live version of your course.

2. Select **Instructor**, and then select **Special Exams**.

3. Expand **Allowance Section**.

4. Select **Add Allowance**.

   The **Add a New Allowance** dialog box opens.

5. For **Username** or **Email**, enter all the learners' emails/usernames seperated by a comma that you wish to add an exception for.

6. For **Select Exam Type**, select the type of exams you want to add extra time for, either proctored or timed exams.

7. For **Select Exams**, click on the desired exams you want extra time for.

8. For **Allowance Type**, select either **Additional Time** or **Time Multiplier**

9. If you selected **Additional Time**, enter the number of extra minutes that you want to grant to the learner.

Note: You must enter a whole number greater than 0.

#. Otherwise if you selected **Time Multiplier**, enter the multiplier for how much total time you want the learners to have. For example for an exam of 30 minutes, a multiplier of 1.5 will give 15 extra minutes to each learner.

Note: You must enter a number greater than 1.

---

1. Select **Create Allowance**.

For proctored exams, the reviewer takes the special allowance for extra time into account when the proctoring service reviews the learner's proctored exam results.

12.5.5 Resuming an Exam in an Error State

If a learner encounters an error while taking a timed or proctored exam, you can allow them to resume the exam with their answers and time remaining saved.

Note: This option is only available if a learner's exam attempt is in an **Error** state. This can be seen by following the directions below.

Note: Onboarding and practice exams can be self-service reset by the learner. See Checking Your Onboarding Status and Resetting Your Onboarding Exam in the edX Help Center.

To allow a learner to resume a timed or proctored exam attempt, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Special Exam**.

3. Expand **Student Special Exam Attempts**. A list of timed and proctored exam attempts appears.

4. Search for the learner's username to locate their exam attempts.

5. In the **Exam Name** column, locate the name of the specific exam for which you are resuming the learner's exam attempt.

6. In the **Actions** column, click the gear icon () and select **Resume**. A message displays asking you to confirm that you want to resume the learner's exam attempt.

7. Select **OK**. The learner's exam attempt status will change from **Error** to **Ready to Resume**, and they will be able to access the exam again.

12.5.6 Allow Learners to Retake a Timed or Proctored Exam

If a learner needs to retake a timed exam, you can clear their exam attempt and allow them to retake the exam.

> **Warning:** Clearing an exam attempt removes all learner answers in an exam. This action cannot be undone.

To clear a timed or proctored exam attempt, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Special Exam**.

3. Expand **Student Special Exam Attempts**. A list of timed and proctored exam attempts appears.

4. Search for the learner's username to locate their exam attempts.

5. In the **Exam Name** column, locate the name of the specific exam for which you are cleaning the learner's exam attempt.

6. In the **Actions** column, select **Reset**. A message displays asking you to confirm that you want to remove the learner's exam attempt.

> **Note:** If the learner's exam attempt is in an error state, there will be a gear icon () in place of the **Reset** button. Click this icon in order to display the **Reset** and **Resume** options. For more information on resuming an exam attempt, see *Resuming an Exam in an Error State*.

7. Select **OK**. The learner's exam attempt is removed from the list.

12.5.7 Hide a Timed Exam After Its Due Date

Timed exams are hidden from learners after they complete and submit their exams, but are available again for viewing after the exam due date has passed. You can configure a timed exam to remain hidden even after the exam due date has passed.

When you keep a timed exam hidden after its due date, learners cannot see the content of the exam, but the grades that they received on the exam are not affected, and their scores for the exam remain visible on the **Progress** page.

> **Note:** This setting applies only to timed exams. It has no effect on other types of special exams, including proctored or practice exams.

1. In Studio, select the **Configure** icon for the timed exam (subsection) that you want to configure.

   The **Settings** dialog box opens to the **Basic** tab.

2. Select the **Visibility** tab.

3. In the **Subsection Visibility** section, select **Hide content after due date**.

4. Select **Save**.

12.6 Using Open edX as an LTI Tool Provider

Your installation of Open edX can be configured to be a learning tool interoperability (LTI) provider to other systems and applications. If your Open edX site is configured to be an LTI provider, you can present content from an Open edX course in any application that is configured to be a consumer of that content. As a result, you can reuse Open edX course content, including advanced problem types and videos, in contexts other than the Open edX LMS. Examples include courses running on Canvas, Blackboard, and other learning management systems and applications.

For more information about the configuration process for this feature, see Configuring an edX Instance as an LTI Tool Provider in the *Installing, Configuring, and Running the Open edX Platform* guide.

You use the topics in this section to prepare your course for reuse.

12.6.1 Reusing Course Content with LTI

Note: This feature was a closed pilot experiment. This feature is not supported for new users.

When you use LTI to reuse edX course content, learners who are already familiar with an external learning management system or other consumer application (external LMS) see content from edX that is seamlessly integrated into a familiar context. Only the content that you specify from edX appears in the external LMS, typically within an iframe on a page.

For example, you can set up a course on an external LMS, such as Canvas, to include a link to a problem component that is part of an edX course. The problem is included as one of the course's assignments, and appears in Canvas like other content.

This section provides background information on different aspects of the experience that learners and course team members have when interacting with edX content in the context of an external LMS.

- *Course Roster Management*
- *Learner Identification and Single Sign On*
- *Learner Progress and Grades*

For information about the content that you can include in an external LMS, see *Preparing to Reuse Course Content*.

Course Roster Management

Course teams manage the course roster entirely on the external LMS, as you would for other courses that run on that platform. Learners do not use the edX LMS to enroll, and the course team does not complete any enrollment activities in Studio or the edX LMS.

To obtain enrollment data for the course, you use the features available in the external LMS.

Learner Identification and Single Sign On

Learners do not need to navigate to a different website, or sign in to any other system (including edX), to access content that originates in an edX course. However, the first time a learner views edX course content in the external LMS, she might have to re-enter her credentials for the external LMS, even though she is already signed in to the external LMS.

Internally, the edX instance associates a unique internal identifier to each learner's credentials to allow for a streamlined, single sign in experience in the future. However, this separate edX identifier can make some edX content confusing for learners when viewed in the context of an external LMS. For example, edX course discussions can identify participants by their edX IDs instead of the usernames they would normally see in the external LMS. As a result, some edX content is not currently suitable for use in an external LMS.

For more information, see *Preparing to Reuse Course Content*.

Learner Progress and Grades

Each learner's progress through the edX content is saved. Learners start, stop, and resume work in the external LMS in the same way that they would in the edX LMS.

Learner responses to edX problem components are graded by the edX system, and then transferred automatically to the grade book in the external LMS. For more information, see *Grading Remote Content*.

To obtain learner engagement and performance data, you use the features available in the external LMS.

12.6.2 Preparing to Reuse Course Content

Note: This feature was a closed pilot experiment. This feature is not supported for new users.

> To make the content of an existing edX course reusable in an external LMS, you create a duplicate version of the course. You use the duplicate course specifically as a source of content for your external LMS. Based on configuration choices your organization makes for using edX as an LTI tool provider, you might be asked to create the duplicate course on edX Edge or on another host site.

Before you begin work to reuse the content in an Open edX course, check with your development operations (DevOps) team for information about the website to use. At some sites, a completely separate Open edX instance, with a different Studio website, is set up to be the LTI tool provider.

- *Planning for Content Reuse*

- *Create the Duplicate Course*

- *Select Content in the Duplicate Course*

- *Verify Content Status*

Planning for Content Reuse

When you create links to edX course content in your external LMS, you can link to components individually, to all of the content in a unit, or to all of the content in a subsection.

As you plan which parts of the course you want to reuse, note the following considerations.

- Some edX content can be confusing to learners when it appears in the context of an external LMS. For example, in some configurations, edX course discussions identify learners by their internally assigned edX IDs instead of by their usernames. Rather than linking to a subsection or unit that contains discussion components, you could plan to either link only to specific components or remove the discussion components from the unit or subsection, and then use the features available in your external LMS to add discussion forums to the course.

- Optional edX course features that create groups of learners based on their IDs, such as content experiments and cohorts, are not designed to provide results for external use. To use features like these for your course, you should plan to set them up in the external LMS.

- To ensure that edX content remains available without interruption, edX course content appears in the external LMS regardless of the start, end, or enrollment dates that are defined for the edX course.

- To ensure that learners see only edX content that is ready for use, only course content that is published appears in an external LMS.

For more information about edX features that might not be suitable for use with LTI, see *Select Content in the Duplicate Course*.

The topics that follow assume use of the edX Studio user interface. However, you can also complete these tasks by exporting the course and then reviewing or editing its XML before you import.

Create the Duplicate Course

Before you create a duplicate course, be sure to check with your DevOps team to determine the website that hosts your organization's courses for LTI use.

To create the duplicate course, follow these steps.

1. In Studio, export the original course. For more information, see *Export a Course*.

2. In Studio on your organization's host site for LTI courses, create a course. This is the duplicate course.

   Note: If your organization uses the same site as the host for both the original course and for LTI courses, be sure to give the duplicate course a different name or run.

3. In the duplicate course, import the tar.gz file that you exported in step 1. For more information, see *Import a Course*.

Select Content in the Duplicate Course

To select content in your duplicate edX course for reuse in an external LMS, you use Studio to review the course outline and make note of the components, units, and subsections you want to include.

Using an organizational tool, such as a spreadsheet, can be helpful. For example, you can use a spreadsheet column to identify the type of content (for example, component, unit, subsection), and add their display names to the next column. Additional columns can contain the values that you use to construct the addresses for your LTI links. For more information about addressing content, see *Determining Content Addresses*.

Optionally, you can streamline the contents of units and subsections by removing components, or disable course features that you do not plan to use.

EdX Content or Feature	Works Well with LTI?
Annotation Problem Components	No
Cohorts	No
Content Experiment Components	No
Course-wide Discussions	No
Discussion Components	No
Text Components	Yes
Internal Links	No
Problem Components	Yes
Randomized Content Block Problem Components	No
Video Components	Yes

For information about removing components, see *Delete a Component*. For information about disabling cohorts, see *Disable Cohorts in Your Course*. To remove course-wide discussions, you select **Settings**, and then **Advanced Settings**, and then delete the contents of the **Discussion Topic Mapping** policy key. For more information, see *Create Course-Wide Discussion Topics*.

Verify Content Status

Only edX course content that is published appears in an external LMS.

Note: The **Hide from students** setting for sections, subsections, and units does not affect the visibility of content in an external LMS. Only the publication status of a unit can prevent content from being included.

To verify that all of the content in your edX course is published, follow these steps.

1. In Studio, from the **Content** menu select **Outline**. The **Course Outline** page opens.

2. Expand each section and subsection.

3. Locate units with "Unpublished units will not be released" or "Unpublished changes to live content" below the unit name.

4. For each unpublished unit, make any changes that are necessary to prepare the content for publication. Alternatively, delete the unit.

5. Publish the unit. For more information, see *Publish a Unit*.

12.6.3 Determining Content Addresses

Note: This feature was a closed pilot experiment. This feature is not supported for new users.

To include the content of an existing course in another system, you use the edX LMS to find the location identifiers for the content you want to include. You then format the identifiers into an LTI URL.

- *Find the Course ID*
- *Finding the Usage ID for Course Content*
    - *View Staff Debug Info for the Usage ID*
    - *View the Page Source for the Usage ID*
- *Constructing the LTI URL*

You might find using a tool like a spreadsheet helpful as a way to organize the course ID and each of the usage IDs that correspond to the course content you want to include in an external LMS.

Find the Course ID

The identifier for your course can be in one of these formats.

- `{key type}:{org}+{course}+{run}`, for example, `course-v1:edX+DemoX+2014`
- `{org}/{course}/{run}`, for example, `edX/DemoX/2014`

Courses created since Fall 2014 typically have an ID that uses the first format, while older courses have IDs that use the second format.

To find the course ID for your course, follow these steps.

1. In the edX LMS, open your course.
2. In the URL shown by your browser, find the course ID.

For example, you open the "Blended Learning with edX" course to the **Course** page for the course. The URL for the **Course** page is `https://courses.edx.org/courses/course-v1:edX+BlendedX+1T2015/course`. From the URL, you determine that the course ID is `course-v1:edX+BlendedX+1T2015`.

Another example is the edX DemoX course. The URL is `https://courses.edx.org/courses/course-v1:edX+DemoX.1+2T2017/course`, and its course ID is `course-v1:edX+DemoX.1+2T2017`.

The same course ID applies to every item of content in the course.

Finding the Usage ID for Course Content

The identifier for a specific component, unit, or subsection in your course can be in one of these formats.

- `{key type}:{org}+{course}+{run}+type@{type}+block@{display name}`, for example, `block-v1:edX+DemoX+2014+type@sequential+block@basic_questions`
- `i4x:;_;_{org};_{course};_{type};_{display name}`, for example, `i4x:;_;_edX;_DemoX;_sequential;_basic_questions`

Courses created since Fall 2014 typically have usage IDs in the first format, while older courses have usage IDs in the second format.

The following terms are used in the usage identifiers to indicate subsections, units, and components.

EdX Studio	Page Source
subsection	sequential
unit	vertical
component	problem, html, or video

The example usage IDs shown above include the word "sequential", so they indicate subsections in a course.

Several methods are available to help you find the usage IDs for items in your course.

To find the usage ID for a unit or a component in the LMS, you can use either of these methods.

- *View staff debug info* for the unit or component.
- *View the page source* for the unit or component.

To find the usage ID for a subsection, you *view the page source*.

Note: You must have the Staff or Admin role in a course to follow these procedures for finding usage IDs.

View Staff Debug Info for the Usage ID

To find the usage ID for a unit or component in the LMS, follow these steps.

1. In the edX LMS, open your course.

2. Select **Course**, and then go to the page that contains the unit or component.

3. Select **Staff Debug Info**.

4. To find the usage ID for a component, find the **location**.

   For example, `location = block-v1:edX+BlendedX+1T2015+type@html+block@2114b1b8fd7947d28fba53414459ff01`

5. To find the usage ID for a unit, scroll down to find the **parent**.

   For example, `parent block-v1:edX+BlendedX+1T2015+type@vertical+block@ae7d9c34c2f34f7aa793ed7b55543ae5`

The usage ID value begins with `block-v1` for newer courses or `i4x://` for older courses. If you are using a spreadsheet to organize your location identifiers, you can select the usage ID value, and then copy and paste it into the spreadsheet.

To close the Staff Debug viewer, click on the browser page outside of the viewer.

For more information, see *Staff Debug Info*.

View the Page Source for the Usage ID

To find the usage ID for a subsection, unit, or component, you view the HTML page source for that page of the edX course.

To find the usage ID for a subsection, unit, or component, follow these steps.

1. In the edX LMS, open your course.

2. Select **Course**, and then go to the page with the content that you want to include in an external LMS.

3. Open the HTML source for the page. For example, in a Chrome browser you right click on the page, and then select **View Page Source**.

4. Use your browser's Find feature to locate the term `data-usage-id`. This attribute contains the usage ID.

5. Review the value for the usage id to determine the part of the course it identifies: the sequential (subsection), a unit (vertical) or a specific component (problem, html, or video).

Important: You might need to search beyond the first match to retrieve the usage ID for the content you want to identify. Be sure to check the `data-usage-id` for sequential, vertical, or problem, html, or video to be sure that you specify the content that you want.

For example, you want to link to a subsection in the edX Demo course. You open the course, go to the problem, and then right click to view the page source. When you search for `data-usage-id`, the first match is `block-v1:edX+DemoX+Demo_Course+type@sequential+block@basic_questions`. You verify that this usage ID value is for the subsection by checking for the presence of `sequential`.

A more complex example gets the usage ID for the Drag and Drop problem in the edX DemoX course. The Drag and Drop problem is the second problem in the first homework assignment in Week 1 of the course. After you view the page source and search for `data-usage-id`, the first match is for the subsection (sequential). You search again, and see a usage ID that uses a slightly different format than the first usage ID, but contains the word "vertical", so you know that it is for the unit. The third time that you search, you get the usage ID for the first of the problems (problem) in the assignment. You search again, and find the usage ID for the second problem in the assignment, `block-v1:edX+DemoX+Demo_Course+type@problem+block@d2e35c1d294b4ba0b3b1048615605d2a`.

If you are using a spreadsheet to organize your location identifiers, you can select the usage ID value within the quotation marks or " ISO codes, and then copy and paste it into the spreadsheet.

Constructing the LTI URL

To identify the edX content that you want to include in an external LMS, you provide its URL. This URL has the following format.

```
https://{host}/lti_provider/courses/{course_id}/{usage_id}
```

To construct the LTI URL, you add your course ID and the specific content ID.

Examples of the possible formats for an LTI URL follow.

LTI URLs for a subsection include "sequential", as follows.

```
https://edx-lti.org/lti_provider/courses/course-v1:edX+DemoX+2014/
block-v1:edX+DemoX+2014+type@sequential+block@basic_questions
```

```
https://edx-lti.org/lti_provider/courses/edX/DemoX/2014/i4x:;_;_edX;_DemoX;
_sequential;_graded_simulations
```

LTI URLs for a unit include "vertical", as follows.

```
https://edx-lti.org/lti_provider/courses/course-v1:edX+DemoX+Demo_Course/
block-v1:edX+DemoX+Demo_Course+type@vertical+block@vertical_3888db0bc286
```

```
https://edx-lti.org/lti_provider/courses/edX/DemoX/2014/i4x:;_;_edX;_DemoX;
_vertical;_d6cee45205a449369d7ef8f159b22bdf
```

LTI URLs for Text components include "html+block" or "html", as follows.

```
https://edx-lti.org/lti_provider/courses/course-v1:edX+DemoX+Demo_Course/
block-v1:edX+DemoX+Demo_Course+type@html+block@f9f3a25e7bab46e583fd1fbbd7a2f6a0
```

```
https://edx-lti.org/lti_provider/courses/edX/DemoX/2014/i4x:;_;_edX;_DemoX;
_html;_2b94658d2eee4d85ae13f83bc24cfca9
```

12.6.4 Grading Remote Content

Note: This feature was a closed pilot experiment. This feature is not supported for new users.

When you include the problem components in a graded edX subsection in an external LMS, the edX system grades the learner responses to those problems. The edX system then transfers the learner scores back to the external LMS. This exchange between an external LMS, the edX system, and the external LMS again is near real time. It can take a few moments to complete this exchange for a single problem component, and up to several minutes to return aggregated scores of all of the problems in a unit or subsection.

When you include edX problem components in an external LMS, note the following requirements.

- The edX problem component must be in one of the graded subsections in your course.

- Your external LMS might also require that you use a specific part of the course for graded content. For example, in Canvas, you must add the LTI URL of a problem component to the "Assignments" section of a course, or to a module item that points to an assignment. In addition, the user who launches the LTI material must be eligible to get a grade for the assignment; that is, a learner and not a TA or course designer.

For more information about constructing an LTI URL for a course component, see *Determining Content Addresses*.

12.6.5 Example: edX as an LTI Provider to Canvas

Note: This feature was a closed pilot experiment. This feature is not supported for new users.

To use edX course content in the Canvas LMS, you add a new app to the course and then add external tool module items.

Note: This example relies on the use of a third-party tool. Because this tool is subject to change by its owner, the steps and illustrations provided here are intended as guidelines and not as exact procedures.

---

1. In Canvas, select your course. In **Settings**, select **Add New App**.

2. In **Modules**, add a new **External Tool** item. The **URL** is the LTI URL that you determined for the edX course content, such as `https://edx-lti.org/lti_provider/courses/course-v1:edX+DemoX+2014/block-v1:edX+DemoX+Demo_Course+type@problem+block@d2e35c1d294b4ba0b3b1048615605d2a`.

For more information, see *Determining Content Addresses*.

3. Review the content to verify that it appears as you expect.

12.6.6 Example: edX as an LTI Provider to Blackboard

Note: This feature was a closed pilot experiment. This feature is not supported for new users.

To use edX course content in the Blackboard LMS, you add a new app to the course and then add external tool module items.

Note: This example relies on the use of a third-party tool. Because this tool is subject to change by its owner, the steps and illustrations provided here are intended as guidelines and not as exact procedures.

---

1. In Blackboard, select your course.

2. From the course control panel, select **Customizations**. In the **Tool Availability** section, verify that the LTI tool has been enabled.

3. Open a **Content Area** page, and from the **Build Content** menu select **Web Link**.
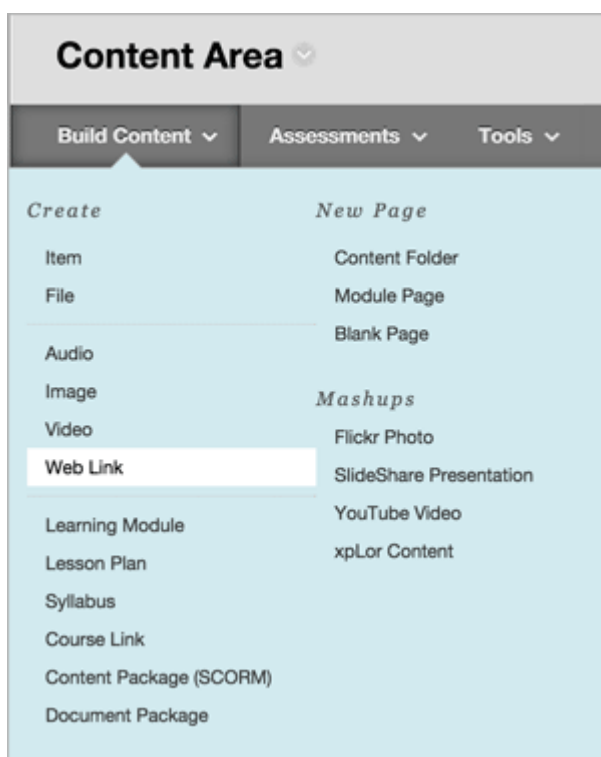
4. On the **Create Web Link** page, enter an identifying name and the URL for the edX content you want to include.

   The **URL** is the LTI URL that you determined for the edX course content, such as `https://edx-lti.org/lti_provider/courses/course-v1:edX+DemoX+2014/block-1:edX+DemoX+Demo_Course+type@problem+block@d2e35c1d294b4ba0b3b1048615605d2a`.

For more information, see *Determining Content Addresses*.

5. Review the content to verify that it appears as you expect.

You can also include content from an LTI provider in your Open edX courses. For more information, see *LTI Component*.

PROCTORED EXAMS

This section describes how to create and manage proctored exams in Studio. Proctored exams are timed exams that learners take while being monitored by online proctoring software.

13.1 Proctored Exam Overview

Proctored exams are timed exams that learners take while online proctoring software monitors their computer, environment, and behavior. When learners complete a proctored exam, a reviewer examines the recording of the exam to determine whether the learner complied with the *online proctoring rules*.

All courses can include proctored exams.

Learners must satisfy the following criteria to pass a proctored exam.

- Take the exam as a proctored exam.

  By default, learners are required to take the exam as a proctored exam. To allow learners the option to take an exam as a proctored exam or as an unproctored exam, see *Allow Opting Out of Proctored Exams*.

- Download and install proctoring software.

- Complete identity and exam environment checks.

- Earn a passing grade on the exam.

- Receive a Satisfactory result for their proctoring session review.

13.2 Preparing Learners for Proctored Exams

To prepare learners for a proctored exam, follow these guidelines.

- Emphasize that learners must be aware of the requirements before taking the exam, and that some of the requirements might take some preparation.

- Well before the exam, provide learners with information about the grading policy in your course.

- Explain what proctored exams are, and provide learners with links to the Proctored Exams topic in the *Open edX Learner's Guide*.

- Communicate the rules for proctored exams, including the *online proctoring rules* in the *Open edX Learner's Guide* as well as any specific rules for a particular exam. For information about creating specific rules, see *Specify Exam Rules and Exceptions*.

13.2.1 The Learner Experience of Proctored Exams

The learner experience of a proctored exam depends on the proctoring service that your course or organization uses. Typically, learners can expect to download and install proctoring software, verify their identities, and use their webcams to scan the testing environment before they take the exam. For more information, see Proctored Exams in the *Open edX Learner's Guide*.

13.2.2 Practice Proctored Exams

You can create an ungraded practice proctored exam for your course so that learners can become familiar with the process of installing proctoring software and performing the required checks ahead of time. Depending on the proctoring service, learners might complete the following steps for a practice proctored exam.

- Install the proctoring software.
- Complete identity checks.
- Complete a room scan.
- Complete any example problems in the exam.

Note: Learners who complete practice exams must usually complete the same software installation and environment scan steps again when they take an actual proctored exam.

For information about how to create a practice proctored exam, see *Create a Proctored Exam or Practice Proctored Exam*.

13.3 Creating Proctored Exams

To create a proctored exam, you modify the course proctored exam settings in Studio to enable proctored exams, and then you modify the settings of a subsection to specify that the subsection is a proctored exam.

13.3.1 Enable Proctored Exams

To enable proctored exams in your course, follow these steps.

1. In Studio, select **Settings**, then select **Proctored Exam Settings**.
2. Locate the **Enable Proctored Exams** policy key. The default for this field is to be unchecked, meaning that proctored exams are not enabled.
3. Check the setting to enable proctored exams.
4. Select **Submit**. You can now create proctored exams in your course.

After you enable this setting for your course, you can create a proctored exam or a practice proctored exam.

13.3.2 Create a Proctored Exam or Practice Proctored Exam

To create a proctored exam or a practice proctored exam, follow these steps.

1. Add and *develop a subsection* as you would any other subsection.

   For a practice proctored exam, edX recommends that you include only a few problems in this subsection. Or, you could add a unit with a text component that provides information about the exam.

2. Select the **Configure** icon for the subsection.
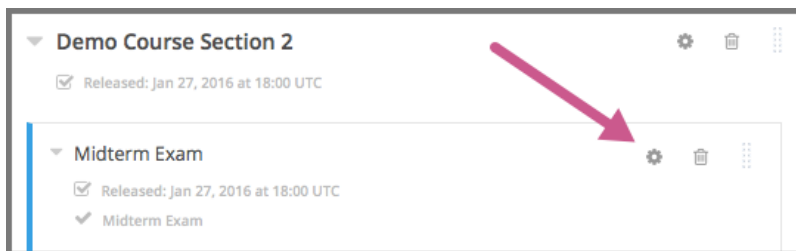
   The **Settings** dialog box opens to the **Basic** tab.

3. In the **Grading** section, set the *assignment type and due date* for the subsection.

   Note: For a practice proctored exam, leave the assignment type as **Not Graded**.

   ---

4. Select the **Advanced** tab, and then locate the **Set as a Special Exam** section.

5. Select the proctored exam type.

   - For a proctored exam, select **Proctored**.

   - For a practice proctored exam, select **Practice Proctored**.

6. In the **Time Allotted** field, enter the length of time that you want to allow for the exam as HH:MM, where HH is hours and MM is minutes.

7. (optional) For a proctored exam, in the **Review Rules** field, enter any additions or exceptions to the *default rules for proctored exams*. For more information, see *Specify Exam Rules and Exceptions*.

8. Select **Save**.

13.3.3 Specify Exam Rules and Exceptions

The rules for proctoring exams vary according to the proctoring service that you or your organization has chosen. However, the *online proctoring rules* that this guide lists are common to many proctoring services.

Note: The course grace period setting does not apply to proctored exams. For more information about the grace period setting, see *Set the Grace Period*.

You can also provide custom rules for a particular exam. For example, you might allow learners to use a calculator, or to have one sheet of blank paper. These rules are visible to reviewers and learners at the start of each proctoring exam.

To specify custom proctored exam rules, follow these steps.

1. In Studio, open your course outline and select the subsection for the exam.

2. Select the **Configure** icon to open the **Settings** dialog box.

3. Select the **Advanced** tab, and then locate the **Set as a Special Exam** section.

4. In the **Review Rules** field, enter any additional rules. For example, you might enter the following rule.

   ```
   Allow one blank sheet of paper and a pencil or pen. Allow a hand-held calculator on
   the desk.
   ```

5. Select **Save**.

13.3.4 Allow Opting Out of Proctored Exams

When a proctored exam opens, by default, learners are required to take the exam as a proctored exam. If you want to allow learners to take proctored exams without proctoring, you can change a setting on the **Proctored Exam Settings** page in Studio.

Note: If a learner opts to take an exam without proctoring, the exam will not be timed either. In effect, learners who opt out of proctoring will have unlimited time to complete the exam and could return to problem sets at any time. You can reduce the ability to view the exam by selecting a due date for the exam.

To enable the option for learners to opt out of proctored exams for a course, follow these steps.

1. In Studio, select **Settings**, then select **Proctored Exam Settings**.

2. Locate the **Allow Opting Out of Proctored Exams** policy key. The default value is No, which requires Verified and Master's learners to take proctored exams with proctoring.

3. Change the value of the setting to Yes.

4. Select **Submit**.

13.3.5 Check Proctoring Results

For information about how to obtain and interpret proctored exam results, contact your proctoring software provider.

13.4 Online Proctoring Rules for Learners

The rules for proctored exams vary according to your online proctoring service. The following rules are common rules for "closed book" exams.

A link to these rules, along with any additional rules that you have specified, is visible to learners on the instructions page at the beginning of every proctored exam.

For more information about specifying rules, see *Specify Exam Rules and Exceptions*.

13.4.1 Learner Rules for Online Proctored Exams

The following proctored exam rules are the basic rules for "closed book" exams.

Note: Some proctored exams have different or additional rules. For example, some proctored exams allow you to use reference material or a calculator. Any additional rules are visible along with the exam instructions before you start the exam.

Test Environment Rules

1. You must take the exam in the same room that you scanned during the proctoring setup for the current exam.

   Note: You must complete a webcam scan of the room where you will take the exam every time you take a proctored exam. However, you do not have to take all of your proctored exams in the same room.

   ---

2. No other person is allowed to enter the room while you are taking the proctored exam.

3. The lighting in the room must be bright enough to be considered "daylight" quality. Overhead lighting is preferred. If overhead lighting is not available, the source of light must not be behind you.

4. You must sit at a clean desk or table.

5. The following items must not be on your desk or used during your proctored exam, unless posted rules for the exam specifically permit these materials.

   - Books.

   - Paper.

   - Pens.

   - Calculators.

   - Textbooks.

   - Notebooks.

   - Phones.

6. The desk or walls around you must not have any writing.

7. The room must be as quiet as possible. Sounds such as music or television are not permitted.

The Computer You Use to Take the Test

1. The computer you are using to take the exam must not have more than one display or monitor. For example, if you usually use a laptop with a monitor connected, disconnect your monitor and use only the laptop screen.

2. You must close all other programs or windows on your testing computer before you begin the exam.

3. You must not use the following tools.

   - Programs such as Excel, Word, or PowerPoint.

   - Communication programs such as Skype.

   - Any website page other than the exam window in your course, including other content on edX.org.

Your Behavior

1. You must establish your identity by using a government-issued photo ID with a name that matches the full name you use in your edx.org account.

2. You must dress as though you were in a public setting.

3. You must not use headphones, ear buds, or any other type of listening equipment.

4. You must not communicate with any other person by any means.

5. You must not use a phone for any reason.

6. You must not leave the room during the exam for any reason, unless posted rules for the exam specifically permit you to do so.

Additional Time or Special Allowances

If you have a disability and need additional time or specific accommodations to take the exam, consult your organization's disability resources or the course team before you make any choices on the exam page. The course team must approve your request and make any adjustments before you start your exam.

ESTABLISHING A GRADING POLICY FOR YOUR COURSE

Use the topics in this section to learn about setting up grading for your course. Establishing a grading policy requires several steps, including deciding whether to include ungraded sections in your course.

Important: Any changes to the course grading policy, to graded subsections, or to graded components after a course begins will affect the student experience in the course and analysis of its data.

For information on how to develop your course content in the Studio Outline, see *Developing Your Course*.

14.1 Set the Grade Range

You must set the grade range for the course. For example, your course can be pass/fail, or can have letter grades A through F.

To set the grade range, from the **Settings** menu, select **Grading**.

The control for the grade range is at the top of the Grading page.
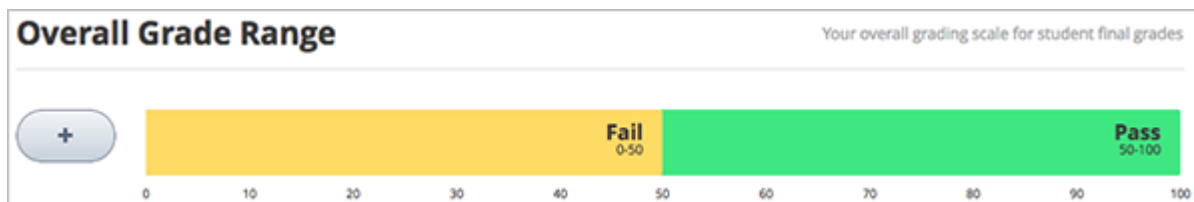
The above example shows that you have a pass/fail grade range, with a score of 50 as the cutoff. This is the default setting for a new course.

You can adjust the grade range as needed.

- To add a grade in the range, select the **+** icon.

  A new grade is added to the range between the existing grades. For example, if you add a grade in the default setting, the grade range changes to **F** (0 to 50), **B** (50 to 75), and **A** (75 to 100):
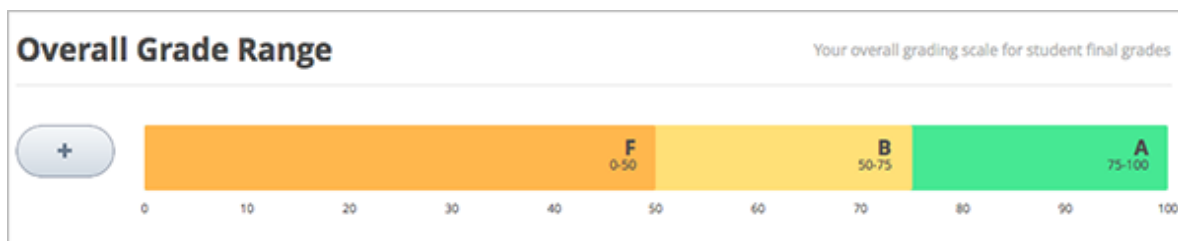
- To change the score range, move the cursor over the line dividing two grades and then select and drag the line left or right.

  You can see the range numbers of the two grades adjacent to the line change. Unselect the line when it is where you want it.

- To change the name of the grade, select the current name of the grade and start typing the name of the new grade. For example, if the original name of the grade is "Pass", you can select "Pass" and then type "Excellent" to replace the name.

  You cannot change **F** or **Fail**.

- To remove a grade, move the cursor so that it is over the grade.

  A **remove** link appears above the grade. Select the link.

  You cannot remove F or A.

After you make any changes to the grade range, you must select **Save Changes** at the bottom of the page.

14.1.1 Grade Ranges and Certificates

If you plan for your course to offer certificates, note that a learner will qualify for a certificate by earning any grade over the F, or Fail, threshold. This is true regardless of how many grade levels you add in the grade range.

For more information, see *Setting Up Certificates in Studio*.

14.2 Set the Grace Period

You can set a grace period that extends homework due dates for your learners. The grace period applies to the whole course; you cannot set different grace periods for individual assignments.

Note: The grace period setting does not apply to the following assignments and exams.

- Timed exams. For more information, see *Grant Learners More Time for a Timed or Proctored Exam*.

- Proctored exams.

- Open response assessments. For information about setting the response date for an ORA assignment, see *Specify Assignment Names and Dates*.

On the **Grading** page, under **Grading Rules & Policies**, enter a value in the **Grace Period on Deadline** field. Enter the value in `HH:MM` format.

14.3 Configure the Assignment Types

You must create assignment types for your course and determine the weight of the total grade for each assignment type.

For example, you might have the following assignment types.

- 10 homework assignments, worth a total of 50% of the grade;

- A midterm exam, worth a total of 20% of the grade;

- A final exam, worth 30% of the grade.

By default, a new course has the following four assignment types.

- Homework

- Lab

- Midterm Exam

- Final Exam

You can use these assignment types, modify or remove them, and create new assignment types.

To create a new assignment type, in the bottom of the Grading page, select **New Assignment Type**, then configure the fields described below.

Note: In a MOOC, some number of learners will experience personal emergencies, technical problems (such as power blackouts or loss of internet access), or other issues. You will not be able to grant individual extensions to such learners, but can provide some amount of flexibility for managing such issues by designing longer deadlines and allowing droppable assignments.

14.3.1 Assignment Type Fields

You configure the following fields for each assignment type.

- **Assignment Type Name:**

  The general category of the assignment. This name will be visible to learners.

  Note: All assignments of a particular type count the same toward the weight of that category. As a result, a homework assignment that contains 10 problems is worth the same percentage of a student's grade as a homework assignment that contains 20 problems.

- **Abbreviation:**

  This is the short name that appears next to an assignment on a learner's **Progress** tab.

- **Weight of Total Grade:**

  The assignments of this type together account for the percent value set in **Weight of Total Grade**.

  The total weight of all assignment types must equal 100.

  Note: Do not include the percent sign (%) in this field.

- **Total Number:**

  The total number of subsections in your course that contain problems of this assignment type.

- **Number of Droppable**

  The number of assignments of this type that the grader will drop. The grader will drop the lowest-scored assignments first.

14.4 Graded Subsections

After you configure assignment types, as you are organizing your course, you set the assignment type for subsections that contain problems that are to be graded.

You can set assignment types and due dates at the subsection level only. You cannot set assignment types or due dates for entire sections or for individual units within subsections. Additionally, you can designate a subsection as one, and only one, of the assignment types you configured.

The subsection level is also where you specify whether you want learners to receive immediate results when they complete problems in the subsection, or if you want to hide the results temporarily or permanently. For more information, see *Set Problem Results Visibility*.

Note: You can create problems in Studio without specifying an assignment type for the subsection. Scores for such problems are listed as "practice scores" on the learner's **Progress** page and do not count toward the learner's grade.

Hidden sections, subsections, or units that contain graded content are not included in grading and also do not count toward a learner's grade. For more information, see *Hiding Graded Content*.

Within a graded subsection, you create problems of the type designated for that subsection. You cannot mix problems of different assignment types in the same subsection.

For example, if you want to create a homework assignment and a lab for a specific topic, create two subsections. Set one subsection as the Homework assignment type and the other as the Lab assignment type. Both subsections can contain other content as well as the actual homework or lab problems.

For more information about creating problems and developing subsections, see *Working with Problem Components* and *Developing Course Subsections*.

For more information about designating a subsection as a graded assignment, see *Set the Assignment Type and Due Date for a Subsection*.

For more information about how to designate a subsection as a timed exam, see *Offering Timed Exams*.

14.5 The Learner View of Grades

After a grading policy is in place, learners can view both their problem scores and the percent completed and current grade on the **Progress** page for the course.
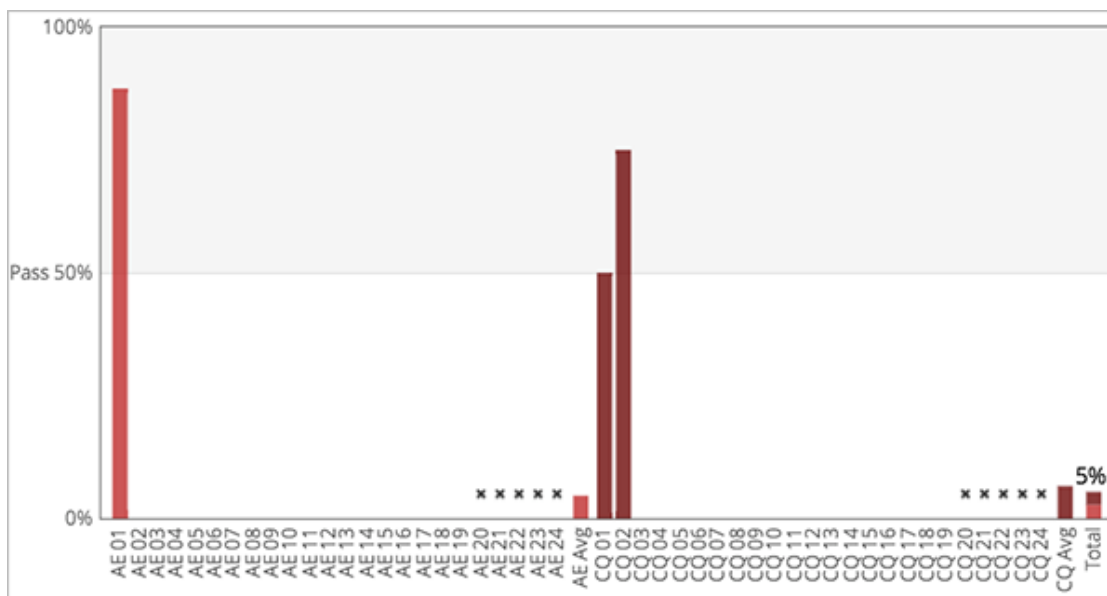
Note: If you have hidden the problem results for some assignments, these scores are not visible on the **Progress** page. The page shows only that the learner has completed the assignment. For more information about hiding problem results, see *Set Problem Results Visibility*.

Each item in the X axis of the chart is for a graded subsection. Graded problems in units are not broken out in the chart; the score from each problem in the subsection is added to that vertical bar.

Graded subsections are grouped in the chart by assignment type rather than listed in chronological order. For example, all homework exercises are grouped together, followed by labs, then exams.

Note: The **x** for an assignment in the Progress tab indicates that the grade for that assignment is currently dropped. You configure how many assignments are dropped when you *configure assignment types*.

RELEASING YOUR COURSE

15.1 Beta Testing a Course

This topic describes how to beta test your course.

- *Overview*
- *The Beta Testing Process*
- *The Beta Testing Role*
- *What to Test*
- *How Beta Testers See Course Content*
- *Adding Beta Testers*
- *Reporting Issues During a Course*

15.1.1 Overview

When you are designing a course in Studio, you can use the **Preview** or **View Live** options to test the course content, find gaps and errors, and mimic the learner experience. For more information, see *Testing Your Course Content*.

To gather information about the overall experience of taking a course, you can also conduct a beta test of the course.

15.1.2 The Beta Testing Process

During a beta test, you gather information about the experience of taking your course in an effort to improve its quality. The phases of the beta testing process, and some questions that you may find useful to consider as you prepare for each phase, follow.

1. **Planning**: What are your objectives for the test? What is the schedule for testing?

2. **Recruitment**: How many testers do you need? How much time do you expect testers to spend? When do you need them to complete their feedback?

3. **Provide access to your course**: Can testers access your entire course immediately, or are its sections and subsections available at different times? How will that affect the schedule?

4. **Collect feedback**: How do you want testers to provide feedback? Who checks for feedback, and how often?

5. **Evaluate feedback**: How is feedback evaluated? Who decides what changes to make as a result, and on what schedule?

6. **Conclusion**: How do you acknowledge the efforts of your testers? What do you share with them about the results of their efforts?

There is no one answer to any of these questions. They are included here as background on the role that beta testing can play in the preparation of your course.

15.1.3 The Beta Testing Role

Beta testers have early access to the course. Beta testers are not members of the course team: they do not have information about "how it is supposed to work". They use their own computers and Internet connections to view videos, follow links, and complete problems. They interact with the course as learners will to find, and make, mistakes.

However, beta testers are not the same as other learners in the course, either. They have privileged access to the course and have more time to review and complete the course materials than the enrolled learners do. Course discussions are not open before the course start date, so beta testers cannot participate in community conversations. As a result of these differences, beta testers do not receive certificates when they complete a course.

Note: If one of your beta testers wishes to earn a certificate for the course, she must create a separate user account with a different username and email address. She can then use that separate, non-privileged user account to enroll in the course and repeat the work, completing assignments and exams when they are available to all learners.

Qualities of Good Beta Testers

A beta test is valuable in part because it is unscripted. Your beta testers are not following a predetermined series of steps, or using a particular computer environment, when they access your course. When you recruit beta testers, however, you may find these skills and characteristics to be helpful.

- Curiosity.
- Attention to detail for identifying problems and inconsistencies.
- Solid communication skills for reporting problems to the course team.

Your beta testers should also have varying levels of knowledge about the course content:

- To recognize when material is wrong or missing, at least one tester should know the content well.
- To identify material that is unclear, at least one tester should be less familiar with the content.

Depending on the objectives you set for your beta test, you might want to consider recruiting testers who use assistive technologies, who have different native languages, or who have varying levels of familiarity with computer software.

Using Course Team Members as Beta Testers

The course team can provide valuable feedback about your course. However, they are typically stakeholders in the success of your course and have a significant amount of knowledge about it. As a result, they can be too close to the course to interact with it in the same way as learners will. They can also be either reluctant to provide feedback, or overly zealous.

If you do want a team member to be a beta tester, note that the privileges of the Staff or Admin role override those of a beta tester. The team member must use a different, second email address to create an additional edX account and enroll in the course, and the course team must assign only the beta tester role to that edX account. The course team member experiences the course as a learner only when she signs in to edX using the beta tester account.

15.1.4 What to Test

Beta testers should interact with everything in the course.

- Select all links.

- Watch all videos.

- Download video transcripts and other files.

- Complete all problems.

Beta testers can use a desktop computer to access an edX website, the edX mobile app on a smartphone, or both to complete their tests. As they work, beta testers log issues and questions for the course team.

15.1.5 How Beta Testers See Course Content

To beta test a course, you:

- Define a number of days before content releases for testing to begin.

    - For instructor-paced courses, this number applies to the release date for each section and subsection. Beta testers can only access course content the number of days you specify before each section or subsection is released.

    - For self-paced courses, this number applies to the course start date. Because sections and subsections for self-paced courses do not have individual release dates, beta testers can access all course content when the beta test begins.

- Identify beta testers.

Designated beta testers see course content before learners can. The matrix that follows shows the course content that beta testers can access earlier than other learners in an example instructor-paced course.

	Yes	No
Before the course enrollment date	X	
Before the course start date	X	
Before the section release day	X	
Before the subsection release day	X	
Before the unit is published		X
Before a draft replaces a live unit		X

The course team can continue to add content in Studio after the beta test begins. When new content is ready for testing, be sure to *publish the unit*.

Important: When you set up the beta test and define when it starts, verify that the first section, subsection, and unit in your course are available to be tested. If that first unit is not available, an error occurs when testers attempt to access any other content in the course.

Define When the Beta Test Starts

To define the start of the beta test, you use Studio to specify a number of days before the course start date for self-paced courses or before the section and subsection release dates for instructor-paced courses. For more information, see *How Beta Testers See Course Content*.

1. In Studio, from the **Settings** menu, select **Advanced Settings**.

2. In the field for the **Days Early for Beta Users** policy key, enter the number of days before content releases for beta testers to have access.

3. Select **Save Changes**.

Example

Beta tester access to course content for an instructor-paced course with **Days Early for Beta Users** = 20 and 2 sections:

Course enrollment date = 31 August	31 August; earlier if enrolled by course team
Course start date = 15 September	26 August
Section 1 release day = 15 September	26 August
section 2 release day = 22 September	2 September
Subsection 1 release day = 22 September	2 September
Subsection 2 release day = 24 September	4 September
Subsection 2, unit 1 visibility = public	4 September
Subsection 2, unit 2 visibility = public; draft in progress	4 September for public version; no access to draft
Subsection 2, unit 3 visibility = private	No access

In this example, the beta testers cannot access all of the content on the **Course** page when the beta test starts on 26 August: they can access section 1 but not section 2. You may want to provide a schedule of section availability to your testers so that they can plan their time appropriately. Future release dates do not display to the beta testers in the course.

15.1.6 Adding Beta Testers

Before you can add beta testers:

- You need the email address or username of each beta tester.

- Each beta tester must register and activate a user account for that email address/username.

When you add beta testers, note the following.

- If the beta test starts before the course **Enrollment Start Date**, testers cannot enroll themselves in your course. However, you can enroll the beta testers prior to the **Enrollment Start Date**.

- If you add the beta testers after the defined start of the beta test, and they are enrolled in the course, they see your course on their **Current Courses** dashboards when they log in.

- If you add beta testers before the test starts, or if they are not enrolled, they do not see your course on their dashboards. You can enroll the beta testers in the course yourself, and you may want to send an email message to remind them when the test begins.

Add Multiple Beta Testers

If you have a number of beta testers that you want to add, you can use the "batch add" option to add them all at once, rather than individually. With this feature, you have options to enroll the beta testers in the course (before or after the **Enrollment Start Date**) and send an email message to notify the beta testers that they have been added.

To add multiple beta testers:

1. View the live version of your course.

2. Select **Instructor**, and then select **Membership**.

3. In the **Batch Beta Tester Addition** section of the page, enter one or more addresses or usernames separated by commas or line feeds (the Enter key). You can also copy data from a CSV file of email addresses and paste it here.

4. To enroll the beta testers in your course, leave **Auto Enroll** selected. If the beta test starts before the course **Enrollment Start Date**, testers cannot enroll themselves in your course.

5. To send an email message to the beta testers, leave **Notify users by email** selected. An example of the message that is sent to a beta tester who is not enrolled in the course follows.:

```
Dear betatester,

You have been invited to be a beta tester for *course* at edge.edx.org
by a member of the course team.

Visit https://edge.edx.org/courses/course-name/about to join the course
and begin the beta test.
```

6. Select **Add beta testers**.

To remove the Beta Tester role from one or more users, enter their email addresses in the **Batch Add Beta Testers** field and then select **Remove beta testers**.

Note: When you select **Remove beta testers**, the **Auto Enroll** option is not affected. The user's role as a beta tester is removed, but they remain enrolled in the course.

Add Beta Testers Individually

1. View the live version of the course.

2. Select **Instructor**, and then select **Membership**.

3. In the **Course Team Management** section, select **Beta Testers**.

4. Under the list of users who currently have that role, enter the email address or username of the person you want to add.

5. Select **Add Beta Tester**.

   The person who you added appears in the list of beta testers.

Note: If the beta test starts before the **Enrollment Start Date** of your course, you can also enroll the beta tester. See *Enrollment*.

To remove the Beta Tester role from users individually, find the user in the list of beta testers, and then select **Revoke access** to the right of that user's email address.

15.1.7 Reporting Issues During a Course

Despite the efforts of the course team and the beta testers, additional problems, questions, and issues can occur while a course is running.

- Often, learners report issues by asking questions in a discussion. Your discussion moderation team can watch for posts that indicate problems.

- To let learners know the best way to report problems, you can post information in the course welcome message, or post it in a discussion.

15.2 Course Launching Activities

To launch a course, you prepare the course itself, the course team, and the learners. This topic describes on how to accomplish this.

- *Course Launch Checklist in Studio*
- *Course Launch Checklist Timeline*

15.2.1 Course Launch Checklist in Studio

You can access a course launch checklist from the **Course Outline** page and from the **Tools** menu. The checklist includes the following important items that you need to complete prior to launching your course.

- **Add a Welcome Message**: Personally welcome learners into your course and prepare learners for a positive course experience. See *Scheduling a Course Run*.

- **Create Your Course Grading Policy**: Establish your grading policy, including assignment types and passing score. All assignments add up to 100%. See *Establishing a Grading Policy For Your Course*.

- **Enable Your Certificate**: Make sure that all text is correct, signatures have been uploaded, and the certificate has been activated. See *Setting Up Certificates in Studio*.

- **Set Important Course Dates**: Establish your course schedule, including when the course starts and ends. See *Scheduling a Course Run*.

- **Validate Assignment Deadlines**: Ensure all assignment deadlines are between course start and end dates.

Note: The last two checklist items only appear for instructor-paced courses.

To help you communicate to the course team or to all course participants before the course launches and while it is running, you can send email messages from the LMS by selecting **Instructor** to access the instructor dashboard. For more information, see *Bulk Email Messages from the Course Team*. The topic on bulk email also includes a set of *example messages to learners* that you can use as guidelines when you write your own email messages.

15.2.2 Course Launch Checklist Timeline

As the start date for your course approaches, the following checklist or timeline of activities can help you make sure that your course, and your learners, are ready to begin. Suggestions for activities to complete before your course starts follow.

Verify Course Settings

- Check the course start date and time in Studio. See *Scheduling a Course Run*.

- Review the grading policy, and set a grace period for homework assignment due dates. See *Establishing a Grading Policy For Your Course*.

- Confirm that any optional features that you want your course to include, such as learner cohorts, are enabled and configured. See *Using Cohorts in Your Courses*.

Verify Certificates

- Make sure that certificates are correctly configured and ready to be issued. See *Setting Up Certificates in Studio*.

Review First Week Content

- Verify that all units are present and published. See *Developing Course Units*.

- Verify that videos, transcripts, and download links are in place and working. See *Working with Video Components*.

- Check all assignments for completeness and verify their due dates. See *Working with Problem Components*.

- Use edX Insights to review the answers that beta testers submitted for problems, and to proofread your display names, accessible labels, and answer text.

- Review feedback from the course team and beta testers to be sure that the content has been thoroughly reviewed and tested.

Welcome Learners

- Two months before the course start date, prepare and send a welcome email message to currently enrolled learners. See *Pre-launch Reminder* and *Send an Email Message to Course Participants*.

- Compose a welcome message and add it to the **Course** page. See *Add a Course Update*.

- Verify that a syllabus and other references are available on the **Course Handouts** page. See *Add a Course Handout*.

- One month before the course start date, prepare and send a welcome email message to currently enrolled learners.

- One week before the course start date, prepare and send a welcome email message to currently enrolled learners.

- Add an "Introduce Yourself" post to a discussion topic. For a MOOC, you may want to manage the size of the thread by distributing learner responses across multiple threads. For example, you can start different threads for introductions based on geographical location, such as "Introduce Yourself: Europe", "Introduce Yourself: North America", etc. See *Running Course Discussions*.

- On the course start date, prepare and send a launch email message to currently enrolled learners. See *Launch Day Welcome*.

Prepare the Course Team

- Define communication methods for all course contributors, including team members with the Staff, Admin, and discussion moderation team roles. For example, set up a course-specific email address.

- Verify that all course contributors know how to record their work, report issues, and collaborate on tasks.

- Verify that the people who will be Admins or Staff for your course have the correct role assignments in the LMS. See *Planning Course Staff*.

- Verify that the people you have given the Discussion Admin, Discussion Moderator, and Discussion Community TA roles have registered and activated their user accounts and enrolled in the course. See *Assigning Discussion Moderation Roles*. Note that team members with the Admin and Staff roles must also be given one of these roles to have discussion moderation privileges.

- Define methods for managing discussions and guidance for discussion moderators, and distribute to the discussion team. See *Moderating Discussions* and *Guidance for Discussion Moderators*.

15.3 Exporting and Importing a Course

When you have released your course, you can use the course export and import tools in Studio to save a backup copy of the course, and optionally re-import your course for editing. For more information, see *Export a Course* and *Import a Course* through Studio.

When you import and export a course, you work with *.tar.gz files*.

To duplicate an existing course for a new run, course creators can use the course re-run option. See *Re-running a Course*.

> **Caution:** Before exporting and importing a course, ensure that links in the course to other course content use the `/jump_to_id/<unit identifier>` syntax. If a link does not use the `/jump_to_id/<unit identifier>` syntax, the link will be broken if you export then import the course. For more information, see *Add a Link to a Course Unit*.

15.3.1 Export a Course

There are several reasons you might want to export your course. Examples follow.

- To save your work.

- To edit the XML in your course directly.

- To create a backup copy of your course, which you can import if you want to revert the course back to a previous state.

- To share with the team members of another course.

- To create a copy of your course that you can later import into another course instance and customize.

When you export your course, Studio creates a **.tar.gz** file that includes the following course data.

- Course content (all Sections, Subsections, and Units)

- Course structure

- Individual problems

- Pages

- Course assets

- Course settings

The following data is not exported with your course.

- User data

- Course team data

- Discussion data

- Certificates

- Prerequisite course subsection settings

To export your course, follow these steps.

1. From the **Tools** menu, select **Export**.

2. Select **Export Course Content**.

When the export completes you can then access the .tar.gz file on your computer.

15.3.2 Course Outline Terminology in Exported Files

Sections, subsections, units, and components have different names in the Studio **Course Outline** view and in the list of files that you see after you export your course and open the .xml files for editing. The following table lists the names of these elements in the **Course Outline** view and in a list of files.

Course Outline View	File List
Section	Chapter
Subsection	Sequential
Unit	Vertical
Component	Discussion, HTML, problem, or video

For example, if you want to find a specific section in your course when you open the list of files that your course contains, look in the **Chapter** directory. To find a unit, look in the **Vertical** directory.

15.3.3 Import a Course

> **Warning:** Content of the imported course replaces all the content of this course. **You cannot undo a course import**. We recommend that you first export the current course, so you have a backup copy of it.

There are several reasons you may want to import a course. Some examples follow.

- To load a course you developed outside of Studio.

- To run a new version of a course that was not created in Studio.

- To prepare course content for reuse in another learning system.

The course that you import must be in a .tar.gz file (that is, a .tar file compressed with GNU Zip). This .tar.gz file must contain a course.xml file in a course data directory. The tar.gz file must have the same name as the course data directory. It may also contain other files.

If your course uses legacy layout structures, you may not be able to edit the course in Studio. To make sure that your course is completely editable, ensure that all components are embedded in a unit.

The import process has five stages. During the first two stages, you must stay on the Course Import page. You can leave this page after the Unpacking stage has completed. EdX recommends, however, that you don't make important changes to your course until the import operation has completed.

To import a course, follow these steps.

1. From the **Tools** menu, select **Import**.

2. Select **Choose a File to Import**.

3. Locate the file that you want, and then Select **Open**.

4. Select **Replace my course with the one above**.

Note: When you import a course, important dates, such as the course start date and time, are overwritten. After the import is complete, you should check dates to ensure they are set as intended. For more information, see *Scheduling a Course Run*.

15.3.4 Work with the .tar.gz File

Courses are exported and imported in .tar.gz files containing OLX (open learning XML), the edX markup format for open course exchange. For more information about OLX, see the EdX Open Learning XML Guide.

To extract and compress .tar.gz files, you use a third-party program.

If you are using Microsoft Windows, see the following resources.

- How to Unpack a tar File in Windows

- How to Extract a Gz File

- The gzip Home Page

- The Windows section of the How to Open .tar.gz Files page

If you are using a Macintosh computer, see the following resource.

- The Mac OS X section of the How to Open .tar.gz Files page

MANAGING A RUNNING COURSE

Use the topics in this section to learn about managing a course that is currently running, including enrolling or unenrolling learners, and sending email to learners in the course.

16.1 Course Information

After you create a course in Studio, you can access information about it on the instructor dashboard. The instructor dashboard is part of the LMS.

- *View Basic Course Information*

16.1.1 View Basic Course Information

On the Course Info page, you can find the following information.

- Identifying information about the course.
- Whether the course has started or ended.
- The number of sections in the course.
- The defined grade cutoff for passing or failing.

To view this course data, follow these steps.

1. View the live version of your course.
2. Select **Instructor** to open the instructor dashboard.
3. On the instructor dashboard, select **Course Info**.

   The **Basic Course Information** section of the page that opens lists the following information about the course.

   - **Course Name**: Specified when you create the course. Becomes part of the course URL. For more information, see *Course Title Guidelines*.
   - **Course Run**: Specified when you create the course. Becomes part of the course URL, and cannot be changed.
   - **Course Number**: Specified when you create the course. Becomes part of the course URL. For more information, see *Course Number Guidelines*.
   - **Organization**: Specified when you create the course. Becomes part of the course URL, and cannot be changed.

- **Course Start Date**: The date and time that the course is scheduled to start. For more information, see *Guidelines for Start and End Dates*.

- **Course End Date**: The date and time that the course is scheduled to end. For more information, see *Guidelines for Start and End Dates*.

- **Has the course started?**: Derived from the **Course Start Date** value and the current date.

- **Has the course ended?**: Derived from the **Course End Date** value and the current date.

- **Number of sections**: The total number of sections created for the course. Includes all course sections, regardless of publication status, release date, or other settings that affect whether learners have access to the sections.

- **Grade Cutoffs**: Specified when you define the cutoff for a failing grade. Learners who earn exactly the cutoff value pass the course. For more information, see *Set the Grade Range*.

Additional data about the course and its learners is available from other pages in the instructor dashboard, and from Insights.

To access the data visualizations, metrics, and reports that are available in Insights from the instructor dashboard, select the link in the banner at the top of each page. For more information, see Using edX Insights.

16.2 Automatic Email Messages from the Open edX Platform

To help learners become and remain engaged in a course, the Open edX platform can send automatic email messages that notify learners of responses to discussion posts.

Note: Before the system can send automatic email messages for any courses, a system administrator must enable automatic messages on the instance of the Open edX platform. For more information, see Enable Discussion Notifications.

16.2.1 Automatic Email Message Text

After a learner or course team member creates a post in the course discussions, the platform sends the following email message the first time a learner or course team member replies to the original post.

```
Subject: Response to <title of post>

<username> replied to <title of post>:

  <text of comment>
```

The message also contains a **View discussion** option that takes the learner to the discussion post.

The platform does not send individual messages for any additional replies on the post. For more information, see Receiving Notifications.

16.3 Bulk Email Messages from the Course Team

For courses on edx.org, you can send bulk email messages to course participants directly from the instructor dashboard: in the LMS, select **Instructor**, and then select **Email**.

Your messages can use HTML styling, and can include links to videos, social media pages for the course, and other material. All course team members who have the Staff or Admin role can use bulk email messages to communicate with course participants before, during, and after the course run.

Learners are less likely to read and respond to email messages from courses when they receive too many of them. As a best practice, do not send more than one email message per week to course participants, unless there is good reason to do so.

Note: Some courses use third party services such as MailChimp to send bulk email. Do not use both a third party service and the edX bulk email service. If you use more than one service to send email message, your messages are more likely to be marked as spam, and learners might not read them.

This section contains the following topics.

- *Message Addressing*
- *Composing Email Messages*
- *Send an Email Message to Course Participants*
- *Send a Scheduled Email Message to Course Participants*
- *Use Keywords in Messages*
- *Message Workflow States*
- *Review Sent Messages*
- *Email Task History Report*
- *Example Messages to Learners*

16.3.1 Message Addressing

When you send a bulk email message from the instructor dashboard, you choose its recipients by selecting a **Send to** option. You can select one or more recipient groups for each message. For details about who is included in each of the preset recipient groups, see *Who Is Included in Each Recipient Group?*

When you send a message to more than one recipient group, duplicate recipients are filtered out, so that someone who belongs to more than one of the recipient groups only receives one copy of the message. For example, if you address an email message to learners in a particular cohort as well as to learners in the Verified enrollment track, a learner who is in the cohort AND is in the Verified enrollment track will only receive one email message.

The following preset recipient groups are available.

- **Myself**. Send an email message only to yourself, to test and review the message before sending it to a larger group.

- **Staff and Administrators**. Send an email message to members of the course team who have Staff or Admin privileges. For information about course team member privileges, see *Planning Course Staff*.

- **All Learners**. Send an email message to all currently enrolled learners. This group does not include learners who have not activated their accounts, or who have opted out of receiving email communications. This group does not include course team members, even if they are enrolled in the course.

If you have more than one enrollment track in your course, each enrollment track is available as a separate recipient group. For more information, see *Sending Email Messages to Learners in Different Enrollment Tracks*.

If you have cohorts enabled in your course, each cohort is available as a separate recipient group. For more information, see *Sending Email Messages to Learners in Cohorts*.

Who Is Included in Each Recipient Group?

When you send a bulk email message to one of the preset recipient groups, you should be aware of who is included in each group.

Note: It is considered good practice to only send messages to active and engaged learners. For this reason, regardless of the recipient groups selected, edX will only send email messages to learners in a course run who have logged in within the last 18 months. This helps reduce the risk of messages being marked as spam (or bouncing) and helps ensure the continued delivery of bulk course email messages through edX's email providers.

Recipient Group	Includes	Does Not Include
Staff and Administrators	• Any course team member who has the **Staff** role. • Any course team member who has the **Admin** role.	• Beta testers who do not also have the **Staff** or **Admin** role. • Discussion moderators who do not also have the **Staff** or **Admin** role. • Discussion administrators who do not also have the **Staff** or **Admin** role. • Learners who have the Community TA or Group Community TA discussion moderator roles.
All Learners	• All currently enrolled learners in your course, including those who have enrolled but have not yet accessed the course.	• Learners who have not replied to the account activation email message that they received when they registered on edx.org. • Learners who have opted out of receiving email messages through the **Email Settings** link for the course on the learner's dashboard. • Course team members, regardless of whether they are enrolled in the course.

Sending Email Messages to Learners in Different Enrollment Tracks

If you have more than one enrollment track in your course, each enrollment track is available as a separate recipient group. If your course includes only a single enrollment track, you will not have a track-based recipient group.

For example, if your course includes an audit track and a verified certificate track, you have two additional recipient groups: **Learners in the Audit Track** and **Learners in the Verified Certificate Track**.

Sending Email Messages to Learners in Cohorts

If you enable cohorts in your course, each cohort is available as a separate recipient group. The recipient groups for individual cohorts only include enrolled learners who have been assigned to a cohort, whether they were automatically assigned when they accessed the course or manually assigned to a cohort by a member of the course team.

The recipient groups for cohorts do not include enrolled learners who have not been added to a cohort. This might be the case if they have not accessed the course or have not been manually added to a cohort by a member of the course team. To make sure such learners are included in email messages that are intended for all enrolled learners, select the **All Learners** recipient group instead of selecting all of the cohort recipient groups.

If a default cohort exists in your course, a recipient group named **Cohort: Default Group** is also available.

Note: The default cohort is created only if you have not created at least one automated assignment cohort in your course by the time the first learner accesses course content. If learners access the course before you have created any automated cohorts, they are automatically placed in the default cohort, to ensure that all learners in the course belong to a cohort. You can manually reassign learners from the default cohort to another cohort. For more information, see *Ensuring That All Learners Are Assigned: The Default Cohort*.

16.3.2 Composing Email Messages

When you compose an email message, you can use the following options.

- *Styling*
  - *Restricted HTML Content*
- *Images*
- *Keywords*

Styling

Messages can include HTML styling, including text formatting and links.

For more information, see Working with Text Components.

Restricted HTML Content

The Bulk Course Email tool restricts use of specific HTML elements from being used in messages. The following HTML elements may not be used in messages authored with this tool:

- iframe

- svg

- form

- script

Images

Messages can include images. To include an image, you must first add the file to your course on the **Files & Uploads** page. For an email message, you copy the **Web** URL that the system assigns to the image. Then, in the email message editor, you select the **Insert/edit image** icon to add the web URL.

Note: Scalable Vector Graphic (SVG) images are restricted from use in messages authored with the Bulk Course Email tool. Please see the above note in the *Restricted HTML Content* section.

To ensure that your course assets are transmitted securely, add the `https://` preface to the web URL. An example follows.

```
https://courses.edx.org/asset-v1:{course}.x+{run}+type@asset+block@{image}.jpg
```

For more information, see *Adding Files to a Course*.

Keywords

Messages can include variables that represent values that are specific to each message recipient, such as learner name or user ID. The LMS substitutes these variables, called keywords, with actual values when it sends a message.

For more information, see *Use Keywords in Messages*.

16.3.3 Send an Email Message to Course Participants

Important: You cannot cancel non-scheduled bulk email messages after you send them.

Before you send a message to a wide audience, send the message only to yourself to test and review it. Make sure it displays as you intend it to, and that any links or media function correctly.

To send an email message to course participants, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Email**.

3. From the **Send to** option, select one or more groups of email recipients.

Note: Make sure you understand who is included or excluded when you send a message to one, or a combination, of the recipient groups. For details, see *Who Is Included in Each Recipient Group?*

4. In the **Subject** field, enter a subject for the message.

5. In the **Message** box, enter the text for the message.

   For details about options for composing your message, see *Composing Email Messages*.

6. Select **Send Email**. A bulk email task is queued for processing.

Multiple courses use the same queue to complete these tasks, so it can take some time for your message to be sent to all of its recipients. You can perform other tasks on the instructor dashboard or navigate to other pages while you wait for your message to be sent.

16.3.4 Send a Scheduled Email Message to Course Participants

We have introduced a way to schedule a bulk email message to be sent at a specified date and time in the future. Once a message has been scheduled, and until the message has been sent, it will be possible to view, edit, or cancel these messages.

Important: Messages may not be sent at the *exact* time specified

Note: We check the message schedules every fifteen minutes. For example, A message scheduled to be sent at 09:10:00 will not be processed until 09:15:00. Once the schedule for a message has elapsed it will be sent. When processed, these messages will be placed on the same queue that non-scheduled messages use, so it may take some time for your message to be sent to all recipients.

To send a scheduled email message to course participants, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Email**.

3. From the **Send to** option, select one or more groups of email recipients.

   Note: Make sure you understand who is included or excluded when you send a message to one, or a combination, of the recipient groups. For details, see *Who Is Included in Each Recipient Group?*

4. In the **Subject** field, enter a subject for the message.

5. In the **Message** box, enter the text for the message.

   For details about options for composing your message, see *Composing Email Messages*.

6. Check the **Schedule this email for a future date** checkbox. This also updates the **Send Email** button to a **Schedule Email** button.

7. Enter a date (in the future) within the **Send date** field, or optionally click on the calendar icon to open up a date picker to assist in selecting a date for the message.

8. Enter a time within the **Send time** field, or optionally click on the clock icon to open up a time picker.

9. Select **Schedule Email**. A bulk email task is then scheduled for processing.

Managing Scheduled Email Messages

Once a message has been scheduled it will appear in the **Scheduled emails** table. Each entry will describe *when* the message will be sent (in local time), the *recipient groups* selected, the *subject* of the message, and the *author* of the message.

Scheduled emails

Showing 1 of 1.

Send date	Send to	Subject	Author	Action
8/6/2022, 4:59:00 PM	myself, learners	scheduled message 2	edx	👁 🗑 ✏

Showing 1 of 1.

Each scheduled email entry in this table will support the following actions:

- The *View* button will open a modal that allows you to view the contents of this message.

- The *Delete* button will cancel the scheduled bulk email task and the message will **not** be sent. This sets the bulk email task's status to **REVOKED**.

- The *Edit* button will allow you to edit the bulk email message. You will be able to adjust the recipients, subject, message contents, and/or the date and time the message should be sent.

16.3.5 Use Keywords in Messages

You can include keywords in your messages. A keyword is a variable: when you send the message, a value that is specific to the each recipient is substituted for the keyword. For example, when you use the `%%USER_FULLNAME%%` keyword, each message contains the name of the recipient.

Note: Do not use keywords in the Subject line of a message. The keyword in the subject will not be assigned a value, and the recipient will see the keyword text.

Supported Keywords

You can use the following keywords in your messages.

- `%%USER_ID%%` - the anonymous user ID of the message recipient

- `%%USER_FULLNAME%%` - the full name of the message recipient

- `%%COURSE_DISPLAY_NAME%%` - the display name of the course

- `%%COURSE_END_DATE%%` - the end date of the course

Keyword Formatting

You format keywords as: %%Keyword%%. You can include keywords in any HTML tags in an email message. An example follows.

```
<h2>%%COURSE_DISPLAY_NAME%% Updates</h2>

<p>Dear %%USER_FULLNAME%%, this is a reminder that the last day of the course
   is <b>%%COURSE_END_DATE%%</b></p>
. . .
```

16.3.6 Message Workflow States

When you select **Send Email** for a message, the server begins to process a bulk email task. The server assigns a series of different workflow states to the task.

When you select **Schedule Email** for a message, the server creates a bulk email task and sets it to the **SCHEDULED** state. This task will remain in this state until it is ready to be processed.
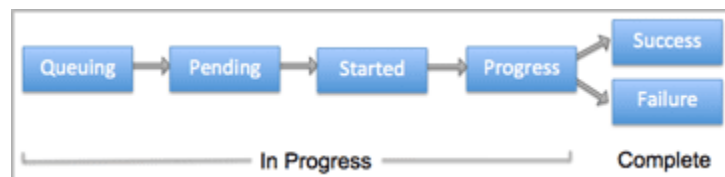
Bulk email tasks can have the following workflow states.

- Queuing: The bulk email task is created and being queued for background processing.

- Pending: The task is queued and is waiting to run.

- Scheduled: The task has been created and is scheduled to run at a future date and time.

- Started: Background processing is in progress to create emailing subtasks.

- Progress: The emailing subtasks are in progress.

- Success: All emailing subtasks are complete. Note that the bulk email task can be in this state even if some or all of its emailing subtasks failed.

- Failure: An error occurred and task processing did not complete successfully.

- Revoked: The task was cancelled before it was processed.

While the bulk email task is in progress, you can find out what stage it has reached in the workflow by checking the **Pending Tasks** section on the **Course Info** page of the Instructor Dashboard.

When the bulk email task is complete, you can find its final state by checking the Email Task History report. For more information, see *Email Task History Report*.

16.3.7 Review Sent Messages

You can review a list of all of the messages that have been sent for the course. For any listed message, you can review the subject, the username of the person who sent it, the date and time sent, its selected recipients, and the message text.

1. View the live version of your course.

2. Select **Instructor**, and then select **Email**.

3. In the **Email Task History** section of the page, select **Show Sent Email History**. The list of sent messages displays.

1. To review additional information for a sent message, select its subject. The message opens in a dialog box.

1. Optionally, use the message as the basis for a new message: select **Copy Email to Editor**. The dialog box closes and you can edit the text, links, and formatting that were duplicated into the **Subject** and **Message** fields.

   When you create a message by copying a previously-sent message, be sure to review and test it thoroughly before you send it to all course participants.

16.3.8 Email Task History Report

The Email Task History report can help you keep track of who sent messages, when, to which groups, and how many messages were successfully sent. For each message sent, the report includes the username of the requester, the date and time it was submitted, the duration and state of the entire task, the task status, and the task progress.

You can use this history to investigate questions relating to bulk email messages that have been sent, such as these examples.

- How frequently learners are sent course-related email messages.

- Whether a message was sent successfully.

- The change in the number of people who were sent course-related messages over time.

To produce the Email Task History report, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Email**.

3. In the **Email Task History** section of the page, select **Show Email Task History**. A report like the following example displays on the instructor dashboard.

Review Email Task History

For tasks with a **State** of Success, the **Task Progress** column shows an informational message. These messages can have a format such as "Message successfully emailed for 13457 recipients (skipping 29) (out of 13486)". To interpret this message, note that:

- The first number ("recipients") indicates the number of messages sent to the selected recipients.

- The second number ("skipping") indicates the number of enrolled and activated users who were not sent the message. This count is of learners who have opted not to receive course email messages.

- The final number ("out of") indicates the number of users in the set of recipients you selected who were enrolled in the course (and had activated their user accounts) when you sent the email message.

  Note that the **Total number of enrollees** shown in enrollment data in Insights includes all currently enrolled learners, regardless of account activation status, and as a result can be different than this "out of" number.

If the "recipients" and "out of" numbers are the same, the message reads "Message successfully emailed for 13457 recipients" instead.

Other **Task Progress** messages for tasks with a **State** of Success indicate that some or all of the emailing subtasks did not successfully send email:

- "Message emailed for {number succeeded} of {number attempted} recipients"

- "Message failed to be emailed for any of {number attempted} recipients"

- "Unable to find any recipients to be emailed"

No **Task Progress** messages display for tasks that have a **State** of Failure.

16.3.9 Example Messages to Learners

You can use these example messages, prepared for delivery before typical course milestones, as models for your own course communications.

- *Pre-launch Reminder*
- *Launch Day Welcome*
- *Reminder to Register for Verified Certificate*
- *Weekly Highlights*
- *Mid-Course Encouragement*
- *Mid-Course Event*
- *Technical Issue*
- *Course Farewell and Certificates*
- *New Course Run Announcement*

These messages are styled as email messages, but you could also post this information in a course discussion topic or in a course update. To use *keywords*, you must send email messages; keywords are not supported in discussion topics.

Important: Revise these message templates carefully to include facts for your own course, meet the needs of your learners, and reflect your own objectives and personality. Search for the "{" and "}" characters to locate prompts and replace them with course-specific values.

Some of these messages also contain *keywords*. Values specific to your course and the recipients will be substituted for the keywords when you send the messages. Ensure you are using keywords appropriately for your course and objectives.

Pre-launch Reminder

Pre-launch reminders raise awareness of the course start date, publicize the course, and generate excitement. In addition to the course start date and time, the example that follows also lets learners know that:

- UTC is used in edX courses. Alternatively, you could include information about your course or the edX platform that will contribute to your learners' success.

- The course has a companion social media site. Alternatively, you might include information about planned meetups or other community-building opportunities.

You may want to send out more than one message before the course launches: use this template as a starting point for crafting the different messages you want to deliver. Replace values enclosed by {braces} with information that applies to your course. In addition, check that you are using *keywords* appropriately.

```
Subject: {course number} Starts Soon!

Hello %%USER_FULLNAME%%,

We are excited that you are joining us for {course number}
```

```
%%COURSE_DISPLAY_NAME%%, offered by {organization name} through edX. Class
begins on {day}, {date} at {time} UTC (which is {time} {local time zone}).
Note that many dates and times in edX courses appear in your local time zone,
but some might appear in Coordinated Universal Time (UTC). Dates and times
that use your local time zone are followed by an indication of the time
zone: for example, 17:00 Sept. 5, 2016 IOT. UTC dates and times do not
have a time zone indicator. For UTC times, you might want to use a time zone
converter such as {link}.

In case you haven't already found it, {course number} has its own official
Facebook page {add link}. You can find videos and photos posted there before
the course even begins.

If this is your first edX course, consider enrolling in the edX Demo course
{add link}. This course gives you an opportunity to explore the edX platform
and learn how to answer problems and track your progress, before {course
number} begins.

Your {course number} course staff
```

Launch Day Welcome

On your course start date, you can send an email message that both welcomes learners and gives them specific actions to accomplish. This example directs learners to two of the course pages to encourage exploration and discovery, and personally introduces the course team leader. Search for the values enclosed by {braces} in this template and replace them with information for your course.

```
Subject: {course number} Starts Today!

Hello everyone!

At this time, edX course {course number} is available from your Dashboard
{add link}, and the staff would like to officially welcome you to the course!
You'll find materials for the first week on the Course page,
including both video lectures and problem sets.

Please take some time to go to the Home page to read the handouts
and get familiar with course policies and philosophy.

I will be your course lead and I hope you will all have a great time learning
{subject}! It may be challenging, it may be frustrating, but it will be
rewarding and you will learn a ton.

On behalf of the staff, welcome, good luck, and have fun!

{name} and the {course number} staff
```

Reminder to Register for Verified Certificate

After your course has launched, you can send an email to remind learners that the last day to register for a verified certificate is approaching. You can use this template as a starting point for your own message; search for the values enclosed by {braces} and replace them with information for your course. In addition, check that you are using *keywords* appropriately.

```
Subject: Earn an edX verified certificate for {course name}!

Dear %%USER_FULLNAME%%,

Interested in using an edX certificate to bolster a college application or to
advance your career? With an edX verified certificate, you can demonstrate to
colleges, employers, and colleagues that you successfully completed a
challenging edX course, while helping to support the edX mission.

We would like to remind you that {date} is the last day to register for a
verified certificate in %%COURSE_DISPLAY_NAME%%. Registering for a
certificate is easy! Just go to this course on your edX dashboard and click
"Challenge Yourself".

Good luck!

{name} and the {course number} staff
```

Weekly Highlights

Sending a weekly email to learners can be a great way to keep them engaged and provide encouragement. At the end of each week you might send learners an email that summarizes the content covered, and reminds learners about upcoming assessments or milestones in the course. Optionally, to encourage participation in the discussion forums, you might also highlight particularly interesting or important discussions, and provide links to the discussion topics.

You can use this template as a starting point for designing your own message, omitting the discussion highlights if they are not appropriate for your course (the example discussion highlights are from a course about urban solutions to the global water crisis). Search for the values enclosed by {braces} and replace them with information for your course. In addition, check that you are using *keywords* appropriately.

```
Subject: {Course Name} Week 1 Highlights

We hope you all had a great week! Below, we have provided links to some
exciting discussions that have been going on, and a Q&A video with
{Professor} that recaps some of the questions that have come up this week.

We'd also like to remind you to take this week's quiz by {date} at {time}
UTC. The next module will be available on {Time and Date}.

{Link to Video}

Here are a few highlights from the discussion forum this week. Please join us
online and keep the conversation going!

* There has been quite a debate over whether urban stream restoration is
  possible and what types of restoration are desirable. How can we improve
```

(continues on next page)

```
   restoration practice and its outcomes? {Link to the Discussion}

* Please continue to share your stories of urban stream restoration - there
  are many great examples here of what is possible! {Link to the Discussion}

See you next week,
{name} and the {course number} staff
```

Mid-Course Encouragement

While your course is running, you can send messages to promote community, remind learners of upcoming due dates, and address any recurring issues.

This example gives learners guidance on how to keep up with the course schedule and encourages contributions to the discussions. You may want to send out more than one message while the course is running. You can use this template as a starting point for your own messages; search for the values enclosed by {braces} and replace them with information for your course. In addition, check that you are using *keywords* appropriately.

```
Subject: {course name} Announcements

Dear students,

We hope that you are learning a lot in {course number}! Remember that problem
set {number} is due on {date} at {time} UTC. You can always check the
schedule {add link} on the Home page to plan ahead.

The contributions to the course discussions have been amazing. You'll also
see on the Home page that we have made several of you community
TAs to thank you for your thoughtful contributions. Keep those conversations
going!

We have a few additional announcements.

* Week {number} on {subject} is now available on the Course page.

* Problem set {number} is also available. It is due on {date} at {time} UTC.

* Remember that the due dates for problem sets and exams are in UTC (the GMT
  time zone). See the current UTC time here {add link}. Please convert the
  times given to your own time zone!

Wishing you continued success in the course,

{name} and the {course number} staff
```

Mid-Course Event

Before an exam or other significant course event, messages can provide practical information about the exam, communicate expectations regarding conduct, and also encourage learners to continue working toward course completion. This example lets learners know:

- How long they have to complete the exam, and when they can see answers to questions.

- How to communicate any errors or other issues found during the exam to the course staff.

- Whether the course discussions will be open or closed during the exam. (In the example that follows, the discussions will remain **open**.)

- What constitutes an honor code violation.

- What technical limitations, if any, are imposed by external tools such as graders.

Be sure to search for the values enclosed by {braces} and replace them with information for your course. In addition, check that you are using *keywords* appropriately.

```
Subject: {course number} Exam Info

Hello %%USER_FULLNAME%%,

Great job working through week {number}! As you know, the {course number}
exam is next week. If you missed a problem set, you can still earn a
certificate. Each problem set is worth only {number}% of the overall grade,
but this exam is worth {number}%.

Please read this important information about the exam before you begin taking
it.

* The exam starts on {date} at {time} UTC and must be finished by {date} at
  {time} UTC. Plan your schedule accordingly.

* Be sure that you know what time the UTC deadline is in your time zone. See
  the current UTC time {add link}. No extensions will be given.

* The exam is not timed. You can start, stop, and come back to it until the
  deadline.

* Each exam question allows only one answer submission. If you accidentally
  click "Check", that problem cannot be reset for you.

* The exam covers everything (video lectures, reading, and problem sets) from
  weeks {number}-{number}. If you missed any of these materials, you will
  want to review them before you take the exam.

* You can use the textbook and the Internet to clarify your knowledge of exam
  topics, as long as you are not deliberately looking up answers to exam
  questions.

* Course discussions will remain open during the exam, but anyone who posts
  an answer to an exam question will be violating the honor code and risk
  being removed from the class, forfeiting the certificate.
```

```
* If you need to alert the staff to an issue with the exam while the exam is
  open, add a post to the General discussion topic and include [EXAM] in
  the subject line.

* Check the Home page periodically. It is the fastest way the
  staff has to communicate any delays, corrections, or changes.

Good luck!

{name} and the {course number} staff
```

Technical Issue

In the event of an unanticipated system failure, a message can both alert learners to the problem and reassure them that the issue is either resolved or being addressed. The message can also provide information about any changes made to the course as a result.

Technical issues can arise during a course for many different reasons, so this example is likely to need revision to apply to an issue that you encounter. Keep in mind that to reassure the learners who are affected by the problem, the message should have a positive tone, and calmly and briefly identify the problem, the status of its solution, and any after effects.

```
Dear students,

We've encountered a technical problem with {video, assignment, etc. name}.
{We are working to resolve it now. / This issue has been fixed.}

As a result of this issue, we have {extended the deadline for / rescored}
this assignment so that it will not affect your grade.

Thanks for your patience, and we look forward to continuing the course with
you.

{name} and the {course number} staff
```

Course Farewell and Certificates

In the last few days before your course ends, a message can direct learners to a course survey, answer questions about certificates, and provide information about future access to course materials. Be sure to replace values enclosed by {braces} with information for your course.

```
Subject: {course number} Final Remarks

Dear %%USER_FULLNAME%%,

Thank you for making %%COURSE_DISPLAY_NAME%% so much fun these last few
months! We had a great time getting to know you through the course
discussions. We appreciate the effort that you put into this course, and we
hope that you enjoyed learning {subject} through edX. With or without a
certificate, you should be proud of your accomplishments.
```

```
* Please take a few minutes to answer the exit survey, now available on the
  Course page. We will use your responses to improve the course in the
  future.

* If you qualify for a certificate (overall score {number}% or higher), the
  edX dashboard will include a link to your certificate in the near future.
  While you may see the link in a few days, it can take up to two weeks for
  edX to generate all of the course certificates.

* As an enrolled student, you will have access to the lecture videos even
  after the course ends. Assessments will remain, but you will no longer be
  able to submit answers to any problem sets or exams with due dates.

* The {course number} discussions close on {date} at {time} UTC. You will not
  be able to add to the discussions after that time, but you will be able to
  continue viewing all of the conversations that took place during the
  course.

We hope that you share what you learned in {course number} with your
colleagues, friends, and family.

Good luck on the final exam and beyond!

{name} and the {course number} staff
```

New Course Run Announcement

When you prepare a course for a new run, you can use the bulk email feature in its previous run (or runs) to inform an engaged and knowledgeable audience: your former learners. Announcing a new run to learners of an earlier run gives you the opportunity to highlight key aspects of the course, such as the quality and variety of its discussions, or the global interest and relevance of the subject, as demonstrated by past enrollment. You can also reveal new features or content that have been added to the new course run. By emphasizing the value of the course, you get people thinking and talking about their experiences, build excitement, and encourage re-enrollment.

This message template offers learners who did not complete the course, or who did not previously choose the verified certificate track, the opportunity to do so. It also invites learners to share the course with colleagues and and friends.

When preparing a message from this template, search for values enclosed by {braces} and replace them with information that applies to your course.

```
Subject: Announcing a new run of {course name}

Hello {course number} learners,

The next run of {course number} {course name} begins on {date}! We are glad
to share this news with you, the students who made the earlier run{s} of
{course number} so successful.

{Success story from the previous run.}

{New content or features for the upcoming run.}
```

```
Perhaps you want to share the {course name} experience with a friend or
colleague, earn an ID-verified certificate of achievement, or work through
course content that you weren't able to complete before. When {course number}
is offered in {time frame}, we welcome you to join the community of learners
again.

To learn more and to enroll, visit the {course name} page {add link}.

We hope to see you in the course,

The {course number} Staff
```

16.4 Enrollment

Learners can enroll themselves in a course during its defined enrollment period.

The course creator and course team members with the Staff and Admin roles can enroll learners in a course. These course team members can also unenroll learners.

- *Registration and Enrollment*
- *Options for Enrolling Learners in a Course*
- *Enroll Learners in a Course*
- *Report Learners Not Yet Enrolled*
- *Unenroll Learners from a Course*

Data about course enrollment is available in the LMS, by selecting **Instructor** to access the instructor dashboard and from Insights. For more information, see *Report Learners Not Yet Enrolled*.

16.4.1 Registration and Enrollment

Before a learner can enroll in a course, he or she must complete these steps.

1. Register a user account, which includes supplying a valid email address, on `www.edx.org`, `edge.edx.org`, or your implementation of the edX platform. Each platform requires a separate user account.

2. Activate the registered account by following the emailed instructions.

As long as the course enrollment end date has not passed, learners who have registered and activated user accounts can enroll themselves in `www.edx.org` courses, or can enroll in other courses if they know the URL.

Course creators, Admins, and Staff, however, can enroll learners in a course either before or after the learners register their user accounts.

Important: Course team members are not automatically enrolled in courses, although they can access content in Studio, the LMS, and Insights. To work on a course, every course team member must register, activate a user account, and enroll in the course.

16.4.2 Options for Enrolling Learners in a Course

You enroll learners, and other course team members, in your course by supplying their email addresses. After the enrollment end date for a course learners can no longer enroll themselves. However, you can still explicitly enroll learners.

Note: When you enroll learners in a course, all learners are automatically enrolled in the audit enrollment track. For more information about course enrollment tracks, see *enrollment track*.

When you enroll people in a course, you have the following options.

- **Auto Enroll**. When you choose this option, the people who you enroll do not need to complete an explicit course enrollment step. Of the list of email addresses that you supply, those that correspond to a registered user account are immediately enrolled in the course, and your course displays on the **Current Courses** dashboard for those users on log in. Email addresses on the list that do not match a registered user account are enrolled as soon as that account is registered and activated.

  You can track the enrollment status of the learners who you auto enroll. For more information, see *Report Learners Not Yet Enrolled*.

  If you do not select **Auto Enroll**, the people who you enroll must also actively locate your course and enroll themselves in it. These learners see the course on their dashboards after they have done so.

- **Notify learners by email**. When you choose this option, an email message is automatically sent to each of the email addresses that you supply. The message includes the name of the course and, for learners who are not already enrolled, a reminder to use that same email address to enroll.

16.4.3 Enroll Learners in a Course

To enroll learners or course team members, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Membership**.

3. In the **Batch Enrollment** section of the page, enter the username or email address of the learner, or enter multiple names or addresses separated by commas or new lines.

   You can copy and paste data from a CSV file of email addresses. However, note that this feature is better suited to courses with smaller enrollments, rather than courses with massive enrollments.

4. For **Role of the users being enrolled**, select the role of the learner.

   - If the learner is a member of the course staff, select **Partner**.

   - If the learner is not a member of the course staff, select **Learner**.

   Note: All of the users that you enroll at one time must have the same role. If you have some users who are partners and others who are learners, you must complete two batch enrollments.

   ---

5. In the **Enter the reason why the students are to be manually enrolled or unenrolled** field, enter a specific, detailed reason why you want to enroll these learners.

6. To streamline the course enrollment process, leave **Auto Enroll** selected.

7. To send learners an email message, leave **Notify students by email** selected.

8. Select **Enroll**.

You can view or download a list of the people who are enrolled in the course. For more information, see *Learner Data*.

Note: When you enroll learners in a course, all learners are automatically enrolled in the audit enrollment track. For more information about course enrollment tracks, see *enrollment track*.

Note: If your course has a fee, and an organization wants to purchase enrollment for multiple seats in your course at one time, you can create enrollment codes for the organization. The organization then distributes these enrollment codes to its learners to simplify the enrollment process. You can also create coupon codes to give learners a discount when they enroll in your course. For more information, see Enable and Create Enrollment Codes.

View an Enrollment Count

After you create a course, you can access the total number of people who are enrolled in it. Note the following information about how this count is computed.

- In addition to learners, the enrollment count includes all course team members, including Admins and Staff. (To work with a course in Studio, the LMS, or Insights, you must be enrolled in that course.)

- The enrollment count displays the number of currently enrolled learners and course team members. It is not a historical count of everyone who has ever enrolled in the course.

    Note: Learners can unenroll from courses, and course Admins and Staff can unenroll learners when necessary.

The total number of current enrollees is shown as the sum of the number of people who selected each of the certification tracks (verified, professional, or honor) that is available for your course.

To view the enrollment count for a course, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Course Info** if necessary.

    The **Enrollment Information** section of the page that opens shows the number of people who are currently enrolled in your course and in each of the certification tracks.

16.4.4 Report Learners Not Yet Enrolled

After you enroll learners in a course using the **Auto Enroll** option, any learner who does not yet have a user account must register and activate an account to complete the enrollment process. In addition, the learner must register the account using the same email address that was used for auto enrollment. You can download a report of auto enrolled email addresses that do not yet correspond to an enrolled learner.

To download this report, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download**.

3. In the **Reports** section of the page, select **Download a CSV of learners who can enroll**.

    A status message indicates that report generation is in progress. This process can take some time to complete, but you can navigate away from this page and do other work while it runs.

To track the progress of the report process, reload the page in your browser and scroll down to the **Pending Tasks** section.

4. To open or save the report, select the {org}_{course_id}_may_enroll_info_{date}.csv file name at the bottom of the page.

16.4.5 Unenroll Learners from a Course

You can remove learners from a course by unenrolling them. To prevent learners from re-enrolling, course enrollment must also be closed. You use Studio to set the **Enrollment End Date** for the course to a date in the past. For more information, see *Scheduling a Course Run*.

Note: Unenrollment does not delete data for a learner. An unenrolled learner's state remains in the database and is reinstated if the learner does re-enroll.

To unenroll learners, you supply the email addresses of enrolled learners.

1. View the live version of your course.

2. Select **Membership**.

3. In the **Batch Enrollment** section of the page, enter a username or an email address, or multiple names or addresses separated by commas or new lines.

4. In the **Enter the reason why the students are to be manually enrolled or unenrolled** field, enter a specific, detailed reason why you want to unenroll these learners.

5. To send learners an email message, leave **Notify students by email** selected.

   Note: The **Auto Enroll** option has no effect when you select **Unenroll**.

   ---

6. Select **Unenroll**. The course is no longer listed on the learners' **Current Courses** dashboards, and the learners can no longer access the course content or contribute to discussions or the wiki.

16.5 Staff Debug Info

The edX system keeps track of learners' progress through a course – recording when the learner watches videos, responds to problems, and so on. If you are a member of a course team, some of that data is visible to you for debugging purposes. Under every problem is a **Staff Debug Info** button: selecting this button opens a window with information about the problem.

None of this information should be necessary for day-to-day usage of edX, but for the sake of clarity, some of these fields are documented here.

is_released Indicates whether the problem is visible to learners.

location An internal unique identifier that corresponds to this problem.

markdown The text of the problem, in Markdown format. This is often written using Studio.

display_name The name of the problem, as shown to the learner.

max_attempts The maximum number of times that a learner can attempt to answer the problem correctly.

attempts The number of times that the currently logged in learner has attempted to answer the problem correctly, so far. Every time this learner attempts to answer this question, this number will go up, until it reaches `max_attempts`.

parent An internal unique identifier that corresponds to the unit that contains this problem.

MANAGING DISCUSSIONS

Course discussions foster interaction among learners and between learners and the course team. You can set up different topics to guide these interactions when you create your course, and then run and moderate discussions throughout the course to encourage participation and develop course community. Discussions are also excellent sources of feedback and ideas for future courses or course runs.

Use the topics in this section to learn about managing course discussions, including creating discussion topics, running discussions in a live course, choosing to divide topics based on learner groups, building a team of discussion moderators, and moderating discussions.

Note: Some features of discussions, especially moderation features, are not available when discussions are accessed in the edX mobile app. For information about the differences between discussions on the edx.org site and in the mobile app, see *Discussions in the edX Mobile App*.

17.1 Creating Course Discussions

Discussions in an edX course include both course-wide topics of interest to all learners (such as "Feedback", "Troubleshooting", or "Technical Help") as well as content-specific topics that you add to course units as discussion components. You can create both types of discussion topics in Studio.

For information about creating discussion topics, see the following sections.

- *Configuring Edx Discussions*
- *Create Course-Wide Discussion Topics*
- *Create Content-Specific Discussion Topics*
- *Understanding When Learners Can See Discussion Topics*
- *Allowing Learners to Make Anonymous Discussion Posts*
- *Discussions in the edX Mobile App*

For information about creating discussions in which learners in a group (cohort) only interact with posts from other learners in the same group, see *About Divided Discussion Topics*.

For information about running and moderating course discussions, see *Running Course Discussions* and *Moderating Discussions*.

17.1.1 Configuring Edx Discussions

To open edx discussions configuration page, follow these steps.

1. Open your course in Studio.

2. Select **Content**, then **Pages & Resources**.

3. Click on the gear icon on top-right of **Discussion** tile (as seen below). This will take you to the discussions configuration page where you can select a discussion provider.

Discussion ⚙

Enabled

Encourage participation and engagement in your course with discussions.

4. Select edx as discussion provider by checking the box on top-right of **edx** tile. Click Next.

edX ✓

Full support

Start conversations with other learners, ask questions, and interact with other learners in the course.

5. This is the edx discussions configuration page. All configuration options for edx discussions can be found here.

17.1.2 Create Course-Wide Discussion Topics

All courses include a page named **Discussion**. When you create a course, a course-wide discussion topic named "General" is already included by default.
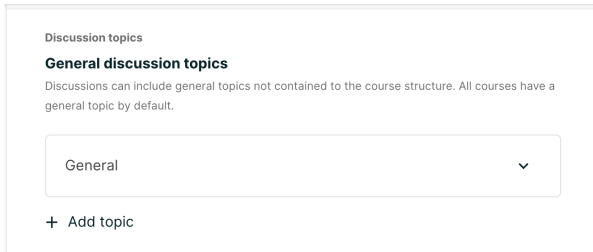
You can add additional course-wide discussion topics to guide how learners share and find information during your course. Such course-wide topics might include Introduction and Announcements, Feedback, or Troubleshooting. Discussions in these topics can begin as soon as your course is available.

Note: Make sure each discussion topic in your course has a unique name, whether it is a course-wide topic or a content-specific discussion topic that you add as a discussion component. If different discussion topics share the same name, learners might be confused as to which discussion topic they are participating in. For example, do not add a content-specific discussion topic named "General", because a course-wide discussion topic named "General" already exists in every course.
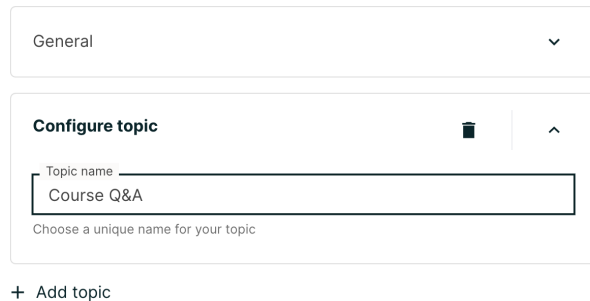
To create a course-wide discussion topic, follow these steps.

1. Navigate to edx discussion provider configuration page (see *Configuring Edx Discussions*).

---

2. Scroll down to **General discussion topics**. You would see a topic named **General** already there. This topic cannot be deleted but can be renamed.
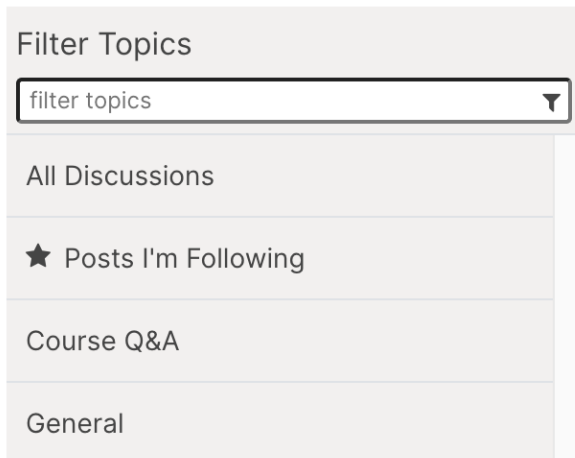
3. Click on **Add topic** and add a topic name (e.g. "Course Q&A")

4. Click Save.

When learners select the **Discussion** page for your course, the drop-down Discussion list now includes the topic you added.

Note: In courses that use cohorts, the course-wide discussion topics that you add are unified. All posts can be read and responded to by every learner, regardless of the cohort that they belong to. You can optionally configure these topics to be divided by cohort. For more information, see *Divide Course-Wide Discussion Topics*.

17.1.3 Create Content-Specific Discussion Topics

To create a content-specific discussion topic, you add a discussion component to a unit. Typically, you do this while you are designing and creating your course in Studio. Follow the instructions in *Working with Discussion Components*. The result is a discussion topic associated with a unit and its content. Learners can access content-specific topics both in the course unit and on the **Discussion** page.

Warning: Follow the recommended steps to add discussion components. Do not create discussion topics by using the **Duplicate** button in Studio, and do not reference the same discussion ID in more than one place in your course. Duplicated discussion components result in discussion topics that contain the same conversations, even if learners post in different discussion topics.

For information about the visibility of content-specific discussion topics, see *Understanding When Learners Can See Discussion Topics*.

Note: In courses with cohorts enabled, when you add discussion components to units in Studio, these discussion topics are by default unified. All learners in the course can see and respond to posts from all other learners. You can change content-specific discussion topics to be divided, so that only members of the same group can see and respond to each other's posts. For information, see *Divide All Content-Specific Discussion Topics*.

17.1.4 Understanding When Learners Can See Discussion Topics

The names that you specify as the category and subcategory names for discussion components are not visible on the **Discussion** page in the LMS until after the course has started and the unit is released.

However, "seed" posts that you create in content-specific discussion topics before a course starts, or before the unit is released, are immediately visible on the **Discussion** page, even though the containing category or subcategory names are not visible. EdX recommends that you do not create posts in content-specific discussion topics before a unit is released. For more information about release dates and the visibility of components, see *Controlling Content Visibility and Access*.

In contrast, *course-wide discussion topics* that you create on the edx discussions configuration page in Studio, including the default "General" discussion topic, are immediately visible, regardless of whether the course has started. They are not associated with any particular section or subsection of the course, and are not subject to release dates.

17.1.5 Allowing Learners to Make Anonymous Discussion Posts

By default, when learners participate in a discussion, their usernames are visible in the discussion. You can allow learners to make discussion posts that are anonymous i.e. their usernames are not visible. You can also choose whether the anonymous posts that learners make are anonymous only to their peers or to the course staff as well.

To allow anonymous discussion posts in your course, follow these steps.

1. Navigate to edx discussion configuration page (see *Configuring Edx Discussions*).

2. Toggle the **Allow anonymous discussion posts** to enable learner make posts that are anonymous to everyone.

3. Once anonymous posts are enabled, you can toggle **Allow anonymous discussion posts to peers** to allow learners to make posts that are anonymous to their peers, but not to the course staff.

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4. Click **Save**.

Users see the *post anonymously* and *post anonymously to classmates* options while creating a post if toggles in step 2 and step 3 have been enabled, respectively, as seen below.

17.1.6 Discussions in the edX Mobile App

Learners can participate in course discussions using the edX mobile app as they do on the edX site, but there are some differences in the actions that moderators can take in discussions using the mobile app. To perform moderation or administrative tasks for your course discussions, you need to work in a web browser.

The following actions are not supported on the edX mobile apps.

- Pinning posts
- Marking responses to question posts as answers
- Endorsing responses to discussion posts
- Closing posts

17.2 Running Course Discussions

On an ongoing basis, the members of your *discussion team* run the course discussion by adding posts and responses, marking answers as correct, and guiding learner messages into pertinent threads. The information and suggested techniques in this section can help you to make discussions in your course successful.

For information about moderating discussions, see *Moderating Discussions* and *Guidance for Discussion Moderators*.

- *Understanding the Elements of a Discussion*
- *Using Naming Conventions for Discussion Topics*
- *Seeding Discussion Topics*
- *Minimizing Thread Proliferation*
- *Closing Discussions*

17.2.1 Understanding the Elements of a Discussion

Learners and the course team use course discussions to share ideas, exchange views, consider different viewpoints, and ask questions. In course discussions there are three hierarchical levels of interaction.

- A post is the first level of interaction. A post opens a new subject. Posts can be made as questions, to solicit a concrete answer, or as discussions, to start a conversation. When participants add a post, they must choose an existing topic to associate it with, and decide whether to add it as a **Question** or as a **Discussion**.

- A response is the second level of interaction. A response is a reply made directly to a post to provide a solution or continue the conversation.

- A comment is the third level of interaction. A comment is often a clarification or side note made to a specific response, rather than to the post as a whole.

The dialog created by a post, its responses, and the comments on those responses is sometimes called a thread. Discussion threads are saved as part of the course history.

For information about participating in discussions, see the Participating in Course Discussions section in the *Open edX Learner's Guide*. Consider referring learners in your courses to that section, which describes the structure and features of course discussions, and provides useful information to help learners make the most of their participation in course discussions.

17.2.2 Using Naming Conventions for Discussion Topics

To identify certain types of messages and make them easier to find, you can define a set of standard tags to include in the subject of a post or in the body of a response or comment. Examples follow.

- Use "[OFFICIAL]" at the start of announcements about course details or changes.

- Provide information about corrections in course assignments with a subject that begins "[CORRECTION]" or "[ERRORS]".

- Ask learners to use "[STAFF]" in the subject of each post that needs the attention of a course team member.

Both the discussion team and your learners can use tags like these to search the discussions more effectively.

When a post is created its type must be selected: either "question" or "discussion". Members of the discussion team should be thoughtful when selecting the type for their posts, and encourage learners to do the same. For more information, see *Find Questions and Discussions*.

17.2.3 Seeding Discussion Topics

To help learners learn how to get the most out of course discussions, and find the best discussion topic to use for their questions and conversations, you can seed discussion topics in course-wide discussion topics before the course starts.

Some examples follow.

- In the "General" topic (which is included in every course by default), add an [INTRO] post to initiate a thread for learner and course team introductions.

- For each course-wide discussion topic that you create, add an initial post to describe the way you intend that discussion to be used. In addition to providing guidance, these initial messages can act as models for learners to follow when they create their own posts.

EdX strongly recommends that you do not create seed posts in content-specific discussion topics before the course starts or before the containing unit is released. The category and subcategory names for content-specific discussion topics are subject to the release visibility of their containing unit, and are not visible until the unit is released. For more details, see *Understanding When Learners Can See Discussion Topics*.

17.2.4 Minimizing Thread Proliferation

To encourage longer, threaded discussions rather than many similar, separate posts, the discussion team can use the following techniques. However, be aware that very long threads (with more than 200 responses and comments) can be difficult to read, and might result in an unsatisfactory experience in the discussion.

Note: You can only pin or close posts and mark questions as answered when you work in a web browser. You cannot complete these activities when you work in the edX mobile app.

- Pin posts. Pinning a post makes it appear at the top of the list of posts in the discussion navigation pane on the **Discussion** page. As a result, it is more likely that learners will see and respond to pinned posts. You can write your own post and then pin it, or pin a post by any author. Select the "More" icon and then **Pin**.
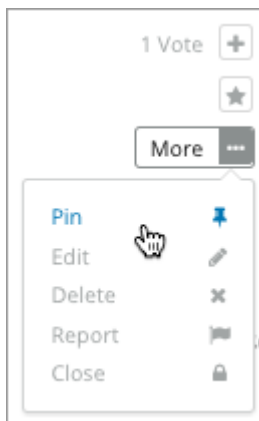
- Mark responses as answered or endorsed. Depending on whether a post is a question or a discussion, you use the same option to mark a response either as the answer to the posted question, or to endorse a response. Marking a question as answered makes it easier for learners to find answers to already asked questions, rather than ask the same question again. Endorsing a response confirms that it adds value to a discussion.

  To mark a response as answered or endorsed, select the "check mark" icon. You cannot mark your own responses as answers or as endorsed.
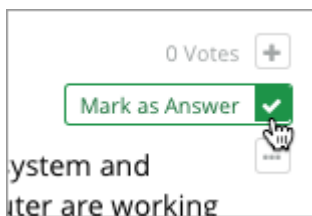
- Vote for posts or responses. Learners can sort discussions by posts with the most votes, so posts and responses with many votes are more likely to be read and responded to. Select the "plus" icon for the response. You cannot vote for your own posts.
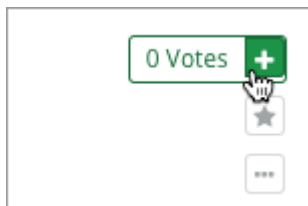
- Close posts. You can respond to a redundant post by (optionally) pasting in a link to the post that you prefer learners to contribute to, and prevent further interaction by closing the post. Select the "More" icon and then

Close.

- Provide post/response/comment guidelines. In a pinned course-wide topic, you can provide learners with guide-lines for participating in discussions, including when to start a new thread by adding a post instead of responding to an existing post, or commenting on a response.

17.2.5 Closing Discussions

You can close the discussions for your course so that learners cannot add messages to topics. Course discussions can be closed temporarily, such as during an exam period, or permanently, such as when a course ends.

Note: When you close discussions, make sure you communicate with learners in your course to let them know why they cannot contribute to discussions, and the dates that discussions are affected. You can post a course update to the **Course** page as well as add a pinned information post to a course-wide discussion topic.

When you close the discussions for a course, all discussion topics in course units and all course-wide topics are affected.

- Existing discussion contributions remain viewable.

- Learners cannot add posts, respond to posts, or comment on responses. However, learners can continue to vote on existing threads, follow threads, or report messages for misuse.

- Course team members who have any of the Staff, Admin, Discussion Admin, Discussion Moderator, Community TA, or Group Community TA roles are not affected when you close the discussions for a course. Users with these roles can continue to add to discussions.

Specify When Discussions Are Closed

Note: You can only close discussions when you work in a web browser. You cannot close discussions when you work in an edX mobile app.

To define when discussions are closed to new contributions and when they reopen, follow these steps.

1. Navigate to edx discussion configuration page (see *Configuring Edx Discussions*).

   2. Scroll down to **Discussion Blackout Dates** field.

   3. Create a new blackout date range by clicking on **Add blackout date range**.

4. Add start and end dates and times in the format specified.

Note: The dates and times that you enter are in Coordinated Universal Time (UTC), not in your local time zone. You might want to verify that you have specified the times that you intend by using a time zone converter.

Note: To close the course discussions permanently, specify an end date and time far in the future.

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5. You can add more than one blackout date ranges using step 3 and 4 above.

6. Select **Save Changes**.

17.3 About Divided Discussion Topics

This section provides information about setting up discussions that are divided by learner groups (cohorts) within your course.

- *What Are Divided Discussions?*
- *Setting Up Divided Discussions*
- *Divide All Content-Specific Discussion Topics*
- *Divide Course-Wide Discussion Topics*

For overview information about discussions in a course, see *Creating Course Discussions*.

For more information about creating differentiated course content for learners in different groups (cohorts), see *Offering Different Content to Different Learner Groups*.

17.3.1 What Are Divided Discussions?

With divided discussions, discussion topics are visible to all learners, but the posts, responses, and comments within these topics are divided so that learners participate in the discussion only with other members of the same group (cohort).

Discussion topics that are not divided are unified, meaning that all learners in the course can see and respond to posts, responses, and comments from any other learner in the course.

Best Practices for Divided Discussions

If you divide discussions, a good practice is to use a naming convention for discussion topics, so that learners clearly understand the audience for a discussion topic before they add posts to that topic. For information about naming conventions, see *Apply Naming Conventions to Discussion Topics*.

You can also appoint learners as Community TAs or Group Commmunity TAs to help you to moderate course discussions. You might use Group Community TAs if the content of discussion topics by one group (cohort) should not be shared with another group. Group Community TAs are themselves members of learner groups (cohorts) that you use in your course. As discussion moderators, they can only see and respond to posts by other members of their own group (cohort). For information, see *Assigning Discussion Moderation Roles*.

For more information about managing discussions, see *Managing Divided Discussion Topics* and *Running Course Discussions*.

Note: Another method of providing different discussion experiences for learners in different groups in your course is to use the access settings of discussion components. For example, you can add multiple discussion components and use each component's access settings to restrict access to each discussion component to a specific content group. You can then assign these content groups to learner groups (cohorts). For more information, see *Setting Up Divided Discussions*.

17.3.2 Setting Up Divided Discussions

Note: You must set up divided discussions before your course starts. You cannot divide discussions after the course start date.

By default, all *course-wide discussion topics* and *content-specific discussion topics* are unified: all learners can interact with all posts, responses, and comments. You can change discussion topics of either type to be divided or unified on the discussions configuration page (see *Create Course-Wide Discussion Topics*).

> **Warning:** If you change settings of discussion topics in a live course after learners have begun reading and contributing to discussion posts, you are changing their course experience. Learners might see posts that were previously not visible to them, or they might no longer see posts that were previously available to all learners.

For information about settings for discussion topics, see the following topics.

17.3.3 Divide All Content-Specific Discussion Topics

When you *create content-specific discussion topics* by adding discussion components to units in Studio, these discussion topics are by default unified. All learners in the course can see and respond to posts from all other learners. You can change content-specific discussion topics to be divided, so that only members of the same group (cohort) can see and respond to each other's posts. To do so, follow the steps below.

> **Warning:** If you make changes to discussion division settings in a running course, be aware that learners will be affected by your changes.

1. Navigate to edx discussion provider configuration page (see *Configuring Edx Discussions*).

2. Turn on the toggle for **Divide discussions by cohort** to divide all content-specific discussion topics by cohort.
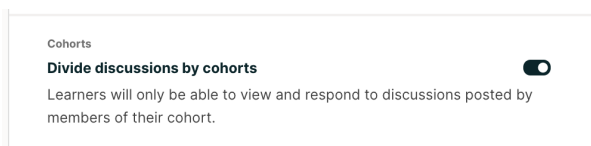
3. Click **Save** at the bottom-right of the configuration page.

All content-specific discussion topics in the course are now divided by cohort.

For information about managing discussions that are divided, see *Managing Divided Discussion Topics*.

17.3.4 Divide Course-Wide Discussion Topics
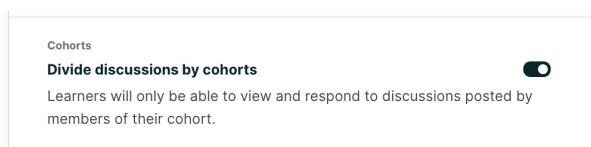
When you create *course-wide discussion topics*, they are by default unified. All learners in the course can see and respond to posts from all other learners.

Note: To divide course-wide discussion topics, you will first need to divide content-specific discussion topics. Consequently, course-wide discussion topics cannot be divided without dividing all content-specific discussion topics.

Warning: If you make changes to discussion division settings in a running course, be aware that learners will be affected by your changes.
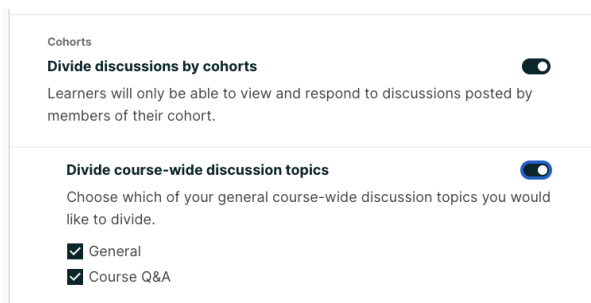
To specify that one or more course-wide discussion topics are divided, follow these steps.

1. Navigate to edx discussion provider configuration page (see *Configuring Edx Discussions*).

2. Turn on the toggle for **Divide discussions by cohort** to divide all content-specific discussion topics by cohort.

3. Turn on the toggle for **Divide course-wide discussion topics** to divide all course-wide discussion topics by cohort.

4. Uncheck the topic names that you want to keep unified.

5. Click **Save** at the bottom-right of the configuration page.

For information about managing discussions that are divided, see *Managing Divided Discussion Topics*.

17.4 Managing Divided Discussion Topics

This section provides information about managing *discussions* that are divided based on learner groups (*cohorts*).

For more information about divided discussions, see *About Divided Discussion Topics*.

Note: You must set up divided discussions before your course starts. You cannot divide discussions after the course start date. For more information, see *Setting Up Divided Discussions*.

- *Overview*

- *Identifying Who Can Read a Post*

- *Choosing the Visibility of a Post*

- *Viewing the Posts of a Group*

17.4.1 Overview

In *discussion topics* in your course, every post has an indicator of who can read it: either all learners, or only the members of a particular group. For learners, this is the only noticeable difference between discussions in courses that use divided discussions, and courses that do not have groups and do not use divided discussions.

You can share the examples in the *Read the Group Indicator in Posts* section with your learners. The Participating in Course Discussions section in the *Open edX Learner's Guide* also provides useful information to help learners make the most of their participation in course discussions.

Course team members who have the Discussion Admin, Discussion Moderator, Community TA or Group Community TA role see the indicator of who can read each post. Team members with these roles, except for Group Community TAs, can read and contribute to every post, regardless of the group membership of the learner who posted it. Group Community TAs can moderate discussions only if the course uses divided discussions, and they can see and manage only posts that other members of their group add. Community TAs, in comparison, can read and contribute to all posts.

Note: Course team members must have the Discussion Moderator or Discussion Admin role in addition to the Staff or Admin role to be able to view posts that are divided by group. For information about assigning discussion moderation roles, see *Assigning Discussion Moderation Roles*.

In courses where cohorts are enabled, course team members who have discussion moderation roles that are not restricted by group can also perform the following actions.

- Choose who will be able to see the posts that they add to divided topics. See *Choosing the Visibility of a Post*.

- Filter the posts that are listed on the **Discussion** page by group. See *Viewing the Posts of a Group*.

All of the other options and features described in the *Creating Course Discussions*, *Moderating Discussions*, and *Running Course Discussions* sections continue to be available to the discussion moderation team.

17.4.2 Identifying Who Can Read a Post

In discussion topics in your course, all posts include a group indicator above the title. This indicator appears after any learner or team member adds a post. No configuration is necessary to include this identifier, although if you use divided discussions in your course, you should use care in naming your groups, because learners see the group names in the group indicators for each post.

Optionally, you can name your discussion topics to make it clear to learners who their posts will be viewed by. See *Apply Naming Conventions to Discussion Topics*.

Read the Group Indicator in Posts

Every post includes a sentence that identifies whether everyone can see and contribute to it, or only the members of a group in the course. Examples follow.
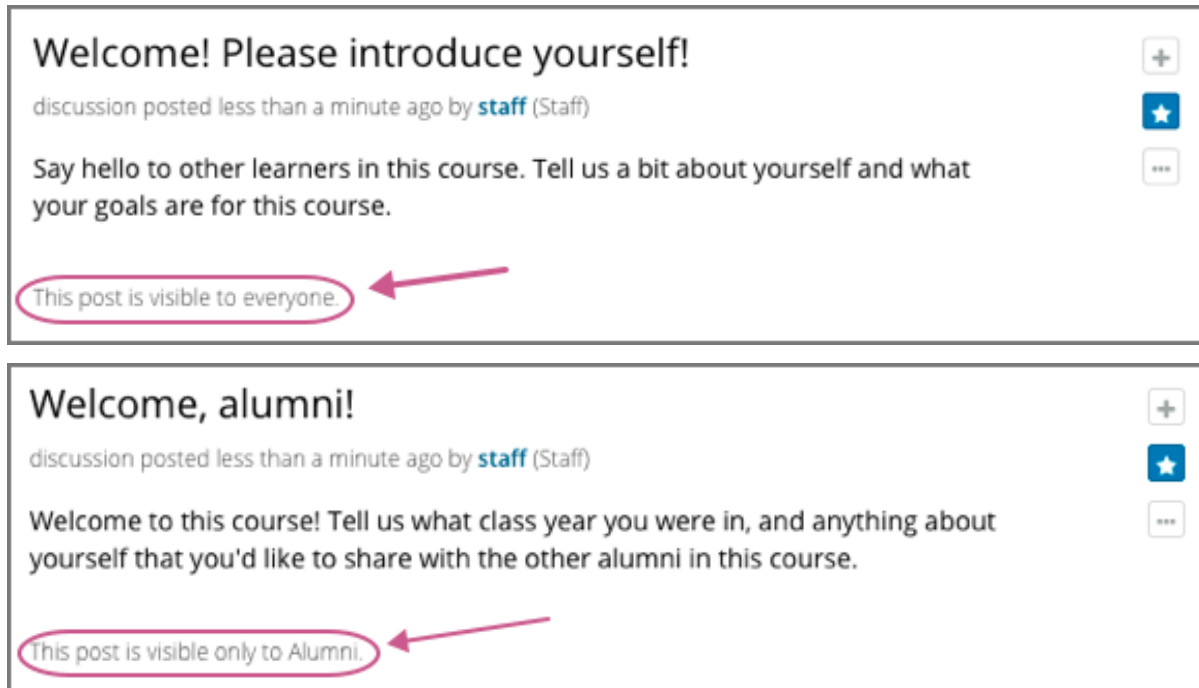
You see this identifier after you add your post. All of the responses and comments that other contributors add to a post are visible to the same group of people as the original post.

Apply Naming Conventions to Discussion Topics

Optionally, course team members can give learners the audience context of their posts before they add them. Indicating who will be able to read posts in the names of the topics themselves can be useful when a group is particularly sensitive about the privacy of their conversations.

For example, you could add "(everyone)" to the names of the unified course- wide discussion topics in your course. Similarly, you could apply a naming convention to content-specific discussion topics that you add as discussion components in Studio. For example, you could include an identifier such as "(private)" or "(small group)" in the **Subcategory** name of every Discussion component that you add.

When learners visit the **Discussion** page and use dropdown lists to select a discussion topic, the topic names indicate who can see the posts, responses, and comments.

For more information about adding and configuring course-wide discussion topics, see *Create Course-Wide Discussion Topics* and *Divide Course-Wide Discussion Topics*.
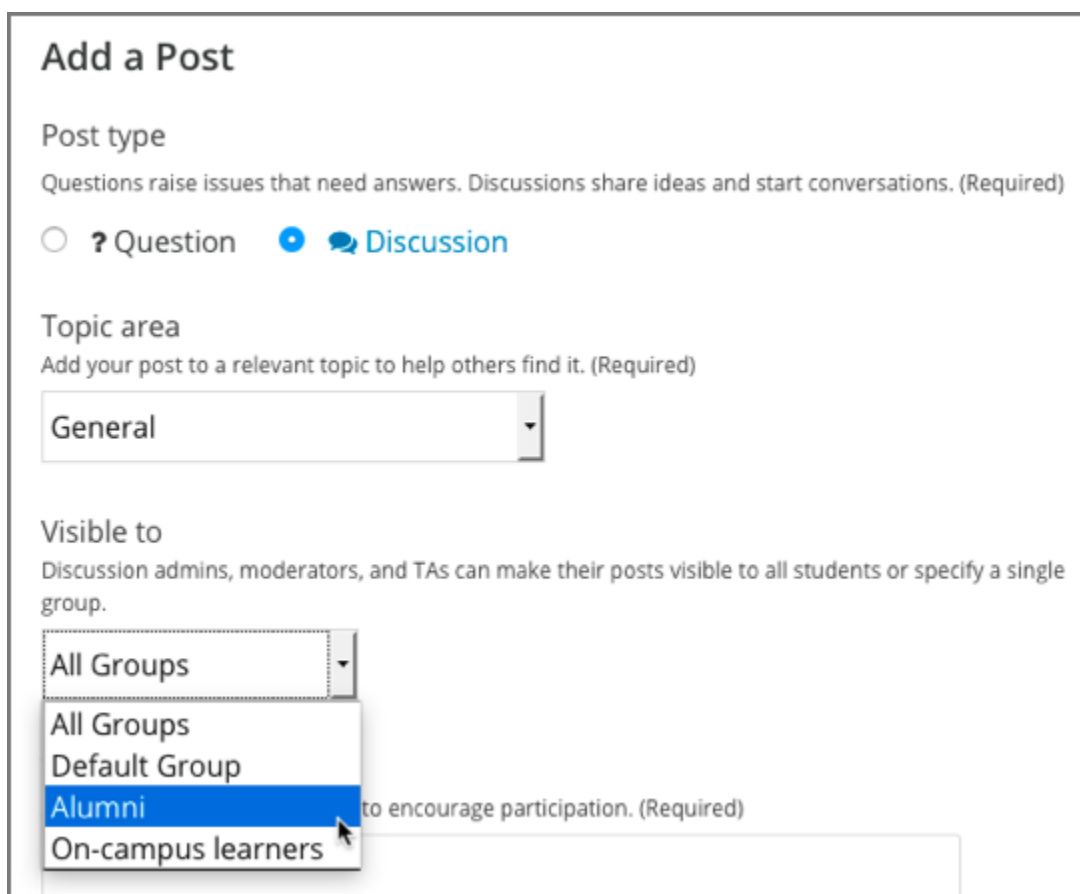
17.4.3 Choosing the Visibility of a Post

Course team members who have the Discussion Admin, Discussion Moderator or Community TA role can make posts to divided discussion topics visible to everyone who is enrolled in the course or only to the members of a specified group.

If you are a course team member with one of these roles, when you add a post, the **Visible to** dropdown list appears above the **Title** field.

Note: Group Community TAs cannot choose the group visibility of a post. Unlike Community TAs, Group Community TAs can only add post to, and interact with, discussion topics that are available to the same group that they themselves belong to.

This example shows a new post being added to a content-specific discussion topic.

When you add a new post in discussion topics that are divided, you can choose whether all learners or a specific group of learners can see your post. This means that you can add a single post with information that you want everyone to see, rather than having to write a separate post for each group. It also means that it is possible for you to unintentionally share information with a different audience than you intended.

Note: Learners cannot choose the visibility of their posts. The visibility of learner posts is determined by the configuration of the topic they post in. See *Identifying Who Can Read a Post*.

Posts that discussion team members add to unified discussion topics are always visible to all learners, regardless of

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what group they belong to.

Considerations When Editing Posts

Keep these additional considerations in mind when you edit posts in a course that includes learner groups (cohorts).

- You cannot change the visibility of a post after it has been added. If you notice that a post contains information that is not appropriate for the group who can read it, edit the content of the post or delete the post.

- If you change the topic that a post appears in, the visibility of the post and its responses and comments **does not change**. This ensures that learners who are following the post, or who have contributed responses or comments to it, will still be able to read it.

- All of the responses and comments that are contributed to a post will be visible to the same group of people as the post itself. You cannot change the visibility of individual responses or comments.

17.4.4 Viewing the Posts of a Group

When a course includes learner groups (cohorts), you can view posts and monitor discussion activity for each of the groups. You can also view all posts.

Note: Course team members must have the Discussion Admin or Discussion Moderator role in addition to the course team Staff or Admin role to be able to view and filter all posts that are divided.

In divided discussions, Group Community TAs can only view posts that are visible to the group that they themselves belong to.

Above the discussion navigation pane on the **Discussion** page, the **in all groups** filter is selected by default. You see every post when you make this selection. To limit the list so that you can view the same set of posts as the members of a particular group, select the name of that group.
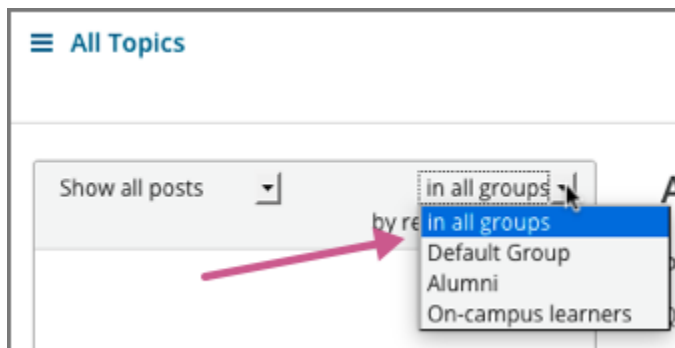
Note that both of these lists include posts that are visible to everyone. When you filter the list by a specific group, you see the same, complete set of posts that the members of that group see.

For other options that you can use to view posts, see *Moderating Discussions*.

17.5 Moderating Discussions

Developing and sustaining a positive discussion culture requires that a team of discussion moderators dedicates sufficient time to reviewing discussions and responding to questions from learners. Keeping up-to-date with a large MOOC forum requires a commitment of five or more hours per week, and involves reading threads, replying to and editing posts, and communicating with the rest of the discussion moderation team and other members of the course team.

Members of the course community, learners as well as course team members, can be given permission to moderate or administer course discussions through a set of discussion moderation or administration roles. The members of a course discussion team monitor discussions and keep them productive. They can also collect information, such as areas of particular confusion or interest, and relay it back to the course team.

Note: The course team members that you set up in Studio or in the LMS are not automatically granted discussion moderation roles. For information about discussion roles, see *About Discussion Moderation Roles*.

Note: Not all options for moderating discussions are available when discussions are accessed using the edX mobile apps. For information about the differences between discussions on the edx.org site and in the mobile apps, see *Discussions in the edX Mobile App*.

- *About Discussion Moderation Roles*
- *Assigning Discussion Moderation Roles*
- *Provide Guidelines for Learners*
- *Develop a Positive Discussion Culture*
- *Find Questions and Discussions*
- *Edit Messages*
- *Delete Messages*
- *Respond to Reports of Misuse*
- *View Profile Information for Discussion Participants*
- *Block Users*

For information about best practices for moderating discussions, see *Guidance for Discussion Moderators*. If you are using *divided discussions*`, see *Managing Divided Discussion Topics*.

17.5.1 About Discussion Moderation Roles

You can designate a team of people to help you run course discussions. All course team members can view discussion topics and posts, but only team members who have one of the discussion moderation roles have additional abilities to moderate discussions and work with posts, responses, and comments.

Important: The course team members that you set up in Studio or in the LMS are not automatically granted discussion administration roles.

Discussion moderation and administration roles must be explicitly granted to members of the course team for them to be able to moderate or administer course discussions. The course author and any team members who have the Admin

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role can grant discussion roles.

The Discussion Roles

Different options for working with discussions are available through the following roles.

Note: The options for moderating discussions described below are only available when members of the discussion administration team work in a web browser. The edX mobile apps do not currently offer moderation options.

For more information about differences between discussions on the edx.org site and on the mobile apps, see *Discussions in the edX Mobile App*.

- Course team members with the Discussion Moderator role can edit and delete messages at any level, review messages flagged for misuse, close and reopen posts, pin posts, and mark responses as correct answers.

  Posts, responses, and comments made by Discussion Moderators are marked with a **Staff** identifier. The Discussion Moderator role is usually given to course team members who already have the Staff role.

- Course team members with the Discussion Admin role have the same options for working with discussions as Discussion Moderators, and their posts, responses, and comments have the same **Staff** identifiers.

  The Discussion Admin role is typically reserved for course team members who have the Admin role within the course: Discussion Admins can both moderate discussions and give other users discussion moderation roles.

- Some learners who are enrolled in the course can be asked to help with moderating course discussions. These learners are assigned the Community Teaching Assistant (TA) role, and have the same options for working with discussions as Discussion Moderators do.

  Posts, responses, and comments made by Community TAs are marked with a **Community TA** identifier.

- In courses with divided discussions, enrolled learners can be assigned the Group Community TA role. Group Community TAs have the same abilities as Community TAs. However, the moderation and posting abilities of Group Community TAs are limited to discussion topics that are visible to members of the group that they themselves belong to.

  Posts, responses, and comments made by Group Community TAs are also marked with a **Community TA** identifier.

17.5.2 Assigning Discussion Moderation Roles

You must either be the course author, or have the Admin role, to add people to discussion moderation roles.

You must obtain the email address or username for each person that you want to add.

- To obtain the email address or username for a course team member, in the LMS select **Instructor**, then select **Membership**. In the **Course Team Management** section, select the current course team role (Staff or Admin) of the person whose information you are looking for. From the list of course team members with the selected role locate the required email address or username.

- To obtain the email address or username for an enrolled learner, in the LMS select **Instructor**, then select **Data Download**. In the **Reports** section, select **Download profile information as a CSV**. In the downloaded file, locate the required email address or username.

Add Someone To a Discussion Role

You can add any user who is already enrolled in your course to a discussion moderation role.

Note: To add someone to the Discussion Admin role, you must be the course author or a course team member who has the Admin role.

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1. View the live version of the course.

2. Select **Instructor**, and then select **Membership**.

3. In the **Course Team Management** section, select the discussion role that you want to assign: **Discussion Admins**, **Discussion Moderators**, **Group Community TA**, or **Community TA**.

4. Under the list of users who currently have that role, enter the email address or username of the person you want to add.

5. Select **Add** for the role type.

   The person who you added appears in the list.

Remove Someone from a Discussion Role

To remove someone from a discussion moderation role, you must be the course author or have the Admin role.

1. View the live version of the course.

2. Select **Instructor**, and then select **Membership**.

3. In the **Course Team Management** section, select the discussion role from which you want to remove the user: **Discussion Admins**, **Discussion Moderators**, **Group Community TA**, or **Community TA**.

4. In the list of users who currently have that role, locate the user you want to remove, and then select **Revoke access**.

   The person who you removed no longer appears in the list.

17.5.3 Provide Guidelines for Learners

You can develop a set of best practices for discussion participation and make them available to learners as a course handout file or on a defined page in your course. These guidelines can define your expectations and optionally introduce features of edX discussions.

You can also refer learners to the Participating in Course Discussions section in the *Open EdX Learner's Guide*. Consider referring learners in your courses to that section, which describes the structure and features of edX course discussions, and provides useful information to help learners make the most of their participation in course discussions.

17.5.4 Develop a Positive Discussion Culture

Team members who are moderating discussions can cultivate qualities in their own discussion interactions to make their influence positive and their time productive.

- Encourage quality contributions: thank learners whose posts have a positive impact and who answer questions.

- Check links, images, and videos in addition to the text of each message. Edit offensive or inappropriate posts quickly, and explain why.

- Review posts with a large number of votes and recognize "star posters" publicly and regularly.

- Stay on topic yourself: before responding to a post, be sure to read it completely.

- Maintain a positive attitude. Acknowledge problems and errors without assigning blame.

- Provide timely responses. More time needs to be scheduled for answering discussion questions when deadlines for homework, quizzes, and other milestones approach.

- Discourage redundancy: before responding to a post, search for similar posts. Make your response to the most pertinent or active post and then copy its URL and use it to respond to the redundant threads.

- Publicize issues raised in the discussions: add questions and their answers to an FAQ topic, or announce them in a course update.

For a template that you can use to develop guidelines for your course moderators, see *Guidance for Discussion Moderators*.

17.5.5 Find Questions and Discussions

When learners create posts, they specify the type of post to indicate whether they are asking for concrete information (a question) or starting an open-ended conversation (a discussion).

On the **Discussion** page, a question mark image identifies posts that ask questions, and a conversation bubble image identifies posts that start discussions. When an answer is provided and marked as correct for a question, a check or tick mark image replaces the question mark image. For more information, see Answer Questions and Mark Questions as Answered.

The titles and icons of posts that you have not yet read appear in blue, with a blue vertical bar on the post's left side. Posts that you have read have dark gray titles and icons. When new responses and comments are made on posts that you have read, a "new" indicator displays with the number of new responses or comments that you have not yet read.
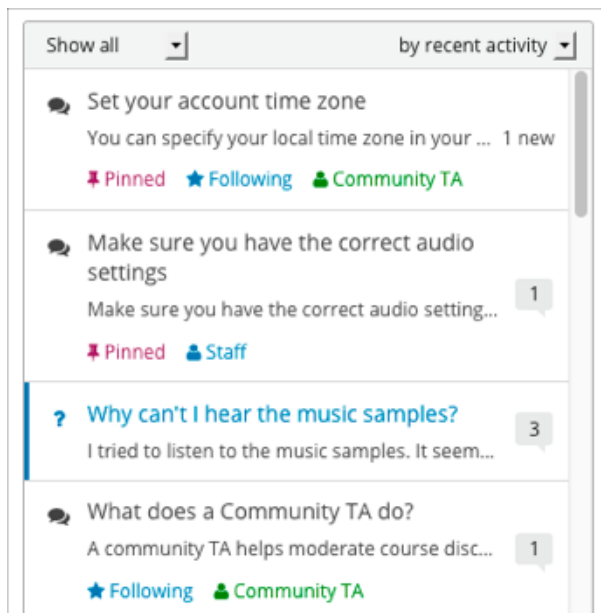
In addition to these visual cues, filters can help you find questions and discussions that need review. In the discussion navigation pane on the **Discussion** page, you can also select the following options from the **Show all** drop-down menu.

- **Unread**, to list only the discussions that you have not yet viewed.

- **Unanswered**, to list only questions that do not yet have any responses marked as answers.

- **Flagged**, to list only posts that learners have reported as inappropriate.

17.5.6 Edit Messages

Team members with the Discussion Moderator, Discussion Admin, Community TA or Group Community TA role can edit the content of posts, responses, and comments. Messages that include spoilers or solutions, or that contain inappropriate or off-topic material, should be edited quickly to remove text, images, or links.

1. View the live version of the course.

2. On the **Discussions** page, open the post with the content that requires editing. You can select a single topic from the drop-down list of discussion topics, apply a filter, or search to locate the post.

3. For the post or for the response or comment that you want to edit, select the "More" icon and then **Edit**.

4. Remove the problematic portion of the message, or replace it with standard text such as "[REMOVED BY MODERATOR]".

5. Communicate the reason for your change. For example, "Posting a solution violates the honor code."

17.5.7 Delete Messages

Team members with the Discussion Moderator, Discussion Admin, Community TA or Group Community TA role can delete posts, responses, or comments. It might be more appropriate to delete rather than edit posts that consist of spam or include abusive language.

1. View the live version of the course.

2. On the **Discussion** page, open the post with the content that requires deletion. You can select a single topic from the drop-down list of discussion topics, apply a filter, or search to locate the post.

3. For the post or for the response or comment that you want to delete, select the "More" icon and then **Delete**.

4. Select **OK** to confirm the deletion.

Important: If a message is threatening or indicates serious harmful intent, contact campus security at your institution. Report the incident before taking any other action.

17.5.8 Respond to Reports of Misuse

Learners have the option to report contributions that they find inappropriate. Team members with the Discussion Moderator, Discussion Admin, Community TA or Group Community TA role can check for messages that have been flagged in this way and edit or delete them as needed.

1. View the live version of your course and select **Discussion** at the top of the page.

2. In the discussion navigation pane at the side of the page, use the filter drop-down list (set to **Show all** by default) to select **Flagged**.

3. Review listed posts. A post is listed if it or any of its responses or comments has been reported. The reported contribution includes a **Reported** identifier.

4. Edit or delete the post, response, or comment. Alternatively, remove the flag: select the "More" icon and then **Unreport**.

17.5.9 View Profile Information for Discussion Participants

To find out more about a specific discussion participant, you can view that learner's edX profile from their linked username on discussion posts.

To access a learner's profile from a discussion post that they contributed, follow these steps.

1. On the **Discussion** page, select a username in a post, response, or comment.

2. On the discussion page for that learner, select the linked username.

The learner's account profile page opens. Learners can have either a limited profile or a full profile.

For more information about profiles, see learners:SFD Dashboard.

17.5.10 Block Users

If a learner repeatedly misuses course discussions despite being warned, you can unenroll that learner from the course. For more information, see *Unenroll Learners from a Course*. The learner cannot re-enroll in the course if the enrollment period for the course is over.

17.6 Guidance for Discussion Moderators

Discussion forums are hugely important tools in running a successful MOOC; they allow for substantive community development, in addition to being excellent sources of feedback and ideas for future iterations of the course.

Moderators are the key to effectively managing these online communities. Moderators keep the discussions productive and relay important information (errors, learner confusion with or interest in particular topics, and so on) to the rest of the course team. Discussions can be moderated by any of a number of members of the course team, but dedicating enough time to moderation is the best way to cultivate a successful discussion culture.

Feel free to use some or all of the information in this section to guide the contributions of your discussion moderators.

> - *Responsibilities*
> - *Qualities of Good Discussion Moderators*
> - *Best Practices for Discussion Moderation*
> - *Guidelines for Specific Types of Posts*

17.6.1 Responsibilities

- Answer basic questions posed by learners, and direct learners with questions to the right resources: syllabi, course documents, course updates, useful lecture segments, example problems, etc.

- Relay reports of errata, common misconceptions and questions, highly disruptive participants, bugs, and amusing or interesting posts to the most appropriate course team members.

- Enforce the Honor Code by editing or deleting problem answers, or requests for answers, promptly.

- Edit out offensive content from the discussion, and remind the originators of discussion etiquette and expectations.

- Communicate problems and successes to your fellow moderators.

- Identify learners whose presence in the discussions has a strongly positive impact. These learners can be promoted to community TA role and publicly acknowledged.

- Add helpful items to the FAQ or to a welcome message or course handout.

17.6.2 Qualities of Good Discussion Moderators

- Good or great content knowledge: stellar learners from previous years often make good moderators.

- Solid communication skills: the ability to organize positive, consistent, and effective communication with learners, other moderators, and members of the course team.

- Time: keeping up-to-date with the discussions for a large MOOC requires at least 5 hours per week for reading posts, replying to or editing posts, and communicating with the other moderators and the course team.

- Enthusiasm: this is the best predictor of moderator excellence!

17.6.3 Best Practices for Discussion Moderation

- Always maintain a positive attitude. Keeping a positive attitude is crucial to encouraging participation in the discussion community.

- Encourage discussion between learners. Actively thank learners who answer the questions of others.

- Use the course's FAQ and updates or handouts on **Course** pages as resources. Provide links to these pages in your responses when appropriate. Suggest that information be added to these resources when necessary to respond to a common question or fix confusion.

- Always make it obvious that you have read the learner's question. When you post a response, make sure that you are on topic. Respond in the context of the thread.

- Develop a discussion persona. Try to answer your questions in your own slightly unique way.

17.6.4 Guidelines for Specific Types of Posts

Certain types of posts require more attention from the moderators than others, or might need to be handled in a particular way.

Time Sensitive Problems

- Try to be present on discussion threads when assignment due dates are approaching or new content is being released. The discussions tend to be extra busy at these times.

- Alert the course team about problems that need to be dealt with quickly, such as problems with graded assignments. Setting up a course email address that is checked frequently is a good way to manage such alerts.

Content Questions

- Assist with content questions sensitively, but be careful not to post spoilers. Do not ask learners to post their solutions!

- A good guiding question can be better than an answer.

Redundant Posts

- When possible, help discourage redundancy by responding to such posts with links to an earlier or higher quality thread that asks the same question.

- When responding to a post, search for similar posts and respond to the most pertinent thread. Redirect the other posts to the thread with your response and then close the redundant threads.

Off Topic, Inappropriate, or Offensive Posts

- Do not simply delete inappropriate or offensive posts. Instead, edit and explain why the posts were edited. Inappropriate posts include spoilers, solutions, and information on how to pirate educational materials.

- Check links that learners post. If you find links to offensive sites and materials, they need to be edited quickly.

Bugs or Errors

- Check to confirm that there is in fact an error.
    - If not, suggest to the learners that they check their work.
    - If so, contact members of the course team, and notify the thread that the error has been reported.
- Use language that does not assign blame or discourage users from the platform.

    You might say: "Thanks for letting us know about that issue. We are working with edX to get it fixed as quickly as possible."

Feature Requests

- Keep an organized collection of feature requests cultivated by the course team. That list can subsequently be shared with an edX product manager, who will log those requests internally.

- Reply to the post to let the person know that their request was heard, without promising that the feature will be implemented.

    You might say: "Thanks for your suggestion. I've logged it for review by edX staff, who will prioritize feature requests on the development roadmap."

- Search the discussions for other similar requests, and respond to and close those as well.

MANAGING LEARNER PROGRESS AND GRADES

Use the topics in this section to learn about accessing learner data and managing learners' answers and grades in your course.

18.1 Learner Data

You can access data about the individuals who are enrolled in your course at any time after you create the course.

- *Guidance for Working with Personal Information*
- *Accessing Learner Data*
    - *About Learner-Reported Data*
    - *Columns in the Student Profile Report*
    - *Download or View Learner Data*
- *Accessing Anonymized Learner IDs*

To supplement the learner data that is available from the instructor dashboard in the LMS, you can use the charts and reports that are available from edX Insights. With Insights, you can review demographic and geographic distributions for enrolled learners. You can also monitor learner activity and review the number of learners who, each week, interacted with your course. For more information, see Using edX Insights.

18.1.1 Guidance for Working with Personal Information

The information that edX collects from site registrants includes personal information that can be used to identify, contact, and locate individuals. This information is available to course team members with the Admin or Staff role for the learners who are enrolled in their courses.

Members of the course team should follow the policies established by their organizations and comply with the legal requirements of their locales to prevent public distribution or misuse of this information.

18.1.2 Accessing Learner Data

In the LMS, you can download data about the individuals who are currently enrolled in your course in a .csv (comma-separated values) file. You can also view data for enrolled learners on the instructor dashboard. For more information, see *Download or View Learner Data*.

For information about course enrollment, see *Enrollment*.

About Learner-Reported Data

When learners create, or register, their user accounts, they select a public username and supply their full names and email addresses. Learners also have the option to provide personal demographic information, including highest level of education completed, gender, year of birth, and preferred language. Because this information is optional, not all of the learners who are enrolled in your course provide it.

After learners create an account, they can enroll in as many individual courses as they choose.

- The learner data that is available from the instructor dashboard reflects the set of live, current enrollments. Data for the course team, who are also enrolled in the course, is included.

- Learners can enroll in your course throughout the defined enrollment period, and they can unenroll from a course at any time.

- Learners can update their personal information at any time on the Account Settings page.

As a result, you might want to download learner data periodically to gain an understanding of how the learner population changes over time.

Columns in the Student Profile Report

The student profile report includes a row for each enrolled learner or course team member and the following columns.

The descriptions of columns in the following table apply to edx.org. Required or optional fields shown to learners during registration and available for editing in **Account Settings** might vary for Open edX sites.

Column	Description
id	The user account ID number that the system assigns to each registrant.
username	The public username entered by the learner. Usernames are required and cannot be changed.
name	The full name entered by the learner. A name is required. Learners can update this value on the **Account Settings** page.
email	The email address entered by the learner. An email address is required. Learners can update this value on the **Account Settings** page.
language	This column is included for backward compatibility only. This data is no longer collected during account creation. The selection that a learner makes for language on the **Account Settings** page is not included in this report.
location	This column is included for backward compatibility only. The selection that a learner makes for **Country** during registration or for **Country or Region** on the **Account Settings** page is displayed in the "country" column of this report.
year_of_birth	This value is optional and can be updated on the **Account Settings** page.
gender	This value is optional and can be updated on the **Account Settings** page.
level_of_education	This value is optional and can be updated on the **Account Settings** page. For a list of the possible values, see the description of the Columns in the auth_userprofile Table table's level_of_education column in the *EdX Research Guide*.
mailing_address	No longer collected during registration. Previously, this value was optional and was supplied only at registration.
goals	This value is optional and is supplied only at registration.
enrollment_mode	Indicates the enrollment track that the learner is enrolled in, such as "audit" or "verified".
verification_status	Indicates whether learners who are enrolled in course tracks that require ID verification have successfully verified their identities to edX by submitting an official photo ID via webcam. The value in this column is "N/A" for learners enrolled in course tracks that do not require ID verification. A value of "Not ID Verified" in this column indicates that the learner is enrolled in a course track that requires ID verification (such as "verified") but she has not attempted ID verification, or the ID verification has failed or expired. A value of "ID Verified" indicates that the learner is enrolled in a course track that requires ID verification, and her ID verification is current and valid.
cohort	This column is included only if the course has cohorts enabled. For courses that include learner cohorts, shows the name of the cohort group that is assigned to the learner. If a learner is not assigned to a cohort, the value is [unassigned].
team	This column is included only if the course has teams enabled. For courses that include teams, shows the name of the team that the learner belongs to. If a learner has not joined a team, the value is [unavailable].
city	Data for this column is not currently collected on edx.org.
country	Learners are required to specify **Country** during registration, and can update this value on the **Account Settings** page.

Download or View Learner Data

You can download a report of learner data to gain more information about the individuals who are enrolled in your course. You also have the option to view learner data on the instructor dashboard.

Download Learner Data

To download learner data, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download**.

3. To download data about enrolled learners in a .csv file, select **Download profile information as a CSV**.

   A status message indicates that report generation is in progress. The number of learners enrolled in your course, and whether your course has the cohort feature enabled, affect how long this process takes. This process can take some time to complete, but you can navigate away from this page and do other work while it runs.

   To track the progress of the report process, reload the page in your browser and scroll down to the **Pending Tasks** section.

4. To open or save a student profile report, select the `{course_id}_student_profile_info_{date}.csv` file name at the bottom of the page.

   All learner-supplied data is included in this file without truncation. For more information, see *Columns in the Student Profile Report*.

View Learner Data

To view learner data, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Student Admin**.

3. To display data about enrolled learners, select **List enrolled students' profile information**.

   A table of profile data displays, with one row for each enrolled learner. Longer values, such as goals, are truncated. For more information, see *Columns in the Student Profile Report*.

18.1.3 Accessing Anonymized Learner IDs

Some of the tools that are available for use with the edX platform, including external graders and surveys, work with anonymized learner data. If it becomes necessary for you to deanonymize previously anonymized data, you can download a CSV file to use for that purpose.

To download a file of assigned user IDs and anonymized user IDs, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download**.

3. Select **Get Student Anonymized IDs CSV**.

You are prompted to open or save the {course-id}-anon-id.csv file for your course. This file contains the user ID that is assigned to each learner at registration and its corresponding edX-wide anonymized user ID and course specific anonymized user ID. Values are included for every learner who ever enrolled for your course.

To research and deanonymize learner data, you can use this file together with the `{course_id}_student_profile_info_{date}.csv` file of learner data or the `{course_id}_grade_report_{date}.csv` file of grades.

18.2 Answer Data

To review learner answers to the problems in your course, you can review the answer submitted by a selected learner for a specific problem or download a course-wide report of any learner answers to a specific problem. You can also download an answer distribution report for course problems.

> - *Learner Answer Submissions*
> - *Student Answer Distribution*

Learner answer distribution data, including both charts and reports, is also available from edX Insights. For more information, see Using edX Insights.

18.2.1 Learner Answer Submissions

You can review a single learner's complete submission history for a specific problem, or the answers submitted by all learners for that problem. For either a single learner or all learners, you can review the exact response submitted, the number of attempts made, and the date and time of the submission.

> - *View One Learner's Submission History*
> - *Interpret a Learner's Submission History*
> - *Report All Learners' Answer Submissions*
> - *Interpret the Student State Report*

View One Learner's Submission History

Before you can check the answer or answers submitted by a learner, you need the learner's username. For more information about how to obtain usernames, see *Download or View Learner Data*.

To review a response submitted by a learner, follow these steps.

1. View the live version of your course.

2. Select **Course** and navigate to the unit that contains the problem you want to review.

3. Display the problem, and then select **Submission History** below the problem.

4. Enter the username for the learner whose work you want to review, and then select **View History** at the end of the page.

   Information about the response or responses provided by the learner displays. For more information, see *Interpret a Learner's Submission History*.

To close the Submission History Viewer, click on the browser page outside of the viewer.

Interpret a Learner's Submission History

The Submission History Viewer shows every timestamped database record of the interactions between a learner and a problem, which can include processes completed both in the browser and on the server. These records appear with the most recent interaction at the top of the Submission History Viewer, followed by each previous interaction.

This topic provides an example submission history for a CAPA problem with guidelines that can help you interpret a submission history. The number and complexity of the records that appear in this report vary based on the type of problem and the settings and features defined.

Record 1: Problem Viewed (Server)

The first interaction, shown at the bottom of the Submission History, records when the server delivered the problem component to the browser for the learner to view.

```
#1: 2015-09-04 08:34:53+00:00 (America/New_York time)

Score: None / None

{
  "input_state": {
    "e58b639b86db44ca89652b30ea566830_2_1": {}
  },
  "seed": 1
}
```

Record 2: Problem Checked (Browser)

The next interaction shown as you scroll up from the bottom records when the learner selected **Submit** in the browser to submit an answer. Note that this record does not contain the actual answer submitted. The answer choice is indicated using a choice identifier: `choice_1` in this example.

Note: The numbering of choice identifiers starts at `choice_0`, so that `choice_0` represents your first answer choice, `choice_1` represents your second answer choice, and so on.

```
#2: 2015-09-04 08:35:03+00:00 (America/New_York time)

Score: 0.0 / 1.0

{
  "input_state": {
    "e58b639b86db44ca89652b30ea566830_2_1": {}
  },
  "seed": 1,
  "student_answers": {
    "e58b639b86db44ca89652b30ea566830_2_1": "choice_1"
}
```

Record 3: Problem Checked (Server)

The next interaction records the results of the server processing that occurred after the learner submitted the answer. This record includes `student_answers` with the submitted answer value, along with `attempts`, `correctness`, and other values.

```
#3: 2015-09-03 18:15:10+00:00 (America/New_York time)

Score: 0.0 / 1.0

{
  "attempts": 1,
  "correct_map": {
    "e58b639b86db44ca89652b30ea566830_2_1": {
      "answervariable": null,
      "correctness": "incorrect",
      "hint": "",
      "hintmode": null,
      "msg": "",
      "npoints": null,
      "queuestate": null
    }
  },
  "done": true,
  "input_state": {
    "e58b639b86db44ca89652b30ea566830_2_1": {}
  },
  "last_submission_time": "2015-09-03T18:15:10Z",
  "seed": 1,
  "student_answers": {
    "e58b639b86db44ca89652b30ea566830_2_1": "choice_1"
  }
}
```

Record 4: Problem Retried (Browser)

When a problem gives learners multiple attempts at the correct answer, and the learner tries again, an additional record is added when a learner selects **Submit** again. The server has not yet processed the new submission, so the data in the record is almost identical to the data in record 3.

Record 5: Problem Retried (Server)

The most recent interaction in this example records the results after the learner attempts the problem again and submits a different answer. Note the differences between values in this record and in record 3, including the reported `Score` and the values for `student_answers`, `attempts`, and `correctness`.

```
#5: 2015-09-03 18:15:17+00:00 (America/New_York time)

Score: 1.0 / 1.0

{
  "attempts": 2,
  "correct_map": {
    "e58b639b86db44ca89652b30ea566830_2_1": {
      "answervariable": null,
      "correctness": "correct",
      "hint": "",
      "hintmode": null,
      "msg": "",
      "npoints": null,
```

```
      "queuestate": null
    }
  },
  "done": true,
  "input_state": {
    "e58b639b86db44ca89652b30ea566830_2_1": {}
  },
  "last_submission_time": "2015-09-03T18:15:17Z",
  "seed": 1,
  "student_answers": {
    "e58b639b86db44ca89652b30ea566830_2_1": "choice_2"
  }
}
```

Report All Learners' Answer Submissions

The Student State report lists the answers that every learner has submitted for one or more problems. You can download this report for just one problem, or for all of the problems in a course, section, subsection, or unit at one time.

Note: The report is limited to 5000 responses. If you expect more than 5000 responses, try generating the report on a section, subsection, or unit basis. Contact your site administrator if you want to increase your response limit.

To download the Student State report for one or more problems, follow these steps.

1. View the live version of your course.

2. On the **Instructor** tab, select **Data Download**.

3. In the **Reports** section, locate and select **Select a section or problem**.

4. Use the arrow icons in the dropdown list to select the section, subsection, unit, or problem that you want. You can also select the entire course.

   If you select a course, section, subsection, or unit, the Student State report includes all of the problems in that part of the course.

5. Select **Download a CSV of problem responses**.

6. At the bottom of the page, select the {course_id}_student_state_from_{problem_location}_{date}. csv file.

7. Use a text editor or spreadsheet application to open the file. For more information, see *Interpret the Student State Report*.

Interpret the Student State Report

The Student State report contains a row for each learner who has viewed a problem or submitted an answer for a problem, identified by username.

The .csv file contains the following columns.

Column	Description
Username	The student's username.
Title	The display name or title of the problem or course component.
Question	The question(s) that were asked to the student.
Answer	The student's answer(s), in human-readable text.
Location	The location of the problem or component in the course. For example, **Introduction > Overview > Testing Your Knowledge** (section, subsection, and unit).
State	The detailed JSON data with details in the student's submission (not human-readable).
Block_key	The ID or key of the XBlock. Note that non-interactive XBlocks, such as HTML/text blocks, will not appear in the report.

The **State** column reports the results of the server processing for each learner's most recently submitted answer. When you open the report, the value in the **State** column appears on a single line. This value is a record in JSON format. An example record for a text input CAPA problem follows.

```
{"correct_map": {"e58b639b86db44ca89652b30ea566830_2_1": {"hint": "", "hintmode":
null, "correctness": "correct", "msg": "", "answervariable": null, "npoints": null,
"queuestate": null}}, "input_state": {"e58b639b86db44ca89652b30ea566830_2_1": {}},
"last_submission_time": 2015-10-26T17:32:20Z", "attempts": 3, "seed": 1, "done":
true, student_answers": {"e58b639b86db44ca89652b30ea566830_2_1": "choice_2"}}
```

You can use a JSON "pretty print" tool or script to make the value in the **State** column more readable, as in the following example.

```
{
  "correct_map": {
    "e58b639b86db44ca89652b30ea566830_2_1": {
      "hint": "",
      "hintmode": null,
      "correctness": "correct",
      "msg": "",
      "answervariable": null,
      "npoints": null,
      "queuestate": null
    }
  },
  "input_state": {
    "e58b639b86db44ca89652b30ea566830_2_1": {

    }
  },
  "last_submission_time": "2015-10-26T17:32:20Z",
  "attempts": 3,
  "seed": 1,
  "done": true,
  "student_answers": {
    "e58b639b86db44ca89652b30ea566830_2_1": "choice_2"
```

(continues on next page)

```
    }
}
```

When you add line breaks and spacing to the value in the **State** column for this CAPA problem, it becomes possible to recognize its similarity to the server problem check records in the Submission History. For more information, see *Interpret a Learner's Submission History*.

A **State** value that appears as follows indicates a learner who has viewed a CAPA problem, but not yet submitted an answer.

```
{"seed": 1, "input_state": {"e58b639b86db44ca89652b30ea566830_2_1": {}}}
```

For open response assessment problems, the **State** value appears as follows for learners who have submitted an answer.

```
{"submission_uuid": "c359b484-5644-11e5-a166-0a4a2062d211", "no_peers":
false}
```

For open response assessment problems, `"no_peers": false` indicates that the learner has completed at least one peer assessment, while `"no_peers": true` indicates that no peer assessments have been submitted.

18.2.2 Student Answer Distribution

For certain types of problems in your course, you can download a .csv file with data about the distribution of learner answers. Student answer distribution data is included in the file for problems of these types.

- Checkboxes (`<choiceresponse>`)
- Dropdown (`<optionresponse>`)
- Multiple choice (`<multiplechoiceresponse>`)
- Numerical input (`<numericalresponse>`)
- Text input (`<stringresponse>`)
- Math expression input (`<formularesponse>`)

The file includes a row for each problem-answer combination selected by your learners. For example, for a problem that has a total of five possible answers the file includes up to five rows, one for each answer selected by at least one learner. For problems with **Randomization** enabled in Studio (sometimes called rerandomization), there is one row for each problem-variant-answer combination selected by your learners. For more information, see *Defining Settings for Problem Components*.

Note: Certain types of problems can be set up to *award partial credit*. When a learner receives either the full or a partial score for a problem, this report includes that answer as correct.

The .csv file contains the following columns.

Column	Description
ModuleID	The internal identifier for the problem component.
PartID	For a problem component that contains multiple problems, the internal identifier for each individual problem. For a problem component that contains a single problem, the internal identifier of that problem.
Correct Answer	0 if this **AnswerValue** is incorrect, or 1 if this **AnswerValue** is correct. For a problem that is set up to award partial credit, 1 if the **AnswerValue** awards either the full or a partial score.
Count	The number of times that learners entered or selected this answer as their most recent submission for the problem or problem variant. For problems with the number of **Attempts** set to a value greater than 1, this means that each learner contributes a maximum of 1 to this count, even if the same answer is provided in multiple attempts.
ValueID	The internal identifier of the answer choice for checkboxes and multiple choice problems. Blank for dropdown, numerical input, text input, and math expression input problems. Note that the numbering of choice identifiers starts at `choice_0`, so that `choice_0` represents your first answer choice, `choice_1` represents your second answer choice, and so on.
AnswerValue	The text label of the answer choice for checkboxes, dropdown, and multiple choice problems. The value entered by the learner for numerical input, text input, and math expression input problems.
Variant	For problems that use the **Randomization** setting in Studio, contains the unique identifier for a variant of the problem. Blank for problems that do not use the **Randomization** setting, or that use the **Never** option for this setting.
Problem Display Name	The **Display Name** defined for the problem.
Question	The text in the problem that is identified with accessible label formatting. In Studio's *The Simple Editor*, this text appears with two angle brackets on either side pointing inward. For example, >>Is this the question text?<<. This column does not include a value for problems that do not have an accessible label defined.

Entries are sorted by the value in each column, starting with the ModuleID on the left and continuing through the columns to the right.

Download the Student Answer Distribution Report

An automated process runs periodically on the edX servers to update the .csv file of learner answer data. A link to the most recently updated version of the .csv file is available on the Instructor Dashboard.

To download the most recent file of learner answer data, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download**.

3. At the bottom of the page, select the `{course_id}_answer_distribution.csv` file. You may have to scroll down to find this file.

Frequently Asked Questions about the Student Answer Distribution Report

Answers to questions about the student answer distribution report follow.

My course doesn't have a student answer distribution report. How can I generate it?

Student answer distribution reports are generated automatically, and refreshed several times each day. The `{course_id}_answer_distribution.csv` file displays after all of the `{course_id}_grade_report_{date}.csv` files. Be sure to scroll to the end of the list of available reports.

Why are some problems missing from this report? The ones that are missing do have the problem types listed under *Answer Data*.

This report includes only problems that at least one learner has answered since early March 2014. For those problems, this report only includes activity that occurred after October 2013.

Why don't I see an AnswerValue for some of my problems?

For checkboxes and multiple choice problems, the answer choices actually selected by a learner after early March 2014 display as described in the previous answer. Answer choices selected by at least one learner after October 2013, but not selected since early March 2014, are included on the report but do not include an **AnswerValue**. The **ValueID** does display the internal identifiers, such as choice_1 and choice_2, for those answers.

Why don't I see a Question for some of my problems?

The value in the **Question** column is the question text that you identified for the problem with the accessible label formatting. If you did not identify question text for the problem, you will not see a question. For more information about how to set up accessible labels for problems, see *The Simple Editor*.

Also, for problems that use the **Randomization** setting in Studio, if a particular answer has not been selected since early March 2014, the **Question** is blank for that answer.

My learners are saying that they answered a question, but it isn't showing up in the report. How can that be?

Only questions that have a **Maximum Attempts** setting of 1 or higher are included on the report.

I made a correction to a problem after it was released. How can I tell which learners tried to answer it before I made the change?

Problem **Count** values reflect the entire problem history. If you change a problem after it is released, it may not be possible for you to determine which answers were given before and after you made the change.

Why is the same answer showing up in two different rows when I view the report in a spreadsheet?

Some spreadsheet applications can alter the data in the .csv report for display purposes. For example, for different learner answers of "0.5" and ".5" Excel correctly includes the two different lines from the .csv, but displays the **AnswerValue** on both of them as "0.5". If you notice answers that appear to be the same on separate lines with separate counts, you can review the actual, unaltered data by opening the .csv file in a text editor.

Why are there strange characters in the report when I view it in a spreadsheet?

The .csv file is UTF-8 encoded, but not all spreadsheet applications interpret and render UTF-8 encoded characters correctly. For example, a student answer distribution report with answer values in French displays differently in Microsoft Excel for Mac than in OpenOffice Calc.

Answer Values in Microsoft Excel for Mac:

ValueID	AnswerValue
choice_0	J'ai particip_ _ la discussion.
choice_0	J'ai regard_ la vid_o: "Une focale sur la non-democratie"
choice_2	le politique
choice_0	le pouvoir
choice_1	l'_conomie

Answer Values in OpenOffice Calc:

ValueID	AnswerValue
choice_0	J'ai participé à la discussion.
choice_0	J'ai regardé la vidéo: "Une focale sur la non-democratie"
choice_2	le politique
choice_0	le pouvoir
choice_1	l'économie

If you notice characters that do not display as expected in a spreadsheet, try a different spreadsheet application such as LibreOffice or Apache OpenOffice to open the .csv file.

Interpret the Student Answer Distribution Report

You can use the Student Answer Distribution report to review learner responses to assignments, which can then help you evaluate the structure and completeness of your course content and problem components.

As an example, you define a text input question in Studio to have a single correct answer, "Warfarin". When you produce the Student Answer Distribution report, you verify that this answer was in fact marked correct: there is a 1 in the **Correct Answer** column for this **AnswerValue**.

However, as you view the report you notice other learner answers that you did not set up to be marked as correct in Studio, but that you might (or might not) also consider to be correct, such as "Warfarin or Coumadin". The **Correct Answer** column shows that the other answers were marked incorrect (0), but for future iterations of your course you may want to revise the question or update the problem to evaluate additional variations of the answer as correct.

Many spreadsheet applications offer data visualization options, such as charts or graphs. Charts can help make your learners' common misconceptions easier to identify.
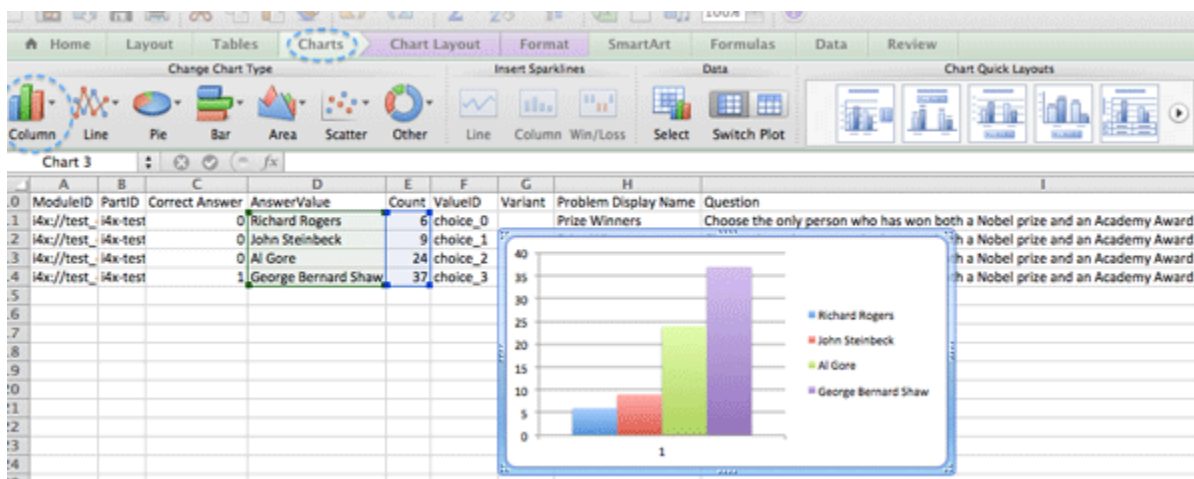
In this example, the Student Answer Distribution report is open in Microsoft Excel. To create a chart that shows how many of your learners chose various answers to a multiple choice question, you move the **AnswerValue** and **Count** columns next to each other. After you click and drag to select the report cells that contain the data you want to chart, you select the Charts toolbar and then select the type of chart you want.

Note: Refer to the help for the spreadsheet application that you use for information on using these options. You may have to make changes to your spreadsheet, such as reordering columns. Save a copy of the file you originally downloaded as a backup before you begin.

You can adjust your course content based on common mistakes. While most learners in this example selected the correct answer, the number of incorrect answer(s) can guide future changes to the course content.

18.3 Learner Grades and Grading

You can review information about how grading is configured for your course, and access learner grades, at any time after you create the course. You can also make adjustments to learner grading for a problem, for a single learner or all learners. For information about the grading data that you can access and the changes you can make, see the following topics.

- *Review How Grading Is Configured for Your Course*
- *Generate a Grade Report for All Learners in a Course*
- *Generate a Problem Grade Report for All Learners in a Course*
- *Review Learner Grades on the Instructor Dashboard*
- *Override Learner Subsection Scores in Bulk*
- *Per-Learner Interventions Report*
- *Check the Progress of a Specific Learner*
- *Grant Due Date Extensions for a Specific Learner*
- *Adjust Grades for One or All Learners*

To review learner answers to course problems, you can check the answer submissions for a specific problem, either for a selected learner or for all learners. You can also review answer distribution data for all of the problems. See *Answer Data*.

For open response assessments, you can generate an ORA data report that provides details of each learner's response and of assessments that were performed on each response. For details, see *Generate a Report for ORA Assignments*.

For information about how you establish a grading policy and work with the Problem components in your course, see *Establishing a Grading Policy For Your Course* or *Working with Problem Components*.

18.3.1 Review How Grading Is Configured for Your Course

You can review the assignment types that are graded and their respective weights in the LMS by selecting **Instructor** to access the instructor dashboard.

You establish a grading policy for your course when you create it in Studio. While the course is running, you can view an XML representation of the assignment types in your course and how they are weighted to determine learners' grades.

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download > Grading Configuration**.

   A list of the assignment types in your course displays. In this example, Homework is weighted as 0.3 (30%) of the grade.

```
=============================================================================
Course grader:
<class 'xmodule.graders.WeightedSubsectionsGrader'>

Graded sections:
    subgrader=<class 'xmodule.graders.AssignmentFormatGrader'>, type=Homework, category=Homework, weight=0.3
    subgrader=<class 'xmodule.graders.AssignmentFormatGrader'>, type=Midterm Exam, category=Midterm Exam, weight=0.3
    subgrader=<class 'xmodule.graders.AssignmentFormatGrader'>, type=Final Exam, category=Final Exam, weight=0.4
=============================================================================
Listing grading context for course test_doc/SB101/2014_Jan
graded sections:
[u'Midterm Exam', u'Homework']
--> Section Midterm Exam:
        Second Verse (format=Midterm Exam, Assignment=Midterm 01)
--> Section Homework:
        Line 1 (format=Homework, Assignment=HW 01)
        Dusk (format=Homework, Assignment=HW 02)
        Parsing the distinctions (format=Homework, Assignment=HW 03)
        Verse 2 (format=Homework, Assignment=HW 04)
        Line 2 (format=Homework, Assignment=HW 05)
all descriptors:
length=37
```

In Studio, you define this information by selecting **Settings** and then **Grading**. For more information, see *Configure the Assignment Types*.

Assignment Type Name		Abbreviation:
Homework		HW
e.g. Homework, Midterm Exams		e.g. HW, Midterm
Weight of Total Grade	**Total Number**	**Number of Droppable**
30	7	1
as a percent, e.g. 40	total exercises assigned	total exercises that won't be graded

---

Important: Any changes that you make to the course grading policy, to graded subsections, or to graded components after the course begins will affect learners' grades and their experience in the course as well as analysis of course data.

EdX recommends that you announce any unavoidable grading related changes to learners by using, for example, updates on the **Course** page. You should also carefully track such changes for researchers.

18.3.2 Generate a Grade Report for All Learners in a Course

For any course, you can generate grades and then download a file with the results for all learners in the course, including unenrolled learners. EdX recommends that you generate a grade report as soon as certificates have been issued for your course.

When you initiate calculations to grade learner work, a process starts on the edX servers. The complexity of your grading configuration and the number of learners in your course affect how long this process takes. You can download a report of the calculated grades in a comma-separated values (.csv) file when the grading process is complete.

You also have the option to review learner grades on the instructor dashboard. For more information, see *Review Learner Grades on the Instructor Dashboard*.

To generate and download the grade report for the learners in your course, follow these steps.

Important: Because the grade report file contains confidential, personally identifiable data, be sure to follow your institution's data stewardship policies when you open or save this file.

---

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download**.

3. To start the grading process, select **Generate Grade Report**.

   A status message indicates that the grading process is in progress. This process can take some time to complete, but you can navigate away from this page and do other work while it runs.

---

4. To check the progress of the grading process, reload the page in your browser and scroll down to the **Pending Tasks** section. The status of active tasks is shown in the table.

   When the report is complete, a linked .csv file name becomes available above the **Pending Tasks** section. File names are in the format `{course_id}_grade_report_{datetime}.csv`. The most recently generated reports appear at the top of the list.

5. To open or save a grade report file, locate and select the link for the grade report you requested.

   You can open .csv files in a spreadsheet application to sort, graph, and compare data.

Note: To prevent the accidental distribution of learner data, you can download grade report files only by selecting the links on this page. Do not copy these links for reuse elsewhere, as they expire within 5 minutes. The links on this page also expire if the page is open for more than 5 minutes. If necessary, refresh the page to generate new links.

Interpreting the Grade Report

A grade report for your course is a time-stamped .csv file that identifies each learner by ID, email address, and username, and provides a snapshot of their cumulative course scores.

Scores in the grade report are presented by assignment. There is a column for every assignment that is included in your grading configuration: each homework, lab, midterm, final, and any other assignment type you added to your course.

Note: The grade report does not include information about individual problems within assignments, or include learner answer distributions. For a report that shows problem-level information, see *Generate a Problem Grade Report for All Learners in a Course*.

The report indicates the enrollment track for each learner. For professional and verified track learners it also shows whether they have verified their identity. The report shows whether each learner is eligible to receive a certificate (determined by whether he has earned a passing grade at the time the report was requested), whether a certificate has been generated, and the type of certificate earned.

If your course includes *cohorts*, *content experiments*, or *teams*, the grade report includes additional columns indicating the name of the cohort, experiment group, or team that each learner belongs to.

Student ID	Email	Username	Grade	Quiz 1	Quiz 2	Quiz (Avg)	HW 1	HW 2	HW (Avg)	Enrollment T	Verification S	Certificate El	Certificate D	Certificate Ty	Enrollment S
			0.93	1	1	0.4	1	0.66667	0.53	audit	N/A	Y	N	N/A	enrolled
			0	Not Atte	Not Atte	0	Not Atten	Not Atten	0	audit	N/A	N	N	N/A	unenrolled
			1	1	1	0.4	1	1	0.6	verified	ID Verified	Y	N	N/A	enrolled

The grade report .csv file contains one row of data for each learner, and columns that provide the following information.

- Learner identifiers, including an internal **Student ID**, **Email** address, and **Username**.

- The overall **Grade**, with the total score a learner has currently attained in the course. This value is expressed as a decimal: a learner with a grade of 0.65 has earned 65% of the credit in the course, and a learner with a grade of 1 has earned 100%.

- Each **{assignment type} {number}** defined in your grading configuration, with the score that the learner attained for that specific assignment. For example, column Homework 3 shows the scores for the third homework assignment. If the learner did not attempt the assignment, the value is "Not Attempted". If the assignment was not available for the learner, the value is "Not Available".

- An **{assignment type} (Avg)** with each learner's current average score for that assignment type: for example, "Homework (Avg)". This column is not included if a particular assignment type has only one assignment.

  This assignment type average takes both dropped assignments and the assignment weight into account. For example, if the course includes five homework assignments and the course grading policy allows one homework

assignment with the lowest score to be dropped, the homework assignment average in this grade report is calculated over four homework assignments rather than five. This average is then multiplied by the assignment weight to calculate the assignment type average.

- If *cohorts* are used in the course, a **Cohort Name** column indicates the name of the cohort that each learner belongs to, including the default cohort. The column is empty for learners who are not yet assigned to a cohort.

- If *content experiments* are used in the course, an **Experiment Group** column indicates the name of the experiment group that each learner belongs to within a group configuration. The column heading includes the name of the group configuration. The column is empty for learners who are not assigned to an experiment group. If you have more than one experiment group configuration in your course, you see one column for each group configuration.

- If *teams* are enabled in the course, a **Team Name** column indicates the name of the team that each learner belongs to. The column is empty for learners who have not joined a team.

- The **Enrollment Track** column indicates whether each learner is enrolled in the course in the honor code, verified, or professional education track.

- The **Verification Status** column indicates whether learners who are enrolled in course tracks that require ID verification have successfully verified their identities to edX by submitting an official photo ID via webcam. The value in this column is "N/A" for learners enrolled in course tracks that do not require ID verification, such as "Audit".

  A value of "Not ID Verified" in this column indicates that the learner is enrolled in a course mode that requires ID verification, such as "Verified", but she has not attempted ID verification, or her ID verification has failed or expired. A value of "ID Verified" indicates that the learner is enrolled in a course mode that requires ID verification, and her ID verification is current and valid.

- The **Certificate Eligible** column indicates whether a learner is eligible for a certificate for your course.

  The value in this column is "Y" for the following learners.

  - Verified learners who attained a passing grade before this report was requested. For example, the learner could have earned a passing grade in an earlier session, or run, of the course.

  - All whitelisted learners, regardless of grade or enrollment track.

  The value is "N" for the following learners.

  - Learners who did not attain a passing grade.

  - Learners who are in the audit track.

  - Learners who live in embargoed countries.

- For learners who are eligible to receive a certificate, the **Certificate Delivered** column has a value of "Y" when the certificates for a course have been generated. The value is "N" for learners who are not eligible to receive a certificate.

- The **Certificate Type** column indicates the type of certificate that the learner is eligible for, such as "honor" or "verified". If a learner is not eligible for a certificate, or if the certificates for a course have not yet been generated, the value in this column is "N/A".

- The **Enrollment Status** column indicates whether the learner is currently enrolled or unenrolled in the course.

18.3.3 Generate a Problem Grade Report for All Learners in a Course

For any course, you can calculate grades for problems and generate a report that can be downloaded. The problem grade report for a course shows the number of points that each learner has earned for each problem, and the number of possible points for every problem in the course. In addition, the report shows the final grade score for each learner.

To generate and download the problem grade report for all learners who have ever enrolled in your course, follow these steps.

Important: Because the problem grade report file contains confidential, personally identifiable data, be sure to follow your institution's data stewardship policies when you open or save this file.

---

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download**.

3. To start the problem grading process, select **Generate Problem Grade Report**.

   A status message indicates that the problem grading process is in progress. This process can take some time to complete, but you can navigate away from this page and do other work while it runs.

4. To check the progress of the problem grading process, reload the page in your browser and scroll down to the **Pending Tasks** section. The status of active tasks is shown in the table.

   When the report is complete, a linked .csv file name becomes available above the **Pending Tasks** section. File names are in the format `{course_id}_problem_grade_report_{datetime}.csv`. The most recently generated reports appear at the top of the list.

5. To open or save a problem grade report file, locate and select the link for the problem grade report you requested.

   You can open .csv files in a spreadsheet application to sort, graph, and compare data.

Note: To prevent the accidental distribution of learner data, you can download problem grade report files only by selecting the links on this page. Do not copy these links for reuse elsewhere, as they expire within 5 minutes. The links on this page also expire if the page is open for more than 5 minutes. If necessary, refresh the page to generate new links.

Interpreting the Problem Grade Report

A problem grade report for your course is a time-stamped .csv file that identifies each learner by ID, email address, and username, and provides a snapshot of earned scores compared with the possible scores for each problem.

The problem grade report includes two columns for every problem that is included in your grading configuration. For each homework, lab, midterm, or final exam problem, there is one column for earned points, and one column for possible points. In addition, the report shows the final grade score for each learner, expressed as a decimal.

Student ID	Email	Username	Grade	Homework 1 Problem 1 (Earned)	Homework 1 Problem 1 (Possible)	Homework 1 Problem 2 (Earned)	Homework 1 Problem 2 (Possible)
			0.6	2	3	3	5
			0.57	2	3	2	5
			0.33	1	3	Not Attempted	5
			0.8	3	3	Not Attempted	5

The .csv file contains one row of data for each learner, and columns that provide the following information.

- Learner identifiers, including an internal **Student ID**, **Email** address, and **Username**.

- The **Grade** column shows the total score that a learner has currently attained in the course. This value is expressed as a decimal: a learner with a grade of 0.65 has earned 65% of the credit in the course, and a learner with a grade of 1 has earned 100%.

- For each problem (identified by assignment, subsection, and problem name), a column showing the number of points actually earned by each learner. If the learner did not attempt the assignment, the value is "Not Attempted". If the assignment is not available to the learner, the value in this column is "Not Available".

- For each problem (identified by assignment, subsection, and problem name), a column showing the number of points that it is possible to earn for the problem. If the assignment is not available to the learner, the value in this column is "Not Available".

18.3.4 Review Learner Grades on the Instructor Dashboard

You can review a gradebook for a course on the instructor dashboard. To review grades for a course, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Student Admin**.

3. Select **View Gradebook**. Grades are calculated and the Gradebook displays.

<< Back to Dashboard

Gradebook

course-v1:edX+DemoX+Demo_Course

Step 1: Filter the Grade Report

▼Edit Filters

Step 2: View or Modify Individual Grades

Showing **4** of **4** total learners
Score View:

Percent ⬍

Username Student Key*	Email	Ex 01	Ex 02	Exam 01	Total Grade (%) ⓘ
audit		9	0	0	3%
honor		0	0	0	0%
staff		0	0	0	0%
verified		0	0	0	0%

Filter panel:
Assignments —
Assignment Types
All ⬍
Assignment
All ⬍
Min Grade **Max Grade**
0 % 100 %
Apply

Overall Grade —
Min Grade **Max Grade**
0 % 100 %
Apply

Student Groups —
Tracks
Track-All ⬍
Cohorts

The gradebook displays a table, with a row for each learner (*see note) enrolled in the course, listed by user name, and a column for each assignment in the course.

Note: By default, the gradebook will not include any user enrolled in the course who also has a "Course Access Role". This includes course staff, course administrators, course data researchers, and beta testers. To see a listing of users who fall into this category, navigate to the Insurector Dashboard and refer to the Course Team Management section of the Membership tab.

The gradebook includes the following features:

- **Filtering:** There are several options for filtering the data shown on the gradebook.

  - *Assignment Type:* only show grades for a certain Assignment Type.

  - *Assignment:* only show grades for a single Assignment.

  – *Assignemnt Grade:* when filtering by *Assignment*, only show users with a grade for that assignment within a certain range.

  – *Overall Grade:* only show learners whose total course grade is within a certain range.

  – *Track:* only show learners of a certain enrollment mode (e.g. verified, audit, masters).

  – *Cohort:* only show learners in a certain cohort.

  – *Include Course Team Members:* By default, users with certain course roles (Staff, Admin, Beta Tester, Course Data Researcher) will be excluded from gradebook results. To include those users, you can select this option, which will include those excluded users in the gradebook.

- **Searching:** You can search for individual learners by their username, using the search field. Searches are case-insensitive.

- **Grade Override:** You can override the grade that a learner has received for a specific graded subsection. For information about how to do this, see *Override a Learner's Subsection Score Using the Instructor Dashboard Gradebook*.

- **Master's courses:** The edX gradebook has several features for high-touch courses. For learners in the Master's track:

  – You can search by email or university student key.

  – You can override grades in bulk. For more information, see *Override Learner Subsection Scores in Bulk*.

  – You can download and view a detailed per-learner report for tracking learner progress and planning learning interventions. For more information, see *Per-Learner Interventions Report*.

18.3.5 Override Learner Subsection Scores in Bulk

Note: Master's-only feature

This feature is available in courses with a Master's track, to support bulk grade adjustments or curving. It allows you to override subsection (i.e. assignment or exam) grades for in bulk by uploading a file.

Note: Grade overrides apply to all learners enrolled in supported courses. There is a size limit of 4MB (~10k learners) for uploaded files. If your Master's track course is bigger than this, you'll have to upload grading files in chunks.

To override grades in bulk, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Student Admin**.

3. Select **View Gradebook**.

4. Set up the filters to identify the segment of learners you want to grade.

5. Click the **Download Grades** button to download a CSV of subsection assignment grades for learners matching the currently specified filters.

   The CSV contains one row per learner, and the following columns:

   - **username**: The user's edX username

   - **student_key**: The user's external university ID, if configured

   - **course_id**: The course ID

- **track**: The user's enrollment track (e.g. audit, verified, etc.)
- **cohort**: The user's assigned cohort, if any

In addition, there are five columns per graded subsection. **<id>** is a unique internal identifier for each graded subsection.

- **name-<id>**: The name of the subsection
- **grade-<id>**: The "effective" grade for the subsection. This is equal to the override grade if there is an override, otherwise it is equal to the "original grade"
- **original_grade-<id>**: The grade that the user earned through answering problems and being scored through the LMS
- **previous_override-<id>**: The overridden grade (if any) that the learner has received through gradebook grade overrides
- **new_override-<id>**: This column will always be blank. This is where you will enter the user's new grade for the subsection

6. Fill in the points to award in the new_override column for the assignment(s) you want to override grades for and save the file.

7. Return to the Gradebook and click the **Import Grades** button.

8. Select your updated grades file and click **Open**.

9. The Gradebook will process your file, update learner grades, and provide a summary of grades updated and any errors.

It can take several minutes for the file upload to complete and grades to be fully updated.

You can find a history of files uploaded and summary of results by clicking the **View Bulk Management History** link at the top of the page.

18.3.6 Per-Learner Interventions Report

Note: Master's-only feature

This feature is available in courses with a Master's track, to support manual learning interventions. It allows you to export per-learner progress and grade information for Master's track learners, and enables you to identify and reach out to learners who may need additional help.

To download and view the interventions report, follow these steps:

1. View the live version of your course.

2. Select **Instructor**, and then select **Student Admin**.

3. Select **View Gradebook**.

4. Set up the filters to identify the segment of learners you want to view

5. Click the **Download Interventions** button to download a CSV report of progress and grades information for these learners.

The report file contains per-learner information for learners in the Master's track, including:

- edX user ID
- edX username

- Student Key

- Email

- Full Name

- Course ID

- Cohort

- Activity in this course – number of videos, problems, and discussion forum posts submitted over the last week and overall in this course

- Assignment grades

- Letter Course Grade

- Numeric Course Grade to-date

Learner data is updated every day to include activity through the end of the previous day (23:59 UTC).

18.3.7 Check the Progress of a Specific Learner

To check a single learner's progress in your course, you can review the data in the *grade report* or *problem grade report*, or review the learner's **Progress** page.

The **Progress** page includes a variety of features which allow learners to gauge their performance in a course. The main features of the **Progress** page are:

- the *Course Completion* chart, which represents all course content completed, both graded and ungraded,

- the *Grades* chart, which compares the current weighted grade compared to the grade required to pass the course and receive a certificate,

- the *Grade Summary* table, which lists all assignment types and their weights,

- the *Detailed Grades* display, which lists each graded assignment in the course and the score earned,

- and the *Certificate Status* display, which describes whether the learner has earned a certificate.

- *View a Specific Learner's Progress Page*

- *Understanding the Progress Page*

View a Specific Learner's Progress Page

To view a specific learner's **Progress** page, you need their email address or username. You can check the progress for learners who are either enrolled in, or who have unenrolled from, the course.

Learners can view their own progress chart and assignment scores when they are logged in to the course.

To view the **Progress** page for a specific learner, follow these steps.

1. View the live version of your course.

2. Next to **View this course as**, select **Specific student**.

3. In the **Username or email** field that appears, enter the learner's username or email address, and then press the Enter key on your keyboard.

4. Select the **Progress** page.

It is important to keep in mind that some of the performance displays may be impacted by content or grade visibility settings in Studio. The implications of these settings will be discussed in the following section.

Understanding the Progress Page

Course Completion

This chart represents how much of the course content learner's have completed. All units that can be completed are accounted for in this chart, including readings, videos, graded assignments, practice assignments, and assignments with future scheduled release dates.

The *Subsection Visibility Setting* in Studio impacts what content is represented in the Course Completion chart.

- Course content with a **Subsection Visibility Setting** of "Entirely Hide Subsection" will not appear in the chart.

- Course content in self-paced courses with a **Subsection Visibility Setting** of "Hide content after course end date" will not appear in the chart once the course has ended.

- Course content in instructor-paced courses with a **Subsection Visibility Setting** of "Hide content after due date" will not appear in the chart once the assignment's due date has passed.
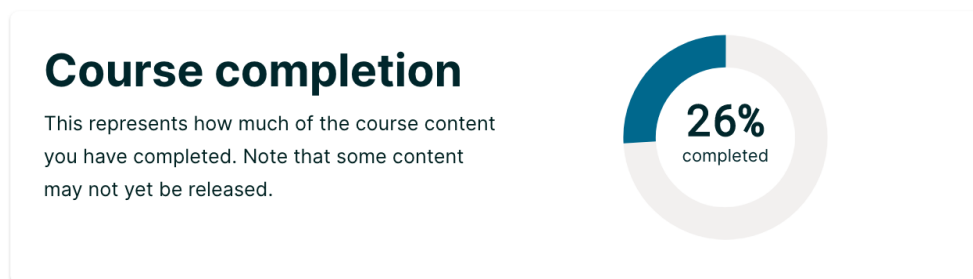
Grades

This feature displays the minimum passing grade in the course against the learner's current grade. The *Assessment Visibility Setting* in Studio impacts the grade calculation on the **Progress** page. Different settings determine whether a graded assignment is considered when calculating the grade to display to the learner.

- If "Always Show Results" has been selected, the assignment will be factored into this grade.

- If "Never Show Results" has been selected, the assignment will not be factored into this grade. This does not change the learner's grade within Gradebook. This also does not impact the learner's eligibility for a certificate.

- If "Show When Subsection is Past Due" has been selected, the assignment will only be factored into this grade when the assignment due date has passed.

Regardless of which **Assessment Visibility Setting** is selected, it will not impact the grade within the **Gradebook** of the **Student Admin** tab. A learner's certificate eligibility is based on the grade in the **Gradebook**.

Additionally, the Grades display includes a description of the *grade range* set for the course. The default grade range for a course is a binary Pass/Fail. If your course has additional ranges, they will be displayed here.
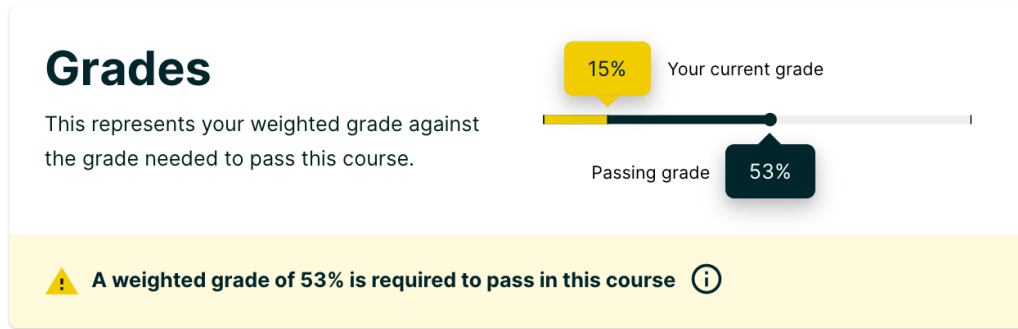
Grade Summary

The Grade Summary table breaks down each *assignment type* available in the course and the learner's performance in each type. The grades displayed in this section follow the same calculation criteria as the *Grades* feature. To recap, an assignment will be factored into this grade calculation if its *Assessment Visibility Setting* has been set to "Always Show Results" or "Show When Subsection is Past Due".

Detailed Grades

The Detailed Grades section is a list of all graded assignments in a course. Both the overall subsection grade and the individual problem scores are included in this list. Assignments will not appear in this display if any of the following criteria are true:

- The assignment has its *Subsection Visibility Setting* set to "Entirely Hide Subsection".
- The assignment has a future scheduled release date.
- The assignment is not graded.

Detailed grades

Example Week 1: Getting Started	Score
▼ Homework - Question Styles	0/11

Example Week 2: Get Interactive	Score
▼ Homework - Labs and Demos	0/5

Certificate Status

Certificate Status will only be displayed if your course has a certificate option. If your course is eligible, this feature will describe which of the following states the learner is in:

- **Passing**, where the learner has earned the minimum grade required to earn a certificate.

- **Not passing**, where the learner has not earned the minimum grade required to earn a certificate.

- **Audit learner**, where the learner is in an audit track and does not qualify for a certificate.

- **Certificate not yet available**, where the course is instructor-paced, and the certificate will not be available until after the course end date.

- **ID not verified**, where the learner has not completed their ID verification.

- **Can request certificate**, where the learner has earned a certificate, but the certificate has yet to be generated. In this case, the learner can request a certificate.

Your certificate is available!

Showcase your accomplishment on LinkedIn or your resumé today. You can download your certificate now and access it any time from your Dashboard and Profile.

View my certificate

18.3.8 Grant Due Date Extensions for a Specific Learner

We're providing a way to allow extending subsection due dates per individual learner.

This could be used to support special circumstances, personal emergencies, and disabilities accommodations.

Note: This feature currently only extends assignment due dates - it does not cover other due dates - e.g. for Open Response Assessments

Instructions

To extend a deadline for a learner, visit the **Extensions** tab on the **Instructor Dashboard**

1. Look up learner by email address or username

2. Choose the graded subsection from the dropdown

3. Enter new due date

4. Specify the reason for the extension

5. Click **Change due date for student**

You can also use this tab to **view all deadlines** or **reset a deadline**.

This feature is supported in courses published after June 1, 2019. To enable for an older course, first Publish the course from Studio. If you have questions, please contact your edX Project Coordinator.

18.3.9 Adjust Grades for One or All Learners

If you *modify a problem or its settings* after learners have attempted to answer it, we recommend that you rescore the changed problem so that learners' grades are updated.

You can adjust an individual learner's score for a problem using either the **Staff Debug Info** option in the course, the gradebook that you can access from the **Student Admin** tab of the instructor dashboard in the LMS, or on the **Student Admin** tab of the instructor dashboard in the LMS. To adjust the scores for all enrolled learners at once, you use the options on the **Student Admin** tab of the instructor dashboard in the LMS. If you use the options in the instructor dashboard **Student Admin** tab, you need to *obtain the unique location identifier* of the problem.

The following sections describe the various ways in which you can adjust learners' scores when you cannot avoid making a correction or other change to a problem.

- *Override a Learner's Score for a Problem*
- *Rescore Learner Submissions for a Problem*
- *Reset Learner Attempts for a Problem*
- *Delete a Learner's State for a Problem*
- *Find the Unique Location Identifier for a Problem*

Override a Learner's Score for a Problem

In some cases, you might want to change, or override, the score that Studio has given a learner for a specific problem. For example, you might receive an email message that explains extenuating circumstances for a learner. You can change an individual learner's score for a problem using either the instructor dashboard Gradebook, the instructor dashboard **Student Admin** page, or the Staff Debug viewer for the problem.

Override a Learner's Subsection Score Using the Instructor Dashboard Gradebook

To override a learner's score for a specific subsection by using the instructor dashboard Gradebook, follow these steps.

1. View the live version of your course in the LMS.

2. Select **Instructor**, and then select **Student Admin**.

3. Select **View Gradebook.**

4. Enter the learner's user name in the **Search** field.

5. Click the score for the assignment that you want to modify. The **Edit Grades** dialog opens, displaying the assignment name, the learner's user name, and the current grade for the assignment.

6. In the **Adjusted grade** field, enter the new grade for the learner on this assignment and select **Save Grade**.

Override a Learner's Score Using the Instructor Dashboard Student Admin

To override a learner's score for a specific problem by using the instructor dashboard Student Admin page, follow these steps.

1. Obtain the location identifier for the problem that you want to rescore. For more information, see *Find the Unique Location Identifier for a Problem*.

2. View the live version of your course in the LMS.

3. Select **Instructor**, and then select **Student Admin**.

4. Under **Adjust a learner's grade for a specific problem**, enter the learner's email address or username, and then enter the location of the problem in the course. For more information, see *Find the Unique Location Identifier for a Problem*.

5. Under **Score Override**, enter the new score for the problem, and then select **Override Learner's Score**.

Note: Make sure that the new score is out of the weighted total points for the problem.

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6. In the confirmation dialog box, select **OK** for each of the confirmation and status messages.

7. To view the results of the rescore process, select **Show Task Status**.

   A table displays the status of the override process.

Override a Learner's Score Using the Staff Debug Viewer

To override a learner's score for a specific problem by using the Staff Debug viewer, follow these steps.

1. Obtain the username or email address of the learner whose score you want to change.

2. View the live version of your course.

3. Select **Course** and navigate to the component that contains the problem you want.

4. Display the problem, and then select **Staff Debug Info**. The Staff Debug viewer opens.

5. In the **Username** field, enter the learner's email address or username.

6. In the **Score (for override only)** field, enter the correct score for the learner, and then select **Override Score**. A message indicates a successful adjustment.

7. To close the Staff Debug viewer, click on the browser page outside of the viewer.

Rescore Learner Submissions for a Problem

Each problem that you create for your course includes the definition of a correct answer, and might also include a tolerance or acceptable alternatives. If you make a change to the accepted answers for a problem, you can rescore any learner responses that were already submitted.

Note: You can only rescore problems that have a correct answer defined in edX Studio, including CAPA problems and drag and drop problems. This procedure cannot be used to rescore open response assessment (ORA) problems or problems that are scored by an external grader. For ORA problems, you can *override a learner assessment grade* in Studio.

Additionally, errors might occur if you rescore a problem that has multiple response fields and you have completed any of the following actions.

  • You removed a response field.

  • You added a response field.

  • You reordered any of the response fields.

  • *Rescore an Individual Learner's Submission Only if the Score Improves*

  • *Rescore an Individual Learner's Submission*

  • *Rescore Submissions for All Learners Only if Scores Improve*

  • *Rescore Submissions for All Learners*

Rescore an Individual Learner's Submission Only if the Score Improves

This method of rescoring updates a learner's score only if it improves with the rescoring. If the score is unchanged or might be lower after the rescoring, the learner's score is not updated.

To rescore a problem for a single learner and update the score only if it improves, follow these steps.

1. Obtain the username or email address of the learner whose submission you are rescoring.

2. View the live version of your course.

3. Select **Course** and navigate to the component that contains the problem you want to rescore.

4. Display the problem, and then select **Staff Debug Info**. The Staff Debug viewer opens.

5. In the **Username** field, enter the learner's email address or username, and then select **Rescore Only If Score Improves**. A message indicates a successful adjustment.

6. To close the Staff Debug viewer, click on the browser page outside of the viewer.

Note: You can also rescore an individual's submission in the **Adjust a learner's grade for a specific problem** section on the **Student Admin** tab of the instructor dashboard. To do this, you need to obtain *the location ID* of the problem as well as the learner's username or email address.

Rescore an Individual Learner's Submission

Note: Depending on the type of change you made to the problem, this method of rescoring might decrease the learner's score. To avoid negatively affecting learner scores, you can instead *rescore a learner's submission only if the score improves*.

To rescore an individual learner's submission, follow these steps.

1. Obtain the username or email address of the learner whose submission you are rescoring.

2. View the live version of your course.

3. Select **Course** and navigate to the component that contains the problem you want to rescore.

4. Display the problem, and then select **Staff Debug Info**. The Staff Debug viewer opens.

5. In the **Username** field, enter the learner's email address or username, and then select **Rescore Learner's Submission**. A message indicates a successful adjustment.

6. To close the Staff Debug viewer, click on the browser page outside of the viewer.

Note: You can also rescore an individual's submission in the **Adjust a learner's grade for a specific problem** section on the **Student Admin** tab of the instructor dashboard. To do this, you need to obtain *the location ID* of the problem as well as the learner's username or email address.

Rescore Submissions for All Learners Only if Scores Improve

This method of rescoring updates learners' scores only if they improve with the rescoring. Learners' scores that are unchanged or lower after the rescoring are not updated.

To rescore a problem for all enrolled learners in your course, and update scores only if they improve, follow these steps.

1. Obtain the location identifier for the problem that you want to rescore. For information, see *Find the Unique Location Identifier for a Problem*.

2. View the live version of your course.

3. Select **Instructor**, and then select **Student Admin**.

4. In the **Adjust all enrolled learners' grades for a specific problem** section of the page, enter the location of the problem, and then select **Rescore Only If Scores Improve**.

5. In the confirmation dialog box, select **OK** for each of the confirmation and status messages.

   The rescoring process can take some time to complete for all enrolled learners. You can navigate away from this page and do other work while the process runs in the background.

6. To view the results of the rescore process, select **Show Task Status**.

   A table displays the status of the rescore process.

Rescore Submissions for All Learners

Note: Depending on the type of change you made to the problem, this method of rescoring might decrease learners' scores. To avoid negatively affecting learners' scores, you can instead *rescore learners' submissions only if scores improve*.

To rescore a problem for all enrolled learners in your course, follow these steps.

1. Obtain the location identifier for the problem that you want to rescore. For information, see *Find the Unique Location Identifier for a Problem*.

2. View the live version of your course.

3. Select **Instructor**, and then select **Student Admin**.

4. In the **Adjust all enrolled learners' grades for a specific problem** section of the page, enter the location of the problem, and then select **Rescore All Learners' Submissions**.

5. In the confirmation dialog box, select **OK** for each of the confirmation and status messages.

   The rescoring process can take some time to complete for all enrolled learners. You can navigate away from this page and do other work while the process runs in the background.

6. To view the results of the rescore process, select **Show Task Status**.

   A table displays the status of the rescore process.

Reset Learner Attempts for a Problem

When you create a problem, you can limit the number of times that a learner can try to answer that problem correctly. If unexpected issues occur for a problem, you can reset the value for one particular learner's attempts back to zero so that the learner can begin work over again. If the unexpected behavior affects all of the learners in your course, you can reset the number of attempts for all learners to zero.

Note: You cannot use this method with open response assessment (ORA) problems. To allow a learner to start an ORA problem again and resubmit responses, you must *delete the learner's state*.

Reset Attempts for an Individual Learner

To reset the number of attempts for a single learner, follow these steps.

1. Obtain the learner's username or email address.

2. View the live version of your course.

3. Select **Course** and navigate to the component that contains the problem you want to reset.

4. Display the problem, and then select **Staff Debug Info**. The Staff Debug viewer opens.

5. In the **Username** field, enter the learner's email address or username, and then select **Reset Learner's Attempts to Zero**. A message indicates a successful adjustment.

6. To close the Staff Debug viewer, click on the browser page outside of the viewer.

Reset Attempts for All Learners

To reset the number of attempts that all enrolled learners have for a problem, follow these steps.

1. Obtain the location identifier for the problem whose attempts you are resetting. For more information, see *Find the Unique Location Identifier for a Problem*.

2. View the live version of your course.

3. Select **Instructor**, and then select **Student Admin**.

4. To reset the number of attempts for all enrolled learners, you work in the **Adjust all enrolled learners' grades for a specific problem** section of the page. Enter the unique problem location, and then select **Reset Attempts to Zero**.

5. A dialog opens to indicate that the reset process is in progress. Select **OK**.

   This process can take some time to complete. The process runs in the background, so you can navigate away from this page and do other work while it runs.

6. To view the results of the reset process, select **Show Task Status**.

   A table displays the status of the reset process for each learner or problem.

Note: You can use a similar procedure to reset problem attempts for a single learner. You work in the **Student-Specific Grade Adjustment** section of the page to enter both the learner's email address or username and the unique problem identifier, and then select **Reset Student Attempts**.

Delete a Learner's State for a Problem

You can completely delete a learner's database history, or "state", for a problem. You can only delete learner state for one learner at a time.

For example, you realize that a problem needs to be rewritten after only a few of your learners have answered it. To resolve this situation, you rewrite the problem and then delete learner state only for the affected learners so that they can try again.

To delete a learner's entire history for a problem from the database, you need that learner's username or email address.

Important: Learner state is deleted permanently by this process. This action cannot be undone.

When you delete a learner's state for an open response assessment (ORA) problem, the learner will have to start the assignment from the beginning, including submitting responses and going through the required assessment steps.

You can use either the **Staff Debug Info** option or the instructor dashboard to delete learner state.

To use the **Staff Debug Info** option, follow these steps.

1. View the live version of your course.

2. Select **Course** and navigate to the component that contains the problem.

3. Display the problem, and then select **Staff Debug Info**. The Staff Debug viewer opens.

4. In the **Username** field, enter the learner's email address or username, and then select **Delete Learner's State**. A message indicates a successful adjustment.

5. To close the Staff Debug viewer, click on the browser page outside of the viewer.

To use the instructor dashboard, you must first obtain the unique identifier of the problem. See *Find the Unique Location Identifier for a Problem*.

1. Select **Instructor**, and then select **Student Admin**.

2. In the **Adjust a learner's grade for a specific problem** section of the page, enter both the learner's email address or username and the unique problem identifier, and then select **Delete Learner's State**.

Find the Unique Location Identifier for a Problem

When you create each of the problems for a course, edX assigns a unique location to it. To make grading adjustments for a problem, or to view data about it, you need to specify the problem location.

Location identifiers for problems can be in one of these formats.

- `location = block-v1:{org}+{course}+{run}+type@problem+block@{id}`, for example, `location = block-v1:edX+BlendedX+1T2015+type@problem+block@72e0f73cdf5c4d648ebec0022854f18b`

- `location = i4x://{org}/{course}/problem/{id}`, for example, `location = i4x://edX/edX101/problem/680cc746e8ee473490841334f0235635`

Courses created since Fall 2014 typically have usage IDs in the first format, while older courses have usage IDs in the second format.

To find the unique location identifier for a problem, follow these steps.

1. View the live version of your course.

2. Select **Course**, and then navigate to the unit that contains the problem.

3. Display the problem, and find the **Submission History** and **Staff Debug Info** options that appear below it.

4. Select **Staff Debug Info**. Information about the problem appears, including its **location**.

5. To copy the location of the problem, select the entire value after `location =`, right click, and then select **Copy**.

To close the Staff Debug viewer, click on the browser page outside of the viewer.

18.4 Obtaining Certificate Data

This topic describes how to access data about certificates that have been issued for a course.

- *Access Certificate Data*
- *Columns in the Certificate Report*

For more information, see the following other topics about certificates.

- *Setting Up Certificates in Studio*
- *Ending a Course*

18.4.1 Access Certificate Data

You can view data about the certificates that have been issued for your course in the LMS by selecting **Instructor** to access the instructor dashboard. You can also download a .csv (comma-separated values) file with the certificate data.

View Certificate Data

To view certificate data, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download**.

3. Select **View Certificates Issued**.

   A table of certificate data is displayed, with one row for each type of certificate issued. For more information on the contents of this report, see *Columns in the Certificate Report*.

Download Certificate Data

To download certificate data, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download**.

3. Select **Download CSV of Certificates Issued**.

   The CSV file is downloaded to your computer.

   For more information on the contents of this file, see *Columns in the Certificate Report*.

18.4.2 Columns in the Certificate Report

The certificate report includes a row for each type of certificate issued for the course.

Column	Description
CourseID	The unique ID of the course for which you are viewing certificate data.
Certificate Type	The type of certificate issued. For example, Verified or Honor.
Total Certificates Issued	The number of certificates of the specific type that have been issued to learners as of the report date.
Date Report Run	The date the report was created.

18.5 Ending a Course

This topic describes how to complete several end-of-course tasks.

- *Sending a Farewell Message*
- *Assigning Final Grades*
- *Issuing Certificates*

For more information, see the following other topics about certificates.

- *Setting Up Certificates in Studio*
- *Obtaining Certificate Data*

18.5.1 Sending a Farewell Message

As you prepare for the end of your course, you can send learners a *course farewell* email message.

18.5.2 Assigning Final Grades

To assign a final grade to each learner enrolled in a course, you generate grades after the course end date and time have passed. For more information, see *Generate a Grade Report for All Learners in a Course*.

The learner's final grade and the grading configuration you set in Studio determine whether the learner has earned a certificate for the course.

18.5.3 Issuing Certificates

Note: Before you can issue certificates, the administrator for your instance of Open edX must configure the platform to allow course teams to generate and issue certificates. For more information, see Enable Automatic Certificate Generation and Enabling Course Certificates in *Installing, Configuring, and Running the Open edX Platform*.

The platform can automatically generate certificates for both self-paced courses and instructor-paced courses. When certificates become available, options for learners to view their certificates are available on the learner dashboard, the learner **Profile** page, and the course **Progress** page.

You can specify when you want to make certificates available.

- For self-paced courses, by default, certificates are generated for learners when they have completed enough of the course, and with a high enough grade, to qualify for a certificate.

  If you want to generate certificates only after learners have completed the course, you can disable this feature. For more information, see *Allow Learners to Receive Early Certificates*.

- For instructor-paced courses, three options are available.

- By default, certificates become available to learners 48 hours after your course end date. If you change your course end date, Studio automatically adjusts the date for certificates as well.

- You can specify a different date to make certificates available. For more information, see *Specify a Different Certificates Available Date*.

- You can allow learners to receive their certificates when they have completed enough of the course, and with a high enough grade, to qualify for a certificate. For more information, see *Allow Learners to Receive Early Certificates*.

Issue Certificates on a Specified Date

If you do not want to generate certificates 48 hours after the course end date, you can specify the date when you want the platform to generate certificates. You can change this date at any time.

For more information about how to specify a day to issue certificates, see *Specify a Different Certificates Available Date*.

Allow Learners to Receive Early Certificates

If the administrator has configured the site correctly (see Enable Automatic Certificate Generation in *Installing, Configuring, and Running the Open edX Platform*), self-paced courses issue certificates to learners as soon as learners have completed enough of the course, with a high enough grade, to earn a certificate. You do not have to change any settings.

Earlier Open edX versions had an **Enable Student-Generated Certificates** option in the LMS instructor dashboard; this option has been removed.

Allow Learners to Download Early Certificates

To allow learners to download early certificates, you modify the **Certificates Display Behavior** advanced setting in Studio.

1. In Studio, on the **Settings** menu, select **Advanced Settings**.

2. On the **Advanced Settings** page, locate **Certificates Display Behavior**.

3. In the **Certificates Display Behavior** field, enter `"early_no_info"`. Be sure that you include the double quotation marks.

4. Select **Save Changes**.

RE-RUNNING YOUR COURSE

Use the topics in this section to learn about re-running your course.

For information on how to develop your course content in the Studio Outline, see *Developing Your Course*.

19.1 Re-running a Course

Another way to create a course in Studio is to re-run an existing course. When you re-run a course, most, but not all, of the original course content is duplicated to the new course. The original course is not changed in any way.

- *Data Duplicated When You Re-Run a Course*

- *Re-Run a Course*

- *Update the New Course*

19.1.1 Data Duplicated When You Re-Run a Course

Type of Content	Duplicated to New Course?
Course start date	No. Set to midnight on January 1, 2030 (UTC).
All other course dates	Yes. You must update all release dates and due dates.
Course structure (sections, subsections, units) and state (published, hidden)	Yes.
Individual problems and other components	Yes.
Files uploaded to the course, including videos and textbooks	Yes.
Pages added to the course	Yes, including all page content and the defined page order.
Course updates	Yes.
Prerequisite course subsection settings	No.
Advanced settings	Yes.
Grading policy	Yes.
Student enrollment data	No.
Course team privileges, including admins, discussion moderators, beta testers	No. Only the user who created the new course has access to it.
Manually created cohorts	No.
Student answers, progress, and grading data	No.
Certificates	Yes.
Discussion posts, responses, comments, and other data	No.
Wiki contributions	No.

After you create a re-run course, modifications to the original course and the re-run course are independent. Changes to either course have no effect on the other course. Therefore, you should ensure that the original course content is as complete as possible before you re-run the course.

For more information, see *Re-Run a Course* and *Update the New Course*.

19.1.2 Re-Run a Course

Note: After the end date for a course has passed, the course moves to the **Archived Courses** tab on the Studio dashboard. If the course that you want to re-run is not visible on the **Courses** tab, look for the course on the **Archived Courses** tab.

To re-run a course, the course team can *use the course Import and Export options*, or a system administrator can *use the Re-Run Course option*. Note that the **Import** and **Export** method takes less time than the **Course Re-Run** option because this method does not require action from a system administrator.

Export and Import the Previous Course

To use the import and export options to re-run a course, follow these steps.

1. In Studio, open the course that you want to re-run.

2. *Export your course*.

3. In Studio, *create a new course*.

Note: You must have course creation privileges to create a new course. If you do not have course creation privileges, contact a member of the course team who has these privileges, or your organization's administrator.

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4. In the new course, *import the content from the previous course*.

5. After the import operation is complete, *review and update the settings and content* for the new course.

Use the Course Re-Run Option

Note: Before you re-run a course, make sure that its settings and content are complete. Additions and changes that you make to the original course after you create the new course have no effect on the new course.

Only global or system administrators have the permissions needed to re-run a course. To re-run a course, contact your system administrator. After your system administrator creates a new course using the re-run feature, you can complete the steps to *update the new course*.

To re-run a course, users who have the required permissions follow these steps.

1. Sign in to Studio. Your dashboard lists the courses that you have access to as a course team member.

2. Move your cursor over each row in the list of courses. The **Re-Run Course** and **View Live** options appear for each course.

3. Locate the course you want to re-run and select **Re-Run Course**. The **Create a re-run of a course** page opens with values already supplied in the **Course Name**, **Organization**, and **Course Number** fields.

4. In the **Course Run** field, indicate when the new course will be offered.

   Together, the course number, the organization, and the course run are used to create the URL for the new course. The combination of these three values must be unique for the new course. In addition, the total number of characters used for the name, organization, number, and run must be 65 or fewer.

5. Select **Create Re-Run**. Your **My Courses** dashboard opens with a status message about the course creation process.

   Duplication of the course structure and content takes several minutes. You can work in other parts of Studio or in the LMS, or on other web sites, while the process runs. The new course appears on your **My Courses** dashboard in Studio when configuration is complete.

19.1.3 Update the New Course

When you create a course by re-running another course, you must carefully review the settings and content of the new course. To assure a quality experience for learners, be sure to test the course thoroughly before the course start date. See *Testing Your Course Content* and *Beta Testing a Course*.

At a minimum, you must make the following changes to prepare the new course for release.

• Add course team members, including discussion admins, moderators, and community TAs. See *Add Course Team Members* or *Planning Course Staff* .

• Update course-wide dates, including course and enrollment start and end dates. See *Scheduling a Course Run*.

• Change the release dates of course sections, subsections, and units. See *Release Dates*.

• Change the due dates of subsections that are part of your grading policy. See *Set the Assignment Type and Due Date for a Subsection*.

• Delete or edit posts on the **Course Updates** page in Studio. See *Add a Course Update*.

• For a course that includes *learner cohorts*, set up the cohorts and select a strategy for assigning learners to the cohorts.

• For a course that includes drag and drop problems, replace any problems created prior to April 2016 with the newer drag and drop problem component, which is accessible and mobile ready. For more information about enabling the new drag and drop problem type and adding these problems to your course, see *Drag and Drop Problem*.

The following additional changes can also improve the experience of learners who enroll in the new course run.

• Review the files on the **Files & Uploads** page. To update a file that contains references to course-related dates, you must complete the following steps.

    1. Locate the source file.

    2. Change course-related dates in the file.

    3. Upload the revised version of the file.

Note: If you use the same file name when you upload a revised file, links to that file in course components and course handouts will continue to work correctly. If you rename a file and then upload it, you must also update all links to the original file name. See *Add a Course Handout* or *Add a Link to a File*.

• Review the staff biographies and other information on the course About page and make needed updates. See *Planning Course Information* and *Planning Course Run Information*.

• Create initial posts for discussion topics and an "introduce yourself" post. See *Creating Course Discussions*.

• Add initial wiki articles.

• For a course that includes core problem types, including checkbox, text input, or math expression input problems, review the *Markdown-style formatting* or *OLX markup* of any problems created before September 2016. For more information about the updates that you can make to improve the accessibility of these problem types, see the Release Notes.

• If your course uses prerequisite course subsections to hide course subsections until learners complete other, prerequisite subsections, configure the prerequisite course subsections. See *Prerequisite Course Subsections*.

• If your course includes instructions for learners, verify that the instructions reflect the current user interface of the LMS.

For example, you could revise a description of the problem **Check** button, which was accurate before October 2016, to reflect its new label, **Submit**.

For more information about tools and ideas that can help you prepare a course for launch, see *Course Launching Activities*.

Note: Changes you make in the new course have no effect on the original course.

GLOSSARY

Note: Most of the links to documentation provided in this glossary are to the Building and Running an edX Course guide, for edX partners. Many of the same topics are available in the Open edX version of this guide, Building and Running an Open edX Course.

20.1 A

AAC

Advanced audio coding (AAC) is an audio coding standard for digital audio compression. AAC is the standard format for YouTube.

A/B test

See Content Experiment.

About page

The course page that provides potential learners with a course summary, prerequisites, a course video and image, and important dates.

accessible label

In a problem component, you use special formatting to identify the specific question that learners will answer by selecting options or entering text or numeric responses.

This text is referred to as the accessible label because screen readers read all of the text that you supply for the problem and then repeat the text that is identified with this formatting immediately before reading the answer choices for the problem. This text is also used by reports and Insights to identify each problem.

All problems require accessible labels.

For more information, see The Simple Editor.

advanced editor

An OLX (open learning XML) editor in a problem component that allows you to create and edit any type of problem. For more information, see The Advanced Editor.

Amazon Web Services (AWS)

A third-party file hosting site where course teams can store course assets, such as problem files and videos. If videos are posted on both YouTube and AWS, the AWS version of the video serves as a backup in case the YouTube video does not play.

assignment type

> The category of graded student work, such as homework, exams, and exercises. For more information, see Establishing a Grading Policy For Your Course.

20.2 C

CAPA problem

> A CAPA (computer assisted personalized approach) problem refers to any of the problem types that are implemented in the edX platform by the `capa_module` XBlock. Examples range from text input, drag and drop, and math expression input problem types to circuit schematic builder, custom JavaScript, and chemical equation problem types.

> Other assessment methods are also available, and implemented using other XBlocks. An open response assessment is an example of a non-CAPA problem type.

certificate

> A document issued to an enrolled learner who successfully completes a course with the required passing grade. Not all edX courses offer certificates, and not all learners enroll as certificate candidates.

> For information about setting up certificates for your course, see *Setting Up Certificates in Studio*.

chapter

> See *Section*.

checkbox problem

> A problem that prompts learners to select one or more options from a list of possible answers. For more information, see Checkbox Problem.

chemical equation response problem

> A problem that allows learners to enter chemical equations as answers. For more information, see Chemical Equation Problem.

circuit schematic builder problem

> A problem that allows learners to construct a schematic answer (such as an electronics circuit) on an interactive grid. For more information, see Circuit Schematic Builder Problem.

closed captions

> The spoken part of the transcript for a video file, which is overlaid on the video as it plays. To show or hide closed captions, you select the **CC** icon. You can move closed captions to different areas on the video screen by dragging and dropping them.

> For more information, see learners:Video Player.

codec

> A portmanteau of "code" and "decode". A computer program that can encode or decode a data stream.

cohort

> A group of learners who participate in a class together. Learners who are in the same cohort can communicate and share experiences in private discussions.

> Cohorts are an optional feature of courses on the edX platform. For information about how you enable the cohort feature, set up cohorts, and assign learners to them, see Using Cohorts in Your Courses.

component

The part of a unit that contains your actual course content. A unit can contain one or more components. For more information, see Developing Course Components.

content experiment

You can define alternative course content to be delivered to different, randomly assigned groups of learners. Also known as A/B or split testing, you use content experiments to compare the performance of learners who have been exposed to different versions of the content. For more information, see Overview of Content Experiments.

content library

See *Library*.

content-specific discussion topic

A category within the course discussion that appears at a defined point in the course to encourage questions and conversations. To add a content- specific discussion topic to your course, you add a discussion component to a unit. Learners cannot contribute to a content-specific discussion topic until the release date of the section that contains it. Content-specific discussion topics can be divided by cohort, so that learners only see and respond to posts and responses by other members of the cohort that they are in.

For more information, see Working with Discussion Components. For information about making content-specific discussion topics divided by cohort, see Setting up Discussions in Courses with Cohorts.

course catalog

The page that lists all courses offered in the edX learning management system.

course handouts

Course handouts are files you make available to learners on the **Home** page. For more information, see Adding Course Updates and Handouts.

course mode

See *enrollment track*.

course navigation pane

The navigation frame that appears at one side of the **Course** page in the LMS. The course navigation pane shows the sections in the course. When you select a section, the section expands to show subsections. When you select a subsection, the first unit in that subsection appears on the course page.

See also *Unit Navigation Bar*.

Course page

The page that opens first when learners access your course. On the **Course** page, learners can view the course outline and directly access the course, either by clicking a specific section or subsection on the outline, or by clicking the **Start Course** button (**Resume Course** if the learner has previously accessed the course).

The latest course update, such as a course welcome message, appears above the course outline. Links to various **Course Tools** including **Bookmarks**, **Reviews** and **Updates** appear at the side of this page. This page is a combination of the former **Home** and **Courseware** pages.

course run

A version of the course that runs at a particular time. Information about a course run includes start and end dates, as well as staff and the languages the course is available in. You can create a course run when you create a course.

course track

See *enrollment track*.

courseware

In OLX (open learning XML) and in data packages, "courseware" refers to the main content of your course, consisting mainly of lessons and assessments. Courseware is organized into sections, subsections, units, and components. Courseware does not include handouts, the syllabus, or other course materials.

Note that the **Course** page was formerly called the **Courseware** page.

course-wide discussion topic

Optional discussion categories that you create to guide how learners find and share information in the course discussion. Course-wide discussion topics are accessed from the **Discussion** page in your course. Examples of course-wide discussion topics include Announcements and Frequently Asked Questions. Learners can contribute to these topics as soon as your course starts. For more information, see Creating Course Discussions and Create Course-Wide Discussion Topics.

If you use cohorts in your course, you can divide course-wide discussion topics by cohort, so that although all learners see the same topics, they only see and respond to posts and responses by other members of the cohort that they are in. For information about configuring discussion topics in courses that use cohorts, see Setting up Discussions in Courses with Cohorts.

custom response problem

A custom response problem evaluates text responses from learners using an embedded Python script. These problems are also called "write-your-own-grader" problems. For more information, see Write-Your-Own-Grader Problem.

20.3 D

data czar

A data czar is the single representative at a partner institution who is responsible for receiving course data from edX, and transferring it securely to researchers and other interested parties after it is received.

For more information, see the Using the edX Data Package.

discussion

The set of topics defined to promote course-wide or unit-specific dialog. Learners use the discussion topics to communicate with each other and the course team in threaded exchanges. For more information, see Creating Course Discussions.

discussion component

Discussion topics that course teams add directly to units. For example, a video component can be followed by a discussion component so that learners can discuss the video content without having to leave the page. When you add a discussion component to a unit, you create a content-specific discussion topic. See also *Content Specific Discussion Topic*.

For more information, see Working with Discussion Components.

discussion thread list

The navigation frame that appears at one side of the **Discussion** page in the LMS. The discussion thread list shows the discussion categories and subcategories in the course. When you select a category, the list shows all of the posts in that category. When you select a subcategory, the list shows all of the posts in that subcategory. Select a post to read it and its responses and comments, if any.

dropdown problem

A problem that asks learners to choose from a collection of answer options, presented as a drop-down list. For more information, see Dropdown Problem.

20.4 E

edX101

An online course about how to create online courses. The intended audience for edX101 is faculty and university administrators.

edX Edge

edX Edge is a less restricted site than edX.org. While only edX employees and consortium members can create and post content on edX.org, any users with course creator permissions for Edge can create courses with Studio on studio.edge.edx.org, then view the courses on the learning management system at edge.edx.org.

edX Studio

The edX tool that you use to build your courses. For more information, see *Getting Started with Studio*.

embargo

An embargo is an official ban on trade or commercial activity with a particular country. For example, due to U.S. federal regulations, edX cannot offer certain courses (for example, particular advanced STEM courses) on the edx.org website to learners in embargoed countries. Learners cannot access restricted courses from an embargoed country. In some cases, depending on the terms of the embargo, learners cannot access any edX courses at all.

enrollment mode

See *enrollment track*.

enrollment track

Also called **certificate type**, **course mode**, **course seat**, **course track**, **course type**, **enrollment mode**, or **seat type**.

The enrollment track specifies the following items about a course.

- The type of certificate, if any, that learners receive if they pass the course.

- Whether learners must verify their identity to earn a certificate, using a webcam and a photo ID.

- Whether the course requires a fee.

- **audit**: This is the default enrollment track when learners enroll in a course. This track does not offer certificates, does not require identity verification, and does not require a course fee.

- **professional**: This enrollment track is only used for specific professional education courses. The professional enrollment track offers certificates, requires identity verification, and requires a fee. Fees for the professional enrollment track are generally higher than fees for the verified enrollment track. Courses that offer the professional track do not offer a free enrollment track.

Note: If your course is part of a MicroMasters or professional certificate program, your course uses the verified track. These courses do not use the professional enrollment track.

- **verified**: This enrollment track offers verified certificates to learners who pass the course, verify their identities, and pay a required course fee. A course that offers the verified enrollment track also automatically offers a free non-certificate enrollment track.

- **honor**: This enrollment track was offered in the past and offered an honor code certificate to learners who pass the course. This track does not require identity verification and does not require a fee. Note, however, that as of December 2015, edx.org no longer offers honor code certificates. For more information, see News About edX Certificates.

- **professional (no ID)**: Like the professional enrollment track, this track offers certificates and requires a fee. However, this track does not require identity verification. Courses that offer the professional (no ID) track do not offer a free enrollment track.

exercises

Practice or practical problems that are interspersed in edX course content to keep learners engaged. Exercises are also an important measure of teaching effectiveness and learner comprehension. For more information, see Adding Exercises and Tools.

export

A tool in edX Studio that you use to export your course or library for backup purposes, or so that you can edit the course or library directly in OLX format. See also *Import*.

For more information, see Export a Course or Export a Library.

20.5 F

forum

See *Discussion*.

fps

Frames per second. In video, the number of consecutive images that appear every second.

20.6 G

grade range

Thresholds that specify how numerical scores are associated with grades, and the score that learners must obtain to pass a course.

For more information, see Set the Grade Range.

grading rubric

See *Rubric*.

20.7 H

H.264

A standard for high definition digital video.

Home page

See Course Page.

Text component

A type of component that you can use to add and format text for your course. A Text component can contain text, lists, links, and images. For more information, see Working with Text Components.

20.8 I

Image mapped input problem

> A problem that presents an image and accepts clicks on the image as an answer. For more information, see Image Mapped Input Problem.

Import

> A tool in Studio that you use to load a course or library in OLX format into your existing course or library. When you use the Import tool, Studio replaces all of your existing course or library content with the content from the imported course or library. See also *Export*.

> For more information, see Import a Course or Import a Library.

instructor dashboard

> A user who has the Admin or Staff role for a course can access the instructor dashboard in the LMS by selecting **Instructor**. Course team members use the tools, reports, and other features that are available on the pages of the instructor dashboard to manage a running course.

> For more information, see Managing a Running Course.

20.9 K

keyword

> A variable in a bulk email message. When you send the message, a value that is specific to the each recipient is substituted for the keyword.

20.10 L

label

> See *Accessible Label*.

LaTeX

> A document markup language and document preparation system for the TeX typesetting program. In edX Studio, you can import LaTeX code.

learning management system (LMS)

> The platform that learners use to view courses, and that course team members use to manage learner enrollment, assign team member privileges, moderate discussions, and access data while the course is running.

learning sequence

> See *Unit Navigation Bar*.

left pane

> See *Course Navigation Pane*.

library

A pool of components for use in randomized assignments that can be shared across multiple courses from your organization. Course teams configure randomized content blocks in course outlines to reference a specific library of components, and randomly provide a specified number of problems from that content library to each learner.

For more information, see Working with Content Libraries and Randomized Content Blocks.

live mode

A view that allows the course team to review all published units as learners see them, regardless of the release dates of the section and subsection that contain the units. For more information, see Viewing Published and Released Content.

LON-CAPA

The Learning Online Network with Computer-Assisted Personalized Approach e-learning platform. The structure of CAPA problem types in the edX platform is based on the LON-CAPA assessment system, although they are not compatible.

See also *CAPA Problems*.

20.11 M

math expression input problem

A problem that requires learners to enter a mathematical expression as text, such as e=m*c^2.

For more information, see learners:Math Formatting in the *EdX Learner's Guide*.

MathJax

A LaTeX-like language that you use to write equations. Studio uses MathJax to render text input such as x^2 and sqrt(x^2-4) as "beautiful math."

For more information, see Using MathJax for Mathematics.

module

An item of course content, created in an XBlock, that appears on the **Course** page in the edX learning management system. Examples of modules include videos, HTML-formatted text, and problems.

Module is also used to refer to the structural components that organize course content. Sections, subsections, and units are modules; in fact, the course itself is a top-level module that contains all of the other course content as children.

multiple choice problem

A problem that asks learners to select one answer from a list of options. For more information, see Multiple Choice Problem.

20.12 N

NTSC

National Television System Committee. The NTSC standard is a color encoding system for analog videos that is used mostly in North America.

numerical input problem

A problem that asks learners to enter numbers or specific and relatively simple mathematical expressions. For more information, see Numerical Input Problem.

20.13 O

OLX

OLX (open learning XML) is the XML-based markup language that is used to build courses on the Open edX platform.

For more information, see What is Open Learning XML?.

open response assessment

A type of assignment that allows learners to answer with text, such as a short essay and, optionally, an image or other file. Learners then evaluate each others' work by comparing each response to a *rubric* created by the course team.

These assignments can also include a self assessment, in which learners compare their own responses to the rubric, or a staff assessment, in which members of course staff evaluate learner responses using the same rubric.

For more information, see Introduction to Open Response Assessments.

20.14 P

pages

Pages organize course materials into categories that learners select in the learning management system. Pages provide access to the course content and to tools and uploaded files that supplement the course. Links to each page appear in the course material navigation bar.

For more information, see Managing the Pages in Your Course.

PAL

Phase alternating line. The PAL standard is a color encoding system for analog videos. It is used in locations such as Brazil, Australia, south Asia, most of Africa, and western Europe.

partner manager

Each EdX partner institution has an edX partner manager. The partner manager is the primary contact for the institution's course teams.

pre-roll video

A short video file that plays before the video component selected by the learner. Pre-roll videos play automatically, on an infrequent schedule.

For more information, see Adding a Pre-Roll Video to Your edX Course.

preview mode

A view that allows you to see all the units of your course as learners see them, regardless of the unit status and regardless of whether the release dates have passed.

For more information, see Previewing Draft Content.

problem component

A component that allows you to add interactive, automatically graded exercises to your course content. You can create many different types of problems.

For more information, see Working with Problem Components and Adding Exercises and Tools.

proctored exam

At edX, proctored exams are timed, impartially and electronically monitored exams designed to ensure the identity of the test taker and determine the security and integrity of the test taking environment. Proctored exams are often required in courses that offer verified certificates or academic credit. For more information, see Managing Proctored Exams.

program

A program is a collection of related courses. Learners enroll in a program by enrolling in any course that is part of a program, and earn a program certificate by passing each of the courses in the program with a grade that qualifies them for a verified certificate.

Several types of program are available on edx.org, including MicroMasters, Professional Certificate, and XSeries programs.

program offer

A program offer is a discount offered for a specific program. The discount can be either a percentage amount or an absolute (dollar) amount.

Progress page

The page in the learning management system that shows learners their scores on graded assignments in the course. For more information, see learners:SFD Check Progress in the *EdX Learner's Guide*.

20.15 Q

question

A question is a type of post that you or a learner can add to a course discussion topic to bring attention to an issue that the discussion moderation team or learners can resolve.

For more information, see Creating Course Discussions.

20.16 R

Research Data Exchange (RDX)

An edX program that allows participating partner institutions to request data for completed edx.org courses to further approved educational research projects. Only partner institutions that choose to participate in RDX contribute data to the program, and only researchers at those institutions can request data from the program.

For more information, see Using the Research Data Exchange Data Package.

rubric

> A list of the items that a learner's response should cover in an open response assessment. For more information, see the Rubric topic in Introduction to Open Response Assessments.
>
> See also *Open Response Assessment*.

20.17 S

seat type

> See *enrollment track*.

section

> The topmost category in your course outline. A section can represent a time period or another organizing principle for course content. A section contains one or more subsections.
>
> For more information, see Developing Course Sections.

sequential

> See *Subsection*.

short description

> The description of your course that appears on the edX Course List page.
>
> For more information, see *Course Short Description Guidelines*.

simple editor

> The graphical user interface in a problem component that contains a toolbar for adding Markdown formatting to the text you supply. The simple editor is available for some problem types. For more information, see Editing a Problem in Studio.

single sign-on (SSO)

> SSO is an authentication service that allows a user to access multiple related applications, such as Studio and the LMS, with the same username and password. The term SSO is sometimes used to refer to third party authentication, which is a different type of authentication system. For information about third party authentication, see *Third Party Authentication*.

special exam

> A general term that applies to proctored and timed exams in edX courses. See *Timed Exam* and *Proctored Exam*.

split test

> See *Content Experiment*.

subsection

> A division in the course outline that represents a topic in your course, such as a lesson or another organizing principle. Subsections are defined inside sections and contain units.
>
> For more information, see Developing Course Subsections.

20.18 T

text input problem

A problem that asks learners to enter a line of text, which is then checked against a specified expected answer.

For more information, see Text Input Problem.

timed exam

Timed exams are sets of problems that a learner must complete in the amount of time you specify. When a learner begins a timed exam, a countdown timer displays, showing the amount of time allowed to complete the exam. If needed, you can grant learners additional time to complete the exam. For more information, see Offering Timed Exams.

third party authentication

A system-wide configuration option that allows users who have a username and password for one system, such as a campus or institutional system, to log in to that system and automatically be given access to the LMS. These users do not enter their system credentials in the LMS.

For more information about how system administrators can integrate an instance of Open edX with a campus or institutional authentication system, see Enabling Third Party Authentication.

transcript

A text version of the content of a video. You can make video transcripts available to learners.

For more information, see *Obtain a Video Transcript*.

20.19 U

unit

A unit is a division in the course outline that represents a lesson. Learners view all of the content in a unit on a single page.

For more information, see Developing Course Units.

unit navigation bar

The horizontal control that appears at the top of the **Course** page in the LMS. The unit navigation bar contains an icon for each unit in the selected subsection. When you move your pointer over one of these icons, the name of the unit appears. If you have bookmarked a unit, the unit navigation bar includes an identifying flag above that unit's icon.

See also *Course Navigation Pane*.

20.20 V

VBR

Variable bit rate. The bit rate is the number of bits per second that are processed or transferred. A variable bit rate allows the bit rate to change according to the complexity of the media segment.

vertical

See *Unit*.

video component

A component that you can use to add recorded videos to your course.

For more information, see Working with Video Components.

20.21 W

whitelist

In edX courses, a whitelist is a list of learners who are being provided with a particular privilege. For example, whitelisted learners can be specified as being eligible to receive a certificate in a course, regardless of whether they would otherwise have qualified based on their grade.

In the grade report for a course, whitelisted learners have a value of "Yes" in the **Certificate Eligible** column, regardless of the grades they attained. For information about the grade report, see Interpreting the Grade Report.

wiki

The page in each edX course that allows both learners and members of the course team to add, modify, or delete content. Learners can use the wiki to share links, notes, and other helpful information with each other. For more information, see Using the Course Wiki.

20.22 XYZ

XBlock

EdX's component architecture for writing course components: XBlocks are the components that deliver course content to learners.

Third parties can create components as web applications that can run within the edX learning management system. For more information, see Open edX XBlock Tutorial.

XSeries

A set of related courses in a specific subject. Learners qualify for an XSeries certificate when they pass all of the courses in the XSeries. For more information, see XSeries Programs.