

LIBRETEXTS ACCESSIBILITY TOOLKIT



Unknown

Accessibility Toolkit – 2nd Edition

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Detailed Licensing

Detailed Licensing

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Accessibility Statement

This is LibreTexts adaptation of the [Accessibility Toolkit](#) published by BCampus for Pressbooks OER development.

LibreTexts and BCampus Open Education believes that education must be available to everyone which means supporting the creation of free, open, and accessible educational resources. Both organizations are actively committed to increasing the accessibility and usability of the textbooks we produce.

Accessibility features of the web version of this resource

The web version of the Libretexts Accessibility Toolkit has been designed with accessibility in mind by incorporating the following features:

- It has been optimized for people who use screen-reader technology.
 - all content can be navigated using a keyboard
 - links, headings, and tables are formatted to work with screen readers
 - images have alt tags
- Information is not conveyed by color alone.

The readability tab at the far right has options to help with reading

- There is an option to increase font size.
- Margin size can be increased or decreased to make reading more comfortable
- There is an option to display the text in dark mode and also use the [BeeLine Reader](#) to provide an eye-guiding color gradient

Other file formats available

In addition to the web version, this book is available as a PDF and you can generate PDFs of individual pages and chapters. You can also purchase a physical book at our online bookstore. Look for the “Download this book” drop-down menu to select the file type you want. Instructors can also download a Lite Common Cartridge imsc file to link the pages into their LMS. Instructions for this can be found in the [LibreTexts Construction Manual](#).

This book links to a number of external websites. For those using a print copy of this resource, the link text is underlined, and you can find the web addresses for all links in the back matter of the book.

Known accessibility issues and areas for improvement

While we strive to ensure that this resource is as accessible and usable as possible, we might not always get it right. Any issues we identify will be listed below. There are currently no known issues.

List of Known Accessibility Issues

Location of Issue	Need for Improvement	Timeline	Work Around

Accessibility standards

LibreTexts is committed to ensuring the LibreTexts platform and features are both accessible and usable by students and content authors. To that end, the LibreTexts platform and features are constantly undergoing comprehensive accessibility audit. Results

will be used to update the accessibility conformance documentation for the LibreTexts platform and features and create a roadmap to address identified accessibility barriers affecting the LibreTexts platform and features.

Our goal is for the LibreTexts platform and features to meet or exceed the Revised 508 Standards and WCAG 2.1 AA. [Accessibility conformance documentation is available](#). LibreTexts provides a variety of content authoring tools and resources for content authors to develop content that is accessible. However, LibreTexts is not responsible for the accessibility conformance level of specific content contributed by authors. Accessibility related concerns with specific content should be reported to the content author.

This handbook follows all guidelines in [Appendix A: Checklist for Accessibility](#). The development of this toolkit involved working with students with various print disabilities who provided their personal perspectives and helped test the content.

Let us know if you are having problems accessing this toolkit

We are always looking for ways to make our resources more accessible. If you have problems accessing this resource, please contact us to let us know so we can fix the issue.

Please include the following information:

- The location of the problem by providing a web address or a description of the PDF source you are using.
- A description of the problem
- The computer, software, browser, and any assistive technology you are using that can help us diagnose and solve your issue
 - e.g., Windows 10, Google Chrome (Version 65.0.3325.181), NVDA screen reader

You can contact us one of the following ways:

- Contact form: [LibreTexts Support](#)

This statement was last updated on March 15, 2024.

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About This Toolkit

This is LibreTexts adaptation of the [Accessibility Toolkit](#) published by BCampus for their Pressbooks OER development environment. LibreTexts provides other resources to help guide OER development on our platform, starting with our [Construction Guide](#) and including a large number of [YouTube videos](#).

Welcome to *LibreTexts' Accessibility Toolkit*. This support resource was written for open textbook authors—and others involved in writing and publishing—to create a truly open and accessible textbook.

[LibreTexts](#) began as the Chemwiki in 2008 because Delmar Larsen he was tired of asking his UC Davis Chemistry students to pay hundreds of dollars for commercial textbooks. He also knew open educational resources (OER) could help his students save money and succeed in his course because he could adapt them directly to their needs. Prof. Larsen understands firsthand the transformative power of education, crediting his own education for lifting him out of poverty while experiencing homelessness, living in his dad's truck behind a Denny's. Others at UC Davis began to notice and wanted to use the system for teaching their courses, first in chemistry, then physics, biology and math. In 2018 Libretexts won the first Department of Education Open Textbook Pilot Award and expanded to fill the rest of the curriculum. Today we are developing software to build the textbook of the future, with an integrated homework system, project management software and much more.

Open educational resources (OER) are defined as teaching, learning, and research resources that, through permissions granted by the copyright holder, allow others to use, distribute, keep, or make changes to them. We consider this publication — along with our guides, slide decks, and other support materials –as a type of OER that trains faculty, staff, and students how to build, customize, and use open textbooks.

This toolkit does not come with an index. Instead, use the search field located in the top-right of each page in the online version to locate a specific topic.

If you find an error in this toolkit or anywhere else in LibreTexts, please report it using the [Report a Textbook Error](#) form. For other feedback or comments, send email to info@libretexts.org.

Acknowledgements

This book is a modification of the BCCampus Accessibility Toolkit which discussed how to build accessibility into Pressbooks.

We thank BCCampus and acknowledge those who built that book

- CAPER-BC and Tara Robertson for their continued involvement and work on ensuring educational resources are accessible to all students
- Sue Doner of Camosun College for her work in Universal Design, and creating the accessibility check points in this book
- Amanda Coolidge for managing the project and providing enthusiastic support
- Josie Gray for adding information on how to create accessible content in Pressbooks, writing the chapter on [Accessibility Statements](#), and making other improvements for the second edition
- Laura Bulk, Mila Cherny, Charmaine Co, Lauren Rubin, Shruti Shravah, Steven Woo, and Chazz Young, the enthusiastic and generous student testers of this toolkit
- Sarah Horton and Whitney Quesenbery for giving permission to remix their [personas of people with disabilities](#) and releasing them under a CC BY license, as part of this toolkit
- Penn State for giving permission to use their [accessibility guidelines on formulas and equations](#) and releasing them under a CC BY license, as part of this toolkit
- Cynthia Ng for working on the personas
- Hilda Anggraeni for creating and adapting several personas
- The University of PEI for developing and contributing four new personas to the [Appendix B: Redesign or Accommodation Activity Guidelines](#)
- BCCampus for leading this initiative to ensure that open textbooks are accessible from both a financial and access perspective

Introduction

The original *Accessibility Toolkit* was a collaboration between BCcampus (Amanda Coolidge), Camosun College (Sue Doner), and Tara Robertson from the Centre for Accessible Post-secondary Education Resources BC (CAPER-BC), an organization that provides accessible learning and teaching materials to students and instructors who cannot use conventional print materials because of disabilities. LibreTexts has modified their contribution to cover our OER system.

Why an accessibility toolkit?

The focus of many open textbook projects is to provide access to education at low or no cost. But what does access mean? If the materials are not accessible for each and every student, do they fulfill the mandate to deliver fully open textbooks?

The goal of the *LibreTexts Accessibility Toolkit* is to provide the resources needed for each content creator, instructional designer, educational technologist, librarian, administrator, and teaching assistant to create a truly open and accessible textbook – one that is free and accessible for all students.

The suggestions provided in this guide are intended for the non-technical user. If you are looking for more technical descriptions about how to make your work accessible, review the [WCAG \(Web Content Accessibility Guidelines\)](#).

Updates to the second BCcampus edition

Josie Gray is responsible for

New information

- A chapter on how to write [Accessibility Statements](#)
- An [Accessibility Statement](#) for this toolkit in the front matter
- Additions to the back matter:
 - [List of Links by Chapter for Print Users](#)
 - [Bibliography](#)

Revised chapters

The following chapters were significantly changed and updated:

- [Images](#)
- [Links](#)
- [Tables](#)

Book-wide changes

- Screenshots of the LibreTexts editor replaced those from Pressbooks
- Information added about how to meet accessibility requirements when publishing in LibreTexts
- Heading levels changed to conform to guidelines outlined in [Organizing Content](#)
- Errors corrected and content updated

In the near future LibreTexts will use its Polyglot engine to produce versions of this Toolkit in French and Spanish. Translations into other languages can be made available on demand

What is Pressbooks?

In addition to providing general strategies for ensuring the creation of accessible content, the *LibreTexts Accessibility Toolkit*

includes specific instructions on how to achieve accessibility requirements in LibreTexts. The LibreTexts online authoring tool is one component of the LibreTexts OER system for creating and modifying open textbooks. (See the [LibreTexts Construction Manual](#).)

[Libretexts' Accessibility Policy](#) outlines our Accessibility Conformance Reports and Useage Guides.

LibreTexts maintains a free self serving system for access to the over 2500 textbooks in our library for faculty and staff from post-secondary institutions worldwide.

To Care and Comply: Accessibility of Online Course Content

Here is a video looking at Portland Community College's web-accessibility guidelines, and how supporting students with disabilities is a shared responsibility across the college. The video includes stories from students whose education is impacted by inaccessible web content, and ways faculty and staff can improve online course materials to make course content more accessible.

YouTube Video

This interactive element is not available in this format. Visit the link or scan the QR code to access it online.

[View this YouTube Video online](#)



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1: KEY CONCEPTS

Section Topics

This section describes key concepts that describe and will direct your accessibility work. They include:

- Definitions of and the rationale for using Universal Design
- How using personas will help you understand the students reading your textbook

[1.1: Universal Design](#)

[1.2: A framework for the universal design for learning](#)

[1.3: UDL and content on LibreTexts](#)

[1.4: Using Personas](#)

1.1: Universal Design

Universal Design is the process of creating products (devices, environments, systems, and processes) that are usable by people with the widest possible range of abilities, operating within the widest possible range of situations (environments, conditions, and circumstances). Universal Design emerged from the slightly earlier concept of being barrier-free, the broader [accessibility movement](#), and [adaptive technology](#) and [assistive technology](#). It also seeks to blend [aesthetics](#) into these core considerations.

Let's review two common definitions of Universal Design.

Definition 1

Universal Design or Universal Instructional Design (UID)

an approach to teaching that consists of the proactive design and use of inclusive instructional and evaluation strategies. This approach provides academic access to a broad range of learners, including students with disabilities, while:

- maintaining academic standards [...]
- reducing the need to having to retrofit after a course is already underway^[1]

Definition 2

Universal Instructional Design (UID)

an approach to designing course instruction, materials and content to benefit people of all learning styles without adaptation or retrofitting. UID provides equal access to learning, not simply equal access to information. UID allows the student to control the method of accessing information while the instructor monitors the learning process and initiates any beneficial methods... It should be noted that UID does not remove academic challenges; it removes barriers to access.^[2]

Why Universal Design?

For our purposes, we frame the practice of using Universal Design in a holistic and manageable way and begin by addressing the barriers that are easy to anticipate and proactively remediate. This toolkit, therefore, will provide guidance if the answer to any of the following questions is "yes."

- Do I have visual materials that present core concepts that not all students may be able to see or understand?
- Do I have multimedia materials (e.g., audio, video) that present core concepts that not all students may be able to be hear, see, or otherwise access?
- Do I have documents that present core concepts in a format that not all students may be able to access?

In the *LibreTexts Accessibility Toolkit*, we focus on an adjunct to Universal Design: [Universal Design for Learning](#) (UDL). UDL is a set of principles for curriculum development that gives all individuals equal opportunities to learn and provides a blueprint for creating instructional goals, methods, materials, and assessments that work for everyone. Rather than a single, one-size-fits-all solution, it offers a flexible approach that can be customized and adjusted for individual needs.^[3]

-
1. University of Victoria, "Universal Instructional Design (UID)," Centre for Accessible Learning, accessed March 27, 2018, <https://www.uvic.ca/services/cal/sta...sign/index.php>. ↵
 2. Ohio State University, "Universal Design for Learning," Partnership Grant: Fast Facts for Faculty, accessed March 27, 2018, https://ada.osu.edu/resources/fastfa...sal_Design.htm. ↵
 3. "The UDL Guidelines," CAST, accessed August 21, 2018, <http://udlguidelines.cast.org/>. ↵
-

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1.2: A framework for the universal design for learning

When building a LibreTexts page, consider: **content, architecture, and pedagogy (CAP)** as a framework. A *framework* is a basic structure underlying a concept, system, or process. In order to maximize learning as a process, we must begin by examining the framework of learning itself -- how we assimilate new knowledge. CAP provides us a starting point to begin to think differently about *how we learn*. Are chapters the only way to learn something new? How do we think about complex ideas? Are there alternatives to traditional textbook reading and lectures? CAP provides us with helpful insights into research-based best practices to enhance student educational outcomes.

- A framework is the guiding principle behind understanding how to design or think about a teaching material.
- **Content, Architecture, and Pedagogy (CAP)** is the design framework for how to approach designing your own teaching material online.
- *Putting a PDF of a textbook online undermines all of the pedagogical advantages that the hypertext online medium has to enhance student learning.*

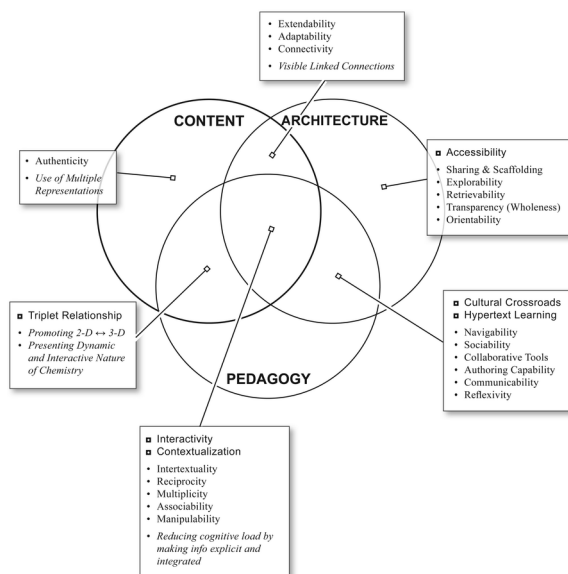


Figure 1. This diagram shows the interaction between Content, Architecture, and Pedagogy. The large square bullet points are headings from Shorb 2011.

The bullet points in *serif* font are from Yang 2001. The italicized headings are from Wu and Shah 2002.

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- [Critical Thinking Questions](#) has no license indicated.

1.3: UDL and content on LibreTexts

A textbook starts with some thoughts about content. What is it we want to teach? This part of CAP is obviously critical - but it is the least important to discuss in general for a few reasons:

1. Each course within each discipline is different;
2. each professor will want to cover different things in different levels of depth; and
3. it is mostly the same as what you would find in a traditional hardcopy textbook.

Notice that in Figure 1, many people have studied how to approach content within the context of Architecture and Content, but the area in the Venn diagram that is completely blank is that which is *only* Pedagogy, as that is inherently an interaction between other areas. The only thing in the Content area is whether or not the content is authentic, and whether or not multiple representations are used.

- Content in the bookshelves is largely unchanged from a hardcopy textbook, and is thus left to the author.
- **Content should never be thought of as independent from how it is taught or organized.**
- *How it is taught is the Pedagogy.*
- *How it is organized within an online textbook is the Architecture.*

The biggest thing to think about is *how* to teach this content. *How to teach* is usually the definition of pedagogy. However, here we break it into two parts: Architecture and Pedagogy. Architecture is the static structure of the course materials: where are things found, how are they linked, what is the organization in general. Pedagogy, here, is how you expect people to interact with your content and what approaches, models, samples, and images within your content will be included.

Questions to Ask Yourself

- What are your learning objectives for the course?
- How many are you teaching in a given lecture? In a given exam period?
- What conceptual links between material are important for your students to understand?
- What depth does a concept need to be covered?
- How are you going to assess your content?
- How many sample problems should be included?

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- **Key Terms** by Rose M. Spielman, William J. Jenkins, Marilyn D. Lovett, et al. is licensed [CC BY 4.0](#). Original source: <https://openstax.org/details/books/psychology-2e>.

1.4: Using Personas

Designers use personas to represent the different types of people who might access a website or product. In this toolkit, we have used personas to help you keep in mind the types of students and their various abilities while you're developing content. We've also used these personas to introduce different types of hardware and software that students typically use.

We've adapted personas from Sarah Horton and Whitney Quesenbery's book [A Web for Everyone: Designing Accessible User Experience](#) so they are specific to post-secondary students with print disabilities in British Columbia (based on data from [CAPER-BC Annual Report \[PDF\]](#) and the students who attended our focus group).

These are some of the students who will be reading the open textbooks that you write.

Mark



Mark is 17 years old. He is a future heavy-duty mechanic with a learning disability that was diagnosed in Grade 8. Mark absorbs information best by hearing it and enjoys making and fixing stuff with his hands. He's in his first semester of college, taking trades courses and loving it. Mark can't wait to complete the foundation courses and move into his first apprenticeship placement. He lives at home with his family; they all share one computer.

Ability: Difficulty absorbing a lot of information when reading

Aptitude: Basic technology user

Attitude: Prefers to do things himself, but can get easily frustrated or impatient, especially with technology

Assistive technology: MP3 player

Format preference: MP3 so he can listen on the go

Listen to an [MP3 recording of a synthetic voice](#).

Jacob



Jacob is a fourth-year business administration student who is blind and a bit of a geek. Jacob is 28 years old and can't wait to get his last few classes out of the way so he can start his career. He shares an apartment with his girlfriend.

Ability: Blind since birth

Aptitude: Skilled technology user

Attitude: Digital native, early adopter, persists until he gets it

Assistive technologies:

- Screen reader (JAWS on his laptop, VoiceOver on his iPhone)
- Victor Reader Stream
- Audio recorder (to take notes)
- Refreshable Braille display

Format preference: Electronic text, which he can easily use in JAWS and with VoiceOver; detests PDFs

Watch a [student using JAWS](#) (4:08-6:18s).

YouTube Video

This interactive element is not available in this format. Visit the link or scan the QR code to access it online.

[View this YouTube Video online](#)



Listen to a [computer-science student's screen reader](#).

[freeCodeCamp · Zersiax's Screen Reader](#)

Diana



Diana is retraining to be a personal coach after she experienced vision loss and was unable to continue working as a bus driver. She is 48 years old and taking many of her classes online. She lives with her husband.

Ability: Gradual loss of vision; can easily read using a magnifier, but her eyes fatigue quickly

Aptitude: Intermediate technology user

Attitude: Has a routine and likes to stick to it

Assistive technologies:

- ZoomText
- TextAloud text to speech software

Format preference: PDF or electronic text that she can enlarge on her computer or listen to using TextAloud

Watch a [student using ZoomText](#) (0-1:31).

YouTube Video

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[View this YouTube Video online](#)



Trish



Trish is a college student taking university transfer courses who prefers using print books. An accident left Trish with several physical disabilities. She is 18 years old and lives with her family.

Ability: Suffers from brain damage, paralysis, and has motor issues

Aptitude: Basic computer user, intermediate iPad user

Attitude: Generally dependent on family, so enjoys reading and studying independently

Assistive technologies:

- iPad
- Motorized wheelchair

Format preference: eBook formats, such as PDF, that can be easily loaded onto her iPad

Ann



Ann is a chemistry major with ADHD, a learning disability that makes it difficult for her to concentrate. She is 20 years old and hopes to become a pharmacist. Ann lives in a dorm on campus with two other female students.

Ability: ADHD, has difficulty concentrating

Aptitude: Intermediate computer user

Attitude: Struggles at times, but is very appreciative of how much learning software helps her

Assistive technology: Kurzweil learning software (on laptop)

Format preference: Reading and listening at the same time

Watch a [student using Kurzweil on a computer](#) (1:32-4:07).

YouTube Video

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[View this YouTube Video online](#)



Steven



Steven is an English major who is deaf. He is 23 years old and likes the flexibility of taking online classes. He lives by himself.

Ability: Native language is ASL; can speak and read lips

Aptitude: Intermediate technology user

Attitude: Can get annoyed about accessibility, such as lack of captions

Assistive technologies:

- CART (communication access real-time translation) for lectures
- Captions
- Video chat

Format preference: No preference in regards to textbook formats; but, videos without captions are meaningless

Watch a [video demonstration of CART](#). Note: this video is also captioned.

YouTube Video

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2: BEST PRACTICES

Section Topics

This section covers best practices for making your open textbook accessible. Each chapter covers which students benefit, why accessibility is important, and the steps required to make various elements accessible.

- How to organize content
- Images
- Links
- Tables
- Multimedia
- Formulas
- Font size
- Colour contrast
- How to write an accessibility statement

[2.1: Organizing Content](#)

[2.2: Images](#)

[2.3: Links](#)

[2.4: Tables](#)

[2.5: Multimedia](#)

[2.6: Formulas](#)

[2.7: Font Size](#)

[2.8: Colour Contrast](#)

[2.9: Accessibility Statements](#)

[2.9: Accessibility Checking](#)

2.1: Organizing Content

Organizing content so it has a logical flow just makes sense. Using chapters, headings, and sub-headings to organize a resource allows students to clearly see how the main concepts are related. In addition, headings are one of the main ways that students using a screen reader navigate through a chapter.

Who are you doing this for?

Everyone benefits from having content that's clearly organized. Well-organized content supports students who:

- Have a learning disability, like [Ann](#)
- Are blind or have low vision, like [Jacob](#)



Ann: "This allows me to go back and easily find the important points."



Jacob: "This gives me more control in navigating through the chapter. I can skip to the relevant section, instead of having to read the whole thing in a linear fashion."

The Editor

The Editor has been configured for most of the needs contributors require. The layout is below; please refrain from using the advanced features in red until you are familiar with the LibreTexts structure. The Toolbar is the section located at the top of the editor window. It contains menu buttons that give you access to various functions of CKEditor. All buttons are grouped according to their function and include both simple operations (like basic text styling or formatting) and more advanced features (like inserting media or forms via a dialog window).

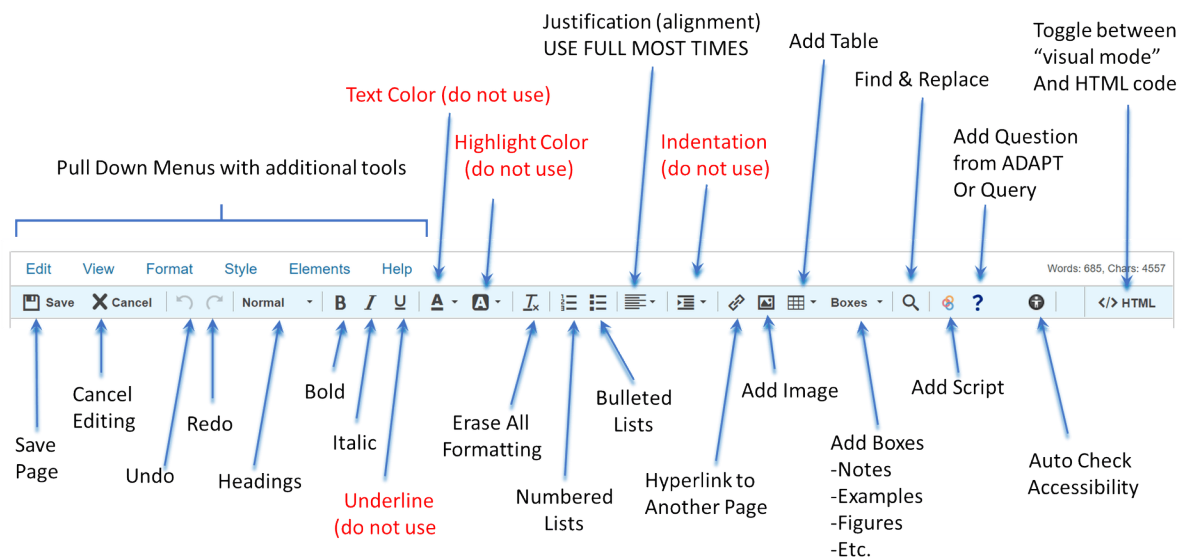


Figure 2.1.1: A simple layout of the editor. Tools in red are rarely used in the LibreTexts typesetting standard.

Why are headings important?

Headings help to identify the hierarchical structure of a document (e.g., sections, sub-sections). They provide a visual cue that helps sighted readers quickly navigate through sections of a document, skimming until they find the section they are looking for. Similarly, headings create logical divisions in the content and allow a non-sighted user to navigate a page or document easily using a screen reader.

When it comes to using visual references to indicate the hierarchy and structure of a document, you might be accustomed to changing the font style, enlarging the type size, or highlighting the text with bold, underline or italics to create the impression of a heading. This approach presents problems when creating material with accessibility in mind because screen readers won't identify the text as a heading. Instead, the screen reader will just "read" through the text of a heading as if it were regular content, missing your intended cues about structure and organization.

What do you need to do?

In LibreTexts, use the [visual editor](#) to tag sections with Heading 2, sub-sections with Heading 3, sub-sections of sub-sections with Heading 4, and so on.

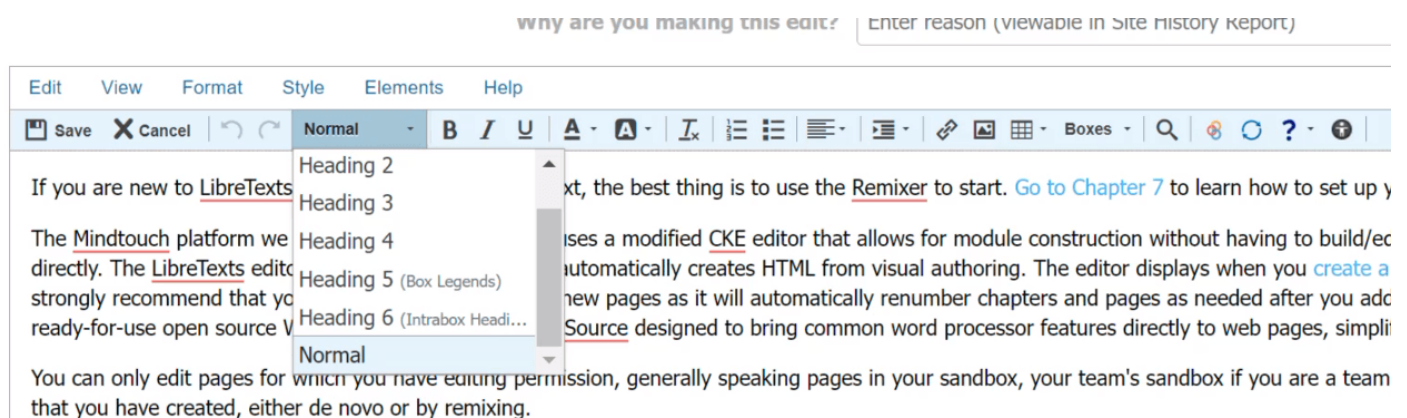


Figure 2.1.1: Heading options in the LibreTexts CK12 editor

Although LibreTexts provides up to six heading levels, that many levels might be difficult for your readers to keep track of. Levels 5 and 6 are reserved for textboxes described immediately below. Level 1, which is the highest, is reserved for the title of the page so within a page Level 2 is the highest. If you find yourself getting to four to six heading levels, consider breaking up your chapter

into multiple chapters.

Textboxes with titles

If you are creating your textbook with LibreTexts, you might use some of the educational textboxes:

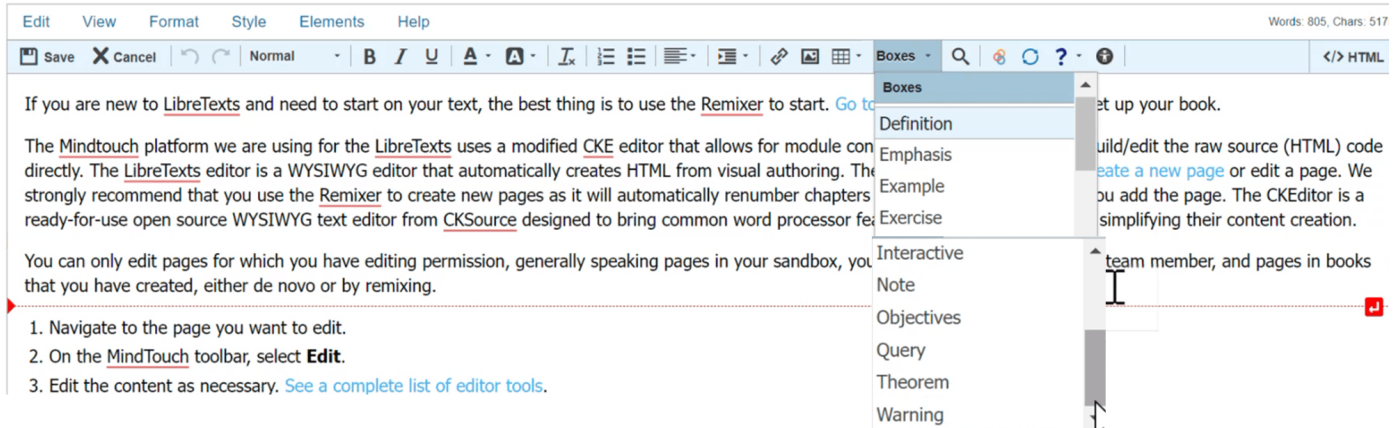


Figure 2.1.1: Copy and Paste Caption here. (Copyright; author via source)

For example

Example 2.1.1

Add example text here.

Solution

Add example text here.

These textboxes have two sections that are different colours. The section on the top is for the textbox title and the section underneath is for the textbox content. For people who can see the textbox, the different colours used in the textbox title communicate that the text is a title. However, this is not communicated to people using screen readers. As such, the textbox title needs to be marked as a heading.

In LibreTexts the textbox title is automatically assigned as Level 5 and the headings inside the textbox are assigned to Level 6

Media Attributions

- Ann: Original artwork by Hilda Anggraeni (BCcampus). © [Creative Commons Attribution 4.0 International Licence](#).
- Jacob: “[WFE003: Jacob](#)” by [Rosenfeld Media](#). © [Creative Commons Attribution 2.0 Generic Licence](#).

2.2: Images

In this section, we provide recommendations to guide your inclusion of accessible, image-based content.

What are images?

Images are non-text elements that include photographs, illustrations, diagrams, pictures, charts, graphs, and maps.

Additional Factors to Pay Attention To:

- **NO BMP** figures are allowed to be imported. Avoid TIFF. Use PNG, JPG, GIF figures instead.
- Please CROP your figures to remove superfluous white space that makes reading your module awkward. The Microsoft Office Picture Editor or Paint will crop images and is free on MS operating systems.
- All figures constructed for this project must have the original image files used uploaded to the LibreTexts, preferable in the module itself. **DO NOT HOTLINK** images. Hotlinks in general are prone to vaporization.

Why are you including the images you have selected?

Before you can determine what to do to make an image accessible, you must identify its *purpose* or *value* to your textbook. Consider the following questions:

1. Does your image serve a functional purpose? In other words, is it conveying non-text content to students? If so, you should:
 - a. provide a text alternative that serves the equivalent purpose of the non-text material^[1]
 - b. not use colour as the only visual means of conveying information^[2]
2. Does your image serve more of a decorative purpose? In other words, is it primarily a design element that does not convey content? If so, you should:
 - a. avoid unnecessary text descriptions

Who are you doing this for?

This work supports students who:

- Are blind or have low vision, like [Jacob](#)
- Have poor contrast vision
- Are colour blind and cannot differentiate between certain colours
- Use a device with monochrome display
- Use a print copy that is in black and white
- Have limited Internet access and cannot download images
- Have a form of cognitive disability



What do you need to do?

Determine the role of each image used in content as either functional or decorative. Once that has been decided, select how each image will meet accessibility needs by providing descriptive text in a variety of ways. Figures, such as charts and graphs that rely on color to convey information, should also be evaluated for accessibility by students who are unable to distinguish between or see color.

Functional images

Consider what your content page would look like if the images didn't load. Now try writing alternative text for each image that would work as a replacement and provide the same information as the image.

There are three ways to provide alternative text descriptions for images:

1. Describe the image in the [surrounding text](#).
2. Describe the image in the [alt tag](#).
3. Create and link to a [long description](#) of the image.

Note

LibreTexts has not settled on a uniform way of handling long alt texts. You may want to consider the [HTML longdesc attribute](#)

As you work on developing your alternative text descriptions, keep the following recommendations and guidelines in mind:

- Remember that alternative text must convey the content and functionality of an image, and is rarely a literal description of the image (e.g., “photo of cat”). Rather than providing what the image looks like, alternative text should convey the content of the image and what it does.^[3]
- For relatively simple images (e.g., photographs, illustrations), try to keep your text descriptions short. You should aim to create a brief alternative (one or two short sentences) that is an accurate and concise equivalent to the information in the image.
- For more complex images (e.g., detailed charts, graphs, maps), you will need to provide more than a one- or two-sentence description to ensure all users will benefit from the content or context you intend to provide.
- Leave out unnecessary information. For example, you do not need to include information like “image of...” or “photo of...”; assistive technologies will automatically identify the material as an image, so including that detail in your alternative description is redundant.
- Avoid redundancy of content in your alternative description. Don't repeat information that already appears in text adjacent to the image.

For strategies on how to make complex visuals such as graphs, tables, charts, and more accessible, see the following resource created by Supada Amornchat (CC BY-NC-SA): [Describing Complex Images for All Learners \[PDF\]](#).

If you need to describe images that appear in assessments, see the [NWEA Image Description Guidelines for Assessments \[PDF\]](#). LibreTexts online assessment system ADAPT allows for an alternate question to be substituted if necessary and LibreTexts H5P Studio rates each question for accessibility.

Descriptions in surrounding text

You can use the surrounding text to provide the same information as conveyed by the image. This is often the best option for complex images because it makes the information available for everyone, not just those using the alt tags.

If you are editing someone else's work for accessibility, you are probably not at liberty to start adding to the main text. However, if you are the author, this is the best and easiest option.

If an image has been adequately described in the surrounding text, you can either provide a few-word description of the image in the alt tag or follow the procedures for [decorative images](#).

Alt tags

An alt tag refers to the alt attribute (*alt* is short for alternative) within an IMG tag. All images uploaded into Pressbooks have an alt tag, but for them to be useful, you need to insert an image description.

Alt tags are used in two cases:

1. When an image doesn't download due to slow Internet, the alt tag content will display instead of the image.
2. For people who are visually impaired and use screen readers, when a screen reader finds an image, it will read out the content of the alt tag.

Alt tags should be no longer than 125 characters, including spaces and punctuation.^[4] This is because when a screen reader finds an image, it will say "Graphic" before reading out the alt tag. If the alt tag is longer than 125 characters, the screen reader will interrupt the flow of text and say "Graphic" again, before continuing to read out the alt tag. This can be confusing. For images that require descriptions longer than 125 characters, see the section on [long descriptions](#).

To edit an image's alt tag in Pressbooks, click on the image and select the PENCIL icon (edit). Under image details, there will be two textboxes: one titled "Caption" and one titled "Alternative Text." The "Caption" box contains the image's caption, which appears under the image in the visual editor. The "Alternative Text" box is where you describe the image.

Long descriptions

Complex images, especially charts or graphs, will often require descriptions longer than 135 characters and it may not always be possible to add an explanation to the surrounding text. [Modern screen readers no longer have a 135 character limit](#) for alt text, although longer ones may try the patience of the reader (both human and computer).

Note

LibreTexts has not settled on a uniform way of handling long alt texts. You may want to consider the [HTML longdesc attribute](#)

How to set up a long description for an image in Pressbooks

Figure 1.1 shows an image from [Introduction to Sociology – 2nd Canadian Edition](#) that requires a longer description than what can fit in an alt tag. As such, at the end of the caption, there is a link to the image's description.

Anyone using this textbook can access this image description by clicking on the [Image description] link, which will take them to the image description at the end of the chapter (or by flipping to the end of the chapter in the print version). This will also work for people using screen readers who are navigating through the book with a keyboard.

Decorative images

If an image does not add meaning, i.e., if it's included for decorative or design purposes only, or if the image is adequately described in the caption and/or surrounding text, it doesn't need an alt tag. Including alternative text descriptions for decorative images "simply slows the process down with no benefit because the screen-reading software vocalizes the content of the [alternative text description], whether that alternative text adds value or not."^[5]

When the alt tag is left blank, the screen reader will not announce the presence of the image and will skip to the next content.

Using color

Consider what your images would look like if they only displayed in black and white. Would any necessary context or content be lost if the color was "turned off?" Images should not rely on color to convey information; if your point requires color, you may need to edit or format the image so the concepts presented are not lost to those who are color blind or require high contrast between colours.

Example 1: Inaccessible Bar Chart

In Chart 1, color is the only means by which information is conveyed. For students who are color blind, have poor contrast vision, or are using a black-and-white print copy (see Chart 2), relevant information is lost.

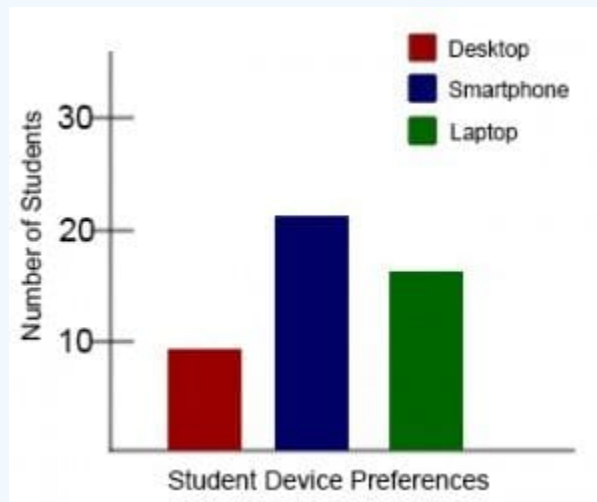


Chart 1: In this bar chart, color is the sole means of communicating the data.

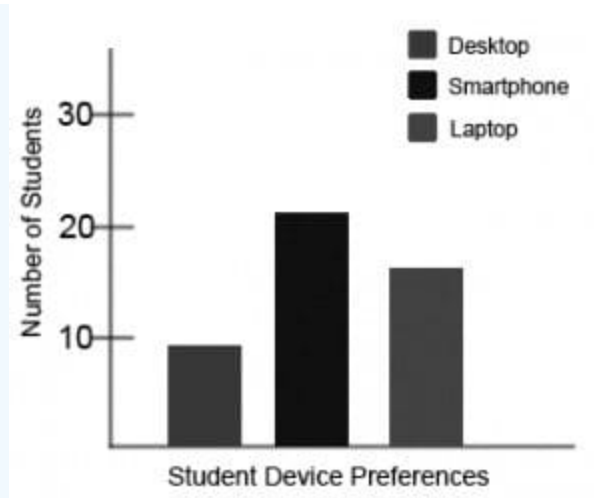


Chart 2: This view of the same bar chart displays how the chart might appear to a student who is color blind, or whose device does not display colour. All of the meaningful data is lost.

Example 2: Accessible Bar Chart

Students who are color blind can distinguish between high-contrast shades. In Chart 3, contextual labels have been added to each bar at the bottom of the chart. Note that the chart will still require an [alt tag](#).

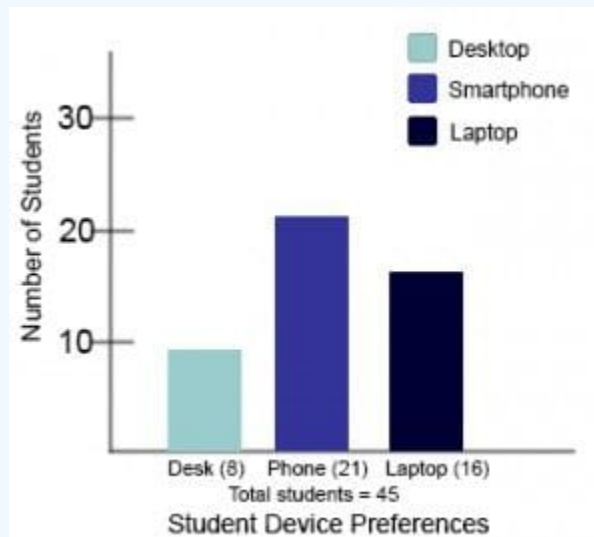


Chart 3: In this view of the bar chart, high-contrast colours have been used so that shading differences will still display in grey scale. Text labels have also been added so that the data is not just being communicated with color.

Media Attributions

- Jacob: “WFE003: Jacob” by Rosenfeld Media. [Creative Commons Attribution 2.0 Generic Licence](#).

1. "Web Content Accessibility Guidelines (WCAG) 2.0: Guideline 1.1," W3C, accessed March 27, 2018, <http://www.w3.org/TR/>

[WCAG20/#text-equiv.](#) ↵

2. "Web Content Accessibility Guidelines (WCAG) 2.0: Guideline 1.4.1," *W3C*, accessed March 27, 2018, <http://www.w3.org/TR/WCAG20/#visual-audio-contrast>. ↵
3. "Alt text blunders," *WebAIM*, accessed March 27, 2018, <http://webaim.org/articles/gonewild/#alttext>. ↵
4. All screen readers are different, so a 125-character max is a recommendation. Other sources may provide a different number. ↵
5. "Top 10 Tips for Making Your Website Accessible," *UC Berkeley: Web Access*, accessed March 27, 2018, <https://webaccess.berkeley.edu/resou...accessible-alt>. ↵

2.3: Links

In this section, we review how to add accessible links to content. Links include weblinks, links between different chapters of a book, links within a chapter, and links to attached files.

What are links?

A link (also called a hyperlink) is found in a file, document, or web page that redirects the reader to additional information found in another online location such as a new web page; links are typically activated by clicking on a highlighted word or image on the screen.

File types used: HTML, PDF, DOCX, XLS

Why are you including the links you have selected?

Generally, links are included within content to point the user to additional information that is available at another location. Links between different parts of a book are also used to facilitate navigation.

For a detailed description on how to link to material in Pressbooks, see [Hyperlink Material](#) in the [Pressbooks Guide](#).

Who are you doing this for?

This work supports students who:

- Have a physical disability, like [Trish](#)
- Have a form of cognitive disability, like [Ann](#)
- Are deaf or hard of hearing, like [Steven](#)
- Are blind or have low vision, like [Jacob](#) and [Diana](#)



What do you need to do?

Links can be helpful. But, like other non-text elements, they must be assessed for how students with a range of challenges can and will access them. Understanding and attending to these needs through descriptive text, proper link opening, and—when needed—a

web address will ensure that all students can benefit.

Create descriptive link text

You need to ensure that all links have text that describes the topic or purpose of the link. This is important because people using screen readers might have their screen reader set to read out the text for each link on a page. As such, the link text must describe the content of the link when taken out of context for the surrounding paragraph. While link texts such as “click here” or “read more” will make sense to sighted users, they mean nothing when read on their own.^[1]

Example 1: Click [here](#) for information on LibreTexts.

Example 2: You can find more information on LibreTexts at <https://libretexts.org/>.

Example 3: [Information on LibreTexts](#) is available online.

While the first two examples make sense in the context of the sentence, neither link text describes the purpose of its link. While the second example is better than the first, having the web address as the link text still does not make the purpose of the link clear. The third example is the most accessible.

Link to non-web content

If you want to link to something that isn’t a web page—such as a Word document, Excel file, or PDF—you should include this information in the link text.^[2] This is important because it informs the user what will happen when they click on the link, thus preventing confusion. In addition, a user may decide not to click on a link if they know it’s a certain file type. This typically happens when a user doesn’t have the software needed to open the file or when they know the file type is inaccessible to them.

New tabs/windows

The default setting for links in LibreTexts is that they not open in a new window or tab. This is the preferred behaviour, since a new window, opening unexpectedly, can be disorienting for people. This is especially true for individuals who have difficulty perceiving visual content.^[3]

However, if a link must open in a new window or tab, the best practice is to include a textual reference.^[4]

LibreTexts allows you to edit whether or not a link opens in a new tab. Here is how:

that isn't a web page

4.3: Web Accessibility Evaluation Tools
https://socialsci.libretexts.org/Workbench/Digital_Accessibility/04%3A_Accessibility_on_the_Web/4.03%3A_Web_Accessibility_Evaluation_Tools

1.11: Appendix
[https://socialsci.libretexts.org/Under_Construction/Purgatory/Book%3A_The_Information_Literacy_Users_Guide_\(Bernard_et_al.\)/01%3A_Chapters/1](https://socialsci.libretexts.org/Under_Construction/Purgatory/Book%3A_The_Information_Literacy_Users_Guide_(Bernard_et_al.)/01%3A_Chapters/1)

5.1: WAVE Web Accessibility Evaluation Tool

Current article:
 Workbench/LibreTexts_Accessibility_Toolkit/02:_Best_Practices/2.03:_Links

Link to:
 Workbench/LibreTexts_Accessibility_Toolkit/02:_Best_Practices/2.03:_Links

Jump to anchor or section:
 No anchor or section selected

Link options:
☒ Default ☐ Open in new window ☐ Open in contextual help overlay

[Learn more about the link dialog](#) Save link Cancel

Figure \(\PageIndex{1}\): Copy and Paste Caption here. (Copyright; author via source)

Links in reference lists

Citation styles often require a URL to be provided for all web-based content. For example, in APA style, the *Accessibility Toolkit* would be referenced as follows:

Coolidge, A., Doner, S., Robertson, T., & Gray, J. (2018). *Accessibility Toolkit* (2nd ed.). BCcampus. <https://opentextbc.ca/accessibilitytoolkit/>

The URL is provided to make it easy for people to navigate to the original source. However, it can be frustrating when screen readers read out the full URL for every source. As such, how can we make this link accessible to people using screen readers while still adhering to citation guidelines?

Option 1: WAI-ARIA labels

One solution is WAI-ARIA.^[5] WAI-ARIA allows you to add attributes to HTML to provide instructions that are recognized by assistive technologies. As such, we can hyperlink the URL and use an ARIA label to specify what the screen reader should read aloud. This way, the URL will still appear visually and can be clicked to navigate to the source, but when a screen reader encounters it, it will read out the ARIA label rather than the URL.

Here is what the citation would look like:

Coolidge, A., Doner, S., Robertson, T., & Gray, J. (2018). *Accessibility Toolkit* (2nd ed.). BCcampus. <https://opentextbc.ca/accessibilitytoolkit/>

Here is what the HTML would look like.

Coolidge, A., Doner, S., Robertson, T., & Gray, J. (2018). *Accessibility Toolkit* (2nd ed.). BCcampus. <https://opentextbc.ca/accessibilitytoolkit/>><https://opentextbc.ca/accessibilitytoolkit/>

Option 2: Link the citation title

If editing HTML is out of your comfort zone, another option is to use the title in the citation as the link text and leave the URL unlinked.

Here is an example:

Coolidge, A., Doner, S., Robertson, T., & Gray, J. (2018). [Accessibility Toolkit \(2nd ed.\)](https://opentextbc.ca/accessibilitytoolkit/). BCcampus. <https://opentextbc.ca/accessibilitytoolkit/>

With this method, screen readers would still read out the URL if references were being read through from beginning to end. However, if a person using a screen reader wanted to navigate through the page by links, they would hear the title rather than the URL.

Provide web addresses in print copies

One thing to keep in mind is that most open textbooks have a print-on-demand option. For that reason, it is a good idea to provide the web address for external links so people using a print copy of the book can find the online content. You can do this by including the web address in-text (Example 1), providing the web address in a footnote (Example 2), or by providing a list of web addresses on a single page in the back matter of the book organized by chapter (Example 3).

Example 1: [Information on BCcampus Open Education](https://open.bccampus.ca) (<https://open.bccampus.ca>) is available online.

Example 2: [Information on BCcampus Open Education](#)^[6] is available online.

Example 3: See the [List of Links by Chapter for Print Users](#) in the back matter of this toolkit.

Media Attributions

- Trish: “[WFE002: Emily](#)” by [Rosenfeld Media](#). © [Creative Commons Attribution 2.0 Generic Licence](#).

-
1. "Ensure link text is meaningful within context," *Web Accessibility*, accessed March 28, 2018, https://www.webaccessibility.com/bes...actice_id=1301. ↵
 2. "Links to non-HTML resources," *WebAIM*, accessed March 28, 2018, https://webaim.org/techniques/hypert...links#non_html. ↵
 3. "G200: Opening new windows and tabs from a link only when necessary," accessed March 28, 2018, *W3C*, <http://www.w3.org/TR/2014/NOTE-WCAG2...-20140916/G200>. ↵
 4. Penn State, "Links on a Web Page," *Accessibility*, accessed March 28, 2018, <http://accessibility.psu.edu/linkshtml>. ↵
 5. Thank you to Baldur Bjarnason for sharing this workaround on the [Rebus Community help page](#). ↵
 6. <https://open.bccampus.ca> ↵
 7. Thank you to Christina Hendricks for sharing this workaround in her blog post: [Some things I'm learning about accessibility and open textbooks](#). ↵

2.4: Tables

In this section, we provide guidelines and recommendations for formatting tables.

What are tables?

In this context, tables refer to *data tables*, which include row and/or column header information to categorize content. (Tables that do not have headers are called *layout tables*.)

File types include: DOCX, HTML, PDF

Are your tables simple or complex?

A simple table includes a maximum of one header column and/or one header row. A complex table includes more than one header column and/or header row, and may include merged or split cells.^[1]

We recommend you make every effort to keep data tables as simple in structure as possible. The more complex the design of a data table, the less accessible it will be for some students using screen-reading technology to access their textbook materials. Screen readers move left-to-right, top-to-bottom, one cell at a time, and because a screen reader does not repeat a cell, merging or splitting cells can affect the reading order of a table.

However, you can use merged or split table cells if they are formatted correctly. Check out this web page to learn more: [Tables Concepts](#)

Who are you doing this for?

This work supports students who:

- Have a form of cognitive disability, like [Ann](#)
- Are blind or have low vision, like [Jacob](#)



What do you need to do?

In the same way that your content hierarchy needs headings and structure (see [Organizing Content](#)), tables need a properly defined structure to be accessible. This means that you must add row and column headers to define the different sections of data. Screen readers read tables horizontally—cell by cell, row by row—and row and column headers help give context to the data in each cell for students who are blind, have low vision, or have a cognitive disability.

Create simple tables

A simple table includes:

1. A table title or caption
2. Maximum of one row of column headers and/or maximum of one column of row headers, with the appropriate scope assigned
3. Avoid using merged or split cells
4. Adequate cell padding for visual learners

Example 1: How to Create a Simple Table

The table below is a simple table. Reviewed against the preceding requirements list, this table:

1. Includes a **caption** (Spring Blossoms)
2. Has one row in which cells are tagged as **column headers** (Colour Family, Bulbs, Shrubs, Trees), and one column (beginning on the second row) in which the cells are tagged as **row headers** (Pink, Yellow)
3. Avoids the use of merged or split cells wherever possible
4. Has adequate **cell padding** to provide space buffering around the data in each cell. (Cell padding in this table is set at "10").

Spring Blossoms

Colour Family	Bulbs	Shrubs	Trees
Pink	Tulips	Flowering currant	Ornamental plum
Yellow	Daffodils	Forsythia	Star magnolia

For a student accessing the table through a screen reader, the first row of data following the column headers will be presented along the lines of:

- Row 2, Colour family, column 1, Pink
- Bulbs, column 2, Tulips
- Shrubs, column 3, Flowering currant
- Trees, column 4, Ornamental plum

Marking cells in the first row and/or column of a table as header cells allows a screen reader to interpret the structure of a table and how cells relate to each other. This, in turn, ensures that someone using a screen reader can navigate through a table and understand what column/row a given cell is in. If a table doesn't have headers, the screen reader will recite cell information starting in the upper left corner and continuing left to right, top to bottom.

How to mark cells and rows as headers

As with section headings, it is not enough to bold or enlarge text in table cells that you want to be marked as headers.

If you are familiar with HTML, you can go into the text editor and change tags to tags. Row-header tags are given the `scope="row"` attribute and column-header tags get a `scope="col"` attribute.^[2]

For those not comfortable with HTML, here is how you create table row and column headers in [LibreTexts](https://libretexts.org/)

Tables are added by via the menu "Elements" in toolbar and selecting Table or directly via the editor toolbar (see below).

Workshop Skills

Last updated: May 16, 2019, 10:08 AM by admin Page restriction: Private Page ID: 150731

◀ Workshop University | BCCE (2018) ▶

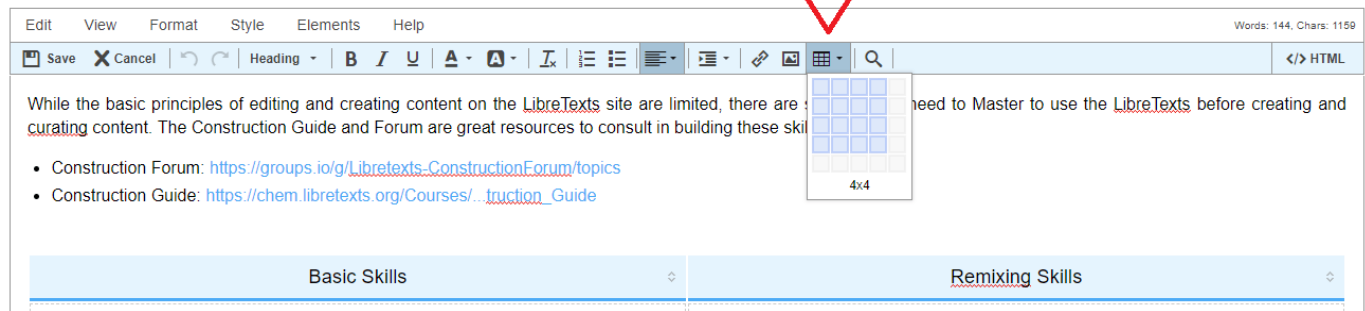


Figure 2.4.1: How to add a table from the editing tool bar.

You can choose the number of rows and columns you need (can be changed later). This gives you an empty table structure that you can start to fill out. If you want to delete a row, select an entry in the row you want to delete and click on the x that appears to the left. If you want to add a row above or below, you can do that by clicking the > that appears above or below the x respectively.

If you are copying a table from a website you will likely be able to copy its structure via a simple copy-paste.

Right click on the table and select table properties. Here you can choose whether the first row and/or column is headings and add a caption to the table. Making the first row/column headings is useful for screen readers and strongly recommended if possible. Allow table to be responsive, this ensures proper viewing on all types of viewing devices.

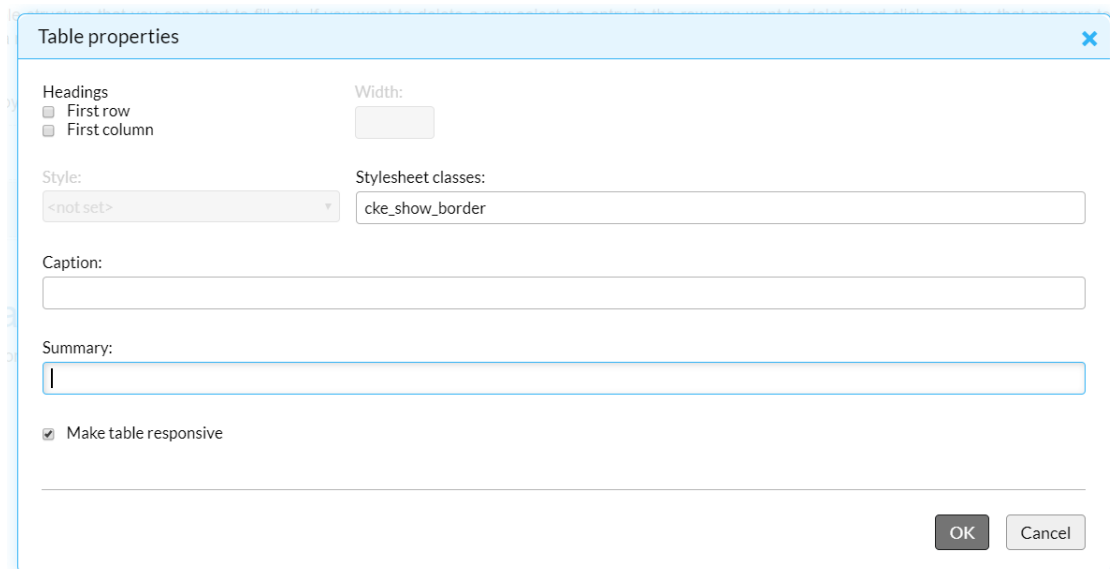


Figure 2.4.2: Table properties for Libretexts tables.

Always be Responsive

It is a good idea to select the "make table responsive" section (see Figure 2.4.2) of any new table so that it will be easily viewable on mobile devices and computers.

Add a [Skip Table] option

For large data tables, it can be a good idea to add an anchor below the table which will allow people to skip the content of the table. See Table 2.4 for an example.

Table 2.4. Main Sociological Research Methods [[Skip Table](#)]

Method	Implementation	Advantages	Challenges
Survey	Questionnaires and interviews	Yields many responses, can survey a large sample, data can be generalized, and quantitative data are easy to chart.	Can be time consuming, can be difficult to encourage participant response, and captures what people think and believe, but not necessarily how they behave in real life.
Fieldwork	Observation, participant observation, ethnography, case study.	Yields detailed, accurate, and real-life information.	Time consuming, data are often descriptive and not conducive to generalization, researcher bias is difficult to control for, qualitative data are difficult to organize.
Experiment	Deliberate manipulation of social customs and mores.	Tests cause-and-effect relationships.	Hawthorne effect, artificial conditions of research, and ethical concerns about people's well-being.
Secondary data analysis	Analysis of government data (census, health, crime statistics), research of historic documents, and content analysis.	Makes good use of previous sociological information.	Data could be focused on a purpose other than yours, data can be hard to find, and taking into account the historical or cultural context of texts.

As shown, this link is best placed in the table caption. That way, someone using a screen reader will hear the caption of the table before being given the option to skip the table.

For more information about creating same page links in LibreTexts see [Anchors](#) in the LibreTexts Construction Guide

Media Attributions

- Ann: Original artwork by Hilda Anggraeni (BCcampus). © [Creative Commons Attribution 4.0 International Licence](#).
- Table 2.4. "Main Sociological Research Methods" in [Introduction to Sociology – 2nd Canadian Edition](#) by William Little. © [Creative Commons Attribution 4.0 International Licence](#).

1. Penn State, "Tables," *Accessibility*, accessed March 28, 2018, <http://accessibility.psu.edu/tables>. ↵
2. "Tables with Two Headers," *Web Accessibility Tutorials*, accessed January 17, 2018, <https://www.w3.org/WAI/tutorials/tables/two-headers/>. ↵

2.5: Multimedia

In this section, we provide recommendations to guide your inclusion of accessible multimedia content.

What are multimedia?

The term multimedia refers to a variety of ways, or media, used to communicate information, such as videos, audio, animations, and slideshows.

File types used: MP3, MP4, PPT

What types of multimedia are you including?

Before you can determine what you need to do to make media accessible, you must understand what is required for different types of multimedia. Consider the following questions:

1. Does your multimedia resource include audio narration or instructions? If so, you should:
 - provide a complete [transcript](#) of all speech content and relevant non-speech content in the resource
2. Does your multimedia resource include audio that is synchronized with a video presentation? If so, you should:
 - provide [captions](#) of all speech content and relevant non-speech content in the resource
3. Does your multimedia resource include contextual visuals (e.g., charts, graphs) that are not addressed in the spoken content? If so, you should:
 - provide [audio descriptions](#) of relevant visual materials in the resource

Who are you doing this for?

This work supports students who:

- Are deaf or hard of hearing, like [Steven](#)
- Are blind or have low vision, like [Jacob](#)
- Have a form of cognitive disability
- Are in a location where they cannot play or hear audio
- Are not native-English speakers and need written-word formats to support understanding



What do you need to do?

Many types of multimedia present information in a non-text manner. For students unable to use the original version of these formats, providing text as a transcript, caption, or written description gives them access.

Transcripts

Consider what your students would get out of your multimedia resource if they were not able to hear the audio portion, or if they had difficulty understanding the spoken word. A text transcript provides students with equivalent information to the audio content in a multimedia resource.^[1]

As you work on developing a text transcript, keep in mind the following recommendations about what to include:

- Speaker's name
- All speech content. If there is speech that is not relevant, it is usually best to indicate that it has been excluded from the transcript, e.g., "[A & B chatted while slides were loading]."
- Relevant descriptions about the speech. Descriptions that convey emotions and mood are usually provided in brackets, e.g., "Don't touch that! [shouted]."
- Descriptions of relevant non-speech audio. These are usually provided in brackets, e.g., "[metal pipes crashing to concrete floor]." Background noise that isn't relevant can be left out.
- Headings and sub-headings. Headings help when they make a transcript more usable or easy to navigate, especially when the transcript is long. When included, put headings in brackets to show they were not part of the original audio, e.g., [Introduction]; [Group Discussion]; [Case Study].

Transcripts and Third-Party Videos

If you are not producing your own video resource but are planning to embed video materials from a third-party source (e.g., YouTube), be aware that not all third-party videos include transcripts. While services like YouTube technically support transcripts, not all of their contributors include them. If you select a video resource that does not already have a transcript, you will need to produce one yourself.

Creating a transcript for a third-party video might infringe on copyright, depending on how the video has been licensed. Before producing a transcript for media materials you did not create, contact the copyright holder of that material for permission to do so. (See information about using [YouTube in LibreTexts](#) in the [Construction Guide](#).)

Captions

Captions are the text that is synchronized with the audio in a video presentation. Captions are important when people need to see what's happening in the video and get the audio information in text at the same time.

The work you put into creating a text transcript for a video resource can be repurposed to provide captions. Keep in mind the following recommendations about what to include in your captions:

- All speech content. If there is speech that is not relevant, it is usually best to indicate that it has been excluded from the captions, e.g., "[A & B chatted while slides were loading]."
- Descriptions of relevant non-speech audio. These are usually provided in brackets, e.g., "[metal pipes crashing to concrete floor]"; "[background music by XXX plays]." Background noise that isn't relevant can be left out.

Audio descriptions

Consider what your students would get out of a multimedia resource if they were not able to see embedded visual materials critical for comprehension. Audio descriptions are helpful if visual content (e.g., a chart or map) in a video or presentation provides important context that is not available through the audio alone.^[2]

When describing visual elements in your multimedia resources, keep in mind the following recommendations and guidelines:

- When contextual visual content on the screen is not described in the audio itself, you will need to provide an objective audio description of the visual element.
- Whenever possible, avoid creating the need for audio descriptions in the first place by being proactive at the time of recording. If you pay attention to contextual visuals while recording, you may find opportunities to convey the visual content with the accompanying spoken material instead of inserting audio descriptions of the visual content after the fact.

Example 1

To help students fully grasp a concept that you are trying to convey in your video, you have included some contextual visual references (e.g., maps, charts, physical demonstrations of a process). However, you realize, after making the video, that the audio portion does not describe these visuals in enough detail for a student, like [Jacob](#), to be able to access all of the concepts you intended to convey.

In this case, you would need to record an audio description of the visual material that provides enough detail so students, like [Jacob](#), have the same content available to visual learners.

Example 2

You are recording a video or presentation that includes a chart that tracks coal production in British Columbia, and as part of the presentation you want to focus on specific data in the chart. The narrator or presenter might point to sections on the chart and say:

"As you can see, metallurgical coal projection increased by three million tonnes over these two years."

In this case, audio descriptions would be necessary to provide the missing context to students with visual disabilities; these students cannot see the data on the chart that tells visual learners what the production figures are and for what dates. However, if the narrator or presenter instead says:

"This chart illustrates that metallurgical coal production in B.C. increased from 23 million tonnes in 1999 to 26 million tonnes in 2001,"

the visual content is conveyed through the audio and no audio description will be necessary.

Media Attributions

- Steven: "[WFE005: Steven](#)" by [Rosenfeld Media](#) is used under a [Creative Commons Attribution 2.0 Generic Licence](#).

1. "Web Content Accessibility Guidelines (WCAG) 2.0: Guideline 1.2," W3C, <http://www.w3.org/TR/WCAG20/#media-equiv> (accessed April 17, 2018). ↵
2. "Web Content Accessibility Guidelines (WCAG) 2.0: Guideline 1.2.3," W3C, accessed April 17, 2018, <http://www.w3.org/TR/WCAG20/#media-equiv>. ↵

2.6: Formulas

In this section, we review how to add accessible formulas to content.

What are formulas?

Formulas refer to math equations and science formulas.

File types used: MathJax, LaTeX, MathType

Who are you doing this for?

This work supports students who:

- Are blind or have low vision
- Have a form of cognitive disability, like [Mark](#)
- Have a physical disability



What do you need to do?

Equations in LibreTexts are handled by the MathJax add-on (based on LaTeX).

NEVER USE AN IMAGE FOR AN EQUATION. Images cannot be read by screen readers.

MathML can be used, but it is ungodly verbose, making it difficult to understand and edit. Equations built with the equation editor in Microsoft Office are not readable in Libretexts.

Mathpix: The Tool You Can't Live Without

MathJax is a little overwhelming at first but thankfully there is a tool that makes it super easy called MathPix Snip.

- Download the tool from <https://mathpix.com/> and install it on your computer
- When you need to transfer an equation press ctrl+alt+m and select the equation that you want to copy.
- Use the first line that doesn't have any environment coding and add the $\backslash$ or $\backslash[$ for inline or display mode environment manually.
- If the snipper got a few details wrong you can edit the code and check that it renders before copying it over
- If it is a complicated equation zoom in on it using your browser before using the tool. If it still doesn't work consider snipping the equation in several parts.

MathJax

LaTeX has any number of extension packages for complex equations which are not supported by MathJax, but MathJax DOES support screen readers while LaTeX especially some of the extension packages do not. The [LibreTexts Construction Guide](#) contains a listing of MathJax syntax and how to use MathJax.

The Libretexts libraries have also installed the mhchem, a tool for writing beautiful chemical equations easily. The syntax for this powerful add-on can be found here: <https://mhchem.github.io/MathJax-mhchem/>

LibreTexts has a [realtime equation editor](#) which can be used to write out MathJax for equations but it requires facility with LaTeX/MathJax. [CodeCogs](#) LaTeX/MathJax equation editor is friendlier for a novice. Unfortunately it also provides images of the equations which should never be used in LibreTexts.

At a BCcampus user-testing session, students indicated that it would be helpful to place an audio file of the formula or equation alongside each, allowing the user to hear exactly how the formula or equation should be interpreted.

MathML

Math ML is a text-based XML (short for “extensible markup language”) designed for math equations. Browsers that support MathML are able to translate the XML into a formatted equation.

Here is information about [creating and viewing MathML](#). MathML may vary from system to system and the content can change rapidly.

Additional resources

Math accessibility at Portland Community College

In 2012, Portland Community College departments took a closer look at making math accessible to blind students. Read more about the [math accessibility study](#).

Watch [Math Accessibility at Portland Community College](#). (This video is an open educational resource.)

Media Attributions

- Mark: Original artwork by Hilda Anggraeni (BCcampus). © [Creative Commons Attribution 4.0 International Licence](#).

Text Attributions

This chapter is a derivative of [Equations: MathML, Images and LaTeX](#) by Penn State. Penn State has provided permission to the authors to use this information under the licence of the toolkit.

2.7: Font Size

In this section, we review the two main concerns regarding font size on the web.

What is font size?

Font size is the size of text visible on the screen.

Who are you doing this for?

This work supports students who:

- Are blind or have low vision, like [Diana](#)
- Have a form of cognitive disability
- Are deaf or hard of hearing
- Have a physical disability



What do you need to do?

There are two main concerns when working with font sizes:

1. Ensuring that default font sizes are not too small.
2. Ensuring that text can be expanded to 200% on websites.^[1]

Keep in mind these recommendations and guidelines:

- Use 12 point for body text. For most documents, body text should be around 12 points. Small fonts may be illegible for some audiences.
- Use 9 point for footnotes. If a document contains footnotes or endnotes, the minimum size should be 9 points.
- The [Web Content Accessibility Guidelines \(WCAG 2.0\)](#) recommend ensuring that text can be zoomed to 200%. As well, we recommend using liquid layouts^[2] that can accommodate 200% text.

Readability on LibreTexts

In the traditional viewing mode LibreTexts has a tab for Readability in the blue bar at the far left of every page that allows adjusting the size of text, the margins and the mode for viewing. In the new Reader View mode the size of text can be adjusted using +/-.

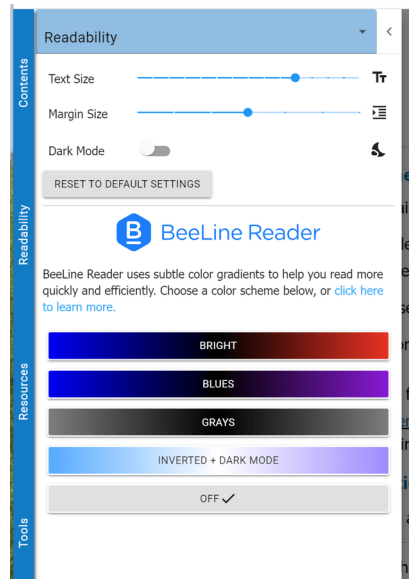


Figure 2.7.1: Readability adjustments

Media Attributions

- Diana: Original artwork by Hilda Anggraeni (BCcampus). © [Creative Commons Attribution 4.0 International Licence](https://creativecommons.org/licenses/by/4.0/).

1. "Font Size on the Web," *Accessibility and Usability at Penn State*, accessed April 17, 2018, <http://accessibility.psu.edu/fontsizehtml/>. ↵
2. Liquid layout are layouts that are based on percentages of the current browser window's size. They flex with the size of the window, even if the current viewer changes their browser size as they're viewing the site. Liquid width layouts allow a very efficient use of the space provided by any given web browser window or screen resolution. ↵

2.8: Colour Contrast

In this section, we provide guidelines and recommendations about color contrast in your textbook materials.

What is color contrast?

color contrast refers to the hue, lightness and saturation of text, images, and background.

File types include: DOCX, HTML, PDF, JPG, GIF

What role does color play in the delivery of your content?

When documents or web pages do not provide enough contrast between foreground elements (e.g., text, images) and background elements (e.g., color, watermark images), some students will have difficulty reading the content. Consider the following questions:

1. Have you presented text- or image-based content on a colored or textured background? If so, you should:
 - confirm that there is [sufficient contrast](#) between your foreground content and the chosen background color or texture
2. Have you included links in your content? If so, you should:
 - confirm that the [color of your web links](#) is distinct from both your background color and the color of the surrounding text
3. Have you used color to convey concepts or information? If so, you should:
 - confirm that you are [not using color alone](#) to convey this information

Who are you doing this for?

This work supports students who:

- Have low vision, like [Diana](#)
- Have poor contrast vision
- Are color blind and cannot differentiate between certain colors
- Use a device with monochrome display
- Use a print copy that is in black and white



What do you need to do?

In order to use color in a way that is most accessible, take into account color contrast between text and background, and whether or not color is used to convey information and the location of a link.

Contrast

Students with low vision and/or a form of color blindness may have difficulty reading text that does not contrast enough with the background color selected. If the color palette you have adopted is too subtle (e.g., white text on a pastel background; medium-grey text on a light-grey background), the contrast between your foreground and background is probably insufficient for some students.

Level AAA of the “Web Content Accessibility Guidelines (WCAG 2.0)” requires that “the visual presentation of text and images of text has a contrast ratio of at least 7:1.”^[1] The following image presents four different foreground/background color-contrast examples to illustrate insufficient and sufficient color contrast ratios.

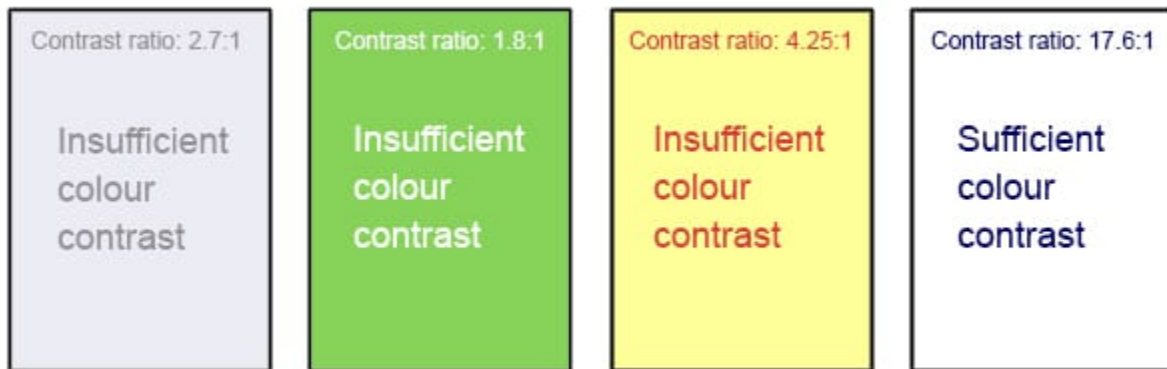


Image displays four examples of different font color against different background colors; only one of the sample combinations provides sufficient color contrast.

How to Test Your Materials for color-Contrast Ratios

There are many online and downloadable tools available to help you evaluate color-contrast ratios. Here are a few we have tried and like:

- [WebAIM's Color Contrast Checker](#): This web-based tool allows you to select or enter color values to test, and provides you with a “pass” or “fail” on your contrast ratio.
- [ACART's Contrast Checker](#): This is a straightforward, web-based tool you can use to both check color contrast and view your selections in grey scale. This tool also allows you to keep a history of the color combinations you have tested.
- [Giacomo Mazzocato's Accessibility Color Wheel](#): This web-based tool includes several options for testing your color selections, including simulations of three types of color blindness. You can also opt to test what your contrast ratio is when the foreground and background color selections are inverted.

Link colors

Links must be visually distinct from both the surrounding, non-linked text and the background color. If you do not underline your links (or provide some other non-color cue), you must ensure that you provide both sufficient contrast between the link and background colors *and* between the link color and that of the surrounding text.

Web Content Accessibility Guidelines (WCAG 2.0) require a:

- 4.5:1 contrast between the link text color and the background
- 3:1 contrast between the link text color and the surrounding non-link text color^[2]

High-contrast mode

Some students need to see light text on a dark background for it to be readable, while others require dark text on a light background. Students with low vision (like [Diana](#)) must be able to see content when it is displayed in high-contrast mode. This can be a subjective experience, based on individual student needs. We recommend testing your text- and image-based content

as you go by using high-contrast mode on your own computer and making adjustments as needed.

All content items such as text, images, bullets, and table borders must be visible in both regular and high-contrast modes.

How to Test Your Content in High-Contrast Mode

To test the visibility of your content in this mode, turn on high contrast by simultaneously pressing the following keys on your (PC) keyboard:

Left ALT + Left SHIFT + Print Screen.

To turn off high contrast mode, repeat this step.

Use of color

You should not rely on color as the sole means of conveying information and instruction. If the point you are making depends on color to be understood, you will need to edit your materials so that concepts presented in the visuals are not lost to those who are color blind or who require high contrast between colors.^[3]

For more information on using color to convey information, see the [Images](#) chapter.

Media Attributions

- Diana: Original artwork by Hilda Anggraeni (BCcampus). © [Creative Commons Attribution 4.0 International Licence](#).

1. WCAG defines three levels of minimum accessibility standards: A, AA, and AAA. AAA outlines the highest level of minimum standards for web accessibility. Large text can have a lower contrast ratio (4.5:1). In addition, text that conveys no information or is part of a logo has no color contrast requirements. See "Web Content Accessibility Guidelines (WCAG) 2.0, Guideline 1.4.6 Contrast (Enhanced)," WC3, accessed February 28, 2018, <http://www.w3.org/TR/UNDERSTANDING-W...contrast7.html>. ↵
2. "WCAG 2.0 and Link Color," *WebAIM*, accessed June 7, 2018, <http://webaim.org/blog/wcag-2-0-and-link-colors/>. ↵
3. "Web Content Accessibility Guidelines (WCAG) 2.0, Guideline 1.4.1 Use of Color," WC3, accessed June 7, 2018, <http://www.w3.org/TR/WCAG20/#visual-audio-contrast>. ↵

2.9: Accessibility Statements

Once you have created an accessible textbook, you should provide an accessibility statement. While an accessibility statement is not required, it can be an important and useful addition to a resource for which you have worked to make accessible. This section will outline guidelines and recommendations about what to include in an accessibility statement and who the accessibility statement is for.

What is an accessibility statement?

An accessibility statement acts as resource for those who have questions about the accessibility features of your resource. It should provide an overview of accessibility features and contact information in case there are any problems.

Who are you doing this for?

When writing an accessibility statement, it is important to keep in mind who the statement is for. This will guide the language you use and the type of information you include. Ultimately, the accessibility statement is for people who have disabilities or are having problems accessing your resource for whatever reason.

Hassell Inclusion's blog post on [“How to write an effective Accessibility Statement”](#) notes that many accessibility statements ignore who will be accessing the accessibility statement or why. Instead, they make statements about the organization's commitment to accessibility, combined with technical jargon related to web development, accessibility, and accessibility legislation. Rather than acting as a helpful resource for people with disabilities, this type of accessibility statement “read[s] like a combination of a sales pitch on how socially responsible the organization is, a technology manual, and some legal small print.”^[1]

Chances are, the only time people will be interested in an accessibility statement is when they have trouble accessing content in the textbook or resource. Therefore, make sure your accessibility statement provides the information readers are looking for.

What do you need to do?

Here are tips for writing a useful accessibility statement:

- Use clear and simple language, avoiding jargon and technical terms
- Include information about how people can personalize their experience. This might include information about:
 - features of the platform used for the resource (e.g., if a book is in Pressbooks, mention the ability of users to increase the font size in the web book)
 - the ability to change browser settings
 - a link to each available file format
 - assistive technologies
- Outline specific accessibility features and how to use them when relevant
- Do not make false claims or ignore known accessibility issues. Be as transparent and open about accessibility barriers as possible. This means:
 - describing what is being done to fix the problem and a timeline
 - providing any temporary workarounds
- Include information about who is responsible for the accessibility of the content and their contact information so people can submit issues, suggestions, or complaints related to accessibility.
- Describe the organization's accessibility policy, and the work that has been done to make the resource accessible. Here, you can provide information like:
 - accessibility guidelines you are following (e.g., WCAG 2.0)
 - any federal, provincial, or state legislation you are conforming to
 - any user testing you performed^[2]

Here is a sample accessibility statement that you can adapt for your own purposes:

Sample Accessibility Statement

[Name of organization] believes that education needs to be available to everyone, which means supporting the creation of free, open, and accessible educational resources. We are actively committed to increasing the accessibility and usability of the textbooks we produce.

Accessibility of This Resource

The web version of this resource [INSERT LINK TO THE WEBBOOK HOMEPAGE] has been designed to meet [Web Content Accessibility Guidelines 2.0](#), level AA. In addition, it follows all guidelines in [Appendix A: Checklist for Accessibility](#) of the [Accessibility Toolkit – 2nd Edition](#). It includes:

- **Easy navigation.** This resource has a linked table of contents and uses headings in each chapter to make navigation easy.
- **Accessible math equations.** Many of the equations in this resource have been written in LaTeX and rendered with MathJax, which makes them accessible to people using screen readers that are set up to read MathML. The rest of the equations are rendered as images with appropriate alternative text.
- **Accessible videos.** All videos in this resource have captions.
- **Accessible images.** All images in this resource that convey information have alternative text. Images that are decorative have empty alternative text.
- **Accessible links.** All links use descriptive link text.

[Note: Make sure the above list only includes content that appears in the book. If there are no videos, don't mention videos.]

Accessibility Checklist

Element	Requirements	Pass?
Headings	Content is organized under headings and subheadings that are used sequentially.	
Images	Images that convey information include alternative text descriptions. These descriptions are provided in the alt text field, in the surrounding text, or linked to as a long description.	
Images	Images and text do not rely on colour to convey information.	
Images	Images that are purely decorative or are already described in the surrounding text contain empty alternative text descriptions. (Descriptive text is unnecessary if the image doesn't convey contextual content information.)	
Tables	Tables include row and/or column headers that have the correct scope assigned.	
Tables	Tables include a title or caption.	
Tables	Tables do not have merged or split cells.	
Tables	Tables have adequate cell padding.	
Links	The link text describes the destination of the link.	
Links	Links do not open new windows or tabs. If they do, a textual reference is included in the link text.	
Links	Links to files include the file type in the link text.	
Audio	All audio content includes a transcript that includes all speech content and relevant descriptions of non-speech audio and speaker names/headings where necessary.	
Video	All videos include high-quality (i.e., not machine generated) captions of all speech content and relevant non-speech content.	
Video	All videos with contextual visuals (graphs, charts, etc.) are described audibly in the video.	
H5P	All H5P activities have been tested for accessibility by the H5P team and have passed their testing.	
H5P	All H5P activities that include images, videos, and/or audio content meet the accessibility requirements for those media types.	
Formulas	Formulas have been created using LaTeX and are rendered with MathJax.	
Formulas	If LaTeX is not an option, formulas are images with alternative text descriptions	

Element	Requirements	Pass?
Font	Font size is 12 point or higher for body text.	
Font	Font size is 9 point for footnotes or endnotes.	
Font	Font size can be zoomed to 200% in the webbook or eBook formats.	

Known Accessibility Issues and Areas for Improvement

[Insert description of any known issues in a bulleted list. If none, then insert: There are currently no known accessibility issues.]

Let Us Know if You are Having Problems Accessing This Book

We are always looking for ways to make our resources more accessible. If you have problems accessing this resource, please contact us to let us know so we can fix the issue.

Please include the following information:

- The name of the resource
- The location of the problem by providing a web address or page description.
- A description of the problem
- The computer, software, browser, and any assistive technology you are using that can help us diagnose and solve your issue (e.g., Windows 10, Google Chrome (Version 65.0.3325.181), NVDA screen reader)

Here is how you can contact us: [Insert a link to a contact form and/or an email]

This statement was last updated on [TODAY'S DATE].

The Accessibility Checklist table was adapted by from one originally created by the [Rebus Community](#) and shared under a [CC BY 4.0 licence](#).

Additional resources

For more information, refer to the following resources:

- [Web Content Accessibility Guidelines: Conformance Claims](#)
- [Nomensa: How to Write an Accessibility Statement](#)
- [Access 8878's Accessibility Statement](#)

For sample accessibility statements, refer to the following pages:

- [B.C. Government Website's Accessibility Statement](#)
- [Hassell Inclusion's Accessibility Statement](#)

1. "Accessibility Statement," *Hassellinclusion*, accessed August 23, 2018, <http://www.hassellinclusion.com/accessibility/>. ↵
2. "Creating an Accessibility Statement," *Access 8878*, accessed August 30, 2018, <https://web.archive.org/web/20161203...statement.aspx>. ↵

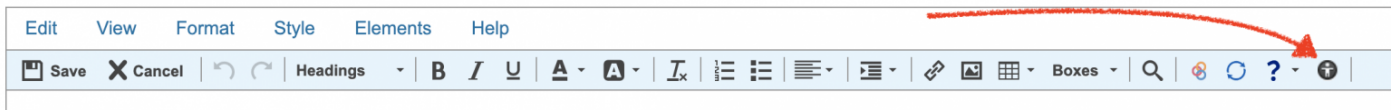
This page titled [2.9: Accessibility Statements](#) is shared under a [CC BY 4.0](#) license and was authored, remixed, and/or curated by Josie Gray.

2.9: Accessibility Checking

Are you an instructor charged with putting together a textbook? You have resources available to help, especially with the LibreTexts remixer, but you're reminded that it has to be accessible. You may not be familiar with accessibility integrations and inquire "What resources are available within LibreTexts to help with accessibility?"

That's where the LibreTexts Accessibility Checker comes to help! The Accessibility Checker is available to authors while editing or remixing textbooks. Select the tool from within the toolbar to fix issues that it finds.

The LibreTexts libraries are housed within the Nice CXOne platform, a CMS, and uses CKEditor 4 to import or create content. Within the editor, we have made a Davinci Vitruvian man available as the Accessibility Checker icon. This feature has both automated and manual fixes which authors interact with. Many of the automation features have manual overrides available so author's have more control of how content is presented.



Arrow points to the Davinci Vitruvian man, the Accessibility Checker, the 22nd element in the toolbar.

Once you have activated the Accessibility Checker, a popup appears allowing authors to select checks to perform, or to perform them all, which is the default setting. Abbreviations are excluded from the default at this time

Accessibility Checker

Please select which issues you would like to test for:

☒

1. All accessibility issues (DEFAULT)

☐

2. Headings

☐

3. Alt Image Tags

☐

4. Tables☐☐☐☐Contact ckellibretext@ucdavis.edu for bug reporting.

OK

Cancel

Heading fixes

The tool will locate bold and italic content and suggest heading levels based on the page layout. H1 is always available at the top of the page, so LibreTexts may suggest H2, H3, and H4 to layout their textbooks. Containers (i.e. Learning Objectives, Examples, etc.) start with H5 and have H6, and H7 to help users navigate using headings. We're using ARIA labels to create headings with a level of 7.

Study Notes

When designating a structure as *R* or *S*, you must ensure that the atom or group with the lowest priority is pointing away from you. The easiest way to show this is to use the wedge-and-broken-line representation. You can then immediately determine whether the configuration is an *R* configuration or an *S* configuration.

To name the enantiomers of a compound unambiguously, their names must include the "handedness" of the molecule. The method for nomenclature.

Introduction

The method of unambiguously assigning the handedness of molecules was originated by three chemists: R. S. Cahn, C. Ingold, and V. Prelog and, as such, is also often called the CIP rules.

The Accessibility Checker recognizes the wrong heading was used for this Study Notes container and suggests H5 with a quick fix button to fix the issue.

The "C-" (right) ranks higher than the "H-" (left) based on the first point of difference and their relative atomic numbers.

However:

Accessibility Checker

Issue 1 of 22 (error)

Headers for box legends should use an h5 tag

Box legends should use headers to maintain page organization

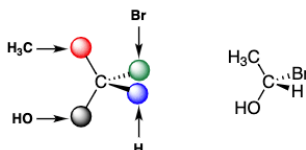
Quick fix

Contact ckellibretxt@ucdavis.edu for bug reporting. If the quick fix button doesn't show up, please refresh the page.

The Accessibility Checker recognizes bold text and suggests a heading of 6 since it's within a container which starts with a heading 5, but has a drop down option to select a different heading if the suggestion isn't correct.

In the following screenshot, the Accessibility Checker identified bold text from a caption and suggested a heading 2. In the "Issue" notification of the checker, which shows the author is on 4 out of 9 issues, there are left and right buttons to allow authors to ignore suggested fixes. Once the "Quick fix" has been submitted, the issue will disappear from the list of issues.

Now take your molecular model and orientate it to match the molecule in question. Remember in the dash/wedge representation, two page. The wedge bond is coming toward you and the dashed bond is going away from you. If you were to hold a piece of paper directly in front of the regular bond should both be touching the piece of paper. The dashed bond should be pointing behind the piece of paper and the



In this structure, the bromine is going away from you, the hydrogen is coming toward you and the hydroxide and methyl groups are in the plane of the page.

Then based on the position, assign each substituent on the chiral carbon a colored ball on your molecular model. In this case, bromine is assigned the green ball. The hydrogen is coming toward you so it is assigned the blue ball. The last two substituents are in the plane of the page, however, the hydroxide is assigned the black ball which leaves OH being assigned the black ball.

Accessibility Checker

Issue 4 of 9 (warning)

Paragraphs must not be used for headers

Headers are extremely useful for non-sighted users to navigate the structure of the page. Formatting a paragraph to just be big or bold, while it might visually look like a header, does not make it a header.

Header level: H2 (Suggested)

Quick fix

Contact ckellibretxt@ucdavis.edu for bug reporting. If the quick fix button doesn't show up, please refresh the page.

Accessibility Checker has incorrectly located bold content within a caption and is suggesting a heading level of 2 be applied.

Graphics and Alt Tags

For all graphics and images, the Accessibility Checker will require user interaction. The pop-up requesting alternative text for images give users the following options:

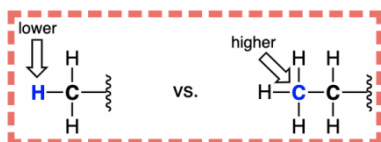
- Non-decorative
- Decorative (select if image is already discussed on page)
- Change alt text to caption

“Non-decorative” will require text within the Alternative text field. “Decorative” will make an empty alt tag to mark it as decorative to screenreaders. “Change alt text to caption” will convert alt text with 150 characters and suggest changing to a caption so learning disabled students benefit. The quick fix button will implement the accessibility fix on the users behalf.

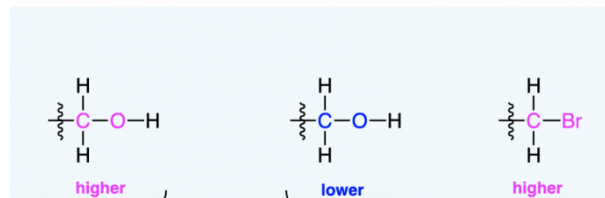
ent directly attached to chiral carbon, proceed along the substituent chains until a point of difference is found.

n with the highest priority (the highest atomic number). That chain has the higher priority.

substituent. At the connectivity of the stereocenter, both have a carbon atom, which are
1 to it, whereas the ethyl has two hydrogen atoms and a carbon atom. The carbon atom
hydrogen; therefore the ethyl takes priority over the methyl.



the "C-" (right) based on the relative molecular weights at the first point of difference.



Accessibility Checker

Issue 1 of 13 (error)

Image alternative text is too long

Image alternative text should be clear and concise. Alternative text longer than 150 characters should be reviewed to see if it can be shortened.

☒ Non-decorative
☐ Decorative (select if image is already discussed on page)
☐ Change alt text to caption

Quick fix

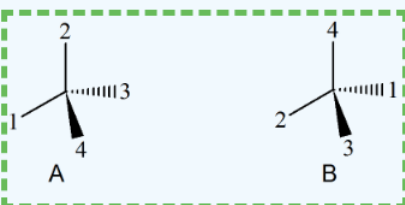
Contact cklibretext@ucdavis.edu for bug reporting.
If the quick fix button doesn't show up, please refresh the page.

The Accessibility Checker appears as a blue dotted popup with 3 options: Non-Decorative (requires user input), Decorative (select if image is already discussed on page), or Change alt text to caption if it's over 150 words.

The tool will also check if the filename is used as alt text and request the author to submit text to replace the filename with an accessible description.

Exercise \(\PageIndex{1}\)

1) Orient the following so that the least priority (4) atom is paced behind, then assign stereochemistry.



2) Draw (R)-2-bromobutan-2-ol.

3) Assign (R)/(S) to the following molecule.



Accessibility Checker

Issue 5 of 13 (notice)

Use empty alternative text only for decorative images

Empty alternative text can only be used if the image serves purely decoration purposes. If the image is supposed to convey any information whatsoever, you need to set a proper alternative text for it.

Image type:
Alternative text:

Quick fix

The Accessibility Checker reports an empty alt for an image and requests user input for a quick fix.

Table fixes

Table accessibility is addressed by the Accessibility Checker and only requires user input for captions and summaries. You don't need to know code for column or row headers, or simplified groups of column or row headers. It's all automatically fixed in the background. Note, there may be complex table(s) which the tool doesn't properly fix.

Complex tables which combine multiple tables into one may need to be separated into multiple tables. While it may be visually appealing to combine the tables, it's impossible to create accessible headings for content after heading columns or rows have been established.

HSP Activities Accessibility Overview

Conformance Level	Definition	Count by Level	Percent by Level
Usable with Best Practices (labeled in green)	The activity requires minimal adjustments by content authors	5	10%
Usable with Workarounds (labeled in yellow)	The activity requires significant adjustments by content authors	25	Accessibility Checker Issue 1 of 4 (error) Data tables should contain a "caption" element if not described elsewhere Unless otherwise described in the document, tables should contain <code><caption></code> elements to describe the purpose of the table. Caption: Quick fix Contact ckellibret@ucdavis.edu for bug reporting. If the quick fix button doesn't show up, please refresh the page.
Requires Alternative Activity (labeled in red)	The activity is not usable by some users	17	
Not Evaluated (labeled in blue)	The activity type was not evaluated	3	
Total	Number of HSP activities	50	

Accessibility Checker has identified a missing caption for the table and requests user input to quick fix the issue.

HSP Activities Accessibility Overview

Conformance Level	Definition	Count by Level	Percent by Level
Usable with Best Practices (labeled in green)	The activity requires minimal adjustments by content authors	5	10%
Usable with Workarounds (labeled in yellow)	The activity requires significant adjustments by content authors	25	Accessibility Checker Issue 2 of 4 (warning) Complex tables should have a summary If a table is complex (for example, has some cells with "colspan" attributes, the table should have a summary. Summary: Quick fix Contact ckellibret@ucdavis.edu for bug reporting. If the quick fix button doesn't show up, please refresh the page.
Requires Alternative Activity (labeled in red)	The activity is not usable by some users	17	
Not Evaluated (labeled in blue)	The activity type was not evaluated	3	
Total	Number of <u>HSP</u> activities	50	

In the same table, the Accessibility Checker has identified a missing summary which can add instructions for reading complex tables.

Links and URL's

To address the inaccessibility of links and URL's, the team worked on a number of updates. Non-unique links (click here, more, etc.) and URL's can be difficult for screenreaders or magnifiers to interact with.

The tool locates non-unique links or posted URL's and request user interaction to enter in text and replace the URL. Once entered, the tool will then detect if it's a LibreTexts link or if it links to another site. If it's a LibreTexts link, nothing else is done. If it's a link outside of LibreTexts, the tool will wrap the base of the site in brackets and place it after the link.

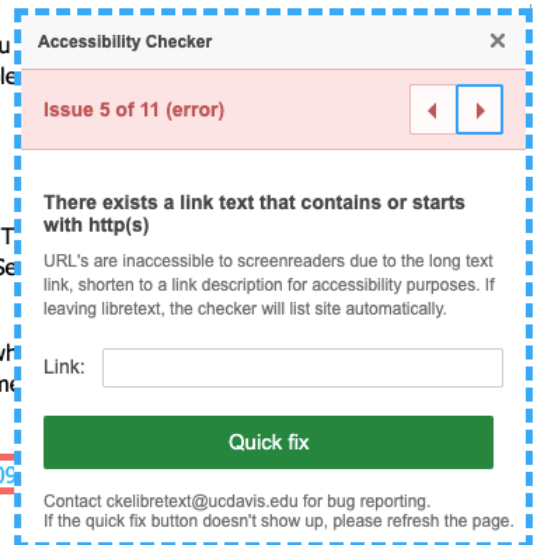
When you log in with your instructor's account a Sandbox will be created for you. You enter your username and select "Sandbox". The content of your sandbox is not publicly viewable without given specific access to, and to curators of [LibreTexts](#).

Step 4: Create an Empty Course

You can start by using the [remixer](#) to set up the structure of the book you will build. Then you can use the "new" button on the black toolbar which appears when you login. See [here](#) for creating. This will be an empty Course Shell that needs content added.

While the organization of a course shell can vary, they almost always have a "Text" which was customized for the instructor for whom the course shell was made. Here are some examples:

- [Search \[google.com\]](#)
- [https://chem.libretexts.org/Courses/Sacramento_City_College/SCC%3A_Chem_309/General%2C_Organic_and_Biochemistry_\(Bennett\)](https://chem.libretexts.org/Courses/Sacramento_City_College/SCC%3A_Chem_309/General%2C_Organic_and_Biochemistry_(Bennett))

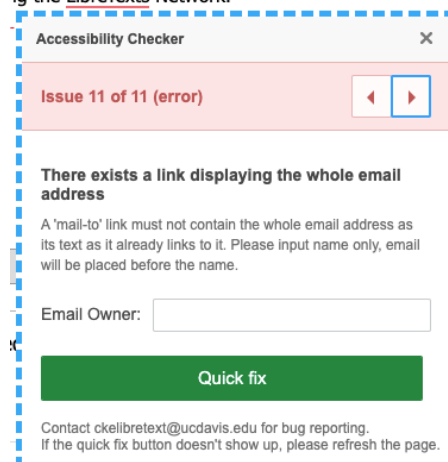


Accessibility Checker found and fixed a Search link, with Google in brackets, while the tool waits for user input on a highlighted inaccessible link.

The tool will also locate emails within content and request user interaction for typing in the name. The tool will automatically place "eMail:" before the name to make it clear what it's linking to.

Hub so your students can access it. Until we get it published at info@libretexts.org to publish.

ing the LibreTexts Network.



Color Contrast

This portion of the tool is still being worked on and is not currently active in the Accessibility Checker. The color contrast will

address contrast issues of text content, to ensure all text is accessible and authors aren't use contrasting colors. This is turned off at the moment due to interfering with links.

Labels

The labels section is also still being worked on and is not currently active in the Accessibility Checker. This section will fix form fields and links to ensure they're properly labeled and interact with assistive technologies. This is turned off at the moment as we work on some reported issues.

Abbreviations and Acronyms

The acronyms section is currently in Beta, and is separate from the rest of the scripts and must be selected from the menu to run.

If you have content in ALL CAPS, such as abbreviations or acronyms, the Accessibility Checker will find unique instances and require user input. Once an element has been located, the following choices will be available:

- Label acronym
- Reformat text to lowercase (recommended for non-acronyms)
- Ignore text

Summary

This document includes a guide designed to help H5P content authors avoid creating accessibility barriers for users. The purpose is to ensure the H5P activities are as accessible as currently possible. Content authors should also follow all accessibility techniques for digital content. For additional information, review [ASCCC Quick Guides Accessibility Overview](#) and [Accessibility Resources](#).

Accessibility Standards

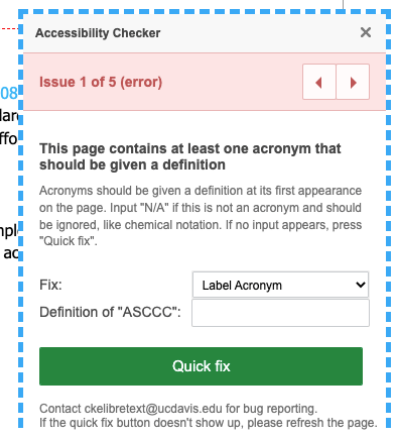
The Academic Senate for California Community Colleges ([ASCCC](#)) Open Educational Resources Initiative ([OERI](#)) uses the [Revised 508](#) standards for instructional content like H5P activities. ASCCC recommends using content that conforms with the Revised 508 Standard. This means that various users with disabilities can read, understand, and interact with content and activities with about as much effort.

Reported Accessibility Barriers

ASCCC identified accessibility barriers with H5P activities in April 2020 and provided detailed feedback to H5P developers. For example, failures with the Mark the Words activity type. In response, H5P updated the [Content types recommendations](#) page to include the activity type.

ASCCC reported the following results for the activity types ASCCC evaluated:

- Drag the Words, not recommended
- Fill in the Blanks, recommended with workarounds
- Mark the Words, not recommended
- Multiple Choice, recommended with workarounds.



The screenshot shows the Accessibility Checker interface. At the top, it says "Accessibility Checker" with a close button. Below that, it indicates "Issue 1 of 5 (error)". The main message states: "This page contains at least one acronym that should be given a definition". It explains that acronyms should be given a definition at their first appearance on the page, and provides instructions on how to input "N/A" or "Quick fix". A dropdown menu for "Fix:" is set to "Label Acronym". Below it, there is a text field for the "Definition of 'ASCCC':" and a green "Quick fix" button. At the bottom, there is contact information for bug reporting: "Contact ckelibrettext@ucdavis.edu for bug reporting. If the quick fix button doesn't show up, please refresh the page."

ASCCC is highlighted in red dashes with the Accessibility Checker requiring a definition entered for ASCCC and a Quick fix button.

Choosing "Label acronym" will allow the user to enter a definition to be added which are accessible to mouse and keyboard as a tooltip. We have altered tooltips to be accessible to keyboard users, which allows users to select and enlarge fonts.

This will add a tooltip to all acronyms which users can use their mouse or keyboard to review the acronym definition. Previously this was presented as small, inaccessible, text.

Choosing "Reformat text to lowercase" will alter the text so that it's no longer ALL CAP, which will force the tool to ignore it. Choosing "Ignore text" will keep the text in ALL CAP and ignore additional attempts to update it.

Because of these labels, a tooltip will be made available to inform users of the meaning. Tooltips were already accessible to screenreaders, but we've worked to make it more accessible to mouse and keyboard users! Users can now enlarge and select the text within tooltips!

Every once in a while, form fields the user interacts with will not display in the tool. Please refresh the page to fix this issue. If you run into further issues, please reach out to ckelibrettext@ucdavis.edu with the link of the page and error(s) occurring.

3: APPENDICES

3.1: Appendix A- Checklist for Accessibility

3.2: Appendix B- Redesign or Accommodation Activity Guidelines

3.3: Appendix C- Inclusive Design Webinar Series

3.4: Appendix D- Improve Online Course Accessibility Video

3.1: Appendix A- Checklist for Accessibility

Organizing content

- ◇ Content is organized under headings and subheadings.
- ◇ Headings and subheadings are used sequentially (e.g., Heading 2, Heading 3, Heading 4. In LibreTexts Heading 5 and Heading 6 are reserved for Textboxes and Heading 1 label the page title).

Images

- ◇ Images that convey information include alternative text (alt text) descriptions of the image's content or function.
- ◇ Graphs, charts, and maps also include contextual or supporting details in the text surrounding the image.
- ◇ Images do not rely on color to convey information.
- ◇ Images that are purely decorative do not have alt text descriptions. (Descriptive text is unnecessary if the image doesn't convey contextual content information).

Links

- ◇ The link text describes the destination of the link and does not use generic text such as “click here” or “read more.”
- ◇ If a link will open or download a file (like a PDF or Excel file), a textual reference is included in the link information (e.g., [PDF]).
- ◇ Links do not open in new windows or tabs.
- ◇ If a link must open in a new window or tab, a textual reference is included in the link information (e.g., [NewTab]).
- ◇ For citations and references, the title of the resource is hyperlinked, and the full URL is not hyperlinked.

Tables

- ◇ Tables are used to structure information and not for layout.
- ◇ Tables include row and column headers.
- ◇ Row and column headers have the correct scope assigned.
- ◇ Tables include a caption.
- ◇ Tables avoid merged or split cells.
- ◇ Tables have adequate cell padding.

Multimedia

- ◇ All audio content includes a transcript. The transcript includes all speech content and relevant descriptions of non-speech audio and speaker names/headings where necessary.
- ◇ Videos have captions of all speech content and relevant non-speech content that has been edited by a human for

accuracy..

- ◇ All videos with contextual visuals (graphs, charts, etc.) are described audibly in the video.

Formulas

- ◇ Equations written in plain text use proper symbols (i.e., $-$, $\times$, $\div$).^[1]
- ◇ Complex equations must be written using LaTeX and are rendered with MathJax (LaTeX).
- ◇ Written equations are properly interpreted by text-to-speech tools.^[2]

Font size

- ◇ Font size is 12 point or higher for body text in Word and PDF documents.
- ◇ Font size is 9 point for footnotes or endnotes in Word and PDF documents.
- ◇ Font size can be enlarged by 200 per cent online using the readability tab or +/- without needing to scroll side to side.

-
1. For example, a hyphen (-) may look like a minus sign ($-$), but it will not be read out correctly by text-to-speech tools. ↵
 2. Written equations should prioritize semantic markup over visual markup so text-to-speech tools will read out an equation in a way that makes sense to auditory learners. This applies to both equations written in LaTeX and equations written in Microsoft Word's equation editor. ↵

3.2: Appendix B- Redesign or Accommodation Activity Guidelines

About the “Redesign or Accommodation” activity

We have grounded the “Redesign or Accommodation?” activity in student-centred Universal Design for Learning (UDL)—a framework that recognizes that we cannot design learning experiences for a specific type of student.

“Redesign or Accommodation?” also incorporates the humanizing element of student *Personas*, some who you will recognize from this accessibility toolkit. Each participant adopts a *Persona* and advocates from that student’s perspective when presented with a *Scenario* that is based on common or recurring components of course delivery.

In facilitated discussions, participants identify potential barriers that the *Scenario* presents for their *Persona*-selves, consider what accommodations to address the barrier would look like—and if their *Persona* would even qualify to receive one, and then determine if the barrier/s could be avoided entirely by applying a UDL-based redesign to the course components in question.

We have created several *Scenarios* for this activity, but we also recommend you try running *Scenarios* arising from your own practice and within your own institution against your *Persona*-based selves; it may help to proactively identify and address barriers before they affect your students.

Below are assorted “Redesign or Accommodation?” activity materials.

- [Redesign or Accommodation Activity Guidelines \[PDF file\]](#)
- [Redesign or Accommodation Scenarios \[PDF file\]](#)

Personas

- [Redesign or Accommodation Persona Cards \(Detailed\) \[PDF file\]](#)
- [Persona Cards for Printing \[PDF file\]](#)
- [Additional Personas for Course Design by OSU Ecampus \[PDF file\]](#)

Attributions

Thank you to the University of Prince Edward Island (*Alex, Khaleed, Maridee, and Natalie*) for developing and contributing four new persona to the “Redesign or Accommodation?” activity, a collaborative effort between UPEI’s Accessibility Services and the E-Learning Office. And thank you to Elisabeth McBrien and Heather Garcia of Oregon State University for creating an additional set of personas to facilitate accessible and inclusive course design.

This page titled [3.2: Appendix B- Redesign or Accommodation Activity Guidelines](#) is shared under a [CC BY 4.0](#) license and was authored, remixed, and/or curated by LibreTexts.

3.3: Appendix C- Inclusive Design Webinar Series

In 2022 LibreTexts hosted presentations on the systems accessibility features

YouTube Video

This interactive element is not available in this format. Visit the link or scan the QR code to access it online.

[View this YouTube Video online](#)



YouTube Video

This interactive element is not available in this format. Visit the link or scan the QR code to access it online.

[View this YouTube Video online](#)



and the evolution of the textbook

YouTube Video

This interactive element is not available in this format. Visit the link or scan the QR code to access it online.

[View this YouTube Video online](#)



BC Campus Inclusive Design WebInArs

In 2019, BCcampus created a four part [inclusive design WebInAr series](#).

Each webinar focused on a different topic to address the varying ways that inclusive design practices can influence post-secondary education.

As they write, inclusive design is never something that we complete. Nor is it something that can be perfected. It is not a finish line we can cross. Instead, it is something to practice, integrate with our everyday work, and continually revisit and reevaluate. And we hope that these webinars can act as a starting place for that process.

CARL Webinar: How to Create Inclusive and Accessible OER

In this webinar, we will talk about how to design OER so they are more inclusive and accessible for all students. This will include an overview of the technical considerations of digital accessibility. For example, what are the minimum technical requirements that ensure students with print disabilities can access and navigate through the resource? We will also look at how inclusive design

practices can help us create educational materials that are more versatile and useful for students. For example, what does an accessible resource look like for a student with no personal computer? Or a student with a learning disability that makes reading difficult? Ultimately, students can be very different from each other, and what may work for one student may not work for another. But by designing for those differences, we can create educational materials that are more useful, powerful, and accessible to all.

YouTube Video

This interactive element is not available in this format. Visit the link or scan the QR code to access it online.

[View this YouTube Video online](#)



3.4: Appendix D- Improve Online Course Accessibility Video

This video provides steps to improve the accessibility of online courses for all students and highlights some free tools that make the process easier.

If you would like to embed the above video in an online resource, visit the [video on the BCcampus Kaltura website](#). At the bottom of that webpage select “Share” from the blue dropdown menu and copy the oEmbed code listed.

This page titled [3.4: Appendix D- Improve Online Course Accessibility Video](#) is shared under a [CC BY 4.0](#) license and was authored, remixed, and/or curated by LibreTexts.

INDEX

H ---

hypothesis:yes

1.2: A framework for the universal design for learning

GLOSSARY

S

Sample Word 1 | Sample Definition 1

List of Links by Chapter for Print Users

This page contains a list of links to external resources referenced in this book for people who are using a print version. Links are listed by the chapters in which they appear and are listed alphabetically. Internal links are not included in this list.

About This Toolkit

- BCcampus (<https://bccampus.ca/about-us/>)
- BCcampus Support (<https://open.bccampus.ca/contact-us/>)
- BCcampus Open Education (<http://open.bccampus.ca/>)
- BCcampus Open Education Style Guide (<https://opentextbc.ca/selfpublishgui...er/appendix-2/>)
- BCcampus Writing Guidelines for Style and Tone (<https://bccampus.ca/bccampus-editori...ice-and-style/>)
- British Columbia Ministry of Advanced Education, Skills & Training (<https://www2.gov.bc.ca/gov/content/g...kills-training>)
- Hewlett Foundation (<http://www.hewlett.org/>)
- Report a Textbook Error form (<https://open.bccampus.ca/reporting-a...extbook-error/>)
- Self-Publishing Guide (<https://opentextbc.ca/selfpublishguide/>)

Acknowledgements

- Accessibility guidelines on formulas and equations (<http://accessibility.psu.edu/math/equations/>)
- Personas of people with disabilities (<http://uxmag.com/articles/book-excer...b-for-everyone>)

Introduction

- *La Trousse d'outils d'accessibilité* (<https://opentextbc.ca/troussedoutildaccessibilite/>)
- Pressbooks announced their *Accessibility Policy* (<https://pressbooks.org/blog/2018/05/...-improvements/>)
- Pressbooks Guide (<https://opentextbc.ca/pressbooks/>)
- Self-serve instance of Pressbooks (<https://pressbooks.bccampus.ca/>)
- To Care & Comply: Accessibility of Online Course Content (<https://www.youtube.com/watch?v=eks3...ature=youtu.be>)
- WCAG (Web Content Accessibility Guidelines) (<http://www.w3.org/WAI/intro/wcag>)

Accessibility Statement

- BCcampus Support (<https://open.bccampus.ca/contact-us/>)
- Download this book in another file format (<https://opentextbc.ca/accessibilitytoolkit/>)
- Report an Open Textbook Error form (<https://open.bccampus.ca/reporting-a...extbook-error/>)
- Web Content Accessibility Guidelines 2.0 (<https://www.w3.org/TR/WCAG20/>)
- Web version of the *Accessibility Toolkit* (<https://opentextbc.ca/accessibilitytoolkit/>)

Universal Design

- Accessibility movement (<http://en.Wikipedia.org/wiki/Accessibility>)
- Adaptive technology (http://en.Wikipedia.org/wiki/Adaptive_technology)
- Aesthetics (<http://en.Wikipedia.org/wiki/Aesthetics>)
- Assistive technology (http://en.Wikipedia.org/wiki/Assistive_technology)
- Universal Design for Learning (<http://www.udlcenter.org/aboutudl/udlcurriculum>)

Using Personas

- *A Web for Everyone: Designing Accessible User Experience* (<http://uxmag.com/articles/book-excer...b-for-everyone>)
- CAPER-BC Annual Report [PDF] (<https://caperbc.ca/files/2014/05/CAP...14.pdf#page=13>)

- Computer-science student's screen reader (<https://soundcloud.com/freecodecamp>)
- MP3 recording of a synthetic voice (<http://caperbc.ca/files/2014/02/Paul.mp3>)
- Student using JAWS (https://www.youtube.com/watch?v=_YpNrOkW0Mw#t=4m08s)
- Student using Kurzweil on a computer (https://www.youtube.com/watch?v=_YpNrOkW0Mw#t=1m32s)
- Student using ZoomText (https://www.youtube.com/watch?v=_YpNrOkW0Mw)
- Video demonstration of CART (<https://www.youtube.com/watch?v=qn4B0gyDosA>)

Organizing Content

- Visual editor (<http://en.support.wordpress.com/visual-editor/#styles>)

Images

- Complex Images for All Learners: A Guide to Making Visual Content Accessible [PDF] (<https://www.lsu.edu/accessibility/tr...lex-images.pdf>)
- Example of what long descriptions look like in practice (<https://opentextbc.ca/introtourism/c...keting/#fig8.1>)
- Hyperlink Material (<https://opentextbc.ca/pressbooks/cha...link-material/>)
- *Introduction to Sociology – 2nd Canadian Edition* (<https://opentextbc.ca/introductionto...ogy2ndedition/>)
- *Pressbooks Guide* (<https://opentextbc.ca/pressbooks/>)

Links

- Customizing your Exports with Custom Styles (<https://guide.pressbooks.com/chapter...custom-styles/>)
- Here (<https://open.bccampus.ca/>)
- Hyperlink Material (<https://opentextbc.ca/pressbooks/cha...link-material/>)
- Information on BCcampus Open Education (<https://open.bccampus.ca/>)
- *Pressbooks Guide* (<https://opentextbc.ca/pressbooks/>)
- Rebus Community help page (<https://www.rebus.community/t/urls-a...liography/1450>)
- Some things I'm learning about accessibility and open textbooks (<https://blogs.ubc.ca/chendricks/2020...pen-textbooks/>)

Tables

- Hyperlink Material (<https://opentextbc.ca/pressbooks/cha...link-material/>)
- *Pressbooks Guide* (<https://opentextbc.ca/pressbooks/>)
- Tables Concepts (<https://www.w3.org/WAI/tutorials/tables/>)

Multimedia

- *Pressbooks Guide* (<https://opentextbc.ca/pressbooks/>)
- YouTube in Pressbooks (<https://opentextbc.ca/pressbooks/cha...media/#youtube>)

Formulas

- Creating and viewing Math ML (<http://sites.psu.edu/accessibility/math/mathml>)
- Equation with audio (<http://opentextbc.ca/accessibilityto...2/equation.m4a>)
- Equations: MathML, Images and LaTeX (<http://accessibility.psu.edu/equations>)
- Math Accessibility at Portland Community College (<https://www.youtube.com/watch?v=VIMW...ature=youtu.be>)
- Math accessibility study (<https://www.pcc.edu/instructional-su...lity/sas/math/>)

Font Size

- Web Content Accessibility Guidelines (WCAG 2.0) (<http://www.w3.org/TR/UNDERSTANDING-W...ast-scale.html>)

Colour Contrast

- ACART's Contrast Checker (<http://www.contrastchecker.com/>)
- Giacomo Mazzocato's Accessibility Color Wheel (<http://gmazzocato.altervista.org/colorwheel/wheel.php>)
- WebAIM's Color Contrast Checker (<http://webaim.org/resources/contrastchecker/>)

Accessibility Statements

- Access 8878's Accessibility Statement (<https://web.archive.org/web/20161203...statement.aspx>)
- BCCampus Support (<https://open.bccampus.ca/contact-us/>)
- B.C. Government Website's Accessibility Statement (<https://www2.gov.bc.ca/gov/content/home/accessibility>)
- Download this book in another file format (<https://opentextbc.ca/accessibilitytoolkit/>)
- Hassell Inclusion's Accessibility Statement (<http://www.hassellinclusion.com/accessibility/>)
- How to write an effective Accessibility Statement (<http://www.hassellinclusion.com/2012...ity-statement/>)
- Nomensa: How to Write an Accessibility Statement (<https://www.nomensa.com/blog/2009/wr...lity-statement>)
- Report a Textbook Error (<https://open.bccampus.ca/reporting-a...extbook-error/>)
- Web Content Accessibility Guidelines 2.0 (<https://www.w3.org/TR/WCAG20/>)
- Web Content Accessibility Guidelines: Conformance Claims (<https://www.w3.org/TR/WCAG20/#conformance-claims>)

Appendix A: Checklist for Accessibility

- OpenStax collection (<https://openstax.org/>)
- This accessibility statement (<https://openstax.org/accessibility-statement>)

Appendix B: Redesign or Accommodation Activity Guidelines

- You can download all files in this chapter from the following link: <https://opentextbc.ca/accessibility...ty-guidelines/>

Appendix C: Inclusive Design Webinar Series

- You can download all files and access all videos in this chapter from the following link: <https://opentextbc.ca/accessibility...ebinar-series/>

Versioning History

- Report a Textbook Error (<https://open.bccampus.ca/reporting-a...extbook-error/>)

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