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OER PRODUCTION SERIES

Technical Accessibility

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August 8, 2024

Download webinar materials:
https://bit.ly/techaccessibility

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Topics

- Definitions of disability and accessibility
- Assistive technology
- Web Content Accessibility Guidelines (WCAG)
- How to make content accessible
- Resources

Ways of thinking about disability

Medical model

Disability as an individual problem, affliction, or deficit that needs a cure or accommodation.

Social model

Disability as a spectrum that can affect different people in different ways depending on their context, environment, and the tools they have access to, and is a product of history and culture.

What is “accessibility”?

Accessibility is what happens when we design and create resources, experiences, tools, and spaces that **make space for and support the diversity of our bodies and minds** and centres the needs of people with disabilities to ensure they can engage in the ways that work best for them.

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Assistive technology

What is assistive technology?

"Any item, piece of equipment, software program, or product system that is used to increase, maintain, or improve the functional capabilities of persons with disabilities." (Assistive Technology Industry Association)

- Can be low to high tech
- Can be designed specifically for an individual or mass produced

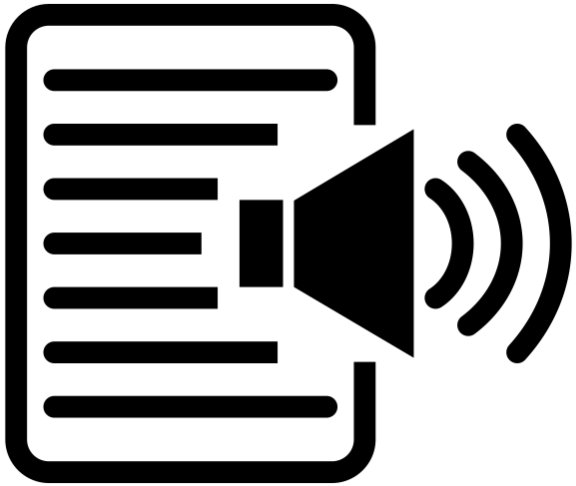
Screen readers

Screen readers will read aloud content on the screen, including structure and navigational elements, and allow someone to navigate using only their keyboard.

Examples: NVDA, JAWS, VoiceOver

"Blind student working on laptop" by Access Matters. CC BY-NC-SA 2.0.

Text-to-speech



"Text to speech" icon
by Trevor Dsouza. CC BY 3.0.

Technology that will read text aloud.

Available as separate software, but also built into many tools like Adobe Reader, Microsoft Word, and internet browsers.

Screen magnifier

Software that allows someone to enlarge content on the screen much beyond what is usually possible. It is often combined with text-to-speech.

"Magnifying Glass" is CC0 Public Domain.

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Technical Accessibility

Web Content Accessibility Guidelines (WCAG)

- Perceivable
- Operable
- Understandable
- Robust

Principle 1: Perceivable

Information and user interface components must be presented to users in ways they can perceive.

Principle 2: Operable

User interface components and navigation must be operable.

Principle 3: Understandable

Information and the operation of user interface must be understandable.

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Structure and Navigation

- **Headings**
- **Links**
- **Tables**

Organizing Content

- Content is organized under headings and subheadings
- Headings and subheadings are used sequentially

<h1>Chapter 1: Introduction to Sociology</h1>

<h2>Introduction</h2>

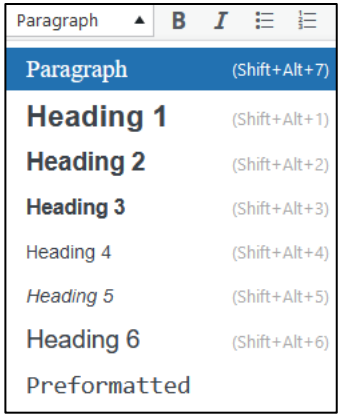
Concerts, sporting matches and games, and political rallies can have...

<h2>1.1 What is Sociology</h2>

A dictionary defines sociology as the systematic study of...

<h3>What are Society and Culture?</h3>

Sociologists study all aspects and levels of society...



Links

- The link text describes the link destination when taken out of a sentence
- Links that open files include the file type in the link text (such as “[PDF]”)
- Links do not open in new windows or tabs (unless a warning is provided)
- The web address is available for those using a print copy

Poll: Which of these links are accessible?

1. For more information on web accessibility, click here.
2. For more information on web accessibility, refer to the *Accessibility Toolkit*.
3. For more information on web accessibility, go to https://opentextbc.ca/accessibilitytoolkit
4. The BC Open Textbook Review Template [Word file] provides guidelines for completing an open textbook review.

Answer: 2 and 4 are accessible

1. For more information on web accessibility, click here.
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Data Tables

- Tables include a caption.
- Tables include row and/or column headers.
- Row and column headers have the correct scope assigned.
- Tables do not have merged or split cells.
- Tables have adequate cell padding.

Table 15.1 One way scholars have categorized religions is by classifying what or who they hold to be divine.

Religious Classification	What/Who Is Divine	Example
Polytheism	Multiple gods	Hinduism, Ancient Greeks and Romans
Monotheism	Single god	Judaism, Islam, Christianity
Atheism	No deities	Atheism, Buddhism, Taoism
Animism	Nonhuman beings (animals, plants, natural world)	Indigenous nature worship, Shinto

Table 15.1 is reproduced from 15.1 The Sociological Approach to Religion in *Introduction to Sociology – 3rd Canadian Edition*
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Multimedia

- Audio
- Video

Audio

Include a transcript

Examples: Podcasts, interviews, recorded lectures

A transcript provides a text equivalent of audio content. It includes

- Speaker name(s)
- Headings and subheadings
- All relevant audio content, including
  - All speech content
  - Relevant descriptions of speech
  - Descriptions of relevant non-speech audio

Video

- All relevant visual information is conveyed via an audio description or transcript
- All relevant audio information is conveyed via captions or a transcript

- **Captions**: Text that is synchronized with audio in a video.
- **Audio descriptions**: Audio descriptions of visual content shown in the video that isn't conveyed through audio
- **Transcript**: Includes the same information as with audio transcripts, but may also include relevant description of visual content

Poll: Who might want captions on videos?

1. People who are Deaf or hard of hearing.
2. People with auditory processing difficulties.
3. People who are not fluent in the language of the video.
4. People who like crunchy, loud snacks.
5. All of the above.

Poll: Who might want captions on videos?

1. People who are Deaf or hard of hearing.
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5. All of the above.

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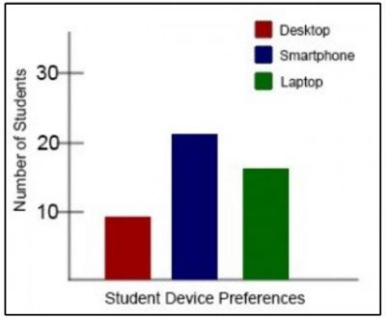
Visuals

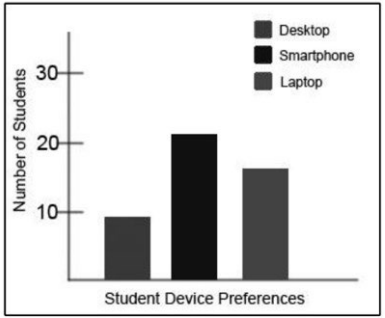
- Visual cues
- Colour contrast
- Decorative and informative images
- Mathematical notation

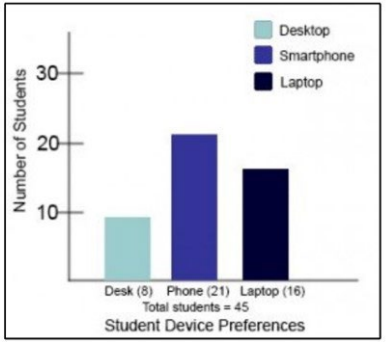
Visual Cues

- Visual cues include **colour**, **icons**, and **text style**.
- Use visual cues consistently throughout the resource.
- Visual elements that are used to convey information are also accessible in non-visual ways.
- Colour alone is not used to convey information.

Never use colour alone to convey information



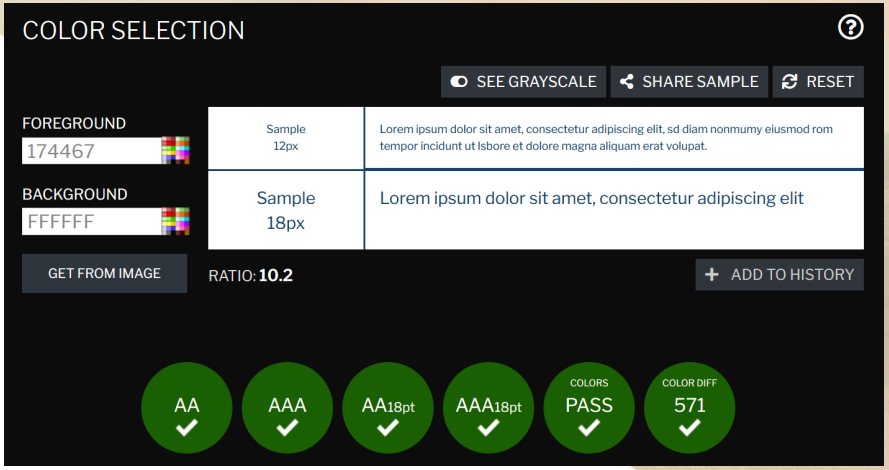




Images originally appear in the Images chapter of the *Accessibility Toolkit – 2nd Edition* © 2018 BCcampus. They are used under a CC BY 4.0 licence.

Contrast Checker

- Use the Contrast Checker tool to test the contrast ratio between text and background colours.



Poll: Is this colour combination accessible?

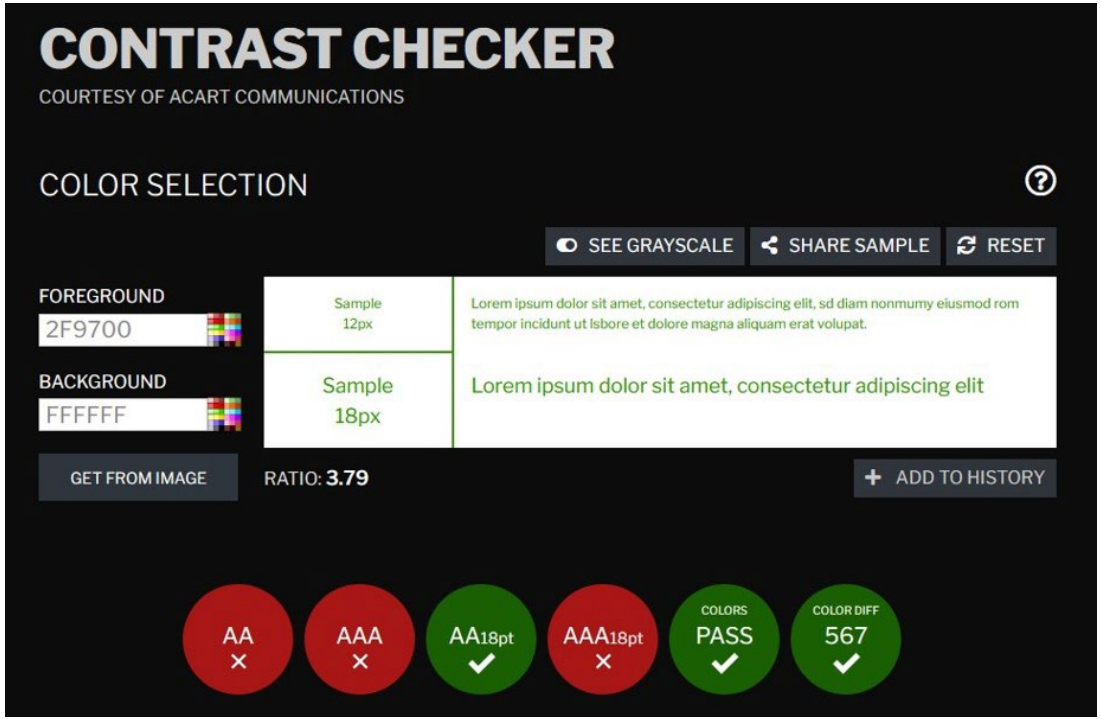
Is this colour combination accessible for regular size text?

Foreground: 2f9700
Background: ffffff

Answer: Not accessible

- Regular size text:
  - AA, AAA: FAILS
- Large text:
  - AA: PASS
  - AAA: FAILS

Contrast: 3.79:1



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Images

- Decorative vs. informative
- Alt text and image descriptions

Decorative vs. informative

A **decorative image** does not need a text description. It

- Is primarily for design
- Does not convey content (or are already described in surrounding text)

An **informative image** contains content that requires a text description. Either as

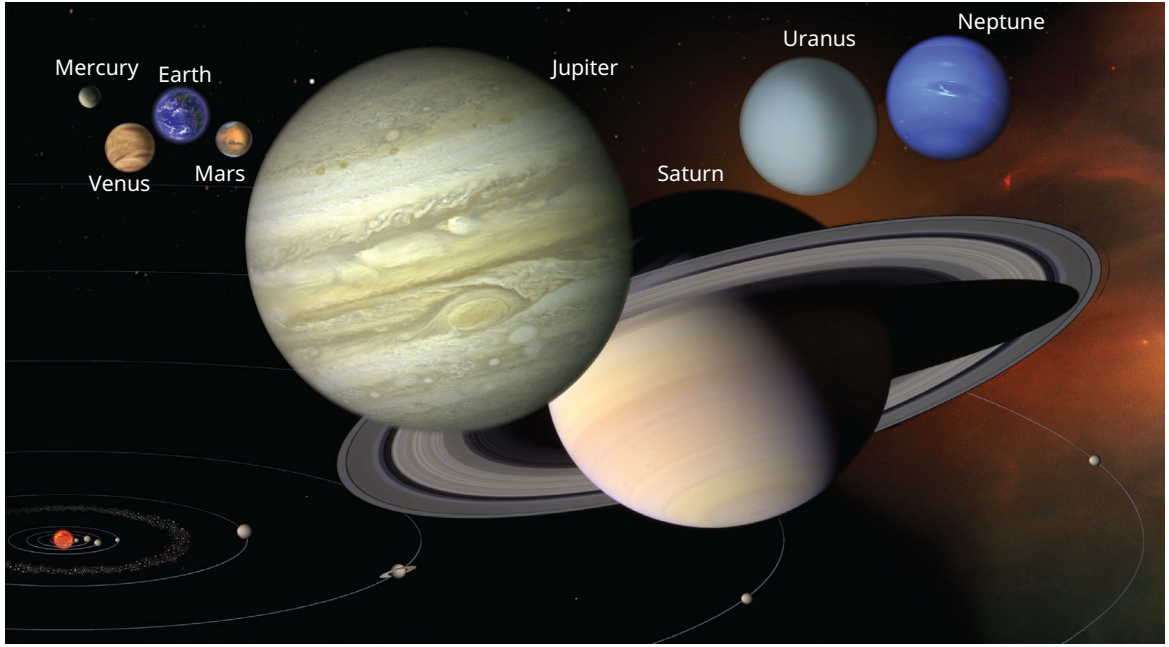
- Alt text
- Surrounding text or caption
- Long description

Decorative image

A car drives down the street at 70 kilometres per hour. How many miles is that?

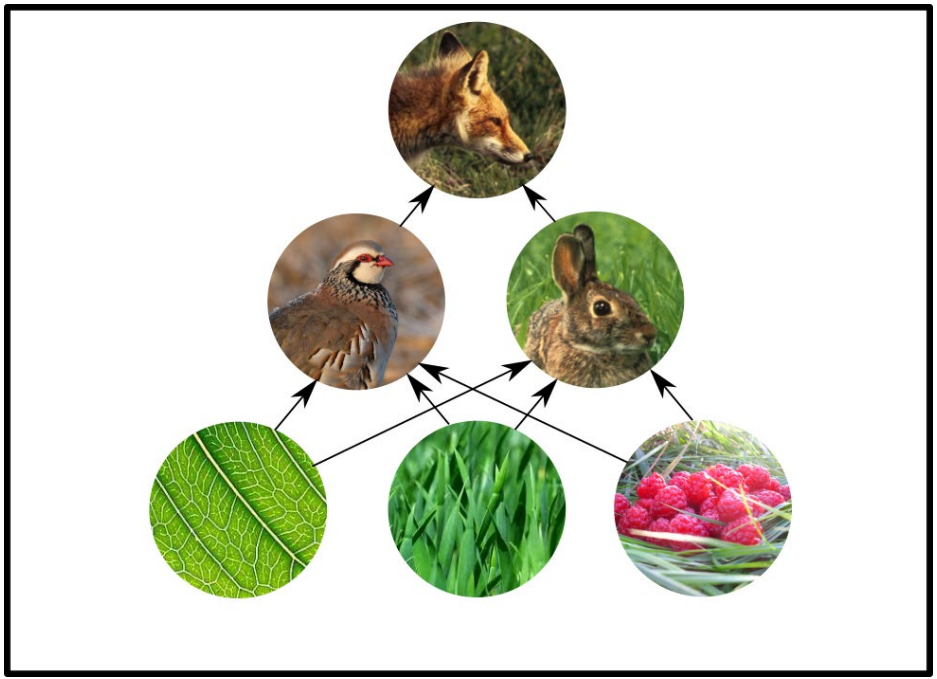
"Yellow sedan parked near red concrete building" by Wolf Schram is free to use under the Unsplash License.

Informative Image



"Our Solar System Lithograph" by NASA is free to use for educational purposes (NASA images and media use guidelines).

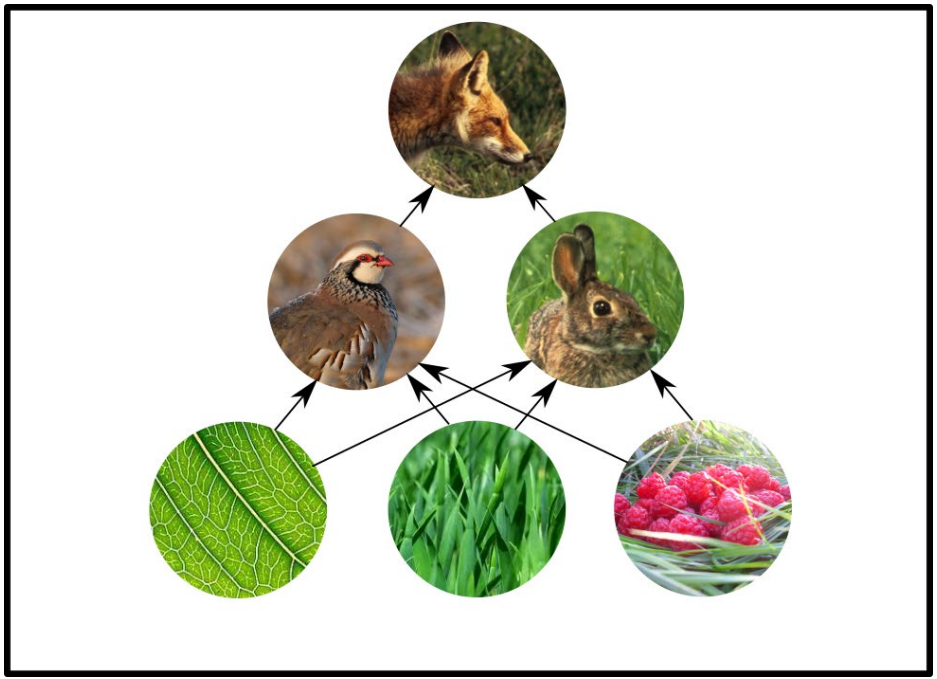
Poll: Which image description is best?



A. A food web showing what feeds a fox.
B. A food web with a fox at the top, a partridge and a rabbit in the middle, and leaves, grass, and berries on the bottom.
C. A food web showing three trophic levels. Organisms in one trophic level eat those in the level below. From bottom to top, the levels are:
    1. Leaves, grass, and berries
    2. Partridge and rabbit
    3. Fox

"Example trophic web fox partridge rabbit and plants" by Wiki brain is used under a CC BY-SA 4.0 licence.

Poll: Which image description is best?



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Alt Text

Alt text is a short text description of an image that appears in the `alt` attribute of the `image` tag.

- Will not appear visually
- Can be accessed by text-to-speech technology (including screen readers)
- Should be less than 125 characters
- Does not need to include “Image of …”

Surrounding Text or Caption

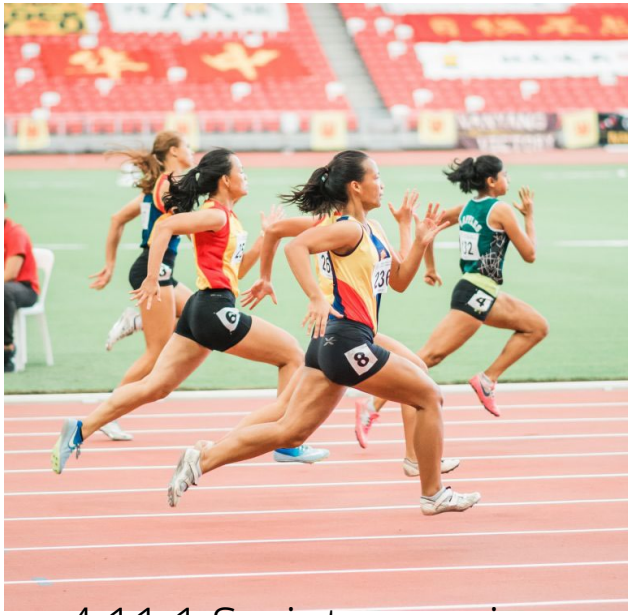


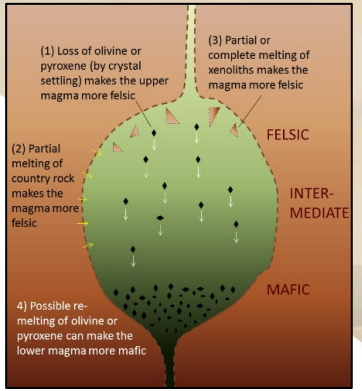
Figure 4.11.1 Sprinters racing on a track.

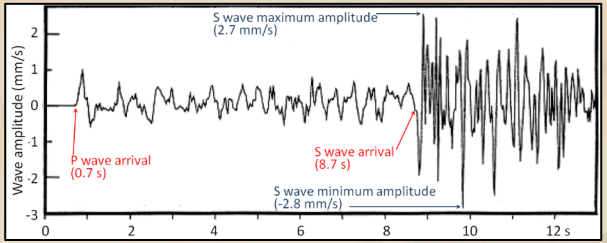
"Sprinters" by Jonathan Chng is free to use under the Unsplash License. Image and figure caption are downloaded from 4.11 Anaerobic Processes in *Human Biology: Human Anatomy and Physiology* © 2020 Christine Miller is under a CC BY-NC 4.0 licence.

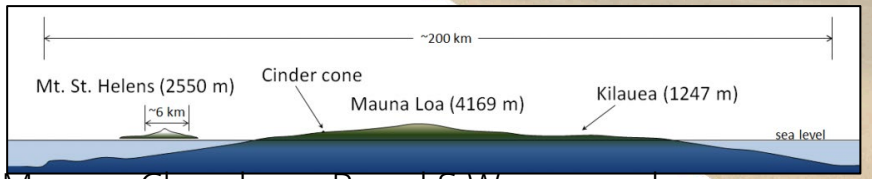
Long Descriptions for Complex Images

Examples

- pie charts
- bar carts
- line graphs
- flow charts
- diagrams
- illustrations
- math graphs
- maps







Magma Chambers, P and S Waves, and Volcano Size © Steven Earle. Used under CC BY 4.0.

Tips for Writing Image Descriptions

What to describe

- Content/purpose of the image
- Will depend on audience/context

How to describe

- Be objective
- Be concise
- If image is complex, go from general to specific

Symbols

Multiplication: x × ·

Subtraction: - – —

Division: ÷ /

Fractions: ½ 1/2

Formulas: LaTeX and MathJax

MathJax

This a display engine that translates mathematical markup (like MathML or LaTeX) into accessible, high-resolution equations.

This allows the equations to be rendered **aurally** or **visually**.

Other Ways of Making Math Accessible

$$m = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

Text description:

m equals begin fraction m sub 0 over begin square root 1 minus begin fraction v squared over c squared end fraction end square root end fraction

Resources for Describing Images

- *Accessibility Toolkit* from BCcampus
- Complex Images for All Learners [PDF] by Supada Amornchat

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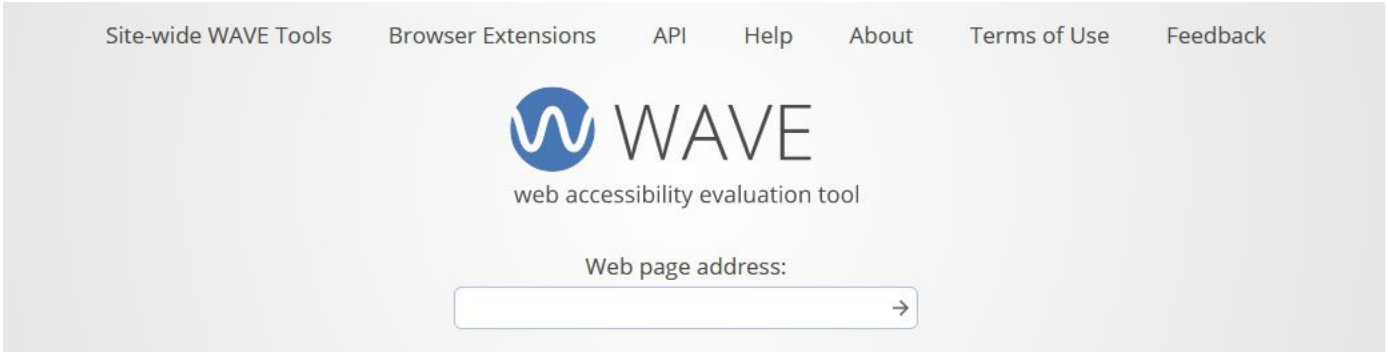
Testing for Accessibility

Different kinds of accessibility testing

- Automated testing: Using accessibility checkers
- Manual testing: Testing yourself
- User testing: Testing with disabled students

WAVE (Web Accessibility Evaluation Tool)



WAVE home page

Accessibility Checklists

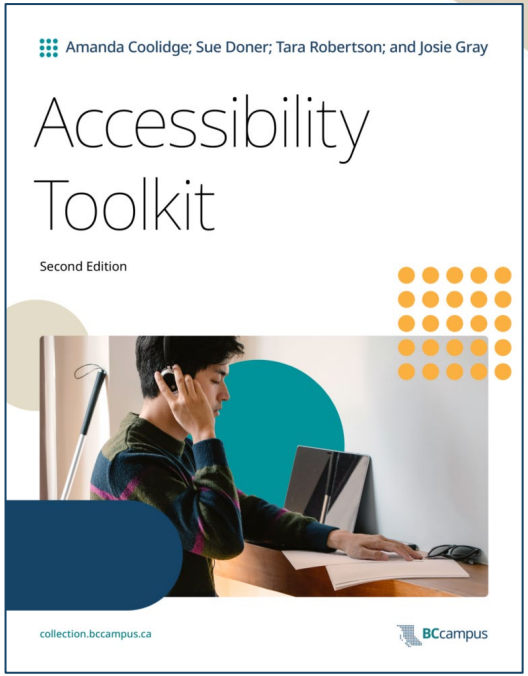
Strengths

- Concrete and easily actionable
- Highlight the most important technical considerations to make sure students with disabilities can access the material

Weaknesses

- Accessibility as something that we can go back and fix later
- Do not ensure good design
- Do not account for the multiple formats of OER
- Students face challenges not addressed in standard accessibility checklists
- Does not ensure equal access to learning outcomes

Accessibility Toolkit



- Accessibility Toolkit
- Information about how to create accessible educational resources
- Accessibility checklists
- Activities
- Webinars on Inclusive Design

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