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# Technical Accessibility

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BCcampus

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Download slides here:  
[bit.ly/technicalaccessibility](https://bit.ly/technicalaccessibility)



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# Topics to cover

- Assistive technology
- Web Content Accessibility Guidelines (WCAG)
- How to make content accessible
- Resources

# 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 very common

# 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

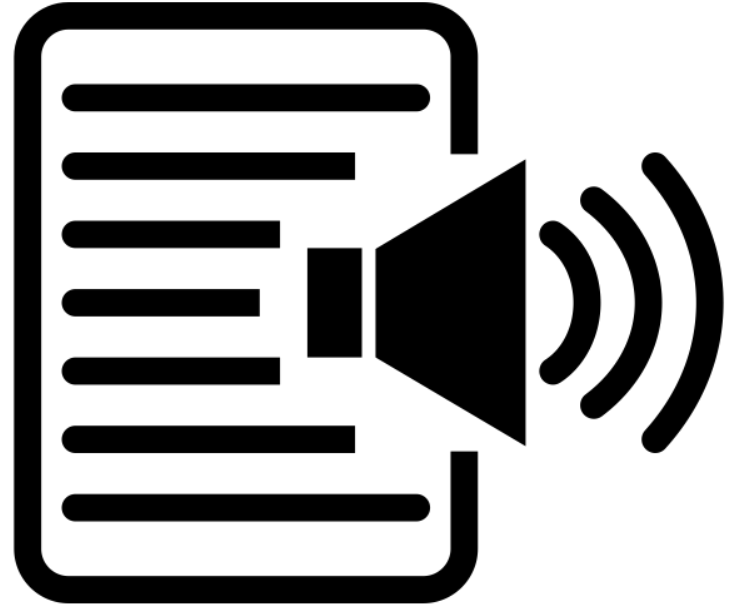


"Blind student working on laptop" by Access Matters. CC BY-NC-SA 2.0.

# Text-to-speech

Technology that will read text aloud.

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



"Text to speech" icon by [Trevor Dsouza](#). [CC BY 3.0](#).

# Zoom text

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)

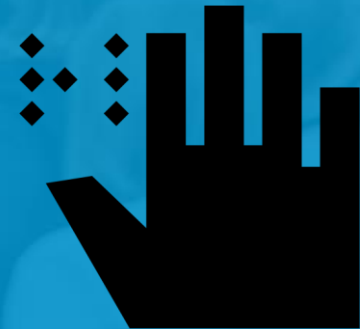
- Perceivable
- Operable
- Understandable
- Robust



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# Principle 1: Perceivable

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







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## Principle 2: Operable

User interface components and navigation must be operable.

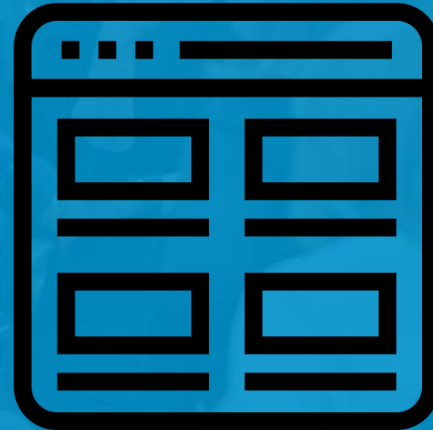
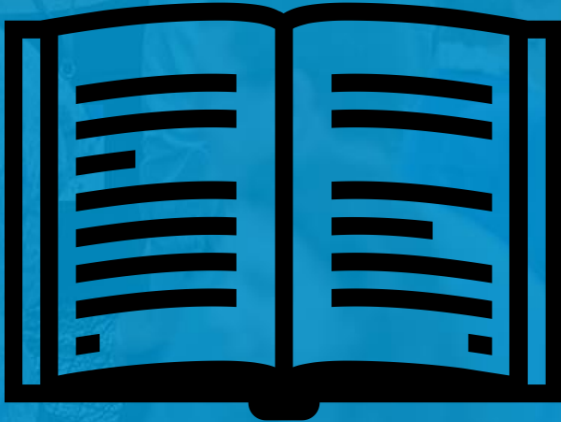




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## Principle 3: Understandable

Information and the operation of user interface must be understandable.



# 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>

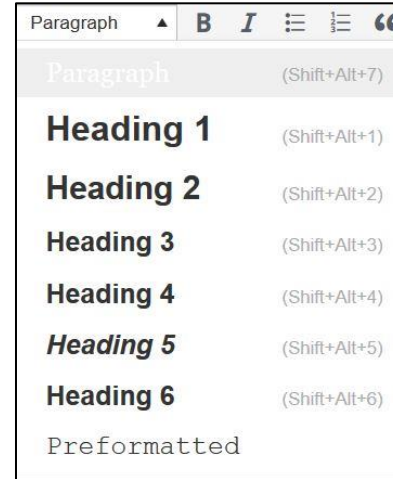
Concerts, sporting matches and games, and political rallies can have...

<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
- ☐ Links do not open in new windows or tabs (unless a text reference is provided)
- ☐ The web address is available for those using a print copy

## Poll: Which link is accessible?

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

Not  
accessible



1. For more information on web accessibility, [click here](#).
2. For more information on web accessibility, go to <https://opentextbc.ca/accessibilitytoolkit/>.

Accessible



3. For more information on web accessibility, refer to the [Accessibility Toolkit](#).
4. The [BC Open Textbook Review Template \[Word File\]](#) provides guidelines for completing an open textbook review.

# 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 Devine	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

# Audio

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

☐ Include a transcript



# 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?

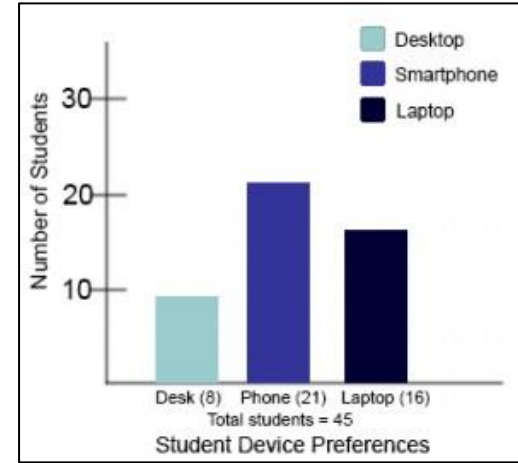
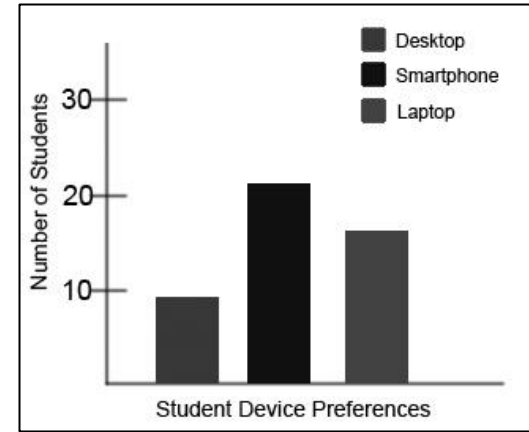
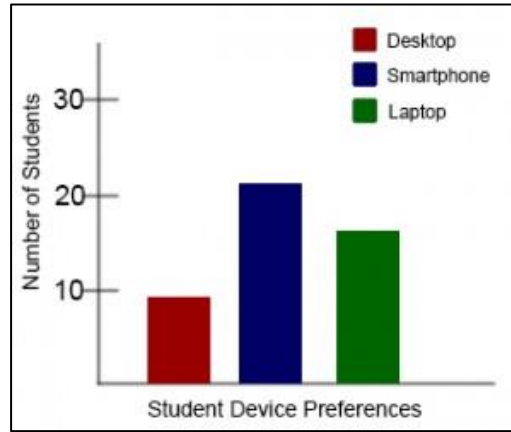
1. People who are Deaf or hard of hearing.
2. People with auditory processing difficulties.
3. People for whom the language of the video is not their first language.
4. People who like crunchy, loud snacks.
5. All of the above.

## 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.

# Colour and Colour Contrast

- ❑ Information is not conveyed by colour alone
- ❑ There is sufficient colour contrast between foreground and background



“Student Device Preferences Graphs” by BCcampus. © CC BY



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# Contrast Checker

<https://contrastchecker.com/>

Poll: Is this colour  
combination  
accessible?

Is this colour  
combination  
accessible for regular  
size text?

Foreground: 2f9700

Background: ffffff

# Answer: Not Accessible

**CONTRAST CHECKER**  
COURTESY OF ACART COMMUNICATIONS

COLOR SELECTION ?

☐ SEE GRAYSCALE ☐ SHARE SAMPLE

FOREGROUND  
2F9700

BACKGROUND  
FFFFFF

GET FROM IMAGE

RATIO: 3.79

+ ADD TO HISTORY

Sample 12px	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy eiusmod rom tempor incididunt ut Isbore et dolore magna aliquam erat volupat.
Sample 18px	Lorem ipsum dolor sit amet, consectetur adipiscing elit

AA  
X

AAA  
X

AA18pt  
✓

AAA18pt  
X

COLORS  
PASS  
✓

COLOR DIFF  
567  
✓

Regular size text:

- AA, AAA: FAILS

Large text:

- AA: PASS
- AAA: FAILS

Contrast: 3.79:1

# Images

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

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

**A functional image** contains content that requires a text description.

- Alt text
- Surrounding text or caption
- Long description



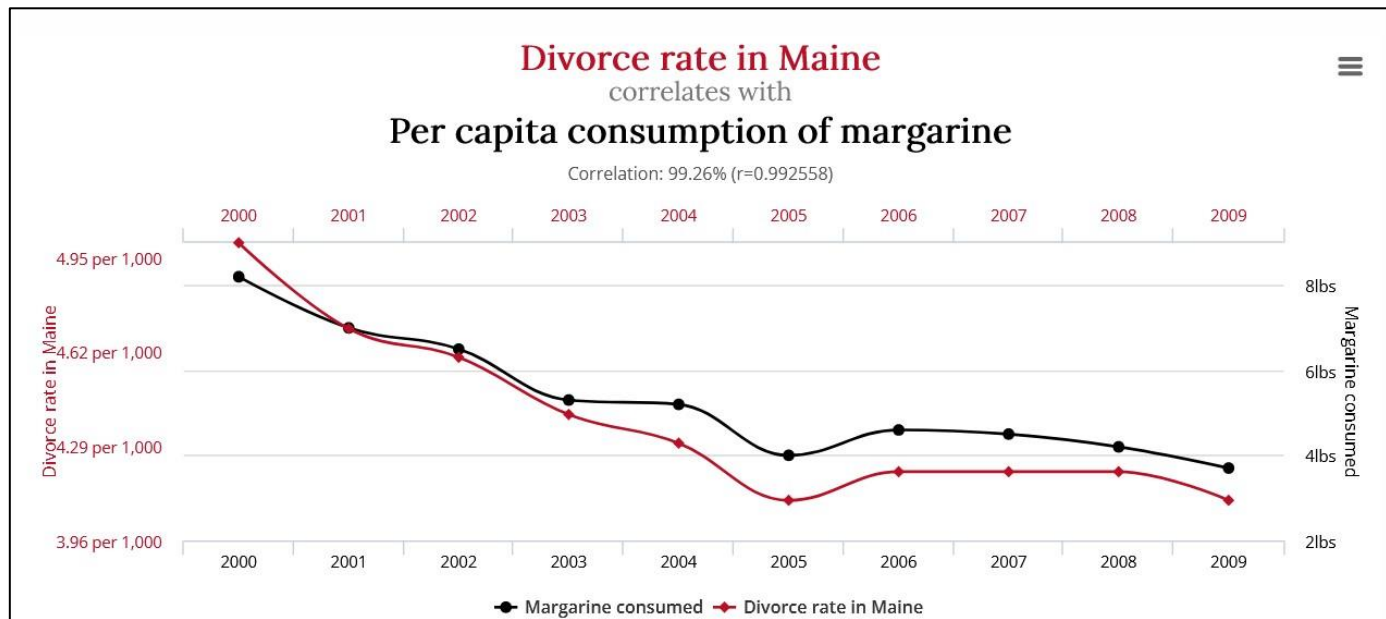
Decorative image

A bag of potato chips weighs 48 grams.  
How many milligrams is that?



“Bag of chips” is licensed under the CC0 licence.

# Functional Image



Spurious Correlations by Tyler Vigen is licensed under a CC BY 4.0 licence.

# Tips for Writing Image Descriptions

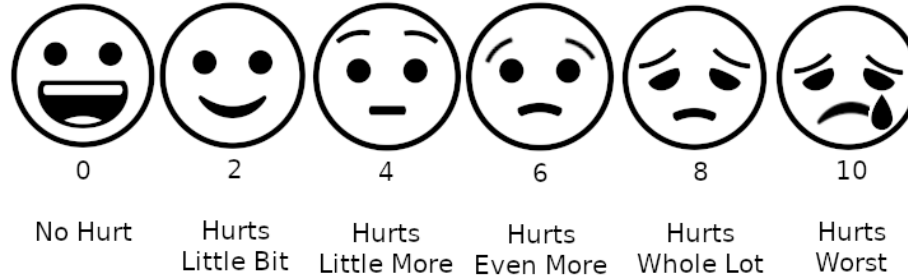
## **What to describe**

- 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

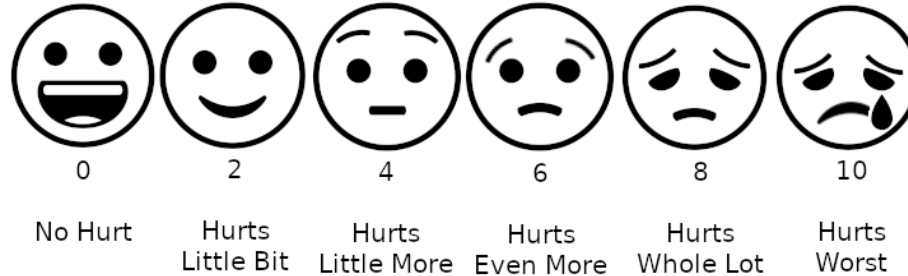
# Poll: Which image description is best?



1. The Wong-Baker Faces Pain-rating scale.
2. A collection of happy, neutral, and sad cartoon faces with numbers 0-10 underneath.
3. A scale that uses cartoon faces to illustrate the different levels of pain that correspond to a numbered scale from 0 to 10. Zero is smiling, 2 is a small smile, 4 is a straight face, 6 is a slightly sad face, 8 is a big sad face, and 10 is a bigger sad face that is crying.

"Wong-Baker scale with emoji" by [Lord Belbury](#). CC BY-SA 4.0.

# Answer: Which image description is best?



1. The Wong-Baker Faces Pain-rating scale.
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# Alt Text

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



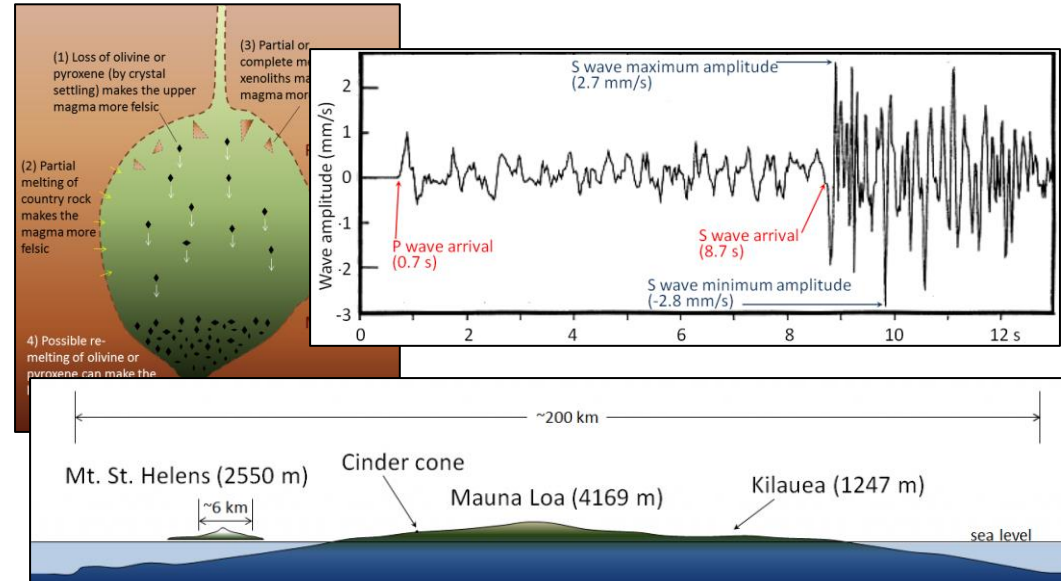
Figure 2.3 In 1871, the newcomer population in B.C. was still outnumbered by Aboriginal people who were, nevertheless, being hustled onto reserves and mostly without treaties. A Stó:lō woman, weaving baskets, n.d.

Stó:lō woman with a cedar basket by Royal British Columbia Museum (PN996). Public Domain. Image caption © John Belshaw. CC BY.

# Long Descriptions for Complex Images

## Examples

pie charts, bar charts, line graphs, flow charts, diagrams, illustrations, math graphs, and maps



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



# Symbols

$\times$  or  $\times$  or  $\cdot$

$-$  or  $-$  or  $-$

$\div$  or  $/$

$\frac{1}{2}$  or  $1/2$

# Formulas: MathJax

- Formulas have been created using MathML.

## MathJax

This is 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**.

# Formulas: Images with Alt Text

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

- ❑ Formulas are images with alternative text descriptions if MathML is not an option.

Alternative Text:

m equals begin fraction m sub 0 over  
begin square root 1 minus begin fraction  
v sup 2 over c sup 2 end fraction end  
square root end fraction

# WAVE

(Web Accessibility  
Evaluation Tool)

<https://wave.webaim.org/>



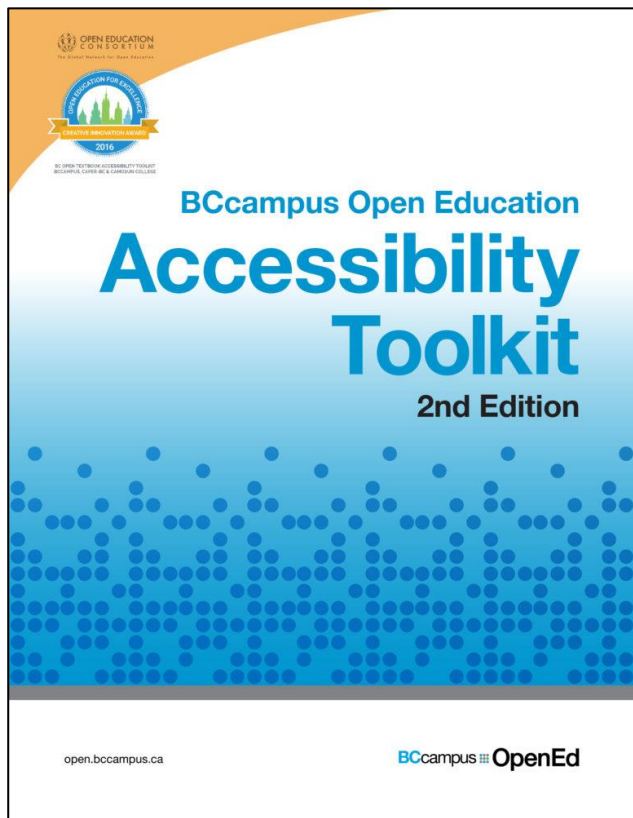
# Accessibility Checklists

## **Strengths**

- Easy to understand and follow
- 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

<https://opentextbc.ca/accessibilitytoolkit>

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



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# Next webinar: Beyond Accessibility in OER

- Social model of disability
- Universal Design for Learning (UDL)
- Multimodality and multiple formats
- Math accessibility
- Writing good image descriptions



# Questions?

Download PPT slides here: [bit.ly/technicalaccessibility](https://bit.ly/technicalaccessibility)