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OER PRODUCTION SERIES

Universal Design for Learning

and Open Educational Resources

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Session Overview

- Social model of disability
- Open Educational Resources (OER)
- Universal Design for Learning (UDL)
- How UDL can be applied to OER creation and design
- Image descriptions

What impacts student success?

- Day-to-day life
- Digital literacy
- Access to technology
- Disability
- Finances
- Caregiving responsibilities
- Mental health
- Family support
- Interest in the subject
- Experiences of discrimination vs. privilege
- Living situation

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.

Results of these different models

Medical model

The onus is on the student to request accommodations.

The instructor is not required to make permanent changes to their teaching practices; only the student who made the request receives the accommodation.

Social model

The onus is on the person designing the learning experience to reduce/ eliminate barriers from the beginning.

It is assumed that students are diverse and have a variety of access needs and preferences.

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Open Educational Resources (OER)

Educational resources shared under an open licence, which indicates the copyright holder gives permission for people to use, edit, and share the resource for free.

Characteristics of OER

- Open licences
- Digital-first design
- Often supported by open source technologies
- Multiple formats
- Multimedia
- Free for students
- Agency for instructors

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Universal Design for Learning

Three UDL Principles

Provide multiple means of

- Engagement (why)
- Representation (what)
- Action and expression (how)

Access

Support

Executive Function

Design Multiple Means of
Representation

Design Options for
Perception (1)

- Support opportunities to customize the display of information (1.1)
- Support multiple ways to perceive information (1.2)
- Represent a diversity of perspectives and identities in authentic ways (1.3)

Design Options for
Language & Symbols (2)

- Clarify vocabulary, symbols, and language structures (2.1)
- Support decoding of text, mathematical notation, and symbols (2.2)
- Cultivate understanding and respect across languages and dialects (2.3)
- Address biases in the use of language and symbols (2.4)
- Illustrate through multiple media (2.5)

Design Options for
Building Knowledge (3)

- Connect prior knowledge to new learning (3.1)
- Highlight and explore patterns, critical features, big ideas, and relationships (3.2)
- Cultivate multiple ways of knowing and making meaning (3.3)
- Maximize transfer and generalization (3.4)

CAST (2024). Universal Design for Learning Guidelines version 3.0. Retrieved from https://udlguidelines.cast.org

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Guidelines for Multiple Means of Representation

1. **Perception (Access)**
2. **Language and symbols (Support)**
3. **Building knowledge (Executive Function)**

Guideline 1: Perception

Ensure that key information is equally perceptible to all learners:

1. Support opportunities to customize the display of information
2. Support multiple ways to perceive information
3. Represent a diversity of perspectives and identities in authentic ways

Guideline 2: Language and Symbols

Ensure that multiple representations are available for clarity, comprehensibility, and creating a shared understanding for all learners.

1. Clarify vocabulary, symbols, and language structures.
2. Support decoding of text, mathematical notation, and symbols
3. Cultivate understanding and respect across languages and dialects
4. Address biases in the use of language and symbols
5. Illustrate through multiple media

CAST (2024). Universal Design for Learning Guidelines version 3.0. Retrieved from https://udlguidelines.cast.org

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Guideline 3: Building Knowledge

Transform accessible information into knowledge that can be used for future decision making.

1. Connect prior knowledge to new learning.
2. Highlight and explore patterns, critical features, big ideas, and relationships
3. Cultivate multiple ways of knowing and making meaning
4. Maximize transfer and generalization

CAST (2024). Universal Design for Learning Guidelines version 3.0. Retrieved from https://udlguidelines.cast.org

Educational Resources

- Open licences
- Multiple formats
- Supported by open technologies (Pressbooks, H5P)
- Free to students
- Greater instructor agency

- Giving students choice and flexibility
- Supporting learning through design
- Disability lens (accessible design, assuming diversity)

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Examples of UDL's Principle of Representation being applied to OER

Multimodality

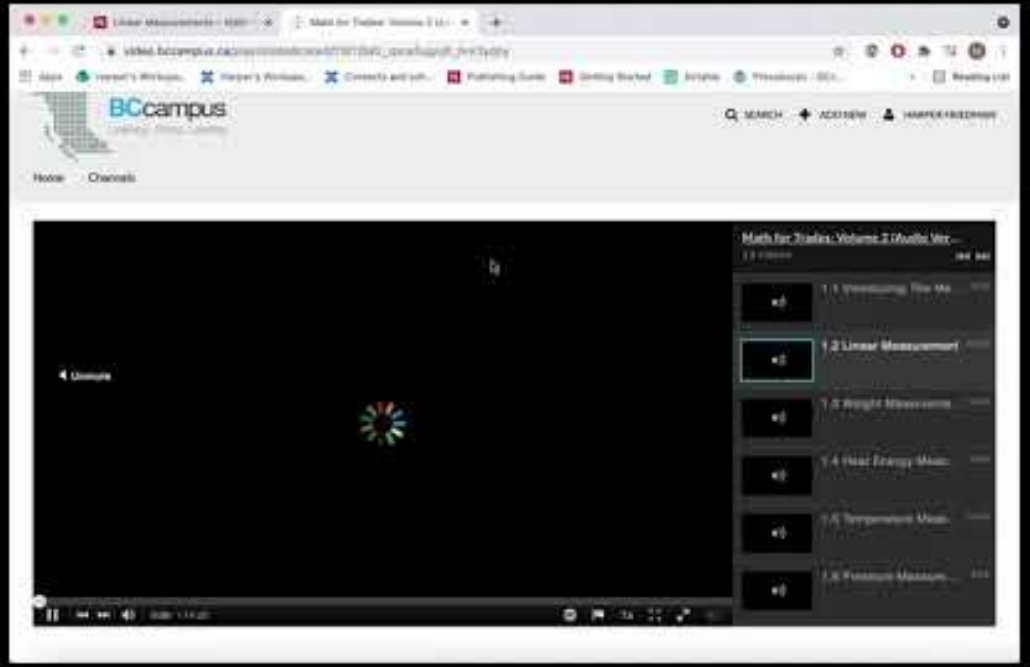
Combining text, images, video, audio, and interactivity to give students multiple ways to engage with content.

Examples:

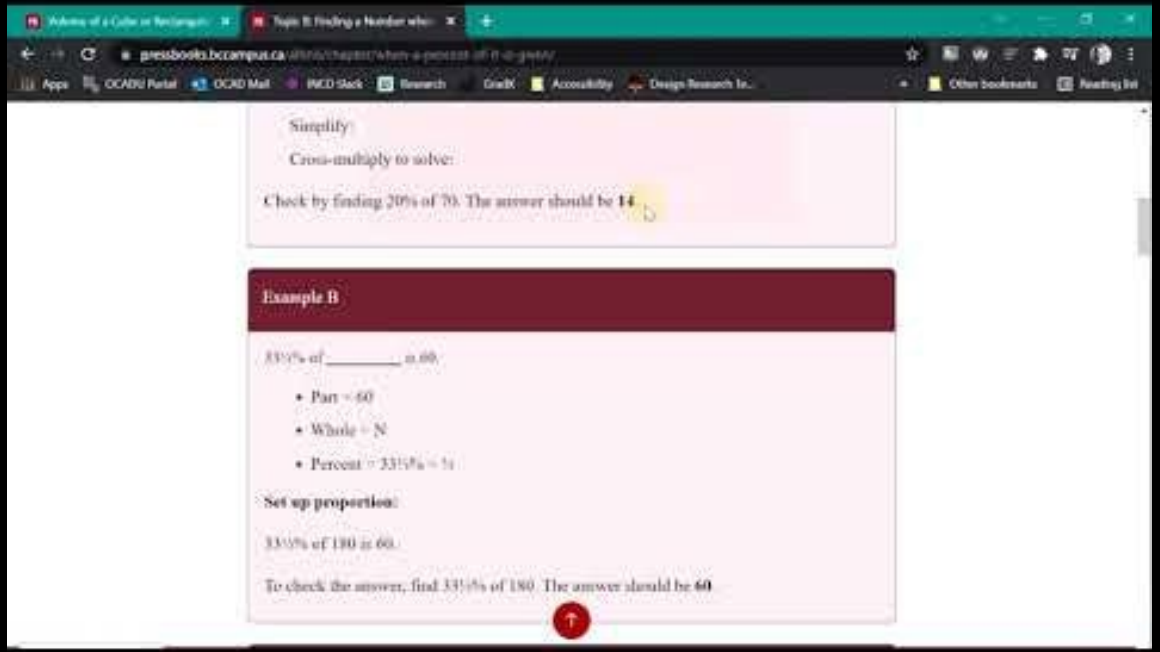
- Text-to-speech
- Audiobooks
- Videos
- H5P

Text-to-speech

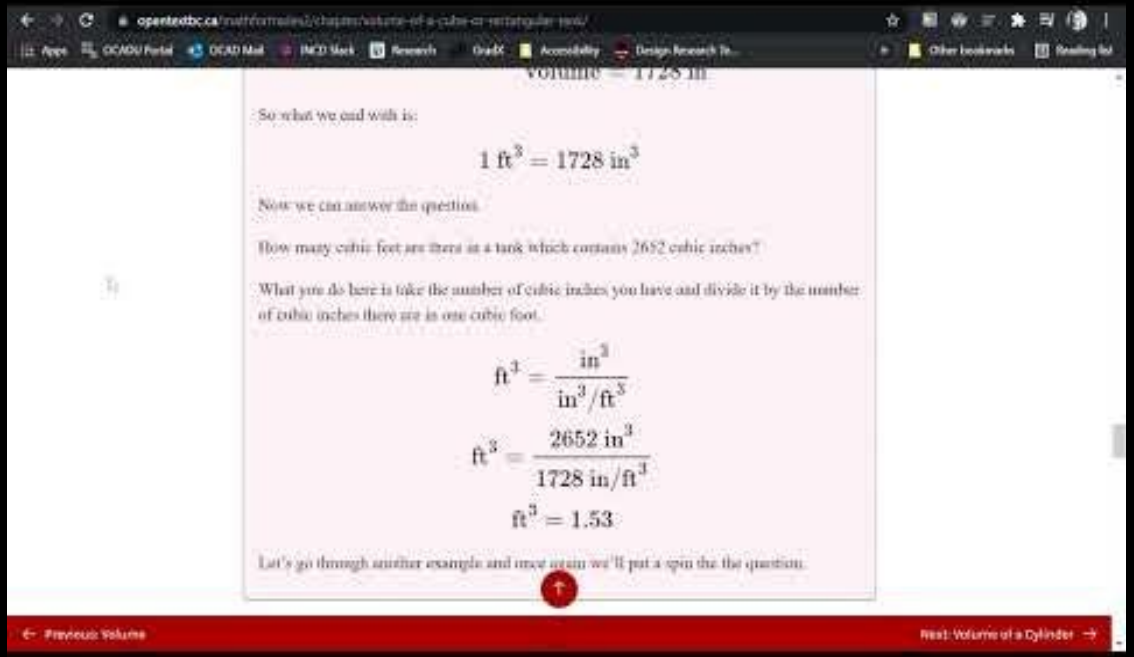
Audio books



MathJax - Zoom



Screen reader reading math



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Glossary

Ohm's Law

Combining the elements of **voltage**, **current**, and **resistance**, George Ohm developed the following formula:

> The difference in electric potential between two points, which is defined as the work needed per unit of charge to move a test charge between the two points. It is measured in volts (V).

- E = Voltage in volts
- I = Current in amps
- R = Resistance in ohms

Video demonstrations

Video: Global Virgin Application – Oxidative Colour

Note: Video has no sound.

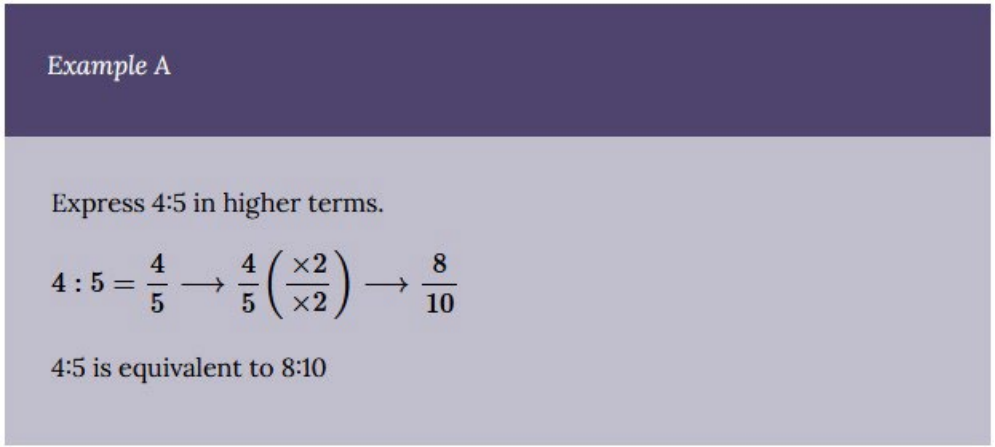
Structure of Information

- Scaffolding new knowledge
- Resource navigation options
- Chapter and heading titles
- Numbering systems (i.e., headings, figures, tables)
- Consistent chapter elements and structure

Textboxes

Can be used to:

- Highlight the most important ideas of a section.
- Walkthrough key processes or procedures.
- Provide concrete examples or case studies to support main ideas.

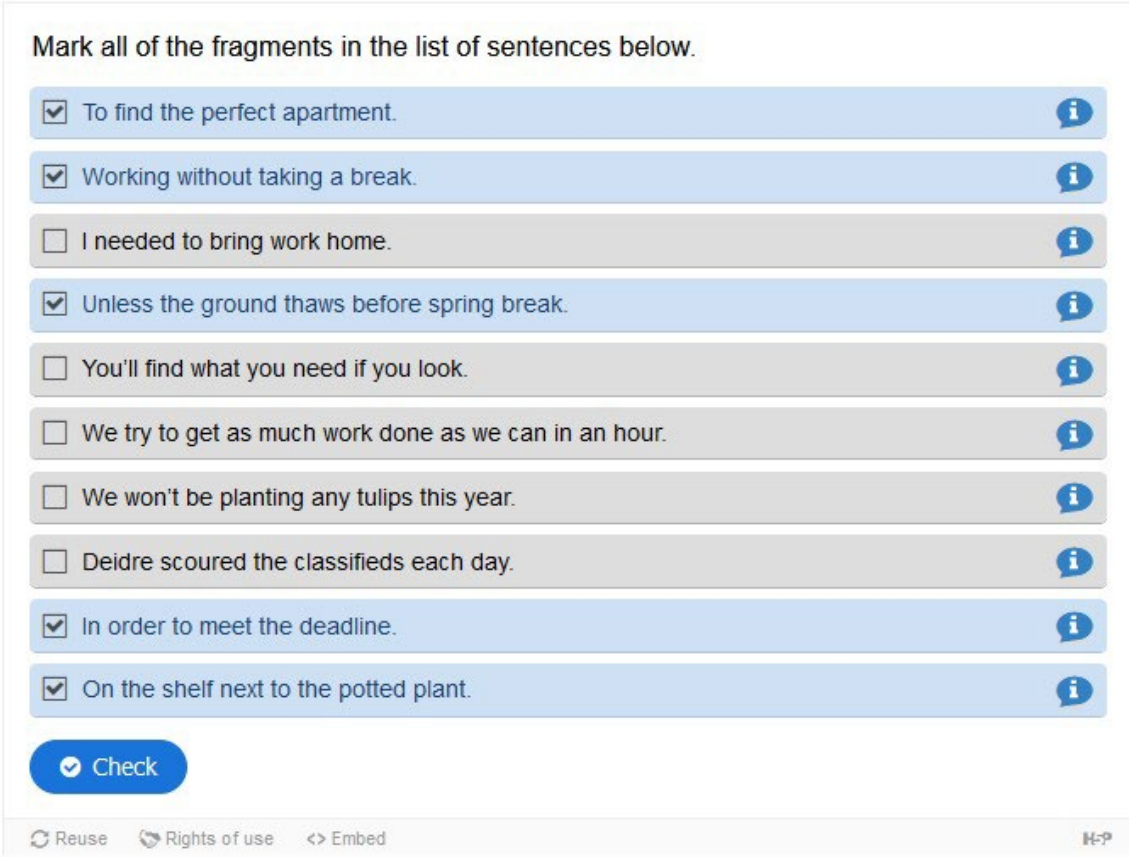


H5P

- Interactive web-based activities and formative assessments
- Available in Pressbooks – activities can be embedded in the webbook
- Can build your own activities or reuse and remix activities created by others

Resources: h5p.org and kitchen.opened.ca

H5P: Multiple Choice



H5P: Interactive Video

H5P: Image Hotspots

More information on UDL

Universal Design for Learning Guidelines

- Explore all of the principles in more detail
- Read about the guidelines and checkpoints, which provide more detail about what each principle includes.
- Lots of concrete examples.

URL: UDLguidelines.cast.org/

What lessons can OER and UDL learn from each other?

Lessons OER can learn from UDL

1. “Access” (aka free) is not enough – resources must be designed to be accessible to students with disabilities
2. Producing OER in multiple formats is important
3. There is value in putting time to making resources more multimodal and interactive

Ultimately, how we design OER matters.

Lessons UDL can learn from OER

1. There are open tools available that support UDL practices
2. Open licenses make it easier for instructors to share work and find educational resources
3. Cost is a real and big barrier for students

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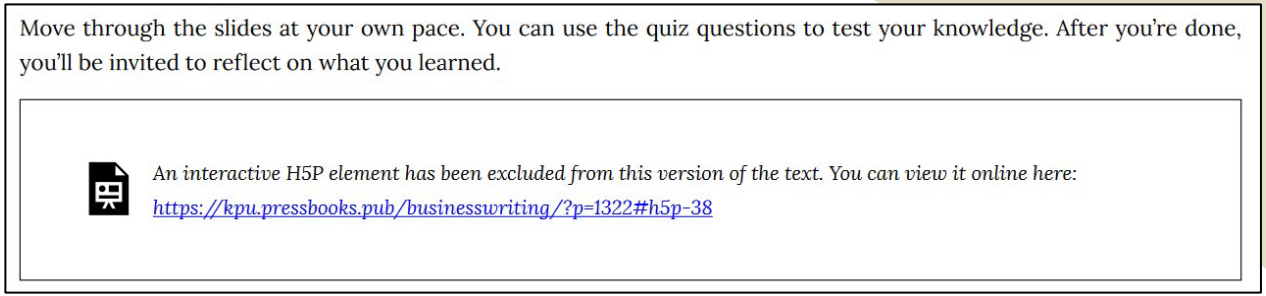
Designing for Print

Annotate: Why might someone want a print copy?

Print Design Considerations

- Text size
- Links to additional resources
- Access to multimedia content



Questions?

Digging deeper into image descriptions

An image description

is a verbal or written description of an image for someone who can’t see it.

Who are image descriptions for?

Someone who has

- A disability affecting vision (i.e., blindness)
- A brain injury that causes sensitivity to screens
- A cognitive disability where a written explanation may be helpful
- Poor internet connection that causes images not to load

Why are image descriptions important?

Images have huge explanatory power. They allow us to give context, represent spatial concepts, show relationships, and provide examples in minimal space.

In education, images are often crucial parts of course materials. Image descriptions ensure that important information is provided for all students from the very beginning.

Figure 1 The Numbered Treaties

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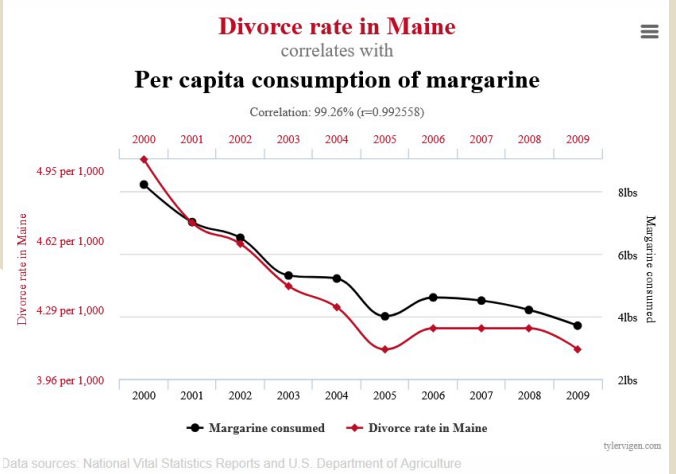
How to write image descriptions

Object – Action - Context

- **Object:** A line graph
- **Action:** shows a close correlation between the divorce rate in Maine and the per capita consumption of margarine between 2000 and 2009.
- **Context:** The lines fall at the same rate from 2000 to 2005, then there is a slight rise before it levels off again.



Chen, A. (2020).

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Things to keep in mind

1. **Context:** Why is the image there?
2. **Audience:** Who is accessing the image?
3. **Concise:** Keep it short
4. **Objectivity:** Avoid judgements
5. **General to specific**
6. **Tone and language**

The DIAGRAM Center. “How to Describe Images.” *Poet Training Tool.* https://poet.diagramcenter.org/how.html

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Example

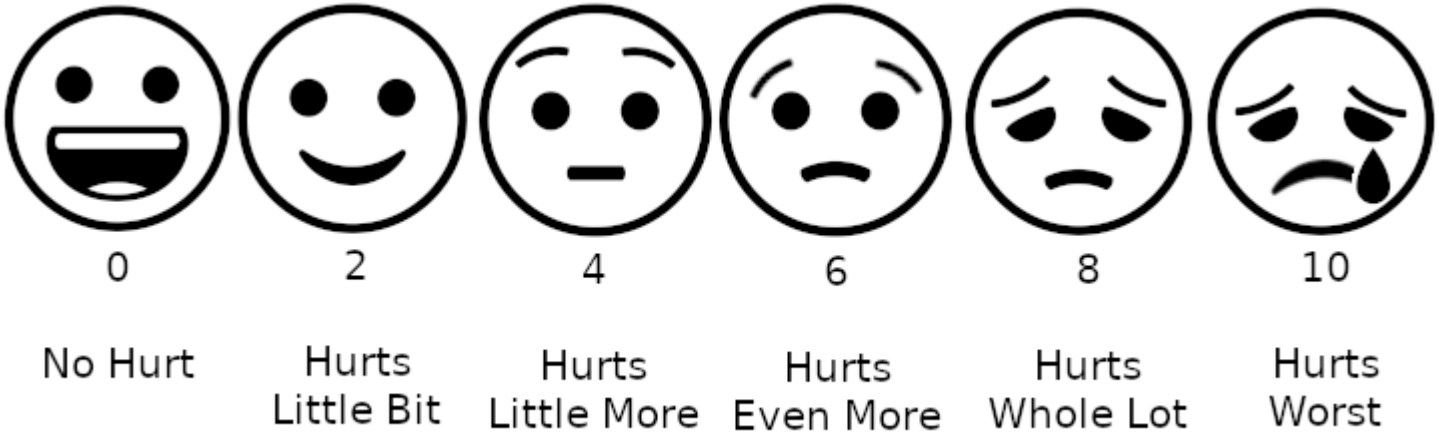

Figure 1: The Wong–Baker Faces Pain Rating Scale was developed to help children identify and communicate their pain level.

Josie's Description

A scale that uses cartoon faces to illustrate levels of pain. Each face has a description of the pain and a number from 0 to 10. Zero is no hurt and smiling, 2 is hurts a little and a small smile, 4 is hurts a little more and a straight face, 6 is hurts even more and a slightly sad face, 8 is hurts a whole lot and a big sad face, and 10 is hurts worst and a bigger sad face that is crying.

Alt Text as Poetry

By Bojana Coklyat and Shannon Finnegan

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Alt Text As Poetry

1. Attention to language
2. Word economy
3. Experimental spirit

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Alt Text As Translation

1. Information is lost and gained
2. There is no single correct answer
3. It always involves creative decisions

Activity 1: What do you see?

Write down 5-10 things you see in the image.

What details do you think are the most important?

Activity 1: Short description

Try writing a short description for this image.

1. Context
2. Audience
3. Concise
4. Objectivity
5. General to specific
6. Tone and language

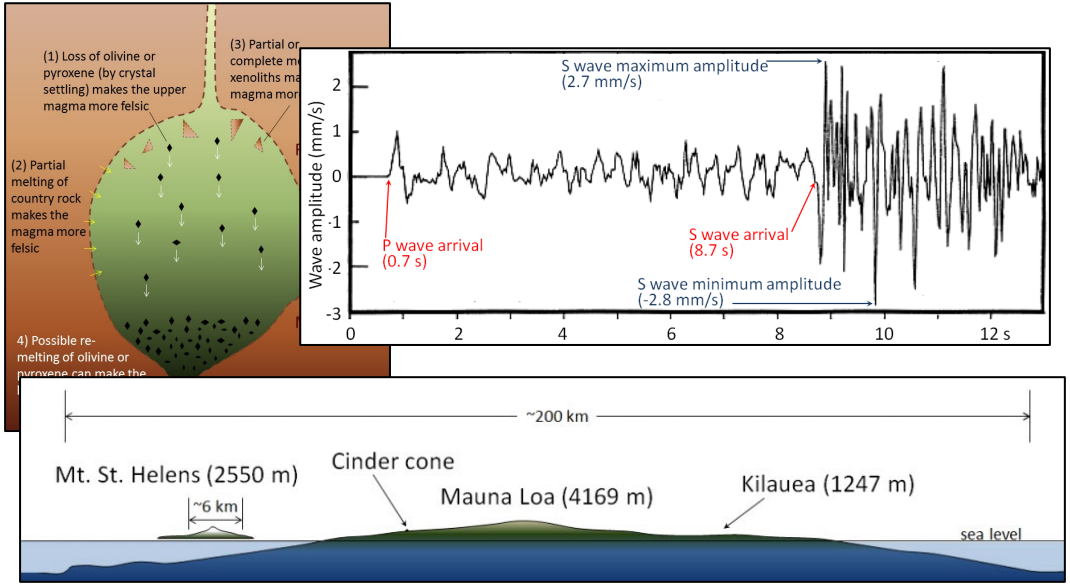
Activity 1: A possible description

Students sit in 4 rows of tiered desks. An instructor stands in front of a projector.

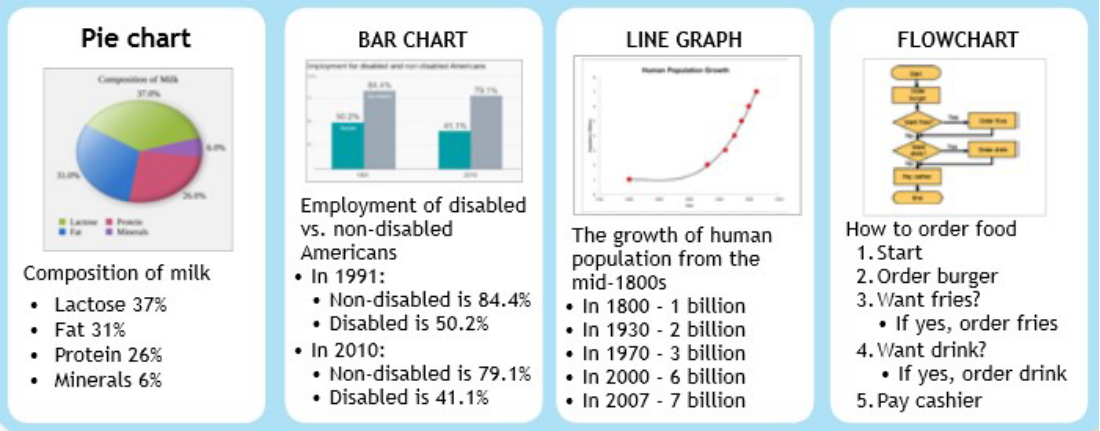
Long Descriptions for Complex Images

Examples

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



Lists



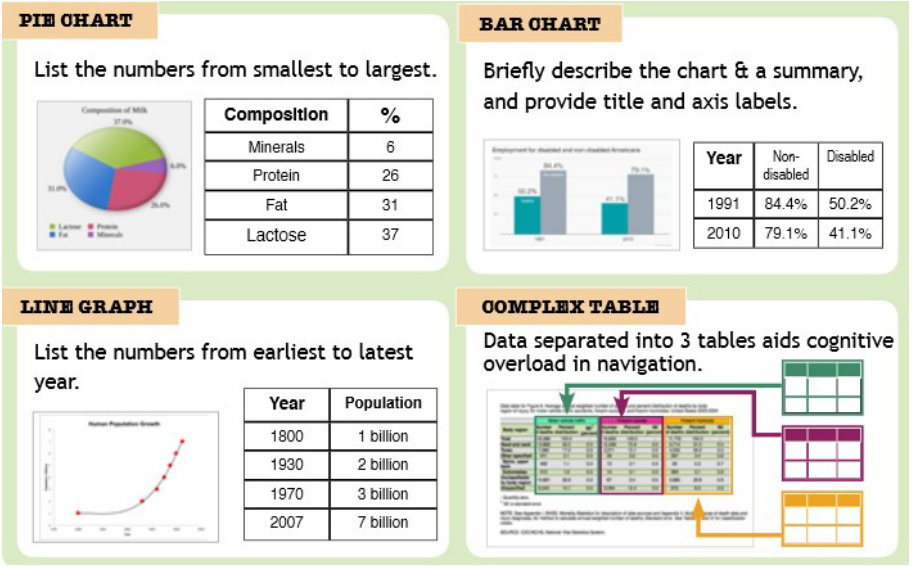
Bulleted and numbered lists can be used to present information found in

- Pie charts
- Bar charts
- Line graphs
- Flow charts

Data Tables

Data tables can be used to present information found in

- Complex tables
- Bar charts
- Line graphs
- Pie charts



How would you describe this image?

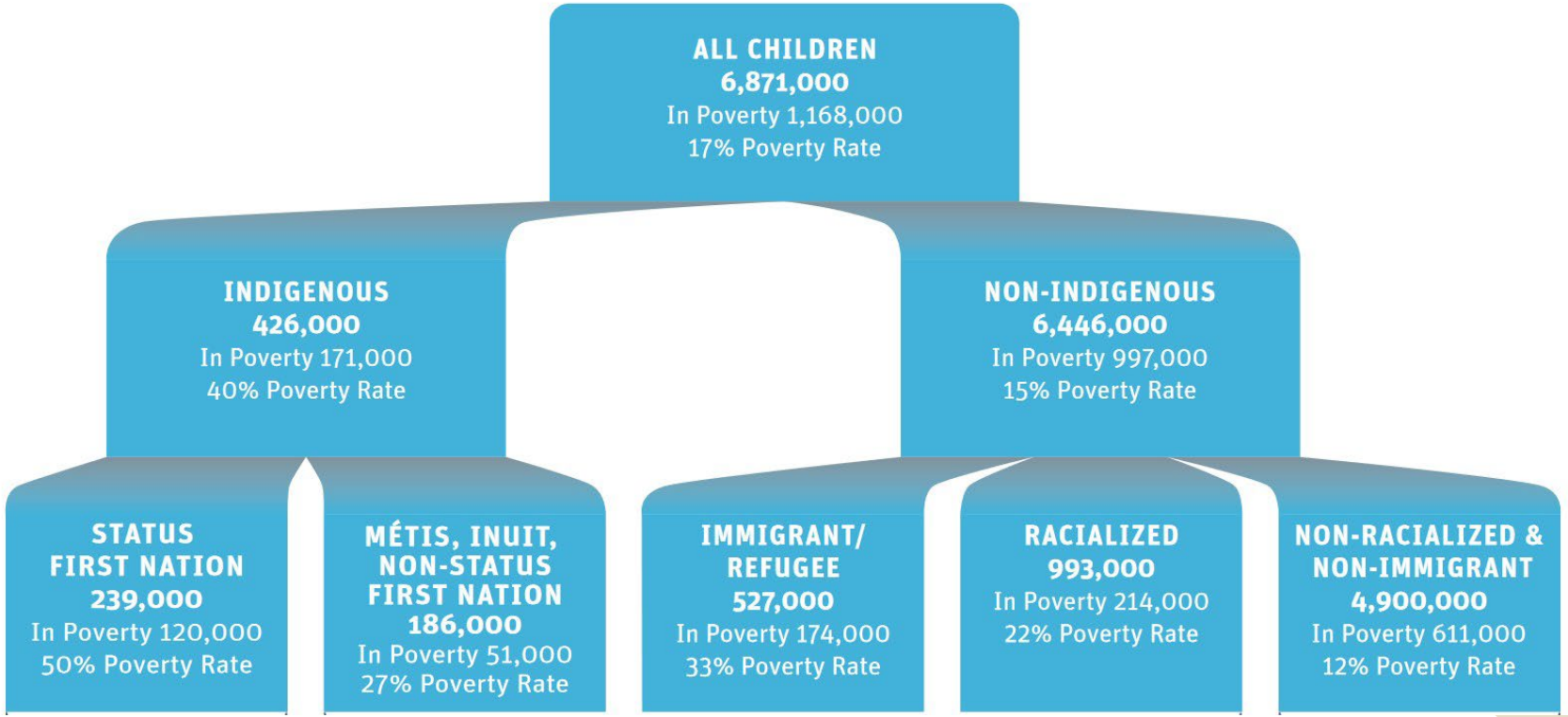


Image source: Macdonald, D., & Wilson, D. (2013). Poverty or Prosperity: Indigenous Children in Canada [PDF]. *Canadian Centre for Policy Alternatives*. Not openly licensed.

Option 1: Bulleted List

A flow chart describing the poverty rates of different groups of children in Canada based on 2006 census data.

- **6,871,000 total children:** 1,168,000 in poverty, 17% poverty rate.
- **426,000 Indigenous children:** 171,000 in poverty, 40% poverty rate.
  - 239,000 Status First Nation children: 120,000 in poverty, 50% poverty rate.
  - 186,000 Métis, Inuit, Non-Status First Nation children: 51,000 in poverty. 27% poverty rate.
- **6,446,000 Non-Indigenous children:** 997,000 in poverty, 15% poverty rate.
  - 527,000 Immigrant/refugee children: 174,000 in poverty, 33% poverty rate.
  - 993,000 Racialized children: 214,000 in poverty, 22% poverty rate.
  - 4,900,000 Non-racialized and non-immigrant children: 611,000 in poverty, 12% poverty rate.

Option 2: Table

A flow chart describing the poverty rates of different groups of children in Canada based on 2006 census data. The data is provided in the below table.

Group	Total Children	Total In Poverty	Poverty Rate
All children	6,871,000	1,168,000	17%
All Indigenous children	426,000	171,000	40%
Status First Nation children	239,000	120,000	50%
Métis, Inuit, and Non-Status First Nation children	186,000	51,000	27%
All Non-Indigenous children	6,446,00	997,000	15%
Immigrant/Refugee children	527,000	174,000	33%
Racialized children	993,000	214,000	22%
Non-racialized & Non-Immigrant children	4,900,000	611,000	12%

POET Training Tool

poet.diagramcenter.org/

- When to describe images
- How to describe images
- Practice describing images

Lots of examples.

Session Recap

- Social model of disability
- Open Educational Resources (OER)
- Universal Design for Learning (UDL)
- How UDL can be applied to OER creation and design
- Image descriptions

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Questions?

OER PRODUCTION SERIES

Find, Use, and Share Open Educational Resources
August 1, 2024

Technical Accessibility
August 8, 2024

Introduction to Pressbooks
August 15, 2024

Advanced Pressbooks
August 22, 2024

UDL and Open Educational Resources
August 29, 2024

Register and view the recordings and resources at: bccampus.ca/events

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