

Designing for All

Designing for All

A toolkit for maximum learning impact

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Contents

Introduction	1
Accessibility Statement	2
Part I. Best Practices	
1. Universal Design	7
2. Organizing Content	10
3. Images	14
4. Links	25
5. Tables	32
6. Multimedia	40
7. Formulas	47
8. Font Size	52
9. Colour Contrast	55
Appendix A: Checklist for Accessibility	63
List of Links by Chapter for Print Users	66
Bibliography	71
Versioning History	73

Introduction

Welcome to CIEL's Designing for All: A Toolkit for Maximum Digital Impact.

This support resource was written for instructors at VIU who would like to make their VIULearn courses and learning materials as accessible as possible.

We would like to acknowledge that we are not experts in this field, but recognize its importance. This book is the beginning of our efforts to learn more and assist the university community. We will continue to add to our knowledge and share it here in subsequent editions of this text.

We would also like to acknowledge that we relied heavily on the the *BCcampus Accessibility Toolkit – 2nd Edition* while creating this book. The *BCcampus Accessibility Toolkit – 2nd Edition* is licensed under a Creative Commons Attribution 4.0 International License, as is our resource. This makes them open educational resources (OER).

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 encourage you to explore other OER that are available on the BCcampus OpenEd Resources page.

If you find an error in this toolkit, please report it
using by emailing learnsupport@viu.ca.

Accessibility Statement

Accessibility features of the web version of this resource

The web version of the *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 colour alone.
- There is an option to increase font size (see tab on top right of screen).

Other file formats available

In addition to the web version, this book is available in a number of file formats including PDF, EPUB (for eReaders), MOBI (for Kindles), and various editable files. Here is a link to where you can download this book in another file format. Look for the “Download this book” drop-down menu to select the file type you want.

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

The web version of this resource 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. 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 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

You can contact us one of the following ways:

- Contact email: learnsupport@viu.ca

This statement was last updated on December 11, 2020.

PART I

BEST PRACTICES

Section Topics

This section covers best practices for making your course content 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

I. 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 underway¹

1. University of Victoria, "Universal Instructional Design (UID)," Centre for Accessible Learning, accessed March 27, 2018, <https://www.uvic.ca/services/cal/staff/>

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?

universal-instructional-design/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/fastfacts/Universal_Design.htm.

- Do I have multimedia materials (e.g., audio, video) that present core concepts that not all students may be able to 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 *Designing for All: A toolkit for maximum learning impact*, 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

3. "The UDL Guidelines," CAST, accessed August 21, 2018, <http://udlguidelines.cast.org/>.

2. 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 certain learning disabilities
 - Are blind or have low vision
-

Why is this 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.

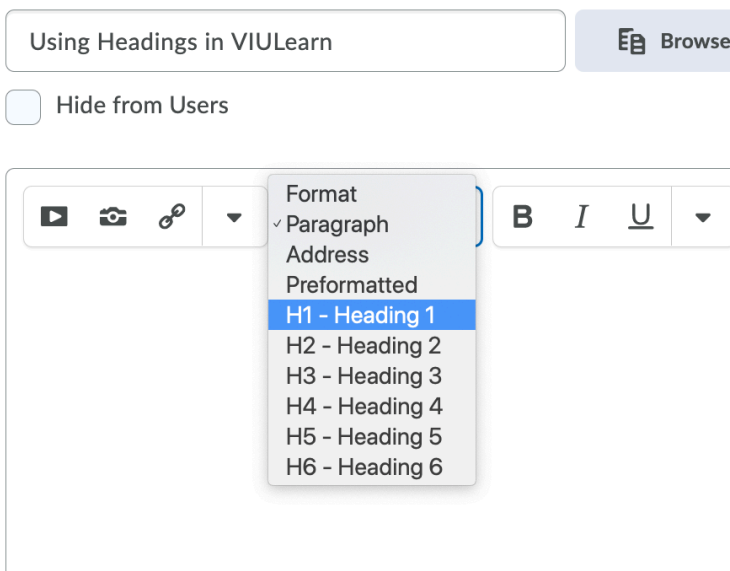
When it comes to using visual references to indicate the hierarchy and structure of a document, you might be accustomed to changing the font style, enlarging the type size, or highlighting the text with bold, underline or italics to create the impression of a heading. This approach presents problems 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?

VIULearn

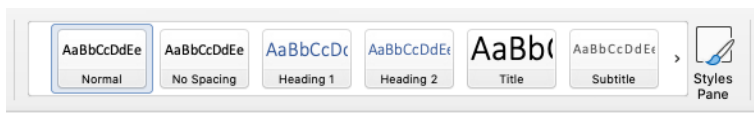
In VIULearn, use the Format option the HTML editor as shown in the screenshot below.

Edit HTML File



Word Documents

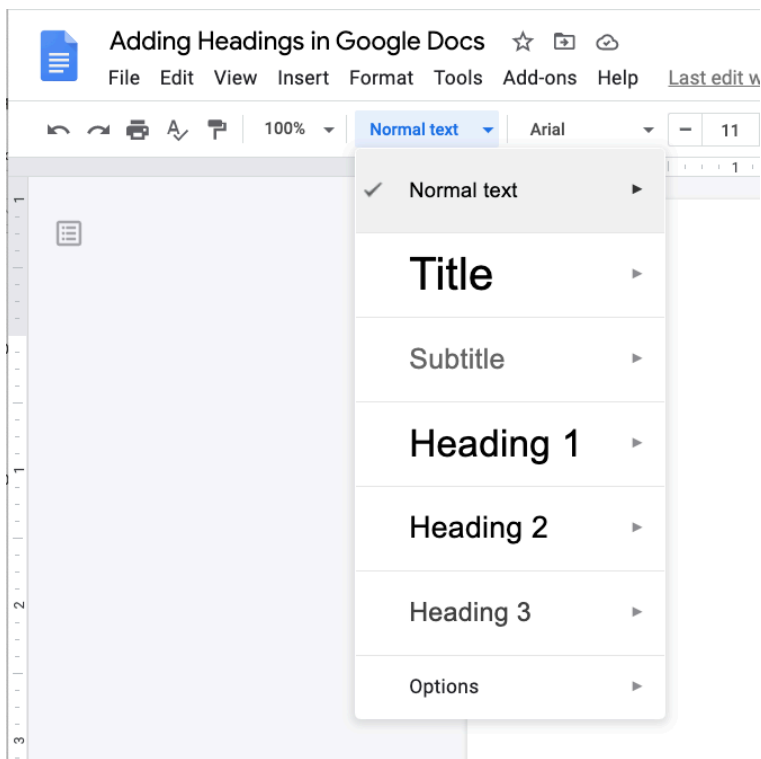
In Word, use the heading styles feature located in the Home tab as shown in the screenshot below.



To read more about using Headings in Word check the [Microsoft Office support website](#).

Google Docs

In Google Docs, use the styles feature as shown in the screenshot below.



To read more about using headings in Google docs check the [Google Docs Help Center](#).

3. 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.

File types used: GIF, JPG, PNG

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 material¹

1. "Web Content Accessibility Guidelines (WCAG) 2.0: Guideline 1.1," W3C, accessed March 27, 2018,

- b. not use colour as the only visual means of conveying information²
- 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:

- 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
-

<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>.

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 colour to convey information, should also be evaluated for accessibility by students who are unable to distinguish between or see colour.

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.

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): [Complex Images for All Learners: A Guide to Making Visual Content Accessible \[PDF\]](#)

3. "Alt text blunders," WebAIM, accessed March 27, 2018, <http://webaim.org/articles/gonewild/#alttext>.

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. 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

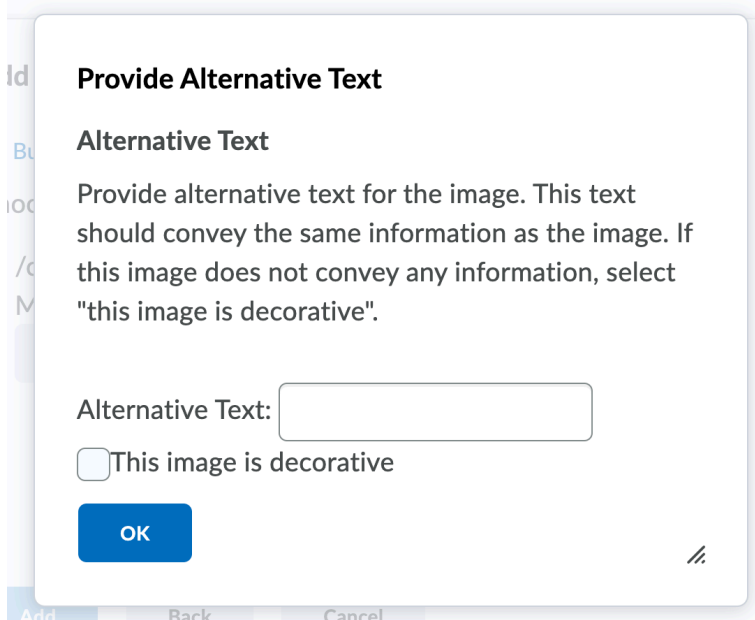
4. All screen readers are different, so a 125-character max is a recommendation. Other sources may provide a different number.

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.

Adding Alt Tags in VIU Tools

Alt Tags in VIULearn

When you upload a new image to VIULearn, you will be prompted to add Alternative Text.

A screenshot of a web application interface showing a modal dialog box titled "Provide Alternative Text". The dialog box has a white background and a thin grey border. Inside, the title "Provide Alternative Text" is in bold. Below it, the section "Alternative Text" is followed by a paragraph of instructions: "Provide alternative text for the image. This text should convey the same information as the image. If this image does not convey any information, select 'this image is decorative'." Below the text is a text input field with the label "Alternative Text:". Underneath the input field is a checkbox labeled "This image is decorative". At the bottom left of the dialog is a blue button with the text "OK". At the bottom right is a small icon of two parallel diagonal lines. The dialog box is overlaid on a blurred background of the application interface, which includes a sidebar with options like "Add", "Back", and "Cancel".

Provide Alternative Text

Alternative Text

Provide alternative text for the image. This text should convey the same information as the image. If this image does not convey any information, select "this image is decorative".

Alternative Text:

☐ This image is decorative

OK

To edit the alt tag of an existing image, click on the image and choose Image options from the menu.

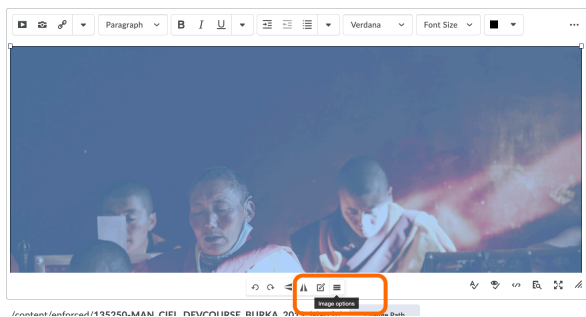
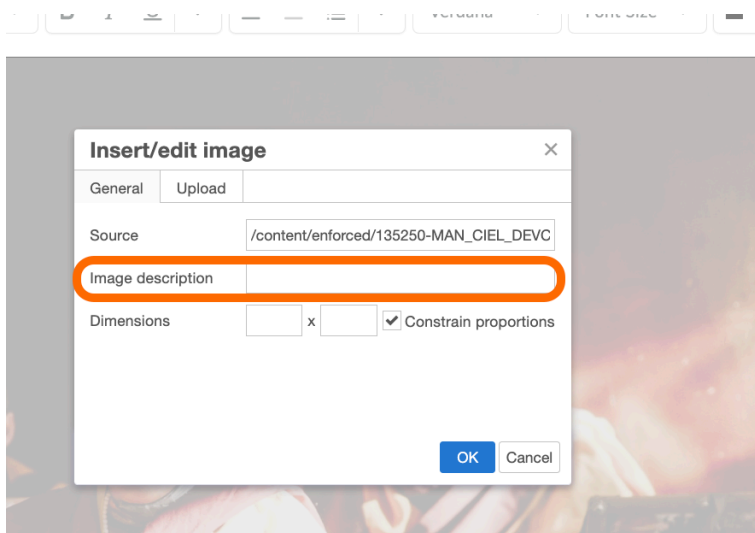


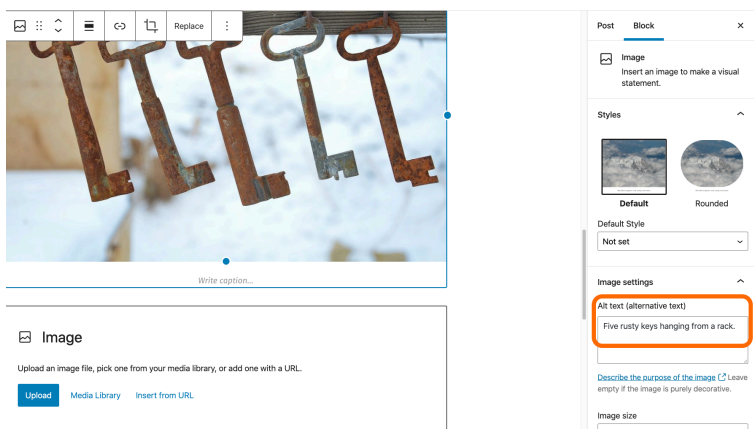
Photo by lee
bernd on
Unsplash

Add the alt tag to the Image Description field.



Alt Tags in VIUBlogs

When you add an image to a blog post you will be given the option to add Alt Text as shown in the screen shot below.



Alt Tags in Word

Learn how to add Alt Tags in Microsoft Office products (e.g. Word and Powerpoint) by accessing the the Microsoft Office support website.

Alt Tags in Google Docs

Learn how to add Alt Tags in Google Suite (e.g. Docs and Slides) by accessing the Google Docs Help Center.

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 However, this doesn't mean that you should leave an alt tag blank.

When a screen reader detects an image with a blank alt tag, it will read out the image file location. If the above picture about the The Wong-Baker Faces pain scale didn't have an alt tag, a screen reader would say, "Graphic: https://opentextbc.ca/accessibilitytoolkit/wp-content/uploads/sites/184/2017/06/2049201506_0f9b17182a_o.jpg."

When an image doesn't require an alt tag, place two double-quotation marks ("") in the Alternative Text field; this step will prompt the screen reader to say "Graphic" and move on to the caption.

Using colour

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 colour was "turned off?" Images should not rely on colour to convey information; if your point requires colour, you may need to edit or format the image so the concepts presented are not lost to those who are colour blind or require high contrast between colours.

5. "Top 10 Tips for Making Your Website Accessible," UC Berkeley: Web Access, accessed March 27, 2018, <https://webaccess.berkeley.edu/resources/tips/web-accessibility#accessible-alt>.

Example 1: Inaccessible Bar Chart

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

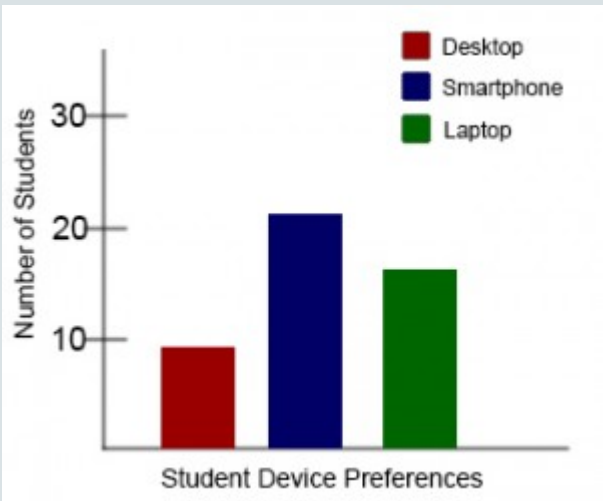


Chart 1: In this bar chart, colour is the sole means of communicating the data.

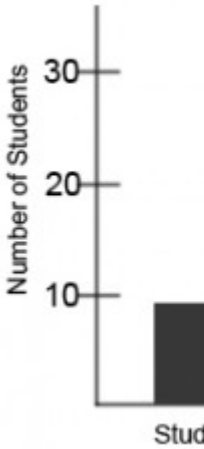


Chart 2: This view of the chart might appear to a student who does not display colour. All of the

Example 2: Accessible Bar Chart

Students who are colour 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.

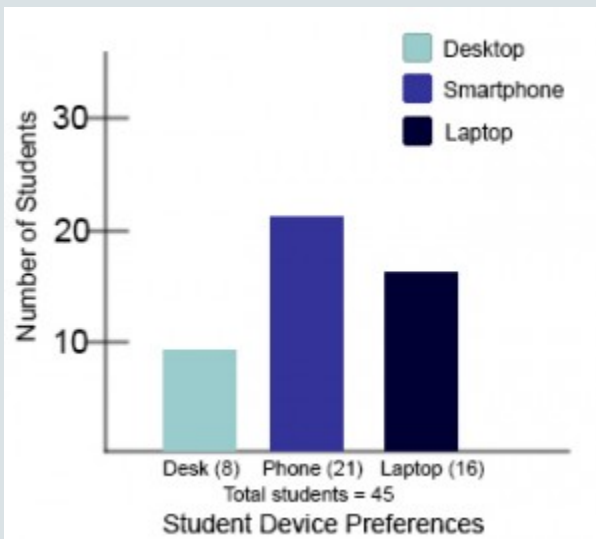


Chart 3: In this view of the bar chart, high-contrast colours have been used so that shading differences will still display in grey scale. Text labels have also been added so that the data is not just being communicated with colour.

4. Links

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

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 course or a website are also used to facilitate navigation.

Who are you doing this for?

This work supports students who:

- Have a physical disability
 - Have a form of cognitive disability
 - Are deaf or hard of hearing
 - Are blind or have low vision
-

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

1. "Ensure link text is meaningful within context," *Web Accessibility*, accessed March 28, 2018, https://www.webaccessibility.com/best_practices.php?best_practice_id=1301.

Example 1: Click here for information on using VIULearn.

Example 2: You can find more information on BCcampus Open Education at <https://ciel.viu.ca/learning-technologies-innovation/viulearn>

Example 3: Information about VIULearn 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.

2. "Links to non-HTML resources," WebAIM, accessed March 28, 2018, https://webaim.org/techniques/hypertext/hypertext_links#non_html.

VIULearn

When you upload a file to VIULearn the system will do this for you by naming the file type below the name of the file.

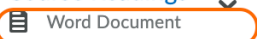
Course Resources ▾



Course Syllabus ▾



Course Readings ▾



Formula Sheet ▾



Other Tools

For most other tools (e.g. Word, PDF, PPT, VIUBlogs) you will need to provide the file type yourself.

Example: Adding Zen to Your Zoom [PDF]

New tabs/windows

<https://codersblock.com/blog/external-links-new-tabs-and-accessibility/#:~:text=Accessibility%20Implications,have%20difficulty%20perceiving%20visual%20content.%E2%80%9D>

The default setting for links in Pressbooks 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

Example: Information on VIU Blogs [New Tab] is available online.

In VIULearn you can set a link to open in a new tab by checking the Open As External Resource option as seen in the screenshot below.

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-WCAG20-TECHS-20140916/G200>.
4. Penn State, "Links on a Web Page," *Accessibility*, accessed March 28, 2018, <http://accessibility.psu.edu/linkshtml>.

New Link ✕

Title *

CIEL

URL *

https://ciel.viu.ca/

☒ **Open as External Resource**

User progress is not tracked for external resources

Create Cancel

Provide web addresses in print copies

In some cases you may be providing print versions of your materials. If that is the case, it is a good idea to provide the web address for external links so people using a print copy of the material 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 print materials.

Example 1: Information about VIULearn (<https://ciel.viu.ca/learning-technologies-innovation/viulearn>) is available online.

Example 2: Information about VIULearn⁵ is available online.

Example 3: See the List of Links by Chapter for Print Users on the resources page of this course.

5. <https://ciel.viu.ca/learning-technologies-innovation/viulearn>

5. 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 learning materials. Screen readers move left-to-right, top-to-bottom, one cell at a

1. Penn State, "Tables," *Accessibility*, accessed March 28, 2018, <http://accessibility.psu.edu/tables>.

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,
 - Are blind or have low vision
-

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.

The following video shows a screenreader reading different table layouts and demonstrates the importance of reading order when creating accessible tables.

Screen reader reading different table layouts

Good Table

This table is easier to understand when using a screen reader because the column headers are indicated in the html code and the cells are not merged. Adding the word "Week" in column one cells also makes the information flow better when it is read aloud by the screen reader. Using the word "to" in the chapter assignments instead of a dash and spelling out the month in the due date column also make the table more understandable when read by assistive technologies like a screen reader.

Week	Assignment	Due Date
Week 1	Reading Chapters 1 to 3	January 20
Week 1	Post Introductions to Discussion List	January 20
Week 2	Read Chapters 4 to 6	February 1
Week 3	Read Chapter 7	February 8
Week 3	Paper Due	February 9

Bad Table

This table is more difficult for a blind student to understand because the column headers are not labeled in the html code, and the merged cells confuse the reading order and the use of a dash and month abbreviations is not very clear.

Week	Assignment	Due Date
1	Reading Chapters 1-3	Jan. 20
	Post Introductions to Discussion List	

A YouTube element has been excluded from this version of the text. You can view it online here:

<https://pressbooks.bccampus.ca/designingforall/?p=49>

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 in VIULearn

The table below is a simple table created in VIULearn. 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”).

[Table of Contents](#) > [Course Resources](#) > Table

Table ▾

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.

The following screenshots will show you how to identify column and row headers in a table created in VIULearn.

Examples: How to add column and row headers in a table created in VIULearn.

Edit HTML File

Browse for a Template

☐ Hide from Users

Table

Format

B

I

U

Verdana

Colour Family

Pink

Yellow

Table Properties

Cell Properties

Row Properties

Remove Column

Remove Row

ns	Trees
currant	Ornamental Plum
	Star Magnolia

Edit HTML File

☐ Hide from Users

Table

Format

B

I

U

Verdana

Colour Family

Pink

Yellow

Table Properties

Cell Properties

Row Properties

Remove Column

Remove Row

Delete Table

Insert Column Before

Cell Properties

Horizontal Alignment

None

Vertical Alignment

Middle

Width

Height

18

Cell Type

Normal

Column Header

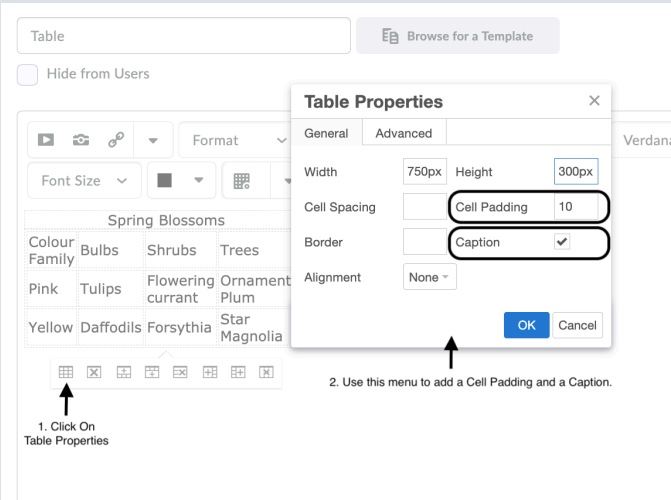
Row Header

Column Group Header

Row Group Header

How to create a table caption and add cell padding

Example 3: Captions and cell padding in VIULearn



Add a [Skip Table] option

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

Spring Blossoms			
Skip Table			
Colour Family	Bulbs	Shrubs	Trees
Pink	Tulips	Flowering currant	Ornamental Plum
Yellow	Daffodils	Forsythia	Star Magnolia

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

In this case the link will take the user to the next piece of content in the VIULearn course.

6. 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
- Are blind or have low vision,
- 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].

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

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 be aware that not all third-party videos include transcripts. If you select a video resource that does not already have a transcript, you will need to produce one yourself.

YouTube does have an autogenerated transcript and closed captioning feature. You can read more about it on the YouTube Help page.

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.

How can I create Captions?

VIU now has a site licence (instructional staff) for a tool called Camtasia. This software can, among other things, be used to create screencasts and it will also autogenerate captions from your speech. You have to do a bit of training with the software, but once it knows your voice it will produce accurate captions.

Email ithelp@viu.ca to get access to request Camtasia.

You can find information about creating or manually adding captions on the TechSmith Support website.

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

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>.

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 all students 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 the same content is available to all 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 production 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.

7. 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: LaTeX, MathType

Note: Both of these types of files are available in VIULearn

Who are you doing this for?

This work supports students who:

- Are blind or have low vision
 - Have a form of cognitive disability
 - Have a physical disability
-

What do you need to do?

There are several ways to handle equations, from images with alt

tags to MathML. MathML is available in the HTML text editor in VIULearn,

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. Since MathML with MathJax can be rendered in many systems, including HTML, sites at Penn State, Angel and Drupal, it is considered the best choice for accessibility.

Here is information about creating and viewing MathML.

MathML may vary from system to system and the content can change rapidly.

MathML is available via the Graphical equation menu in VIULearn. The screenshot below shows where to find it.

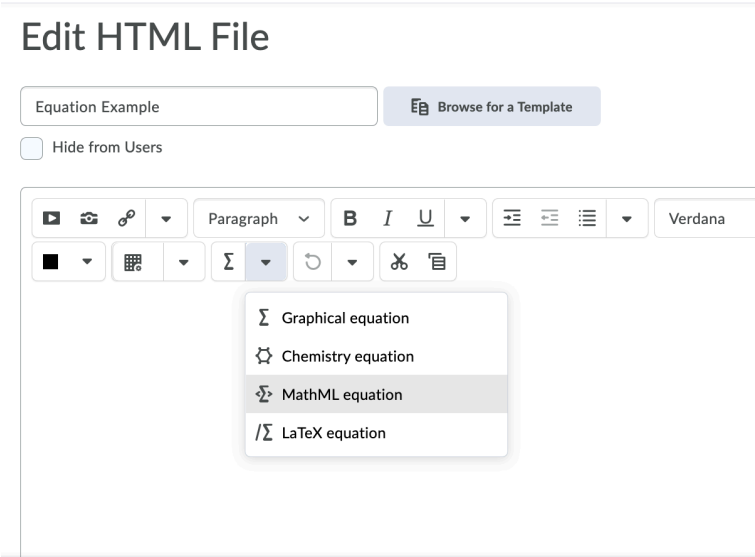
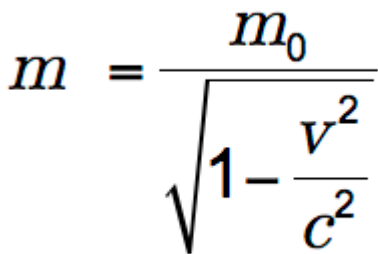


Image with an alt tag

A safe option is to create an image of an equation (or export it from an equation editor) and then insert the image into a document with an alt tag.

Example 1: An equation in HTML


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

View the alt tag

alt = "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"

LaTeX

LaTeX is a math markup language familiar to many in the science

and math community. Unfortunately, it is not currently supported by screen reader technology. It is, however, fairly simple to convert LaTeX to an image or MathML in most equation editors.

To import LaTeX, follow these steps in MathMagic and MathType:

1. Copy a piece of LaTeX code such as
$$m = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$
into an equation editor's main editing window.
2. The equation should appear fully formatted. Make minor adjustments as needed.

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.

Example 2: An equation with audio

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



An audio element has been excluded from this version of the text. You can listen to it online here: <https://pressbooks.bccampus.ca/designingforall/?p=53>

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.)

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.

8. 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,
 - 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 layouts² that can accommodate 200% text.

Where do I change Font Size in VIULearn?

You can change the font size using the HTML editor. The screenshot below shows where the font menu is located in the HTML editor.

1. "Font Size on the Web," *Accessibility and Usability at Penn State*, accessed April 17, 2018, <http://accessibility.psu.edu/fontsizehtml/>.
2. Liquid layouts 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.

Edit HTML File

Welcome to the Course

Browse for a Template

☐ Hide from Users

Paragraph

B

I

U

Verdana

Font Size

1 (8pt)

2 (10pt)

3 (12pt)

4 (14pt)

5 (18pt)

6 (24pt)

7 (36pt)

...

9. Colour Contrast

In this section, we provide guidelines and recommendations about colour contrast in your learning materials.

What is colour contrast?

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

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

What role does colour 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., colour, 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 coloured or textured background? If so, you should:
 - confirm that there is sufficient contrast between your foreground content and the chosen background colour or texture

2. Have you included links in your content? If so, you should:
 - confirm that the colour of your web links is distinct from both your background colour and the colour of the surrounding text
3. Have you used colour to convey concepts or information? If so, you should:
 - confirm that you are not using colour alone to convey this information

Who are you doing this for?

This work supports students who:

- Have low vision
 - 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
-

What do you need to do?

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

Contrast

Students with low vision and/or a form of colour blindness may have difficulty reading text that does not contrast enough with the background colour selected. If the colour 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 colour-contrast examples to illustrate insufficient and sufficient colour contrast ratios.

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 colour 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-WCAG20/visual-audio-contrast7.html>.



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

How to Test Your Materials for Colour-Contrast Ratios

There are many online and downloadable tools available to help you evaluate colour-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 colour 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 colour contrast and view your selections in grey scale. This tool also allows you to keep a history of the colour combinations you have tested.

NOTE: VIULearn has its own accessibility checker. You can read more about it later in this chapter.

Link colours

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

Web Content Accessibility Guidelines (WCAG 2.0) require a:

- 4.5:1 contrast between the link text colour and the background
- 3:1 contrast between the link text colour and the surrounding non-link text colour²

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 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.

2. "WCAG 2.0 and Link Color," WebAIM, accessed June 7, 2018, <http://webaim.org/blog/wcag-2-0-and-link-colors/>.

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 colour

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

For more information on using colour to convey information, see the Images chapter.

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>.

What does this mean in VIULearn?

The default colour settings for creating HTML (e.g. Create a File) content in VIULearn have sufficient contrast for both text and links. So, you really don't need to change anything. Just be aware that if you do change the default colours you will want to be sure that they meet the standards outlined in this chapter. The good news is that there is a contrast checker built into VIULearn. As shown the screenshot below, it appears when you choose the "Apply Colour" drop down menu in the HTML Editor. Note the green check beside WCAG AA. This indicates that the colour contrast is sufficient.

Select a Color

×

Foreground Colour

Recent Colours

<

Appendix A: Checklist for Accessibility

Organizing content

- ? Content is organized under headings and subheadings.
- ? Headings and subheadings are used sequentially (e.g., Heading 1, Heading 2).

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 colour to convey information.
- ? Images that are purely decorative do not have alt-tag descriptions. (Descriptive text is unnecessary if the image doesn't convey contextual content information.)

Links

- ? The link is meaningful in context and does not use generic text such as "click here" or "read more."
- ? 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]).

Tables

- ? 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

? A transcript is available for each multimedia resource including relevant non-speech content.

- Transcript includes:
 - speaker's name
 - all speech content
 - relevant descriptions of speech
 - descriptions of relevant non-speech audio
 - headings and subheadings

? Captions of all speech content and relevant non-speech content are included in the multimedia resource; this includes the audio synchronized with a video presentation.

? Audio descriptions of contextual visuals (e.g., graphs, charts) are included in the multimedia resource.

Formulas

- ? Formulas have been created using MathML.
- ? Formulas are images with alternative text descriptions if MathML is not an option.

Font size

- ? Font size is 12 point or higher for body text.
- ? Font size is 9 point for footnotes or endnotes.
- ? Font size can be zoomed to 200%.

All open textbooks from the OpenStax collection are accessible according to this accessibility statement.

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.

Introduction

- BCcampus Accessibility Toolkit (<https://opentextbc.ca/accessibilitytoolkit/>)
- BCcampus OpenEd Resources (<https://open.bccampus.ca/>)

Accessibility Statement

- Download this book in another file format (<https://pressbooks.bccampus.ca/designingforall/>)
- 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>)

Organizing Content

- Google Docs Help Centre (https://support.google.com/docs/answer/116338?hl=en&ref_topic=9045931)
- Google Docs Help Centre (https://support.google.com/docs/answer/116338?hl=en&ref_topic=9045931)

Images

- Complex Images for All Learners: A Guide to Making Visual Content Accessible [PDF] (<https://www.lsu.edu/accessibility/training/complex-images.pdf>)
- Google Docs Help Centre (<https://support.google.com/docs/answer/6199477?hl=en>)
- Microsoft Office support website (<https://support.microsoft.com/en-us/office/add-alternative-text-to-a-shape-picture-chart-smartart-graphic->

or-other-object-44989b2a-903c-4d9a-b742-6a75b451c669)

Links

- Here (<https://ciel.viu.ca/learning-technologies-innovation/viulearn>)
- Information on VIULearn (<https://ciel.viu.ca/learning-technologies-innovation/viulearn>)
- VIUBlogs (<https://ciel.viu.ca/learning-technologies-innovation/technology-tools/viublogs>)

Tables

- Screen reader reading different table layouts (<https://youtu.be/XN2MTLNH5Xk>)
- Tables Concepts (<https://www.w3.org/WAI/tutorials/tables/>)

Multimedia

- TechSmith Support website (<https://support.techsmith.com/hc/en-us/articles/360044416251-Captions>)

Formulas

- Creating and viewing Math ML (<http://sites.psu.edu/>)

accessibility/math/mathml)

- Equation with audio (<http://opentextbc.ca/accessibilitytoolkit/wp-content/uploads/sites/94/2015/02/equation.m4a>)
- Equations: MathML, Images and LaTeX (<http://accessibility.psu.edu/equations>)
- Math Accessibility at Portland Community College (https://www.youtube.com/watch?v=VlMWINOe_5s&feature=youtu.be)
- Math accessibility study (<https://www.pcc.edu/instructional-support/accessibility/sas/math/>)

Font Size

- Web Content Accessibility Guidelines (WCAG 2.0) (<http://www.w3.org/TR/UNDERSTANDING-WCAG20/visual-audio-contrast-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>)

Appendix A: Checklist for Accessibility

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

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

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- “Web Content Accessibility Guidelines (WCAG) 2.0: Guideline 1.1” *W3C*. Accessed March 27, 2018. <http://www.w3.org/TR/WCAG20/#text-equiv>.
- “Web Content Accessibility Guidelines (WCAG) 2.0: Guideline

- 1.2.” W3C. Accessed April 17, 2018. <http://www.w3.org/TR/WCAG20/#media-equiv>.
- “Web Content Accessibility Guidelines (WCAG) 2.0: Guideline 1.2.3.” W3C. Accessed April 17, 2018. <http://www.w3.org/TR/WCAG20/#media-equiv>.
- “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>.
- “What is UDL.” *National Center on Universal Design for Learning*. Accessed March 27, 2018. <http://www.udlcenter.org/aboutudl/whatisudl>.

Versioning History

This page provides a record of changes made to this toolkit. Each set of edits is acknowledged with a 0.1 increase in the version number. The exported files for this toolkit reflect the most recent version.

If you find an error in this toolkit, please fill out the [Report an Open Textbook Error](#) form.

Version	Date	Change	Details
1.01	February 2015	Toolkit published in the B.C. Open Textbook Collection.	
1.02	September 19, 2017	Added a link to the Appendix: Checklist for Accessibility page.	Added a link to information describing the accessibility standards for all OpenStax books.
2.01	August 31, 2018	Second edition of toolkit completed and published in the B.C. Open Textbook Collection.	For details, see this list of changes and additions [Word file] made to the first edition of the toolkit.
2.02	May 1, 2019	New back matter chapter titled Appendix C.	Added Inclusive Design Webinar Series recordings and PowerPoint slides.
2.03	Jun 27, 2019	New theme	Changed from Open Textbook to Clark theme.
2.04	August 21, 2019	Updated Images chapter and list of links.	<ul style="list-style-type: none"> The “Long Descriptions” section of the Images chapter was edited to show how to use anchors for creating internal links. The List of Links by Chapter for Print Users chapter was updated to account for changing links and new resources added to the book.
2.05	October 1, 2019	ISBNs added: Print and eBook.	
2.06	January 14, 2020	Added new personas.	Posted a new collection of personas created by people working at Oregon State University to Appendix B: Redesign or Accommodation Activity Guidelines.

2.07	January 20, 2020	Added a webinar.	Added a webinar recording called “How to Create Inclusive and Accessible OER” to Appendix C: Inclusive Design Webinar Series.
2.08	February 10, 2020	Updated Links chapter.	Added a section called “Provide web addresses in Print PDF in Pressbooks.”
2.09	September 15, 2020	Updated Tables chapter.	Revised the Tables chapter to allow for merged or split table cells if they are formatted properly.
