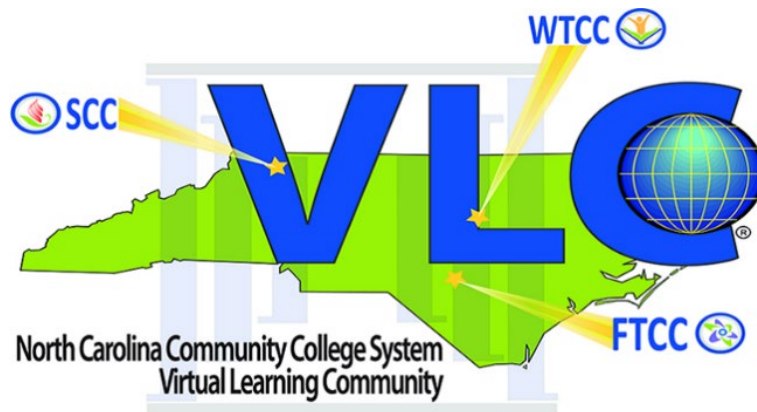# Accessibility Handbook for Online Courses

Provided by
North Carolina Community College System
Virtual Learning Community (VLC)

Last Revised June 2023

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How to Use this Handbook

This guide has been designed to provide instructors and other higher education content creators, such as instructional designers, with an overview of accessible design concepts. Its content is based on the most recent version (2.1) of the World Wide Web Consortium's Web Content Accessibility Guidelines, as they pertain to online course design.

The Online Course Accessibility Checklist provided on the next two pages has been positioned at the beginning of this handbook as a quick reference to help you evaluate the accessibility of your courses. However, the Checklist may also be a useful tool in helping you become more aware of which accessible design skills you may need to learn. The topics presented in this handbook are divided into scaffolded parts.

It is the hope of the VLC that you will find this handbook and the information therein useful. Please contact us if you are interested in receiving professional development.

Topics Discussed in this Handbook:

- **Part 1: What is Digital Accessibility?**
  If you're new to digital accessibility, Part 1 will help you understand why authoring accessible digital content is important and who benefits from these efforts.

- **Part 2: Foundational Concepts of Digital Accessibility**
  This section provides an explanation for each of the items listed in the Online Course Accessibility Checklist. The intention of Part 2 is to help you understand how each item in the checklist contributes to digital accessibility compliance.

- **Part 3: Applying Foundational Concepts to Course Design**
  This section's simple DO THIS / NOT THIS format is intended to provide you with a quick reference of what to do and what not to do as you design online courses.

- **Part 4: Authoring Digitally Accessible Word Documents**
  This section provides step-by-step instructions for creating digitally accessible Word documents. Information on color contrast, structure, hyperlinks, accessible images, and tables is provided.

- **Part 5: Authoring Digitally Accessible PowerPoint Presentations**
  This section provides step-by-step instructions for creating digitally accessible PowerPoint presentations. Information on color contrast, structure, hyperlinks, accessible images, and tables is provided.

- **Part 6: A Note on Universal Design for Learning**
  This section provides an introduction to Universal Design for Learning (UDL) and makes the connection between digitally accessible content and one of UDL's primary principles.

- **Part 7: Resources**
  This section contains additional resources related to the topics and information discussed in this handbook.

Special Acknowledgements
Thank you to Wake Technical Community College for providing accessibility examples contained in this guide and to Durham Technical Community College for updating the content.

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Online Course Accessibility Checklist

This checklist follows WCAG 2.2 AA guidelines and is intended to serve as a guide in evaluating online courses for ADA accessibility compliance. It contains 43 items divided into six categories: Color, Contrast, and Text/Font Style; Structure; Images; Hyperlinks; Multimedia; and File Names.

Color Contrast, Use of Color, Text/Font Style

- Strong color contrast is present between the foreground (text or graphics) and the background. The content is readable.
- Color combinations that seem to vibrate or create an after image are avoided.
- Black text on a red background or red text on a black background is avoided.
- Images required to understand content have sufficient color contrast.
- Color used to emphasize or convey information is supplemented with secondary formatting.
- Color-coding is supplemented with a secondary mechanism, such as a shape or symbol.
- Basic, simple, easy-to-read fonts are used.
- Real text, NOT text in a graphic, is used whenever possible.
- Blinking or moving text is avoided.
- Text content is NOT locked; students can customize paragraph spacing, letter spacing, word spacing, and line height.

Structure

Word Documents

- The document is organized with Heading styles.
- Lists are structured with Word's bulleted or numbered list options.

PowerPoint Presentations

- The presentation was created with built-in slide layouts.
- Lists are structured with PowerPoint's bulleted or numbered list options.
- All text content appears in Outline View. (Note: content in tables will not appear in the Outline View pane).
- Information appearing in the Outline View is in the same order as it appears on the slides.
- Each slide has a unique title.

Tables

- Tables have a designated header row and include a title. Verify the reading order using the Tab key.
- When the table contains information that is more complex or abbreviated, more explanation in the form of a long description, is provided near the table.
- All cells contain content; blank cells are avoided.
- Cells are not merged across rows or columns. Cells have not been split.
- When a table extends beyond one page in a document, the rows are restricted from breaking across pages.

Learning Management System (LMS) Content

- Content typed in the text editor is organized with Headings styles.
- Lists are structured with one of the text editor's List commands.
- Course navigation is simple and consistent.

Images

Alternative Text

- Alternative text is provided for all images, charts, graphs, and diagrams.
- The alternative text is meaningful and sufficiently "replaces" the images, charts, graphs, and diagrams. It is succinct, generally between 5 and 15 words (or about 125 characters).
- All instances of Word Art in the Word document or PowerPoint presentation have been replaced with real text or an alternative text is provided.

Long Description (when needed)

- An indication of where to find the longer description is provided in the alternative text for ALL complex images, such as charts, graphs, and diagrams.

   AND OPTION A

- A long description is typed near complex images, charts, graphs, and diagrams. (Note: In PowerPoint, compose the long description in the slide's Notes area.)

   OR OPTION B

- A link to the image's long description is provided before or after the complex image, chart, graph, or diagram.

Hyperlinks

- All hyperlinks should be readable, descriptive, and convey the purpose of the link. (e.g., Where is the link going? What content is the link providing?)
- Hyperlinks that open another application or web browser tab are clearly indicated as such in the hyperlink's clickable text.
- If students will likely print the content, the URL/web address for each hyperlink is provided.

Multimedia

- Embedded (or linked) videos are captioned. Audio description (narrative description of on-screen visuals) is provided when needed.
- A transcript is provided for each video and audio recording (e.g., Films On Demand, YouTube, a podcast).
- Avoid the audio and video player auto-start (and looping) feature.
- When necessary, provide a link to relevant video/audio plugins.
- Internet resources, including videos, can be navigated or operated with the keyboard alone.

Accessible File Names

- File name uses alphanumeric (abc, ABC, 123) characters.
- File name does NOT include spaces.
- File name does NOT include special characters, such as: &, ( ) % # $ ¢ / \ { } [ ] < > : ; @
- You may use the hyphen (-). It is preferred over the underscore (_).
- File names should be under 31 characters.

END OF CHECKLIST

Part 1: What is Digital Accessibility?

In order to understand what digital accessibility is, it's important to first understand that consumers of digital content, such as your students, may access that content in a number of ways. Some might use computers, others laptops, and some might use their mobile devices. However, students with some types of disabilities may *also* use another layer of technology, called **assistive technology**, to help them use their computer equipment and access digital content.

What is assistive technology?

The federal definition of assistive technology (AT) is:

"...any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities" [20 U.S.C. Chapter 33, Section 1401 (25)].

Examples include, but are not limited to:

- Screen reading technology
- Refreshable braille display
- Screen magnifier

What are some of the potential accessibility barriers for assistive technology users in online classes?

When the digital content (or the platform hosting it) is inaccessible, students with disabilities may run into a host of problematic barriers, such as: being completely blocked from accessing any content in an inaccessible PDF, being unable to find particular sections in an important study document, being unable to perceive information an instructor provides in an audio recording, or many other potential barriers.

What is Digital Accessibility?

According to a policy brief from the Southern Regional Education Board…

> *Digital accessibility ensures the ready availability and usability of content, websites and processes on computers and electronic devices for all users, including those with hearing, visual, motor or cognitive impairments.*
>
> *(Source: [Expanding Accessibility to Digital Spaces Through Improved Policy and Practice [opens new window]](), SREB, March 2017)*

As mentioned above, individuals with disabilities may access digital resources using various assistive technology tools; however, these tools work only when the content and systems being accessed adhere to accessibility standards. Providing guidance on many of these standards, as they pertain to online course design, is the goal of this handbook.

Who Benefits from Digital Accessibility?

Though the primary beneficiaries of digital accessibility efforts are students with disabilities, the benefits of such efforts are often extended to all students.

For example, providing closed captioning for a video allows a person unable to perceive the video's audio content access to it via a text representation (the closed captions). People this digital accessibility measure benefits include: hearing impaired and deaf students; students studying in places where a video's audio is difficult to hear, such as a café or library; students needing to watch a video featuring people with unfamiliar accents, learning impaired students, and second-language learners.

Providing
Universal Access
to Education

Part 2: Foundational Concepts of Digital Accessibility

This section contains a brief explanation for each digital accessibility guideline outlined in the Online Course Accessibility Checklist. This information is provided to help answer the question of "why?" for each digital accessibility guideline.

Color Contrast

≫ Strong color contrast is present between the foreground (text or graphics) and the background. The content is readable.

Students with low vision or colorblindness need sufficient contrast between the foreground (text or graphics) and the background. Good contrast also benefits mobile users.

Tip: If you're unsure of the color contrast, use TPGi's free Color Contrast Analyzer to check the contrast of your foreground and background colors (see *Part 7* for a link to the TPGi Color Contrast Analyzer.)

≫ Color combinations that seem to vibrate or create an after image are avoided.

Placing areas of brightly colored hues together can cause an afterimage effect (or "visual vibration"), which makes it difficult to focus on the content.

≫ Black text on a red background or red text on a black background is avoided.

Some students with color blindness lack the ability to detect the lower color wave frequencies associated with red; red appears black, so this combination should be avoided.

≫ Images required to understand content have sufficient color contrast.

When a graphic is essential for understanding content, then the image should be perceivable by students with low vision or other impairments without the need for contrast-enhancing assistive technology.

Use of Color

≫ Color used to emphasize or convey information is supplemented with secondary formatting.

Students unable to distinguish between colors rely on secondary formatting as cues to help figure out emphasis or meaning.

》》 **Color-coding is supplemented with a secondary mechanism, such as a shape or symbol.**

Students unable to distinguish between colors rely on shapes or symbols as cues to help figure out content. This is an especially beneficial revision to graphs and charts that would otherwise rely on color alone to convey data or information.

Text Considerations

》》 **Basic, simple, easy-to-read fonts are used.**

Use fonts that are available by default in modern operating systems. Avoid decorative, frilly fonts. Good options to consider are: Arial, Calibri, Tahoma, Trebuchet MS, and Verdana.

》》 **Real text, NOT text in a graphic, is used whenever possible.**

When text is actually an image, it cannot be read by a screen reader. Providing an alternative text for the image may be an option; however, using real (typed) text is the recommendation because when the image needs to be significantly enlarged for students with low vision, real text will not become distorted or unrecognizable as text in an image might.

》》 **Blinking or moving text is avoided.**

Text that blinks or moves can be distracting to all learners and especially so for learners with attention deficits or cognitive disabilities. Additionally, for those susceptible, there is a possibility that blinking text will trigger a seizure.

》》 **Text content is NOT locked; a student can customize paragraph spacing, letter spacing, word spacing, and line height.**

Whenever possible, allow students the flexibility to change the text formatting of digital content to meet their own needs for readability.

Structure: Text Content

》》 **The text content is organized with Heading styles.**

People with vision impairments rely on headings to provide an outline of the content that allows them to easily navigate through text and documents. A screen reader does not recognize text formatting (e.g., bold, large font size) as a meaningful heading until a Heading style has been applied.

》》 **Lists are structured with build-in bulleted or numbered list options.**

People with vision impairments rely on structured lists to determine how many items a list contains.

Structure: PowerPoint Presentations

>> **The presentation was created with built-in slide layouts.**

The placeholders in slide layouts provide slide structure. Placeholders may be rearranged on a slide; however, it is important to check Outline View to verify the sequential order of the slide's content.

>> **Lists are structured with PowerPoint's bulleted or numbered list options.**

People with vision impairments rely on structured lists to determine how many items a list contains. By default, a bulleted list is created when first typing in a placeholder. This can be changed to another list format, if desired.

>> **All text content appears in Outline View. (Note: content in tables will not appear in the Outline View pane).**

Any text typed in a slide's placeholder appears in Outline View. Verifying that all of the text content is appearing in Outline View is a useful way to confirm that assistive technology is able to access all of a slide's text content. Any content appearing in author-created text boxes will not appear in Outline view and may not be accessible by assistive technology users.

>> **Information appearing in the Outline View is in the same order as it appears on the slides.**

At first glance, a slide's content may appear logically sequenced; however, viewing the presentation as a text outline in Outline View, will make it apparent when content has inadvertently been placed out of order. Screen reader users depend on logically sequenced content.

>> **Each slide has a unique title.**

Slide titles function much like document Headings, allowing for quick navigation. They are assigned bold formatting when viewed in Outline View. The title of each slide should reflect the slide's content.

Structure: Tables

>> **Tables have a designated header row and include a title. Verify the reading order using the Tab key.**

Designating a header row ensures that the first row will be designated as column titles. Including a title introduces the table and provides some context for it. Checking the reading order using the Tab key makes sure that the table is not an image and that it will be read by a screen reader.

» When the table contains information that is more complex or abbreviated, more explanation as a long description is provided near the table.

Students with visual impairments or blindness will be unable to see any visual cues that might be present in a complex data table and it should not be assumed that students know the meaning of all abbreviations. Providing a long description to help provide this important information to students will help all of them more easily understand the information in the table.

» All cells contain content; blank cells are avoided.

Instead, type *blank cell* or *data not available*. You may change the font color to blend the text in with the background, if desired.

» Cells are not merged across rows or columns. Cells have not been split.

Avoid controlling the spacing in your table with blank rows or columns. Adjust line spacing instead.

» When a table extends beyond one page in a document, the rows are restricted from breaking across pages.

When a table becomes large enough that it needs an additional page to display all of the content, restricting the table's ability to break rows across pages will help keep each row's information intact and make the table easier to follow as it goes on to the next page.

Structure: Learning Management System (LMS) Content

» Course navigation is simple and consistent.

Keeping content within three clicks of the main (or Home) course page will allow students to more easily locate course material.

Images: Alternative Text

» Alternative text is provided for all images, charts, graphs, and diagrams.

Screen reading software is unable to interpret images, charts, graphs, and diagrams. The image's alternative text (alt text) is instead accessed by the technology and is read aloud to the student. Providing alt text allows the content and function of images and other visual elements to be accessible to those with visual or certain cognitive disabilities.

» The alternative text is meaningful and sufficiently "replaces" the images, charts, graphs, and diagrams. It is succinct, generally between 5 and 15 words (or about 125 characters).

For a student unable to see the image, a meaningful replacement allows the student to conceptualize the image's content.

»» **All instances of Word Art in the Word document or PowerPoint presentation have been replaced with real text or alternative text is provided.**

When text is actually an image, like Word aArt, it cannot be interpreted by a screen reader. Providing an alternative text may be an option; however, using real (typed) text is the recommendation because when the image needs to be significantly enlarged for students with low vision, real text will not become distorted or unrecognizable as it might in a Word Art image.

Images: Long Description

»» **An indication of where to find the longer description is provided in the alternative text for ALL complex images, such as charts, graphs, and diagrams.**

Providing the location of a long description in the complex image's alternative text helps students who use screen readers find the image's long description.

PLUS, THIS OPTION

»» **A long description is provided near the complex image. (Note: In PowerPoint, compose the long description in the slide's Notes area.)**

The content of some images can be more complex than what the image's succinct alternative text can provide, especially when the images are instructional in nature. For these complex images, additional information is needed so that students may learn what is intended from the image. Providing the long description near the image allows ALL students to benefit, instructionally, from it.

OR THIS OPTION

»» **A link to the image's long description is provided before or after the complex image, chart, graph, or diagram.**

The option of providing a link rather than text near the image is a design choice. Providing a longer description on the same page or linking to it provides an opportunity for all students to learn from the description. To link to a long description, type the image's description in a word processor, upload the document to the *Resources* area of your course site, and then create a link to it.

Hyperlinks

»» **All hyperlinks should be readable, descriptive, and convey the purpose of the link (e.g., Where is the link going? What content is the link providing?)**

Well-formed hyperlink text makes sense independently of surrounding text, informs people of the purpose of the link, and lets people know what will happen when the link is clicked. Note that while most screen reading technology announces links, it can be very helpful for learners with cognitive disabilities when they know that a hyperlink may open a new tab in the browser or another application.

» Hyperlinks that open another application or web browser tab are clearly indicated as such in the hyperlink's clickable text.

Providing the forewarning that a new tab in the web browser or that an application will open is helpful to all users; however, this is especially important for screen reader users because a new tab/window or application opening without warning can be disorienting.

» If students will likely print the content, the URL/web address for each hyperlink is provided.

It is impossible to click a link on a printed document, and so providing the URL/web address allows the student to type the address in a web browser. Tip: If the web address is especially long, use a URL shortener such as bitly.com or shorturl.at to create a shorter version.

Multimedia

» Embedded (or linked) videos are captioned. Audio description (narrative description of on-screen visuals) is provided when needed.

Captions and audio description provide access to videos for people who are deaf, hard-of-hearing, blind, or low-vision. Recent research suggests non-disabled students find captions to be a useful learning aid, as well. Audio description is an additional audio track that provides a voice-over description of the on-screen content. It is not a necessary addition ONLY IF sufficient verbal description of visuals is already provided in the video.

» A transcript is provided for each video and audio selection (e.g., Films On Demand, YouTube, a podcast).

A transcript is a text representation of aural content. It provides access to videos and audio content for people who have hearing impairments. Ideally, transcripts should be saved as a text document (e.g., with Window's Notepad).

» Avoid the audio and video player auto-start (and looping) feature.

Audio or video should not automatically start upon page load or loop continuously. This is frustrating especially to those who rely on keyboard-only navigation and screen reading technology. These users must use the keyboard to navigate through the page, find the video player, and then find the pause button as the video or audio continues to play, often overlapping with screen readers' voice synthesizers.

» When necessary, provide a link to relevant video/audio plugins.

When providing video or audio files for your students to download, provide any relevant plugin that will allow your students to access the files.

»» Internet Resources, including videos, can be navigated or operated with the keyboard alone.

Course components and multimedia elements are controlled only by the user's keyboard. This means pressing the Tab key should move the "focus" logically through the content appearing on screen. Pressing Enter (or Spacebar) should confirm a selection (you can test this by using only your keyboard – not your mouse – to navigate areas of your course, such as downloading an assignment or opening a hyperlink).

A multimedia element (such as a video or audio recording) should not start or begin playing when the page in which it is located is opened. It should also be fully controllable by the user's keyboard.

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Part 3: Applying Foundational Concepts to Course Design

🖥 Applying Color Contrast to Course Design

1. **Course theme or template provides strong color contrast between background and text.**
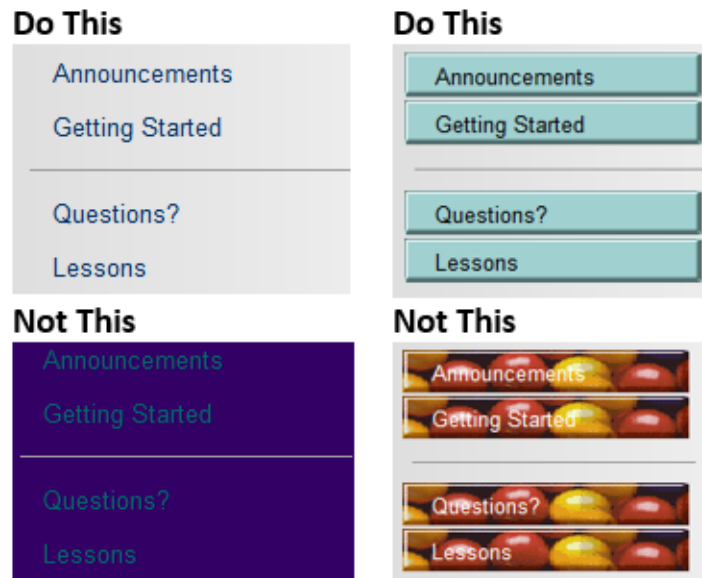
Figure 1: Blackboard examples of good
color contrast compared to insufficient color contrast
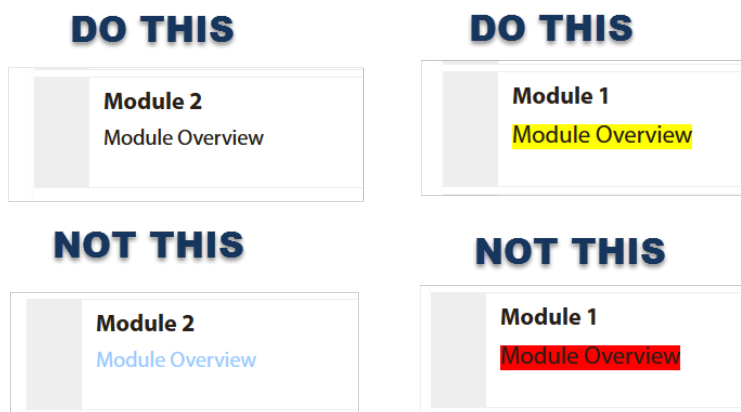
Figure 2: Moodle examples of good
color contrast compared to insufficient color contrast

2. **Images required to understand content have sufficient color contrast.**

DO THIS
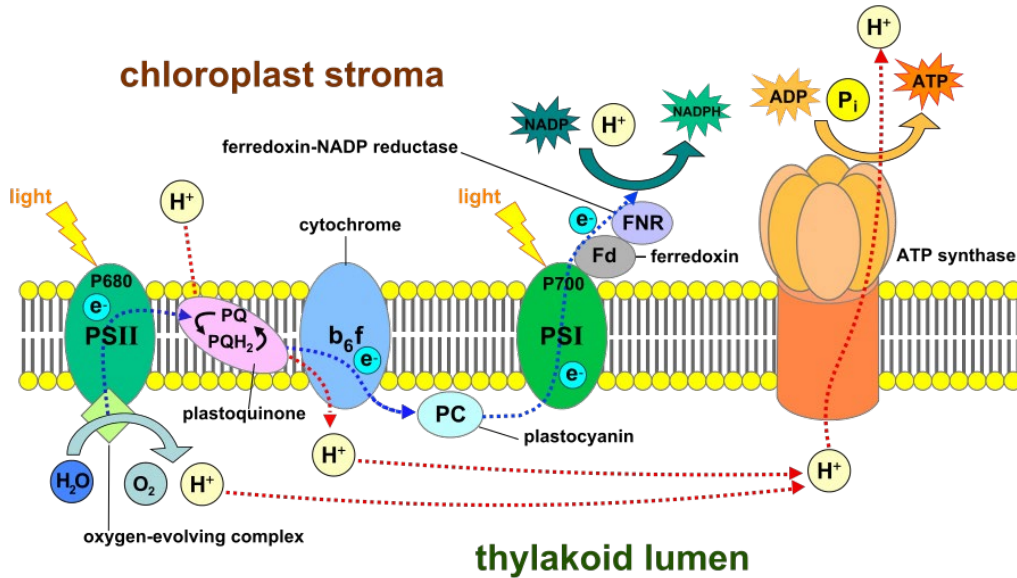
*Figure 3: Graphic with **sufficient** color contrast*
*utilizing **dark** text on **light** backgrounds.*

NOT THIS
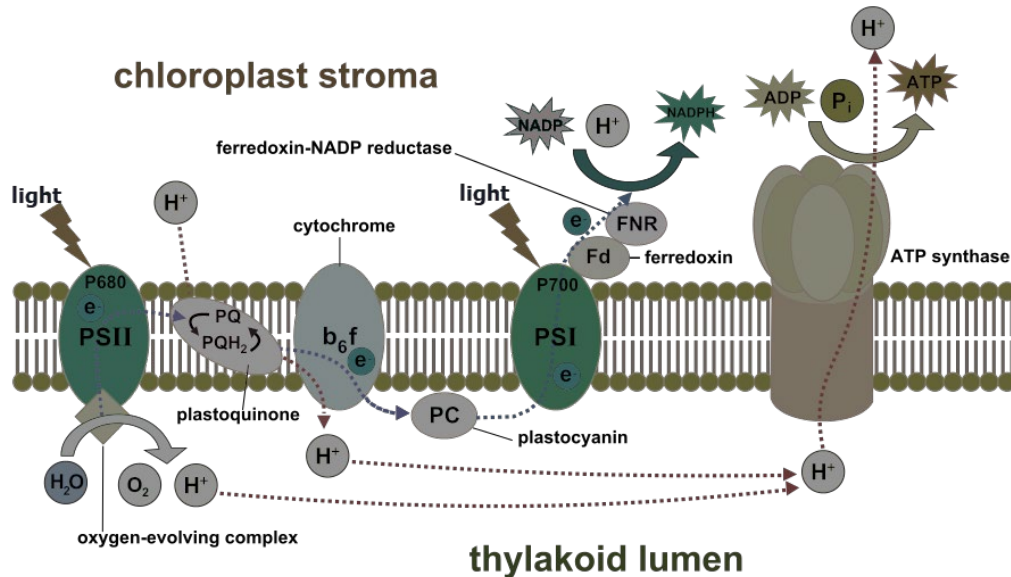
*Figure 4: Graphic with **insufficient** color contrast*
*due to **dark** text on **dark** backgrounds.*

A Note about Contrast and Orange

Orange is neither very dark nor very light, so it is often difficult to pair with another color — with the exception of black.

Sample Text

🖥 **Applying Color to Instructional Content**

1. **No more than 3 different text fonts or colors are used throughout the course.**

DO THIS

Máximo de tres textos diferentes colores de la fuente se debe utilizar. SPANISH
Maximum de trois textes différents ou les couleurs de police doivent être utilizes. FRENCH
Maximal drei verschiedene Text-oder Schriftfarbe verwendet werden soll. GERMAN
Massimo di tre testi diversi o colori dei caratteri devono essere utilizzati. ITALIAN
Maximum aut ex tribus text font color utatur. LATIN

Figure 5: Example of two font colors, one of which is being used to denote language classifications.

NOT THIS

Maximum of three different text or font colors should be used.
Máximo de tres textos diferentes colores de la fuente se debe utilizar. SPANISH
Maximum de trois textes différents ou les couleurs de police doivent être utilizes. FRENCH
Maximal drei verschiedene Text-oder Schriftfarbe verwendet werden soll. GERMAN
Massimo di tre testi diversi o colori dei caratteri devono essere utilizzati. ITALIAN
MAXIMUM AUT EX TRIBUS TEXT FONT COLOR UTATUR. LATIN

Figure 6: Example of confusing visual appearance when many font colors and font styles are used.

2. **Color is not used as the only means of conveying information. Color blindness is the inability to perceive differences between some colors that others can distinguish.**

DO THIS

LADY MACBETH
Whiles I stood rapt in the wonder of it, came missives from the king, who all-hailed me 'Thane of Cawdor;' by which title, before, these weird sisters saluted me, and referred me to the coming on of time, with 'Hail, king that shalt be!' **This have I thought good to deliver thee, my dearest partner of greatness, that thou mightst not lose the dues of rejoicing, by being ignorant of what greatness is promised thee.** Lay it to thy heart, and farewell.'

Figure 7: Example in which the instructor has indicated with bold formatting and red font the lines that must be memorized for the next quiz.

NOT THIS

LADY MACBETH
Whiles I stood rapt in the wonder of it, came missives from the king, who all-hailed me 'Thane of Cawdor;' by which title, before, these weird sisters saluted me, and referred me to the coming on of time, with 'Hail, king that shalt be!' This have I thought good to deliver thee, my dearest partner of greatness, that thou mightst not lose the dues of rejoicing, by being ignorant of what greatness is promised thee. Lay it to thy heart, and farewell.'

Figure 8: Example in which the instructor has indicated with only red font the lines that must be memorized for the next quiz

A Note about Combining Red and Black

A common color combination used to alert or warn people is red and black. Consider the image below.

Warning   Warning

A person with normal vision is able to distinguish between the red background and the black and white text. Both sets of text say Warning.

Now, consider the same image as it would appear to someone with Deuteranomaly, or red-blind color vision deficiency.

Warning

The red background appears black, which causes the black text to blend in with the background and disappear. The white text is still visible, but to the person with red-blindness, the text appears white

on a black (rather than red) background. An awareness of this limitation may help you avoid pairing red and black when emphasizing or conveying information to students.

🖥 Applying Text Considerations to Course Design

1. **Text is easy to read.**

Sans serif fonts are recommended (fonts without "feet" or other ornamentations). Calibri, Arial, Verdana, and Tahoma are examples of sans serif fonts:

| This is Calibri. | This is Arial. | This is Verdana. | This is Tahoma. |

Verdana is considered the easiest to read of the basic sans serif fonts. It is larger, has more spacing between letters, and its characters are not easily confused.

DO THIS
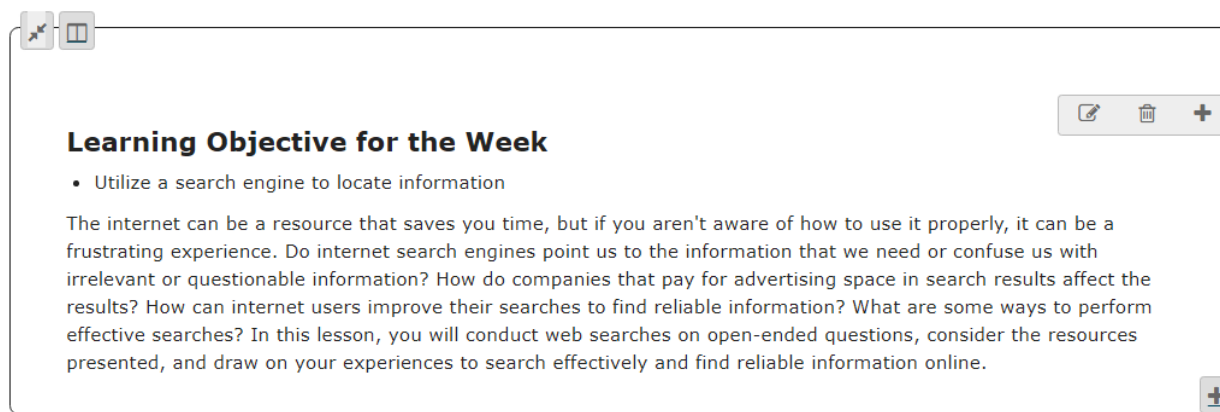
Figure 9: Verdana example in a Learning Management System

NOT THIS
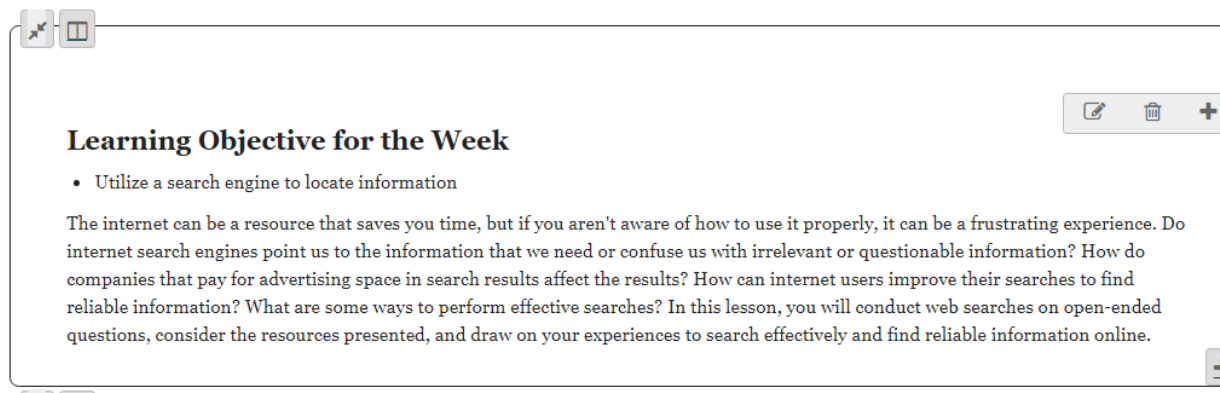
Figure 10: Georgia example in a Learning Management System
(the font size was set the same as the Verdana example in Figure 9)

2. **Real, typed text, NOT text in a graphic is used whenever possible.**

DO THIS

Type the text directly onto the document or presentation, such as:
Thank you!

NOT THIS

Avoid using a graphic of text.

Without alt text, the graphic above would be unavailable to screen reading assistive technology. For this reason, the recommendation is to use real text typed directly in the text editor

3. **Content is not locked.**

Paragraph spacing, letter spacing, word spacing, and line height can be customized by the student to enhance readability. An example of locked content is a PDF document. If you wish to use a PDF, upload a companion Word document containing ALL of the same information to allow students to select the document format that is more suited to their individual technology requirements.

4. **No moving or blinking animations or text should be present in course content.**

Blinking/flashing elements can trigger an event in individuals who are prone to seizures. Additionally, blinking and animated elements are known to be distracting to all students regardless of cognitive or attention challenges.

Applying Text Structure to Course Design

1. Content is logically structured.

Headings and lists are used appropriately to establish content hierarchy, much like an outline for the content. The structure that headings and lists create is available to screen reading technology as a logical, hierarchical reading order.

DO THIS

As you apply heading styles to your content (*see Figure 11*), make sure to apply them logically so that a proper hierarchy is established. Heading levels create an outline of the content, and so it is important to apply them in numeric order rather than skipping levels:

- **Heading 1**
  This heading style is applied to the title of a page (or content). It is the main heading and denotes the overall topic; therefore, it is usually used only once.
- **Heading 2**
  Most of the subheadings that come after Heading 1 will receive a Heading 2 style. Heading 2 can be used as many times as needed.
- **Heading 3, 4, and beyond**
  Your text may require additional subsections; these additional heading styles are available, if needed.
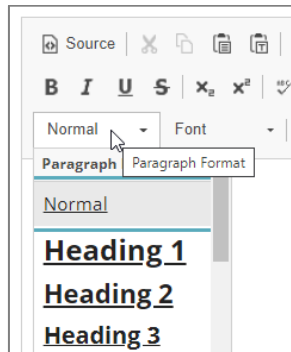
Figure 11: Heading Styles as they appear in a text editor.

NOT THIS

Adjusting the color and size or applying bold and italics to text only changes the visual components of the text; it does not address structure or establish an accessible content hierarchy.
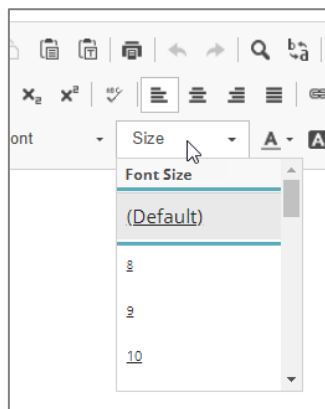
Figure 12: Font size options as they appear in a text editor.

2. PowerPoint Slides have Unique Titles

DO THIS

If you have two or more PowerPoint slides dedicated to the same main idea, make sure all of the slide titles remain unique. You can do this by adding a little supplementary information to help identify how many slides will have a similar name.
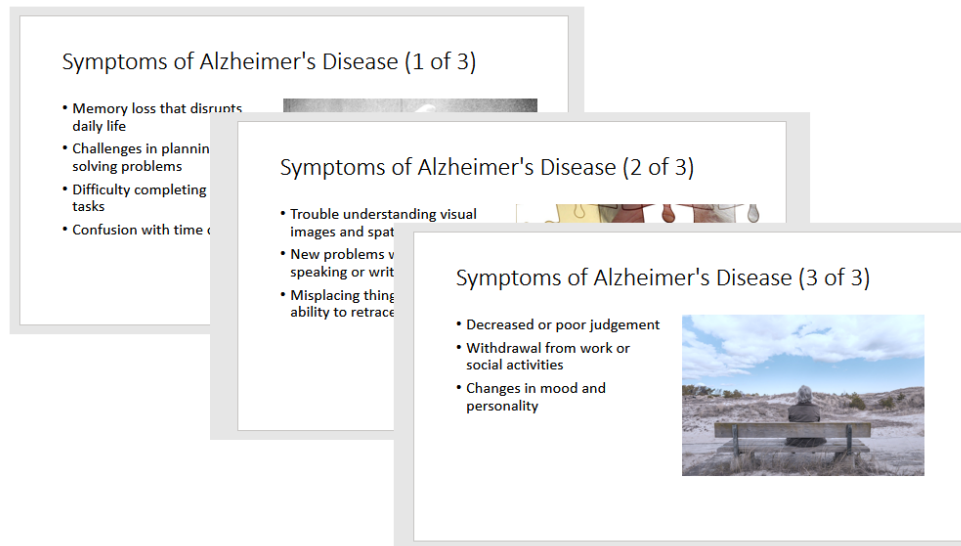
Figure 13: Series of three PowerPoint slides with unique slide titles

NOT THIS
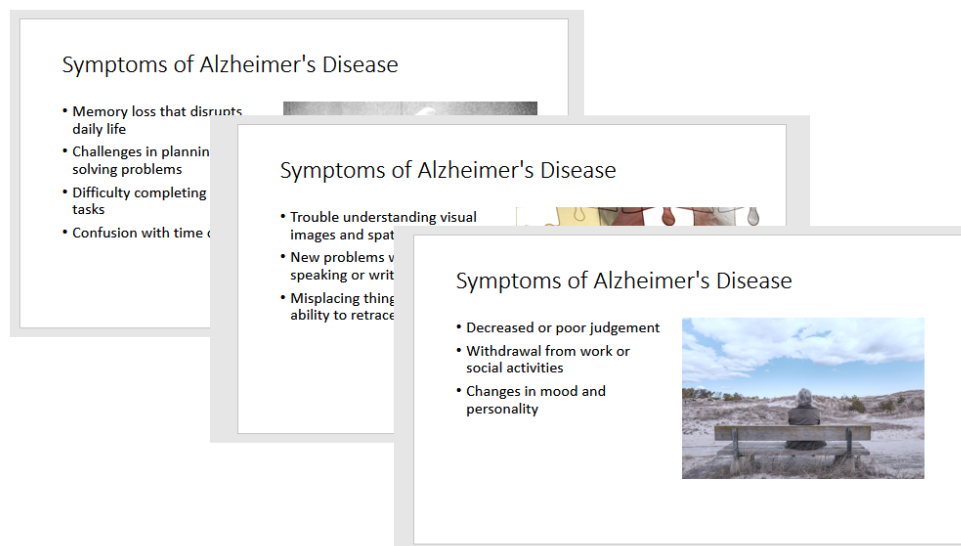
Figure 14: Three individual PowerPoint slides with the same slide title

Tables are simple and have logical left-to-right, top-to-bottom reading order. Table headers are implemented when available. A table title helps introduce the content of the table.

DO THIS

Types of Arabian Horses			
TYPE OF ARABIAN HORSE	REGIONAL CHARACTERISTIC	PLACE OF HISTORIC ORIGIN	IMPORTANT REGIONAL ARABIAN HORSES
Egyptian	Extreme dish head and teacup muzzle	Historically, Egyptian breeders imported horses bred in the deserts of Palestine and the Arabian peninsula	Ghazala
Polish	Typey features with additional strength and size.	In the early 20th century, the military was involved in the breeding of Arabian horses throughout Europe, particularly in Poland	Witez II
Crabbet	Sturdy and sound conformation that permitted them to be ridden or driven without undue worry about breakdowns	Perhaps the most famous of all Arabian breeding operations founded in Europe was the Crabbet Park Stud of England, founded 1878.	Mesaoud

Figure 15: Table displaying information about Arabian horses.

AVOID THIS

- Embedding a table within a table. Screen readers always read embedded content first and the user can easily become disoriented.
- Empty, merged, or split cells. Their presence can cause the table to be confusing to assistive technology users.
- Using tables for visual layout purposes. Tables should be used to convey meaningful information or data (rather than page formatting).

The table in *Figure 16* has been used to visually position content. It contains a nested table, merged cells, and two empty cells. Also, notice the absence of column titles indicating there is no header row. This table is very difficult for an assistive technology user to navigate, as well as understand.

Figure 16: Images of Arabian horses, a map, and a tapestry appear in various cells of a table. No title is provided for the table.

⌨ Applying Alt Text and Long Description to Course Design

Non-text elements have meaningful alternative text and when necessary, a long description.

All images require alternative (alt) text. Alternative text replaces the image for screen reader users, allowing the users to visualize the graphic.

Generally, the length of alternative text is less than 125 characters (about 10-15 words).

To create alt text, consider your purpose for using the image:

- Is it purely decorative?
- Is it an example of something you mention in the surrounding text/lecture?
- Is it a more complex graphic containing important information?

Table 1: Considering Alternative Text for Decorative and Example Images

Considering Alt Text for Decorative Images	Considering Alt Text for Example Images
Example: An architecture instructor might use the following image, as decoration, on a title slide of a PowerPoint presentation about Greek architecture.	**Example:** An architecture instructor might use the following image, in a text lecture, as an example of a type of Greek column.
DO THIS **Alt Text:** North face of White House mansion (Washington DC, USA) **Explanation:** The alt text provides a brief overview of the content that appears in the image.	**DO THIS** **Alt Text:** North face of White House mansion (Washington DC, USA) featuring square portico surrounded by Ionic columns **Explanation:** The alt text identifies the type of columns and the White House as an example of them.
NOT THIS **Alt Text**: Washington DC **Explanation:** The alt text does not provide a brief overview of the content appearing in the image.	**NOT THIS** **Alt Text**: White House **Explanation:** Even though the image depicts the White House, the instructor is using the image as an example of a type of Greek column. **NOR THIS** **Alt text:** whiteHouse.jpg **Explanation:** Note that this is the name of the image file. This should be replaced with alt text sufficient enough to replace the visual.

Considering Alt Text for Complex (STEM) Images

Alternative text AND a long description are required for more complex educational images, such as Science, Technology, Engineering, and Math (STEM) images. Depending on the type of STEM image, use one of three long description strategies: **Linear Description**, **List Description**, or **Table Description**. (See *Appendix A* for information on these long description strategies.)

DO THIS

When a long description is needed, include where to find it in the image's alt text.
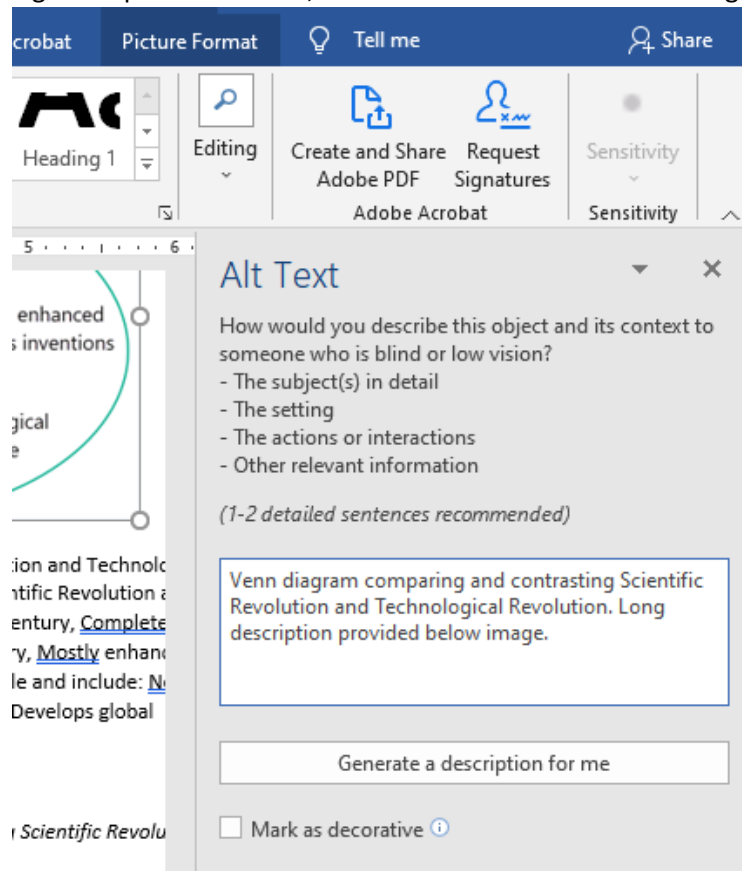
Figure 17: Example in Microsoft Word of how information about where to find the complex image's long description is included as part of the image's alt text.

ALSO DO THIS

Determine the format in which you want to provide the long description:

- **Option A (Ideal for instruction and Word documents)**: Typed under (or near) the image.
- **Option B: (A good choice for images embedded in the LMS)**: In a separate Word document or text document. You will upload the long description file to your class site's Resources area, and then create a link to it under the image.
- **Option C: (In PowerPoint ONLY)**: Typed in the Notes area under the image's Slide.

An Important Note Regarding Images and Tables

If you teach with digital materials created by someone else, such as a publisher, you may occasionally encounter a table that is actually an image and likely not accessible. How can you tell if this is the case?

Part 3 and Part 4 offer additional information on how to work with images in Word and PowerPoint; however, performing a Tab test will allow you to determine whether or not a table's cells are available to assistive technology.
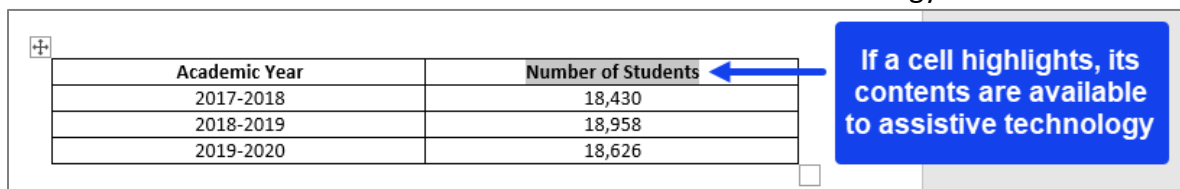
DO THIS

Perform a **Tab Test**

Place the cursor in the first cell of the table. Then press the **Tab** key on the keyboard.

One of two actions will occur:

- **Action A:**
  The cell to the right of the first cell will gain focus by **visually highlighting**. Highlighting indicates that the contents of a cell are available to assistive technology.

Academic Year	Number of Students
2017-2018	18,430
2018-2019	18,958
2019-2020	18,626

If a cell highlights, its contents are available to assistive technology

Figure 18: A highlighted table cell

- **or Action B:**
  A **selection handle** will appear around the table. If a selection handle appears, the table is an image and requires alternative text and very likely, a long description. (See *Appendix A* for information on how to provide long description for data tables.)
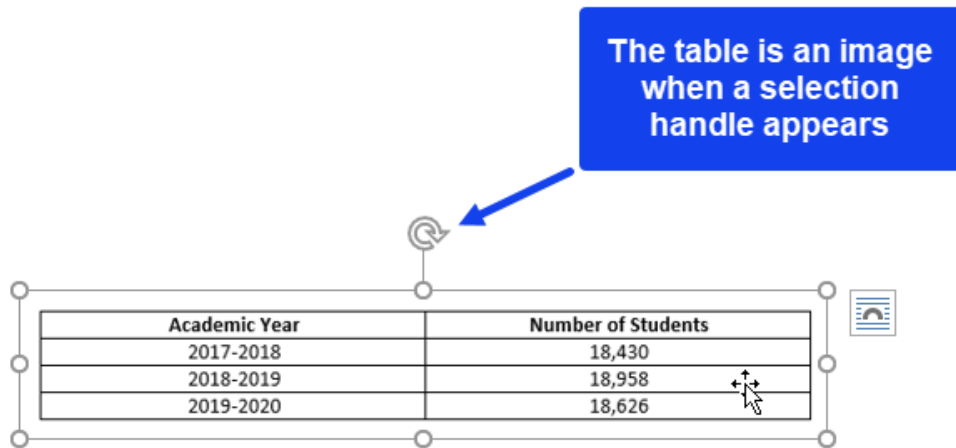

Figure 19: The selection handle appearing around the perimeter of the image

🖥 Applying Hyperlinks in Course Design

Hyperlink text clearly states the purpose of the link. Web addresses are provided in text-only format.

SCENARIO A:
A science instructor is sending students to WRAL TV online to observe current local weather radar reports.

DO THIS

Go to the WRAL Online Local Radar (opens in new tab)
www.wral.com/weather/radar

AND THIS

Hyperlinks to **web resources in PowerPoint** include (link) as part of the clickable text.
Virtual Learning Community Tools and Resources (link)

Hyperlinks in PowerPoint can be tricky for an assistive technology user to navigate. To help ensure the student is alerted to the presence of a hyperlink, always include: (link) as part of the active hyperlink text.

NOT THIS

Go to http://www.wral.com/weather/radar/ to see the local radar.

NOR THIS

Click here to see the local radar.

SCENARIO B:
A science instructor is providing a link to a PDF document of the North Carolina Climate Science Report.

DO THIS

North Carolina Climate Science Report (PDF)

Hyperlinks to documents or other files indicate the type of file or content in the clickable text (e.g., DOCX, PDF, PPTX, TXT, etc.).

Applying Multimedia in Course Design

1. **All audio files should have a text transcript and appropriate user controls.**

AutoPlay should be disabled and the multimedia should NOT loop (play over and over).

DO THIS

- Enable user controls
- Add a link to the transcript
- Add link to download to the audio file, if possible

Transcript of Food Bites Back (TXT)
Download audio file: vitalSigns-FoodBitesBack.mp3

NOT THIS

Click here for podcasts

2. **All videos are synchronously captioned and a transcript is provided.**

All video and multimedia content that contain speech or other necessary audio information should be open or closed captioned.

Captions are a synchronous text-based representation of multimedia audio content. Open captioning cannot be turned on and off. Closed captioning, which is the preferred method, can be turned on and off.

DO THIS

- Video is captioned
- Add a link to the transcript below the video

[Transcript of Sharing Creative Videos (TXT)](#)

3. **Visual descriptions are incorporated into video narratives.**

When creating multimedia content, use a script to help plan your video narration to include sufficient verbal visual description of what the learner is being shown on screen. Your script can then be a useful tool in creating the video's captions and transcript.

SCENARIO:
A history instructor creates a video about Southern European countries and references the following map of Italy.

*Figure 20: Example map illustrating the
content the instructor references*

DO THIS

Instructor narration:
*"Italy's boundaries are shaped like a boot with the city of Rome at the knee and with the toe of the boot
pointed towards the island of Sicily. Italy is surrounded by water on three sides…"*

Detailed visual descriptions enhance learning for all students, including students who are blind or
visually impaired.

NOT THIS

Instructor narration:
"Rome is here, Sicily is here…"

⌨ Applying Accessible Web Resources to Course Design

1. **Hyperlink text clearly states the purpose of the link. As a courtesy for printing purposes, web addresses are also provided in text-only format.**

DO THIS

W3C: Web Accessibility Initiative (opens new tab)
[URL: https://www.w3.org/WAI/]

NOT THIS

›› READ MORE

2. **Multimedia components and controls are accessible with a keyboard (Tab Key test).**

Anyone should be able to use the Tab key to navigate through all elements of the course and all multimedia controls in the course.

DO THIS

To perform the Tab Key test, press the tab key repeatedly to navigate through all multimedia elements and controls.

The four steps below demonstrate the Tab key test performed on a video player:

1. To begin, Tab is pressed to locate the **focus**. In this example, the PLAY button has **focus.** It appears as a blue box around the button; however, depending upon the content you are testing, focus may appear in a different color or as a different type of box.

2. Pressing Tab again moves the focus to MUTE.

Tab focus appears on the MUTE button

Mute (m)

▶ 🔊 0:00 / 6:29   CC ⚙ ▣ ⛶
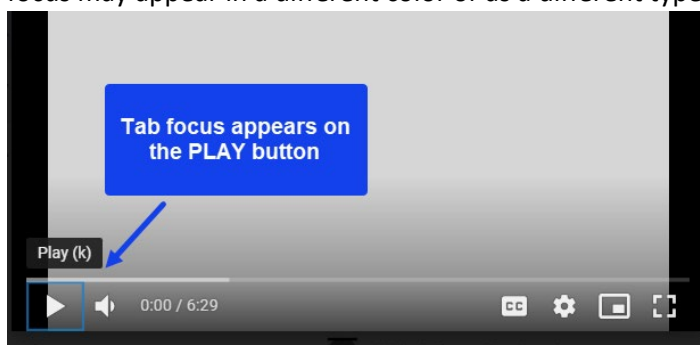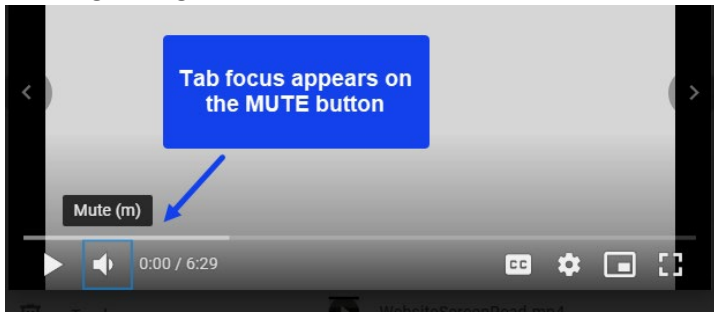
3. Pressing Tab again moves the focus to the VOLUME control.

Tab focus appears on the VOLUME control

▶ 🔊 ● 0:00 / 6:29   CC ⚙ ▣ ⛶
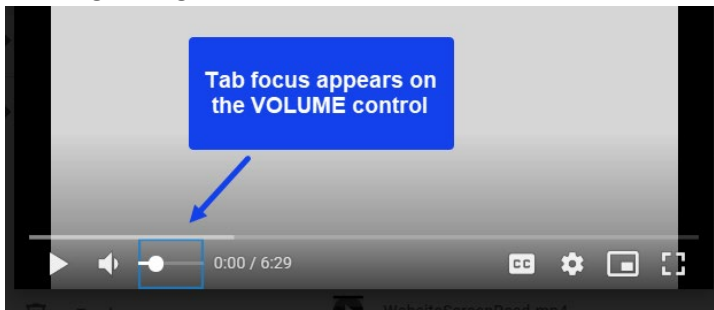
4. Pressing Tab again moves the focus to the CLOSED CAPTIONING button.

Tab focus appears on the CLOSED CAPTIONING button

▶ 🔊 0:00 / 6:29   CC ⚙ ▣ ⛶
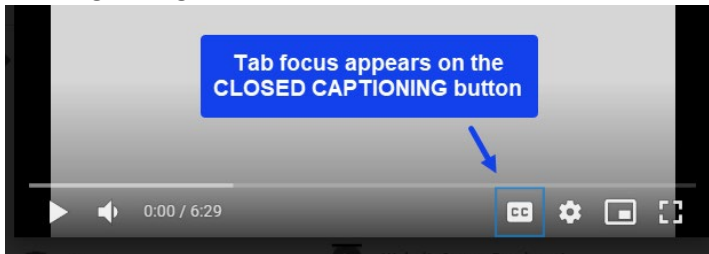
5. If it's possible to Tab through the rest of the controls, the Tab test is considered successful. *It is also a good idea to press Spacebar (or Enter) to make selections, such as turning on the Closed Captioning or press Shift+Tab to move focus back to the PLAY button and press Spacebar (or Enter) to start and stop the video.*

AND DO THIS

Instructions should always be provided within the course for:

- downloading and installing any needed plug-ins (including links to the specific plug-ins),
- enabling captions,
- navigating players, or for
- accessing accessible alternatives specific to the multimedia types used within the course.

3. **External resources meet accessibility guidelines, including the availability of captions and transcripts.**

Internet resources, including videos and publisher ancillary material, can be navigated, operated, or downloaded with keyboard-only shortcuts.

Part 4: Authoring Accessible Word Documents

▤ Step 1: Consider Color Contrast and Accessible Font Styles

- When considering color contrast for text on Word's white background, your best options are dark font colors, such as black or navy blue.
- When using color to convey information, reinforce the color with text (or symbols) so people who cannot perceive color can access the information.
- Fonts should be readable.
- Limit the number of fonts.
- Avoid using ALL CAPS or <u>all underlined text</u>.

⬚ Step 2: Structure the Document

Apply Heading Styles

As you create content in Word, consider the **structure** of your document and text. It is good design practice to divide longer content into **sections**, and then label each section with a **heading** or **subheading**. Applying **heading styles** to the title of the document or page and subheadings throughout the rest of the content creates **accessible** content **structure**, allowing all users to scan the document or content for meaning.

Remember to nest headings appropriately to create a hierarchical outline structure.

To Apply a Heading Style in Word:

1. Highlight the heading (or subheading).

2. On the **Home** tab, click the appropriate **heading style** from the **Styles** group.
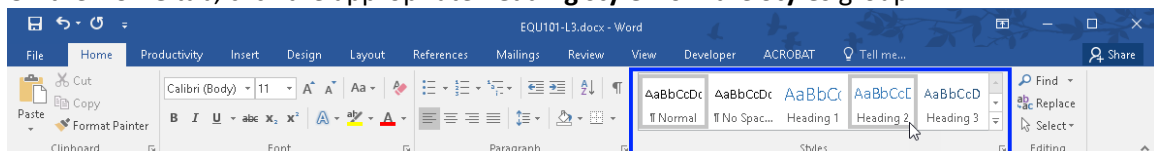
3. The heading style is applied.

Word's Navigation Pane

Microsoft Word's Navigation Pane displays any text that's been formatted with a Heading Style. Whether you're working on a new document, or editing an existing one, the Navigation Pane can be a useful tool for taking a quick look at your document's structure or for verifying whether or not appropriately nested heading styles have been applied.
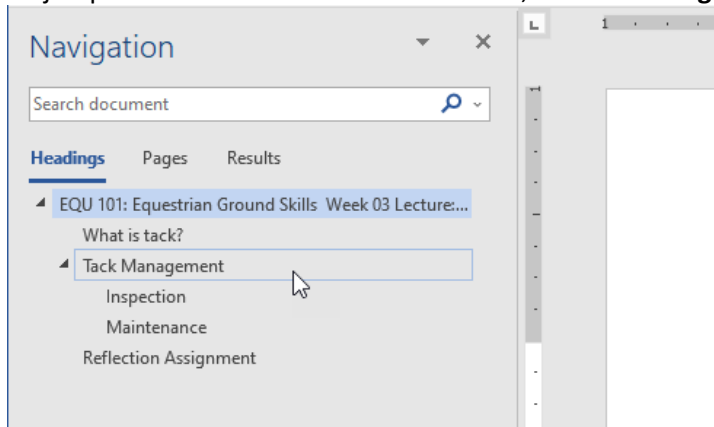
To Open the Navigation Pane:

1. Click the **View** tab on the Ribbon. Locate the **Show** group and place a check in the box next to **Navigation Pane**.
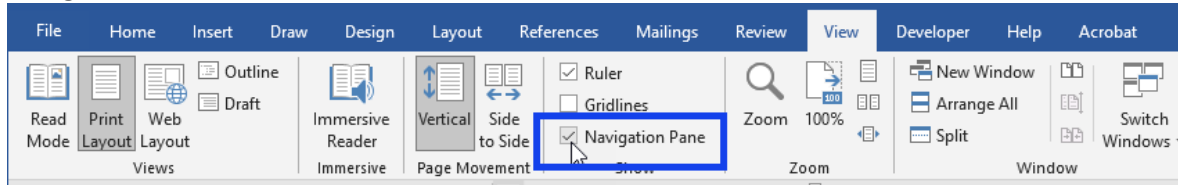
2. The Navigation Pane appears on the left side of the screen. If heading styles are used in the document, they will appear here.
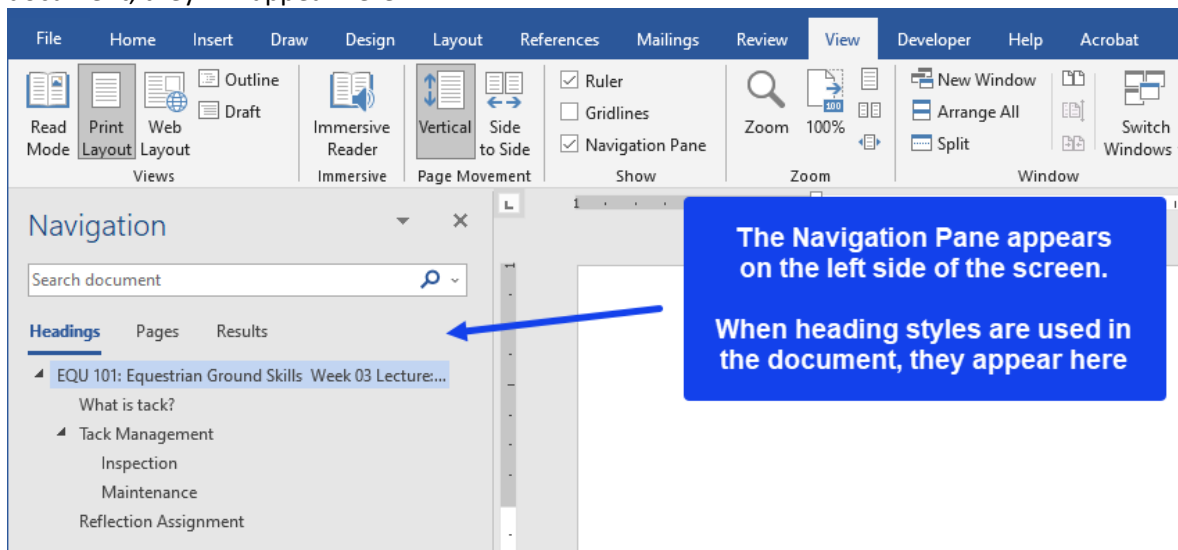
3. To jump to a new location in the document, click a **heading** in the Navigation Pane.

Apply Bulleted and Numbered Lists

Lists are useful for organizing items or drawing attention to important information. Using Word's Bullets and Numbering list options will structure your lists so that they appear uniform and tidy, and they will be easy to reformat, if desired.

Additionally, screen reading software will announce when focus has arrived at a properly formatted list, informing the user to expect a series of items.
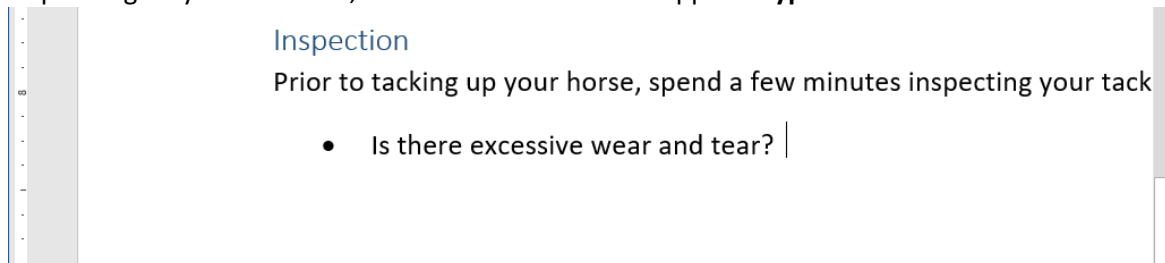
To Structure a List in Word:

1. Place the **cursor** in the **location** where you want to begin the list.
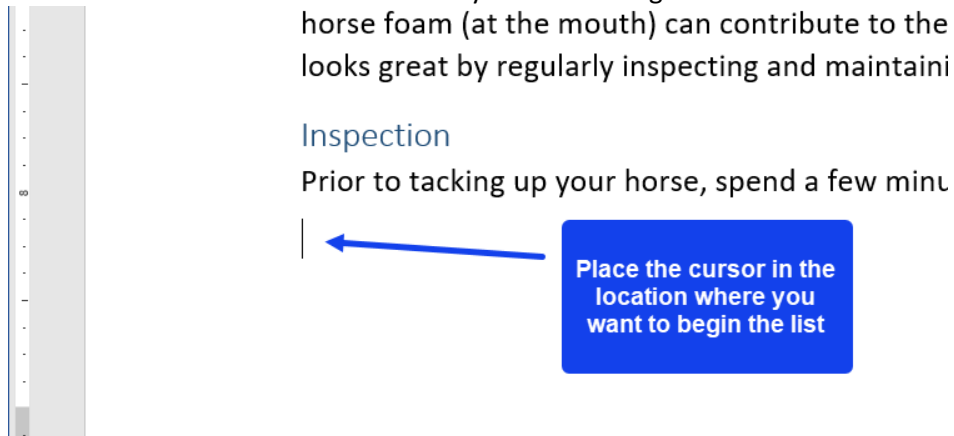
2. On the **Home** tab, locate the **Paragraph** group. Taking into consideration the type of list you would like to create, click the **Bullets** option or the **Numbering** option.
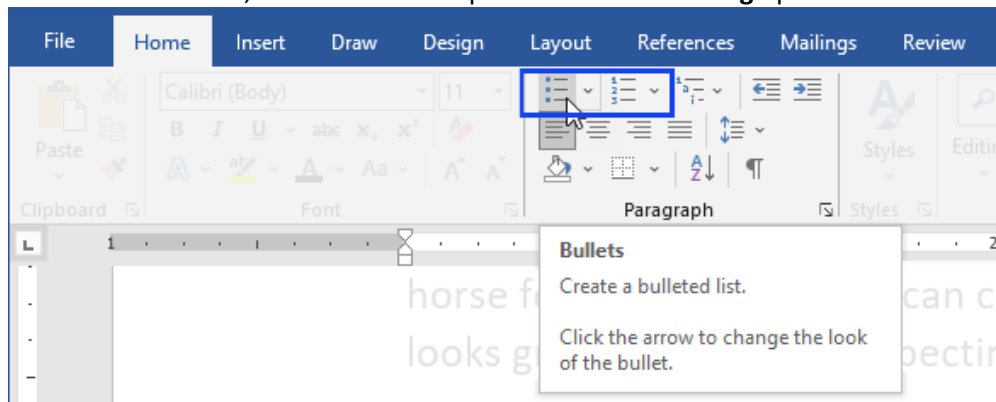
3. Depending on your selection, a bullet or a number will appear. **Type** the first list item.

4. To create the next list item, press **Enter**.

> Inspection
>
> Prior to tacking up your horse, spend a few minutes inspecting your tack
>
> - Is there excessive wear and tear?
> -
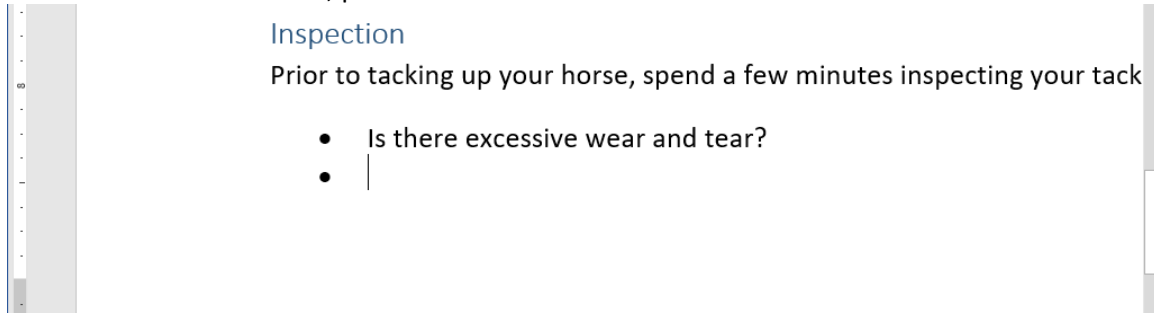
5. To leave the list, press Enter **twice**.

> horse foam (at the mouth) can contribute to the problem. You can ensur
> looks great by regularly inspecting and maintaining it.
>
> Inspection
>
> Prior to tacking up your horse, spend a few minutes inspecting your tack
>
> - Is there excessive wear and tear?
> - Is the leather cracking?
> - Has dirt begun to pack in at the seams?
> - Are there signs of fraying?
> - Is the stitching beginning to come loose?

Other Bullet and Numbering Options

For more bullet or numbering options in Word, click the drop-down arrow next to a list option.
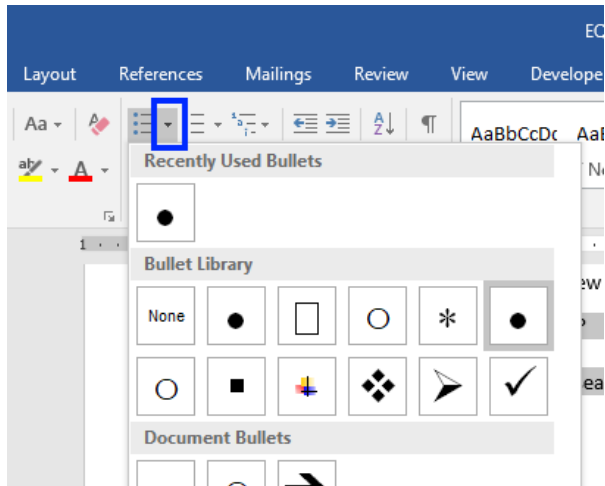
⛰ Step 3: Ensure all Images are Accessible

Images can perform a variety of useful tasks, such as supplementing your lecture content or providing thoughtful imagery for discussion. To make them available to students unable to see them, they need text representation, called alternative text.
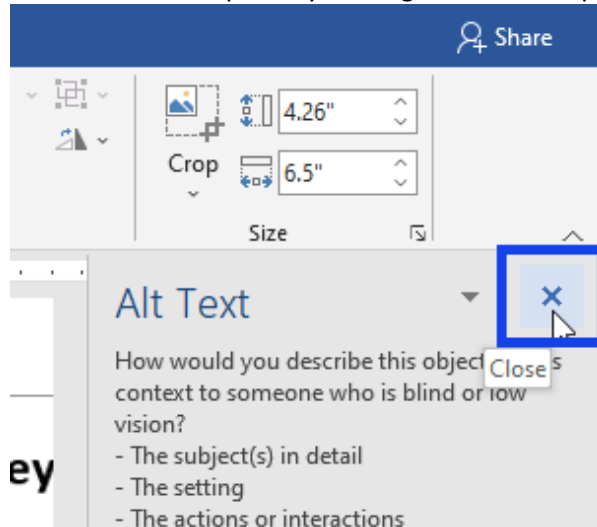
Adding Alternative Text to an Image in Word

1. After inserting an image, **right-click** the image and select **Edit Alt Text** from the menu that appears.

2. The Alt Text pane appears on the right. Type the image's text representation in the box. (*Note: Do **NOT** check the box next to Mark as decorative. This feature does not yet work properly.*)

3. Close the Alt Text pane by clicking the **X** in the upper-right corner.

Often, a **long description** will be required for more complex or educational graphics. When the information portrayed in an image requires more text representation than what can be provided in its succinct alternative text, a long description will provide the means by which you can further describe an image.

All students can benefit from having access to the long description; they will have access to the information you have decided is important for them to know about the image. (See *Appendix A* for more information on providing long descriptions.)

Adding a Long Description to an Image in Word

1. Type the long description near the image. For example, as a paragraph after the image.

2. **IMPORTANT!** Type the location of the long description in the image's alt text so the student using assistive technology will know where to find it.
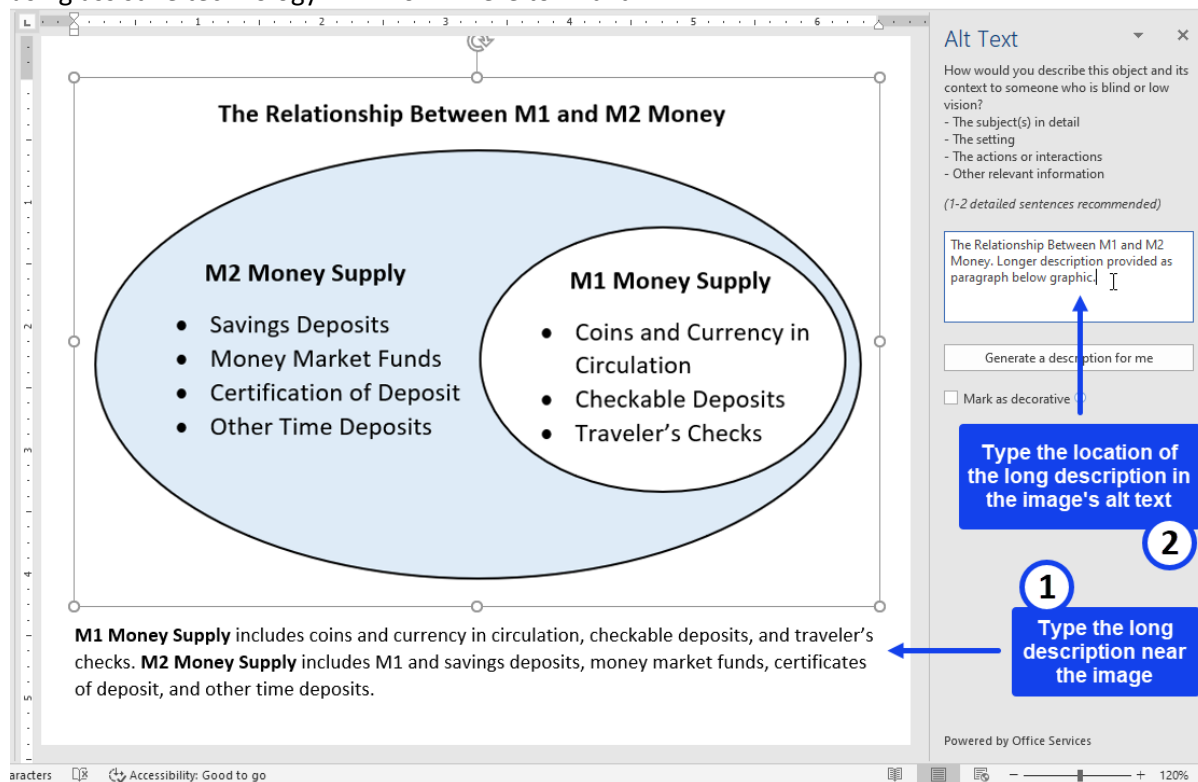
⚭ Step 4: Compose Descriptive Hyperlinks

When creating a hyperlink, use **descriptive language** that specifies the purpose of the link. This is usually a few words, or a succinct description, stating where the link leads.

When creating a hyperlink in Word, first determine whether it is to a **webpage** or to a **downloadable file**.
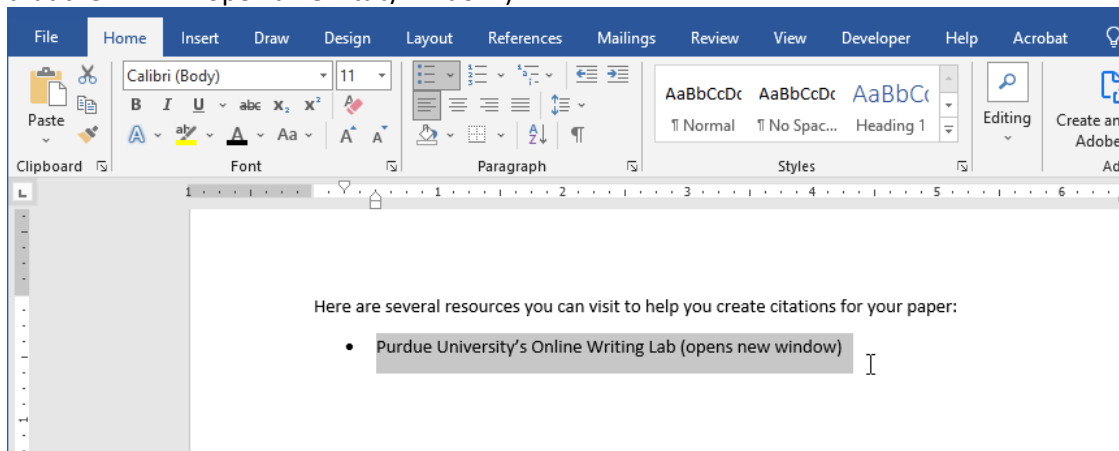
Creating a Hyperlink to a Webpage

If creating a hyperlink to a webpage, first visit the website and copy the page's address (URL).
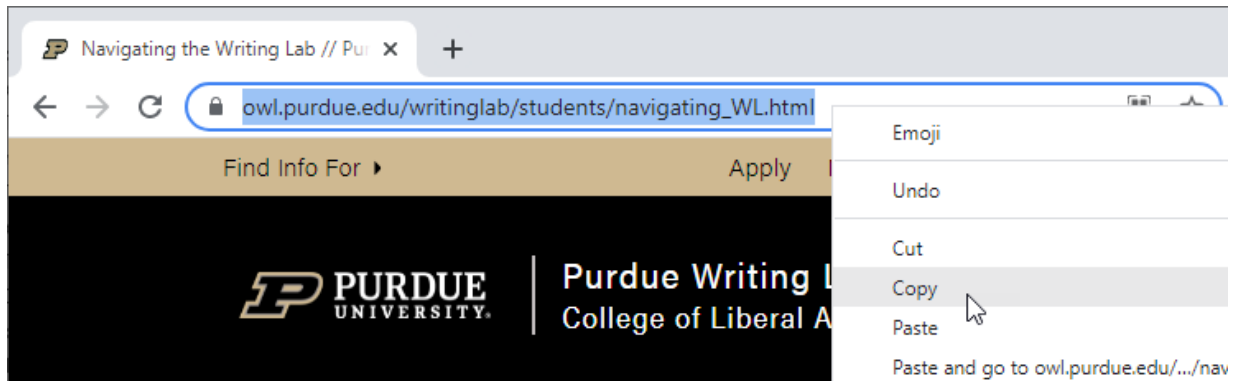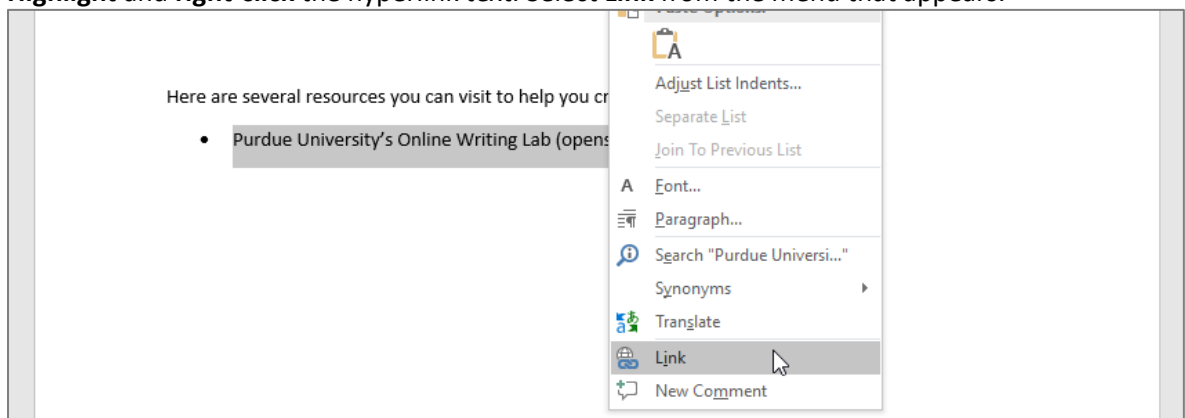

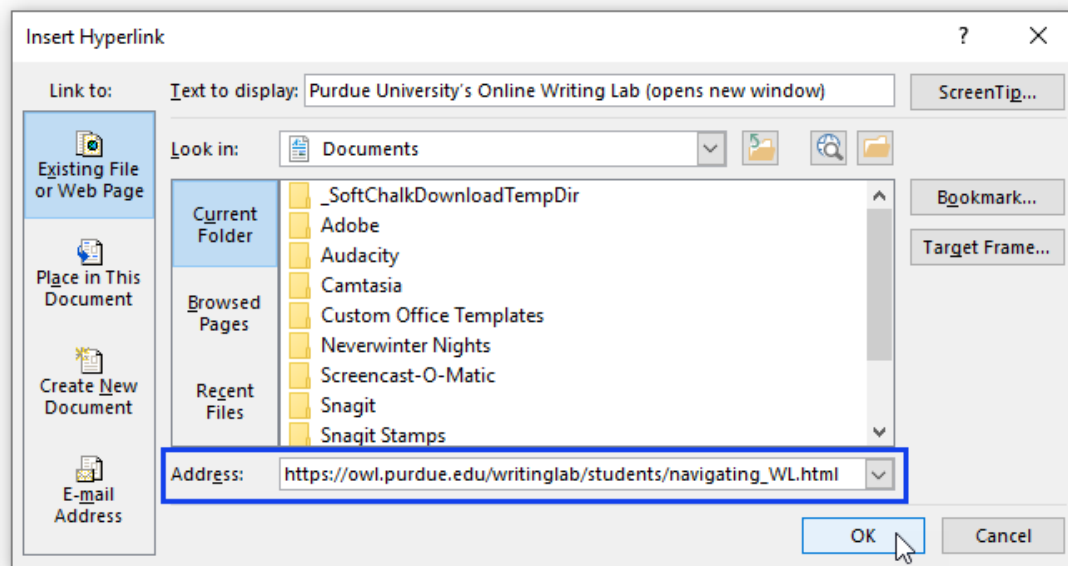**To Create a Hyperlink in Word:**

1. Type the descriptive hyperlink text, and **highlight** it. (Remember to indicate in the hyperlink text that the link will open a new tab/window.)

2. **Highlight** and **right-click** the hyperlink text. Select **Link** from the menu that appears.

3. A dialog box appears. In the **Address** field, paste the address (URL). Click **OK**.

4. The hyperlink is active (clickable).

> Here are several resources you can visit to help you create citations for your paper:
>
> - Purdue University's Online Writing Lab (opens new window)

If you think the document will likely be printed, it is recommended that you **paste the address (URL)** near the active hyperlink as a courtesy. (Pasting the address is not necessary for accessibility compliance; however, it *is* useful when the content is printed, and if the URL is longer, you can shorten it using Bitly.com or shorturl.at.)

Creating a Hyperlink to a File

If you're creating a link to a downloadable file, indicate the type of file in the active hyperlink text. This helps make students aware that they will be downloading a file.

- If the file is a:
    - Word document, then use (doc or DOC)
    - Adobe PDF file, then use (pdf or PDF)
    - PowerPoint presentation, then use (ppt or PPT)
    - Text file, then use (txt or TXT)
    - For example: North Carolina Climate Science Report (PDF)

(If you'd like, you can substitute **Word doc** for DOC, **PowerPoint** for PPT, etc. The important measure you are taking is indicating the **type** of file.)

⊞ Step 5: Create Accessible Tables

An accessible table generally contains simple data or structured information that is logical from left to right, top to bottom. It will have a title and a header row.


Table 1: Sample Enrollment Data

Semester	Number of Online Students	Number of Face-to-Face Students
2018FA	1440	902
2018SP	1188	877
2018SU	900	973
2018FA	1201	881

To Create a New Table:

1. Select the **Insert** tab on the Ribbon.
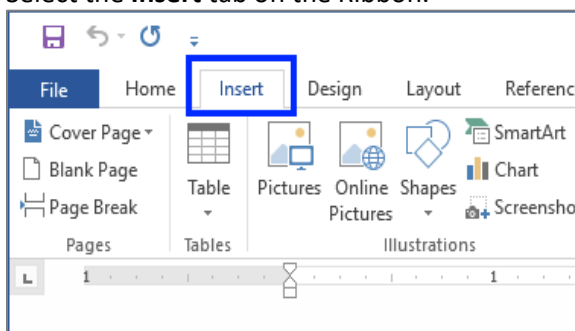
2. Click the **Table** command. A drop-down menu containing a grid of squares will appear. Hover the mouse over the grid to select the number of **columns** and **rows** in the table.
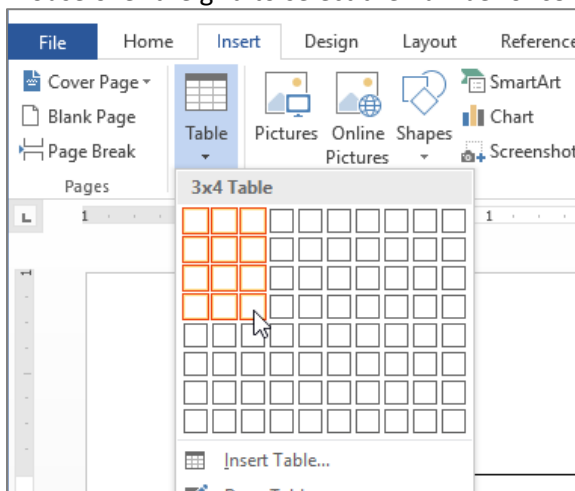
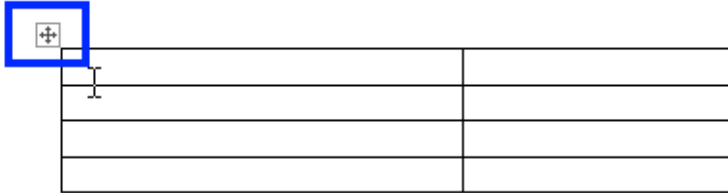3. Click the mouse, and the table appears in the document.

Formatting a Table for Accessibility

Adding a title and denoting the header row help make a table more accessible.
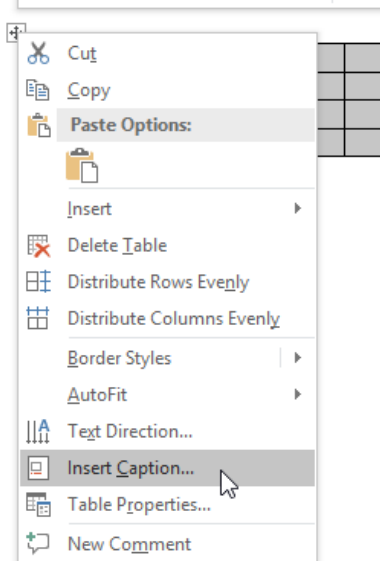
To Add a Title

Providing a title introduces the table to someone using assistive technologies, and it will also help identify the table's content for everyone. Word identifies a title as a caption.
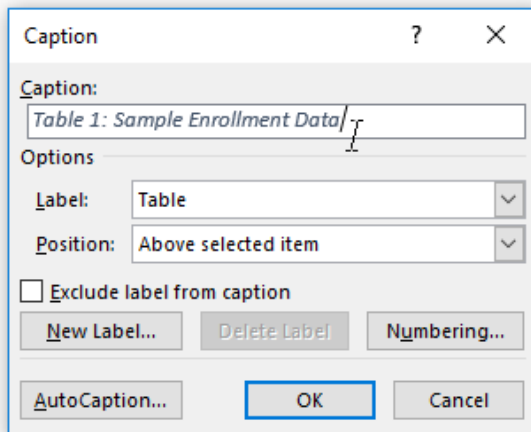
1. Hover the mouse over the table. A **plus sign** appears in the upper-left corner.
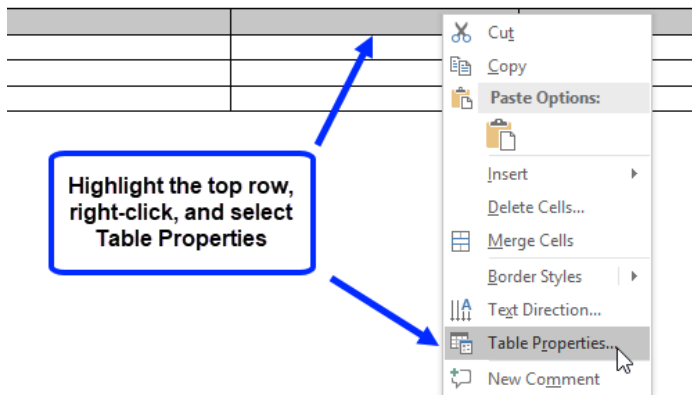

2. **Right-click** the plus sign and select **Insert Caption.**

3. A dialog box appears. In the **Caption:** field, type a title for the table and click **OK**.
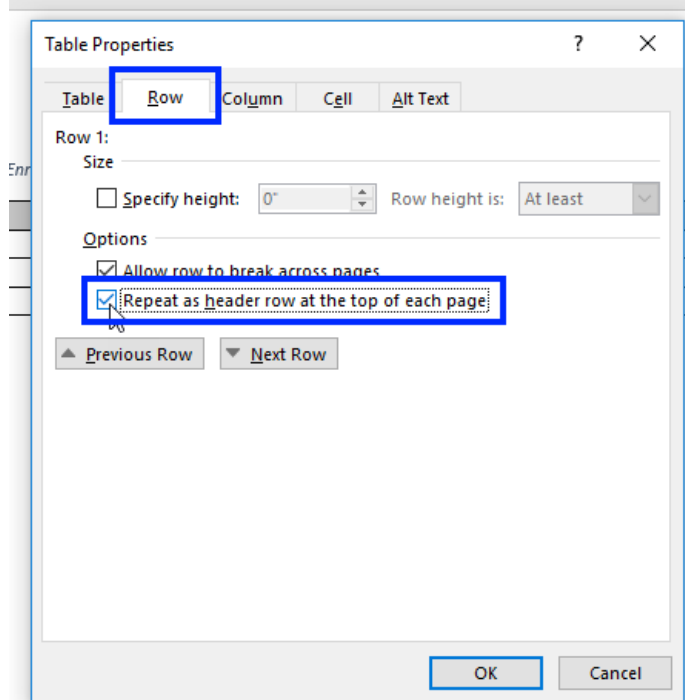

4. The caption/title appears above the table.

To Identify the Header Row

1. Highlight the top row and right-click. Select **Table Properties** from the menu that appears.

2. A dialog box appears. Select the **Row** tab, and place a check in the box next to **Repeat as header row at the top of each page.**

Other Accessibility Considerations When Creating Tables

- **Avoid Blank Cells.** If a blank cell is needed in your table, type *blank cell* or *data not available* (or another word that makes sense in the context of the table, such as *data unknown*) in the cell. If the visual appearance of a blank cell is desired, you may change the font color of this text to match the cell's background color.

- **Avoid Merging or Splitting Cells.** When merged or split cells are present, the table will become inaccessible by either causing the screen reading software to repeat information or skip around in the table. The result is disorienting for the listener and the table's format can be confusing for other students to interpret.

- **Avoid creating page layouts with tables.** Tables should be used to present data or structured information.

- **Avoid creating blank rows or columns** to visually control the spacing in your table. Adjust line spacing instead.

Restrict Rows from Breaking across Pages

When a table becomes large enough that it needs an additional page to display all of the content, restricting the table's ability to break rows across pages will help keep each row's information intact and easier to follow.

● In the example below, Row 3 is breaking across pages.

		• Take the self-assessment
2	Chapter 2	Take the quiz
3	Chapter 3	• Submit your Journal (Weeks 1 through 3)

The information in Row 3 is broken across two pages

		• Watch the video on Financial Literacy and take the Week 3 quiz
4	Chapter 4	• Submit your SMART goal • Submit your questions for next week's guest speaker

● Restricting the table's ability to break rows across pages moves the broken row (Row 3) to the next page.

		• Introduce yourself in the discussion board • Take the self-assessment
2	Chapter 2	Take the quiz

Row 3 is no longer broken across pages. All of the information appears on the next page

| Week	Readings	Assignment(s)
3	Chapter 3	• Submit your Journal (Weeks 1 through 3) • Watch the video on Financial Literacy and take the Week 3 quiz
4	Chapter 4	• Submit your SMART goal • Submit your questions for next week's guest speaker

To restrict rows from breaking across pages:

1. Select the entire table.

Week	
1	Chapter 1
2	Chapter 2
3	Chapter 3

2. Right-click, and choose Table Properties from the menu that appears.
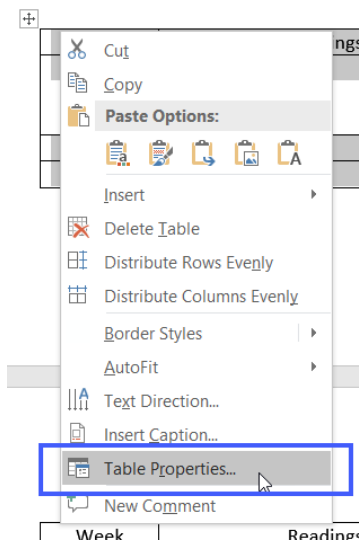
3. Select the **Row** tab, and uncheck the box next to **Allow row to break across pages**.
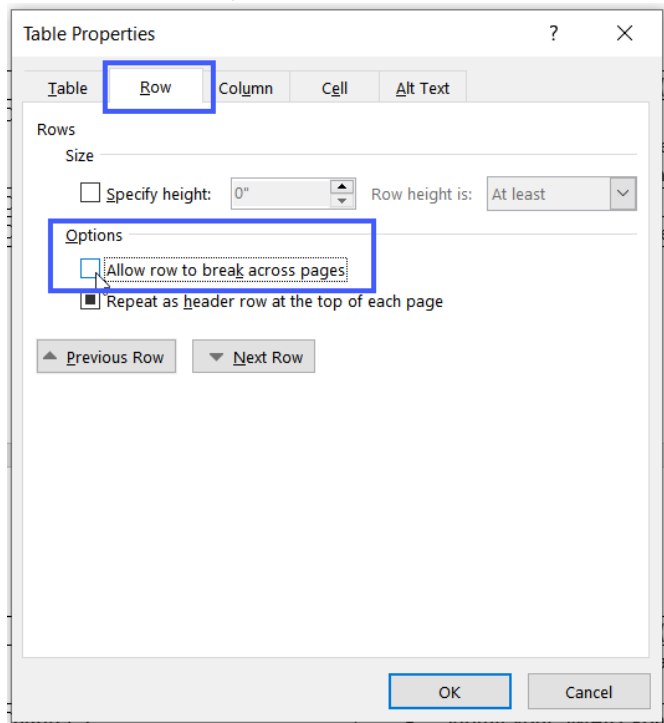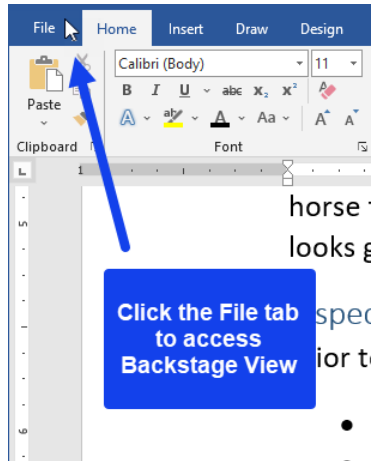

4. Click **OK**. The rows will no longer break across pages.

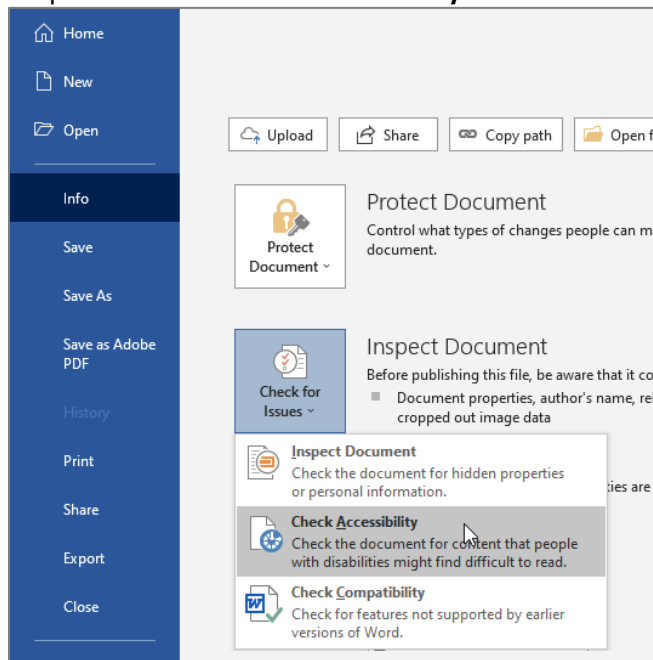# ✓ Step 6: Running the Accessibility Checker

Microsoft Word has a built-in **Accessibility Checker** that can help you verify the accessibility compliance of documents. The Accessibility Checker scans the file and looks for content that could be a potential barrier or issue for people with disabilities.

To Activate the Accessibility Checker:

1. Click the **File** tab to access **Backstage View**.

2. Make sure **Info** is selected on the Backstage View menu, and then click the **Check for Issues** drop-down. Select **Check Accessibility**.

Addressing Accessibility Issues

When the Accessibility Checker detects one or more accessibility issues, a list of **Errors and Warnings** appears in its **Inspection Results**. From the Accessibility Checker's **Inspection Results**, select an **issue**. The inaccessible content becomes **highlighted** in the document, and information about how to fix the issue appears under the **Additional Information** area of the Accessibility pane (see *Figure 21*).
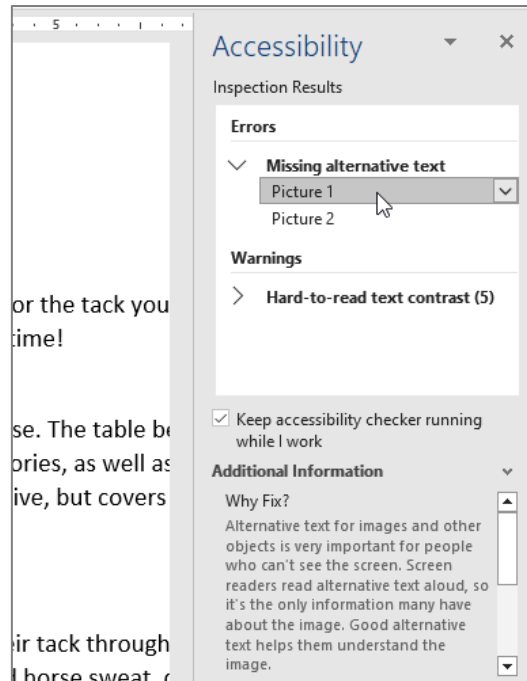
Figure 21: The Accessibility pane in Microsoft Word

FAQ: Can I trust the Accessibility Checker to catch everything?

Unfortunately, no. While the Accessibility Checker catches some accessibility issues, it does not take the place of human review. For detailed information on the errors and warnings the Accessibility Checker currently looks for, please visit:

Microsoft's Accessibility Checker Rules page
URL: https://bit.ly/3uvRaht

Part 5: Authoring Accessible PowerPoint Presentations

Step 1: Consider Color Contrast and Accessible Font Styles

Microsoft Office offers a number of colors and themes that can be applied to slides in PowerPoint. If you wish to use a theme, consider each one carefully for proper color contrast and a readable font style and size.
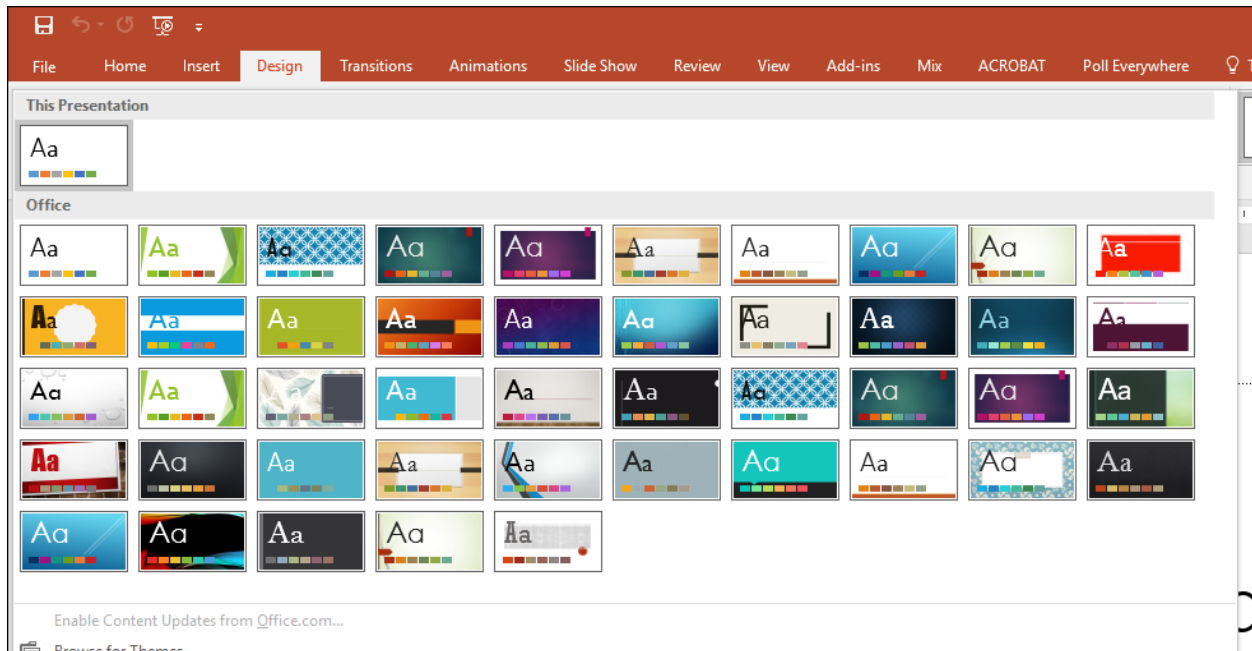
You can check the color contrast in a couple of ways:

- With your printer's black and white option, print a page to check whether or not the contrast is sufficient.
- Test the foreground and background color with the Color Contrast Analyzer by TPGi (see *Part 7* for a link to the TPGi Color Contrast Analyzer.)

Other Accessible Color, Contrast, and Font Considerations

- When using color to convey information, reinforce the color with text (or symbols) so people who cannot perceive color can access the information.
- Fonts should be readable.
- Limit the number of fonts.
- Avoid using ALL CAPS or all underlined text.

⛰ Step 2: Structure the Presentation

When you're ready to add content to a slide, PowerPoint has a number of built-in **slide layout templates**, many of which contain **placeholders** for entering text, lists, images, tables, and more. Using slide layout templates will **structure** the content of your presentation, making it easier for your students to understand the information, as well as making it accessible to assistive technology.
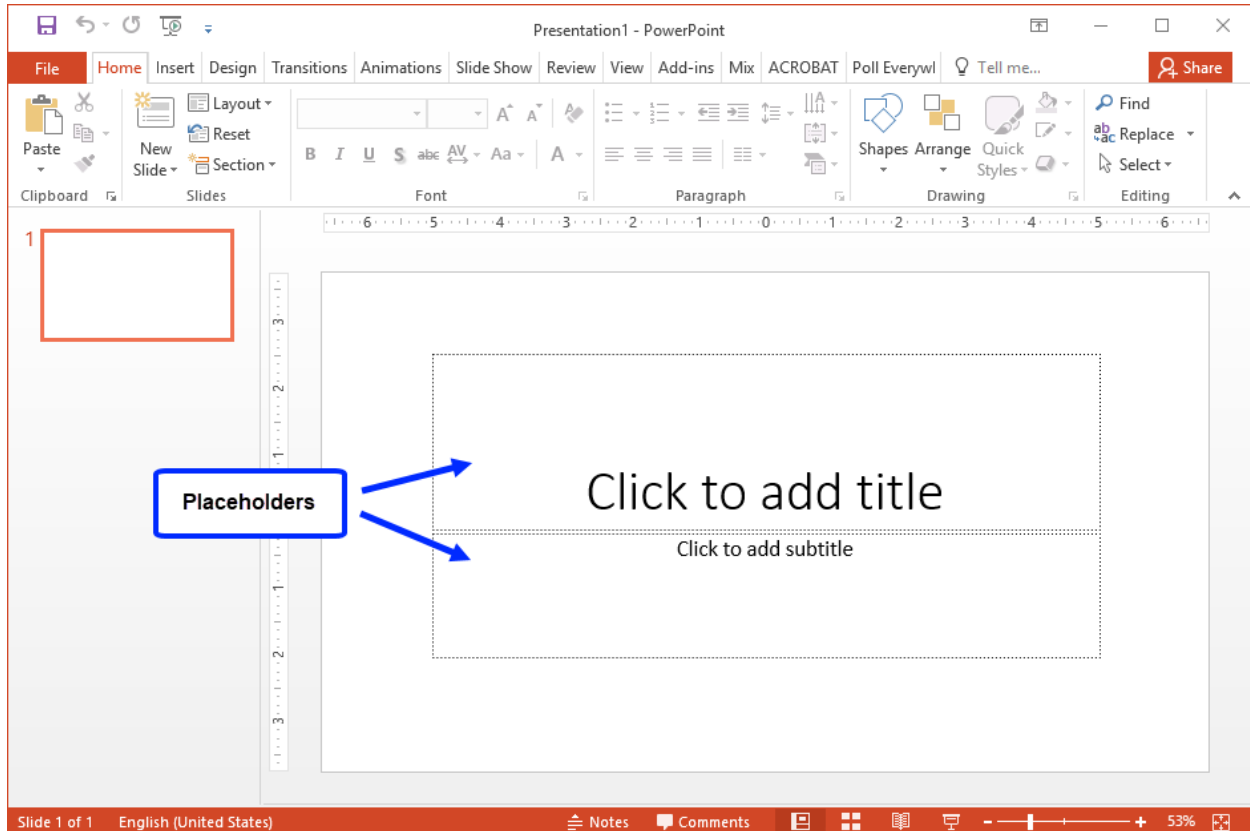

Figure 22: Title Slide layout template

The Title Slide layout template in *Figure 22* is one of the templates in PowerPoint's collection of slide layout templates.

Considering Slide Layout Templates

The variety of slide layout templates offered in PowerPoint allows you to select a placeholder arrangement that best suits the style in which you wish to present your content. *Figure 23* presents PowerPoint's default collection of slide layout templates (see *Figure 23*).
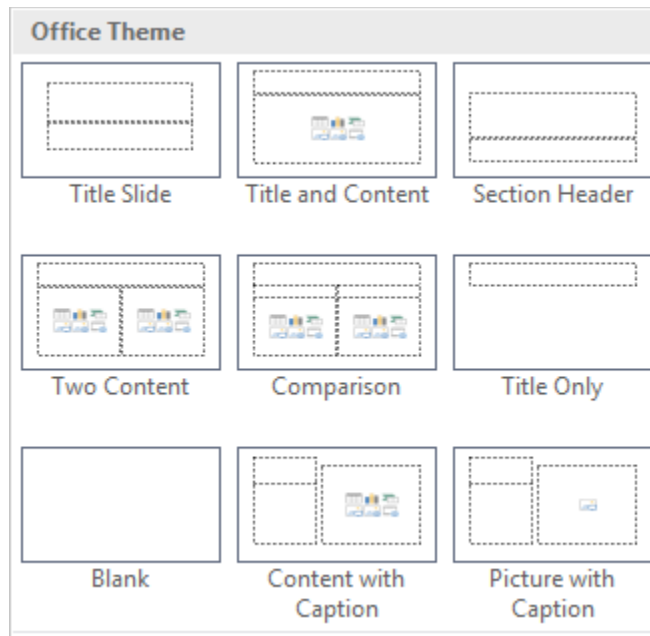
Figure 23: PowerPoint's collection of slide layout templates

Avoid using the Blank slide layout template

If you prefer to start with a "blank slate" in PowerPoint, it can be tempting to select the Blank slide layout and build upon it. However, starting from a blank slide and adding content to it is inaccessible because screen reading technology may not be able to find the content. Though located within the list of slide layout templates, the Blank slide is not a template, and unfortunately, does not provide the necessary structure.
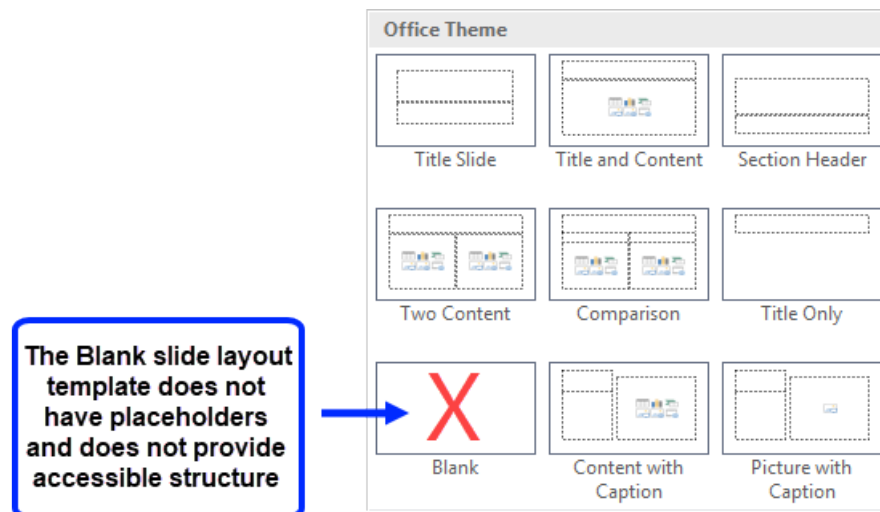

Figure 24: Avoid the blank slide layout

Rather than selecting the Blank slide, use one of the slide layout templates that has content placeholders.

Avoid adding text boxes to slides

Text boxes are very difficult for users of assistive technology to navigate, and they may not convert well into other formats such as PDF, Braille, or large print. Think of text boxes as objects that "float" above the slide and are very difficult to reach by assistive technology. This potentially creates a barrier to your content.
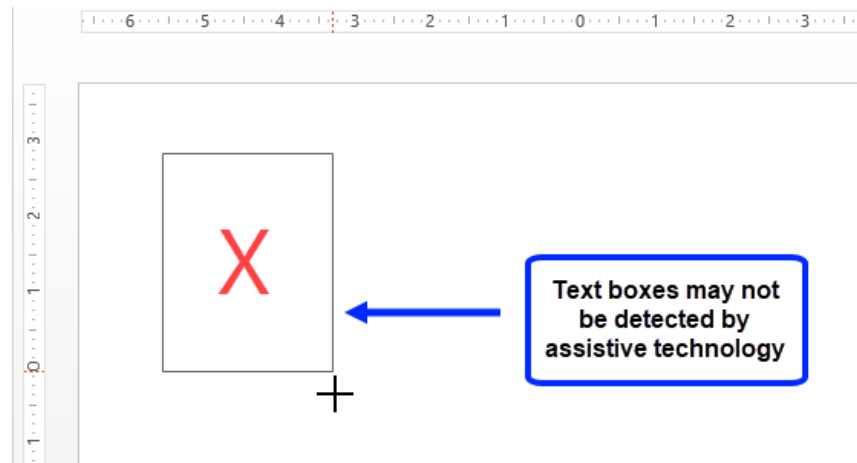

Figure 25: Avoid drawing a text box on a slide

Instead, select a slide layout template that has at least one placeholder.

Avoid using the Insert tab to insert pictures (or other objects) to slides

Similar to text boxes, images inserted with the Insert tab are also difficult for users of assistive technology to navigate, and when the presentation is converted into other formats such as PDF, Braille, or large print, an image inserted with this technique may not be available to an assistive technology user. Like text boxes, images inserted with the Insert tab also "float" above the slide, potentially creating a barrier to your content.
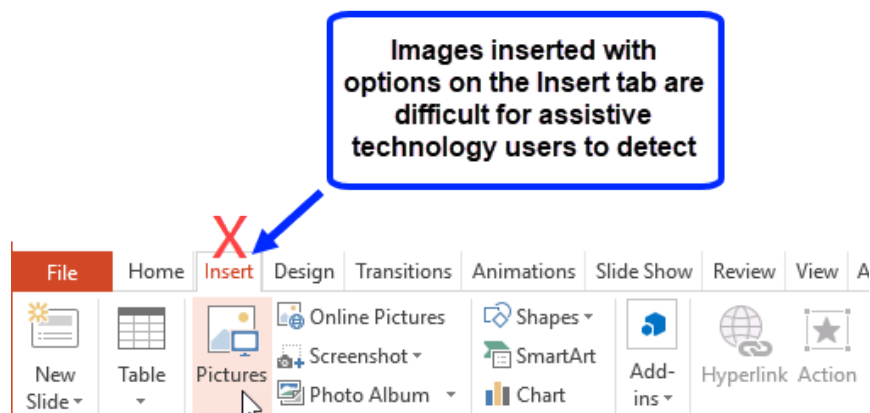

Figure 26: Avoid inserting a picture through the Insert Tab

Instead, select a slide layout template that has at least one content placeholder. Specifically: Title and Content, Two Content, Comparison, Content with Caption, or Picture with Caption.
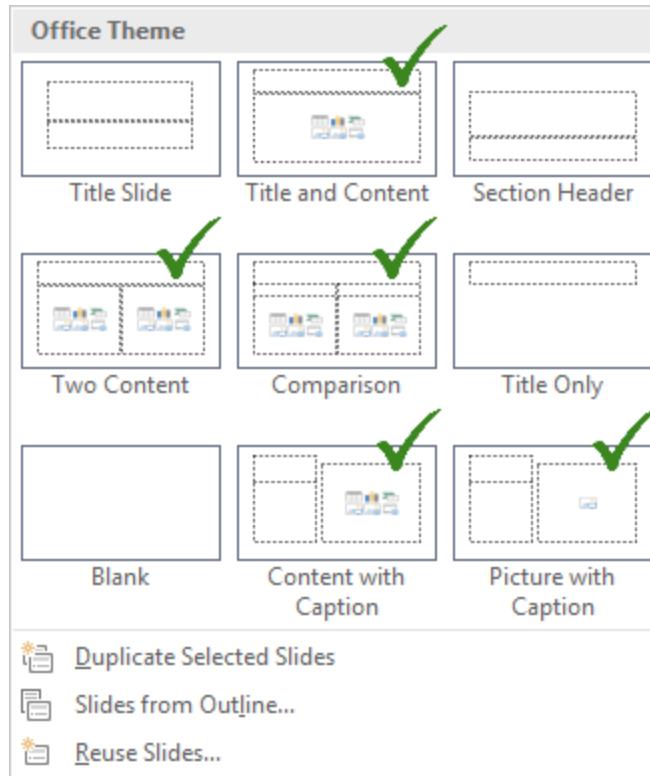
Figure 27: Five slide layouts have
at least one content placeholder

Then, once a slide layout template with a content placeholder is selected, click the **Pictures** icon to insert an image.
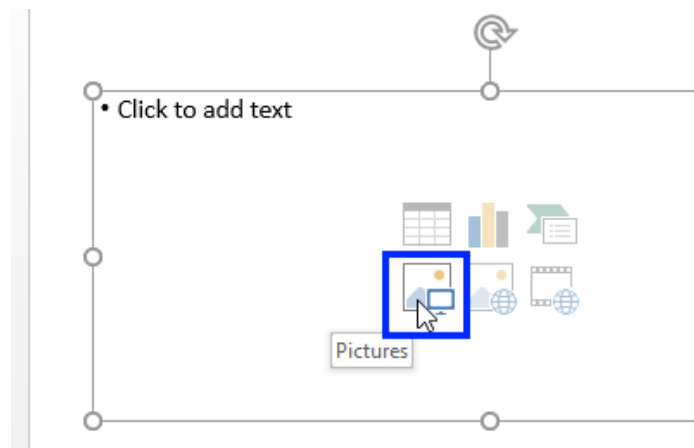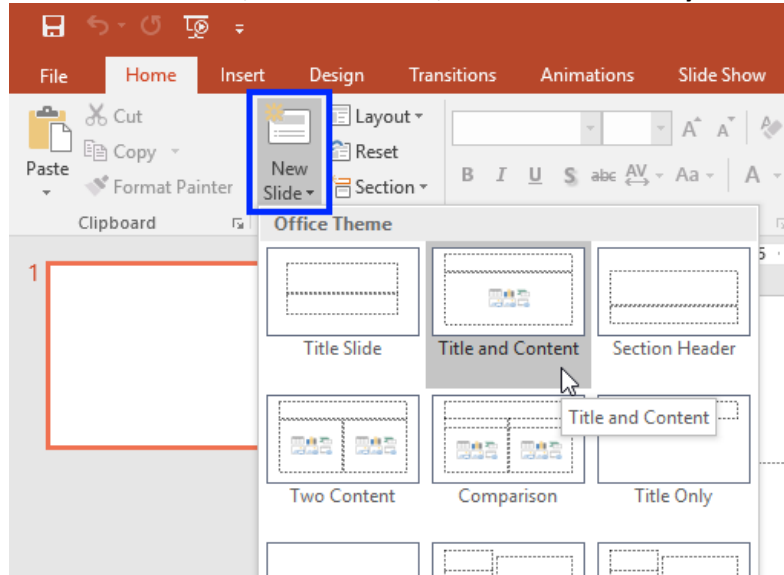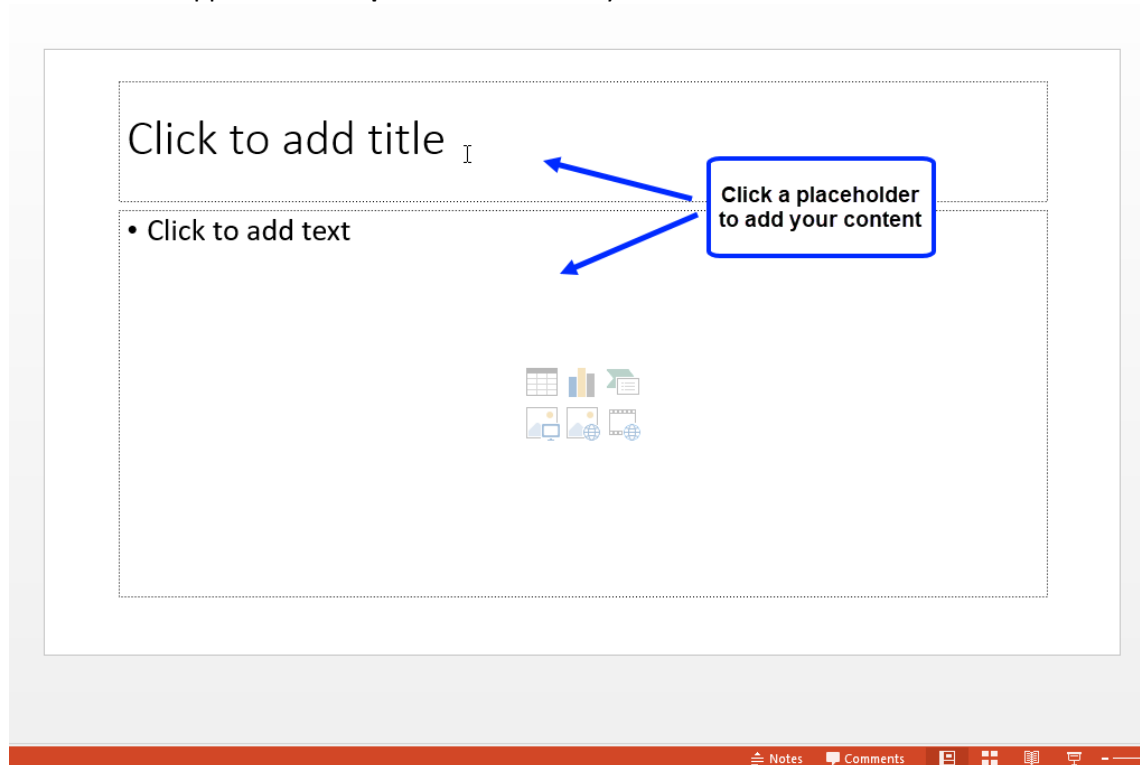

Figure 28: The Pictures icon in the placeholder

To Create a New Slide:

1. From the **Home** tab, click **New Slide**, and then select a **layout template**.
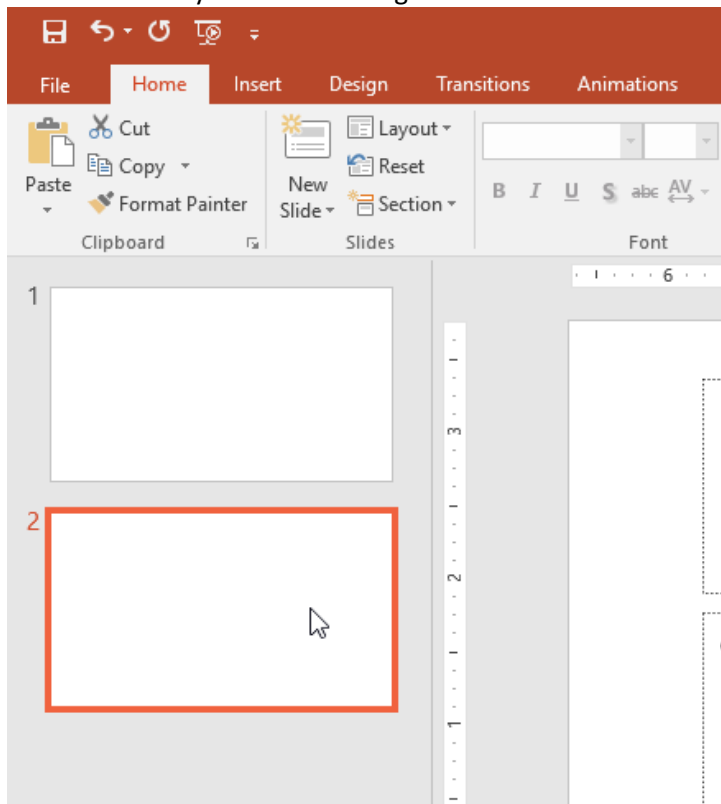

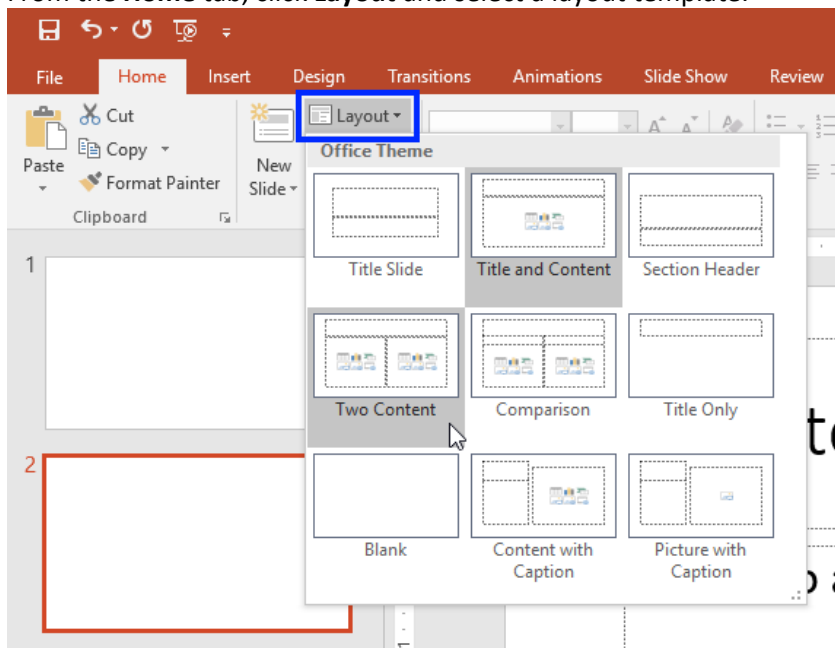2. The new slide appears. Click a **placeholder** to add your content.

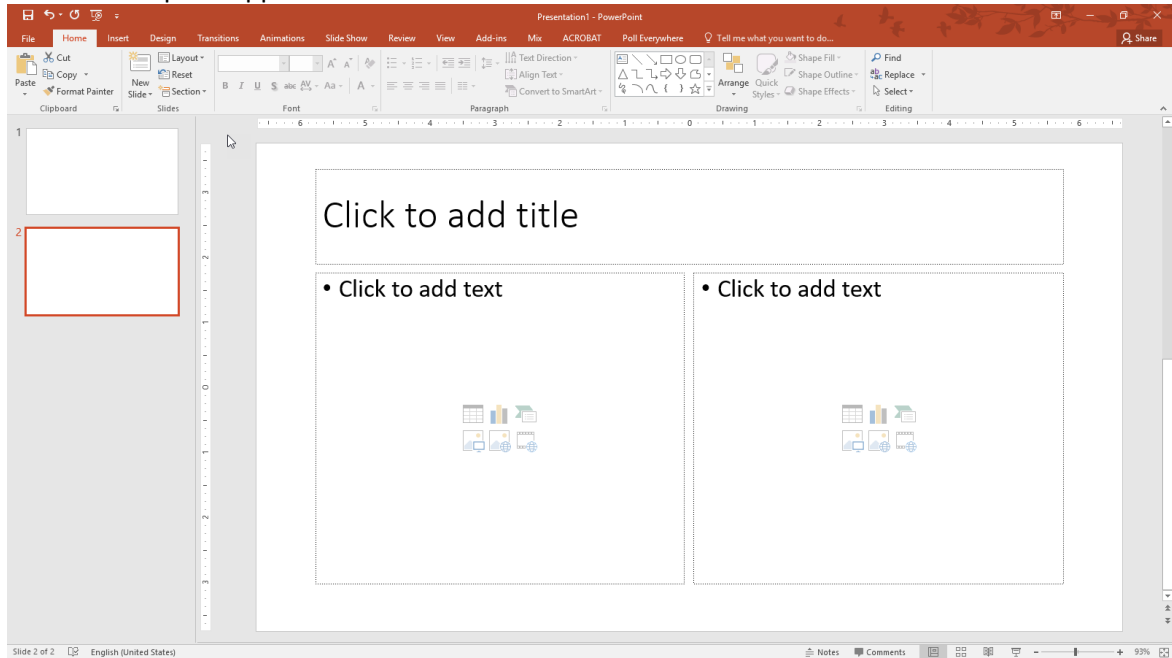**To Modify the Layout of an Existing Slide:**

1. Select the slide you wish to change.

2. From the **Home** tab, click **Layout** and select a layout template.

3. The new template appears on the slide.

Bulleted and Numbered Lists in PowerPoint

When developing text content, avoid writing paragraphs or long passages in the content placeholders. Instead, use PowerPoint's bulleted and numbered list commands to help structure the text on your slide. Using lists will make the content more manageable for students to digest, and screen reading software will announce when it has arrived at a list, informing the user to expect a series of items.

By default, many content placeholders in PowerPoint will begin to format your text as a bulleted list as soon as you start to type; however, you can also create a numbered list.

To Create a Bulleted List:

1. Make sure you have selected a **template** that contains at least one **content placeholder**. Click the content placeholder and type the first list item. By default, the content placeholder will format the text as a bulleted list item.

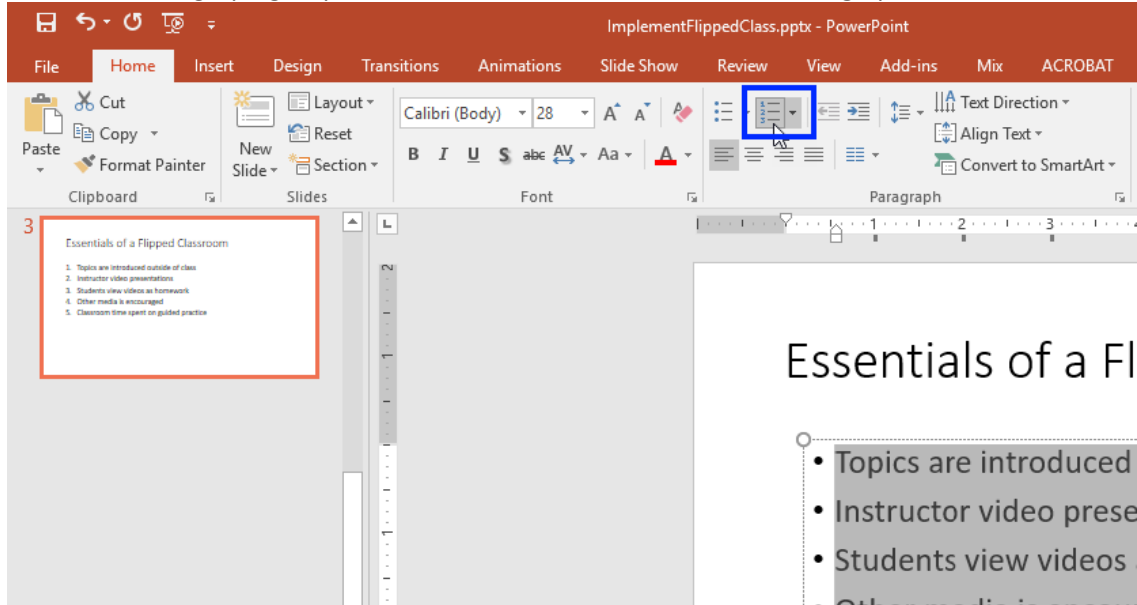2. Press **Enter** to move the cursor to the next line.
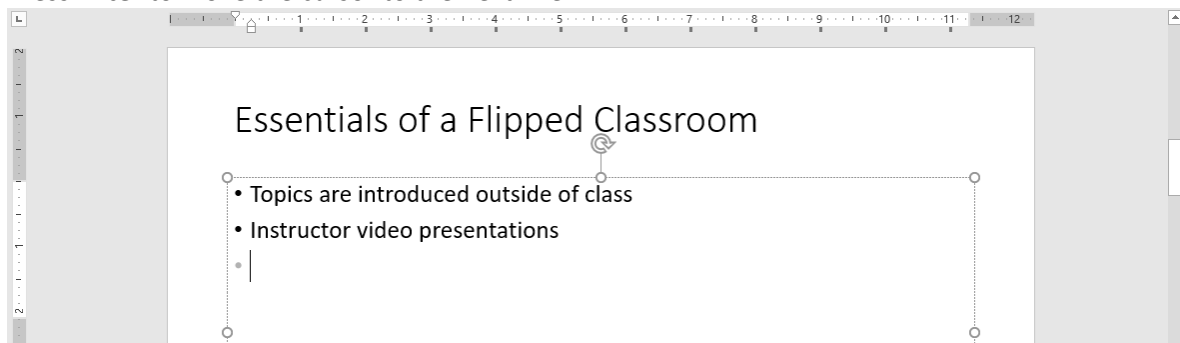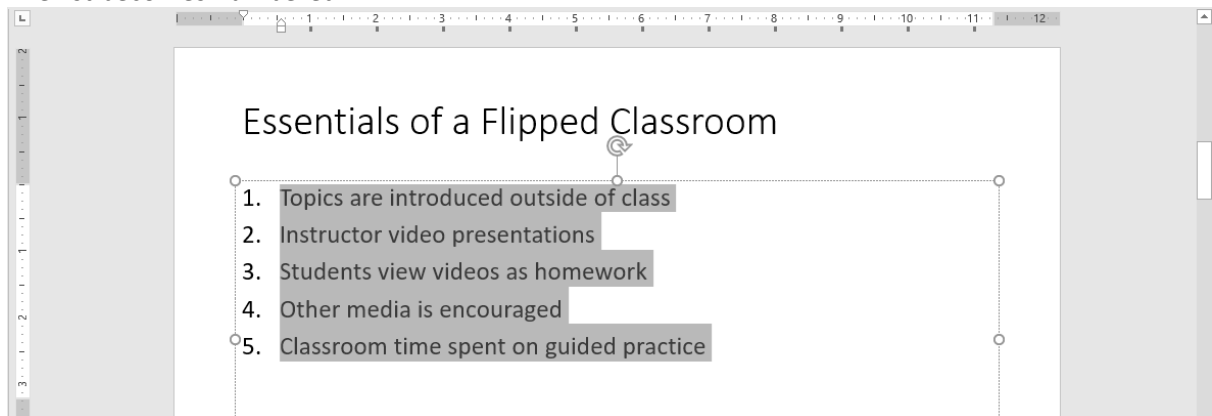
To Create a Numbered List:

1. Highlight the list items you want to number.
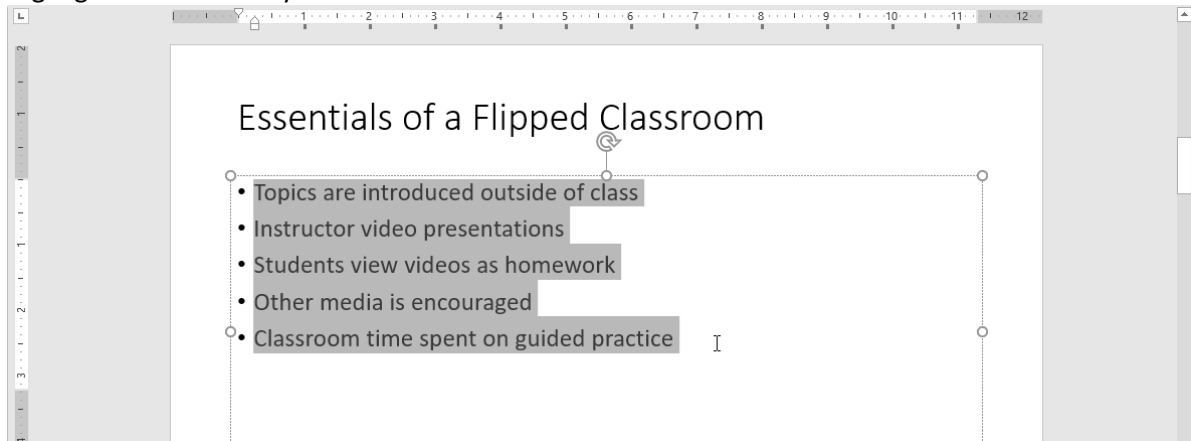
2. Locate the Paragraph group on the **Home** tab, and click the **Numbering** option.


3. The list becomes numbered.

Viewing a Presentation in Outline View

Beyond accessibility, one of the benefits of utilizing PowerPoint's placeholders is the ability to **view an outline** of the presentation to verify its structure. **Outline View**, located on the **View** tab, displays all of the text content that has been added to each slide's title and content placeholder(s). It provides an easy way to make sure all of your slide titles are unique and all of your text content is available to screen reading technology.

Once you've created some content, you can then verify the presentation's structure in Outline View.

1. Click the **View** tab, and select **Outline View**.
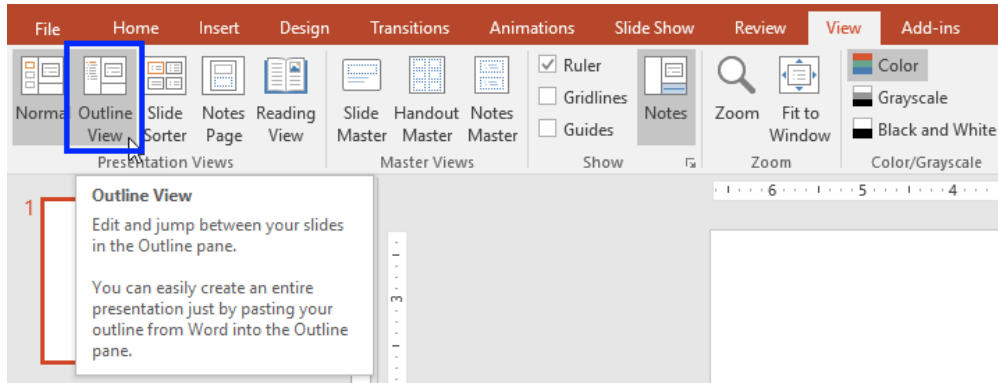
2. The **Outline** pane appears on the left side of the screen. Check to make sure each slide has a **unique title** and that all of the slide text is appearing. (Note that each slide title appears as bold text.)
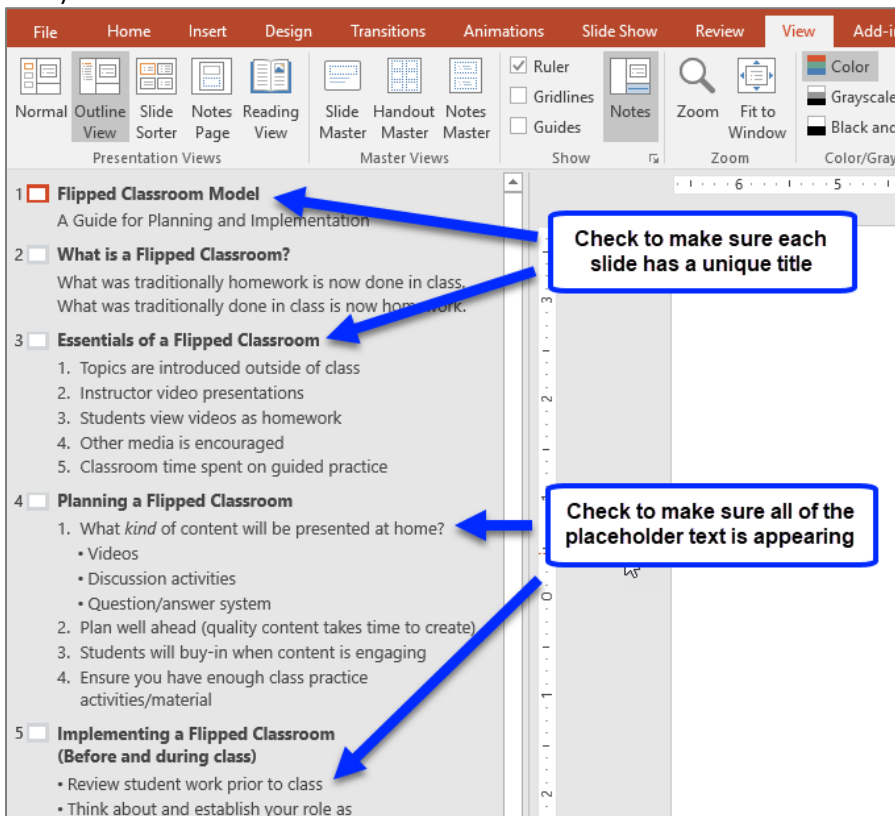
⛰ Step 3: Ensure all Images are Accessible

Images can perform a variety of useful roles, such as supplementing your lecture content or providing thoughtful imagery for discussion. To make images available to students unable to see them, they need text representation, called **alternative text**.

Adding Alternative Text to an Image in PowerPoint

1. After inserting an image, **right-click** the image and select **Edit Alt Text** from the menu that appears.
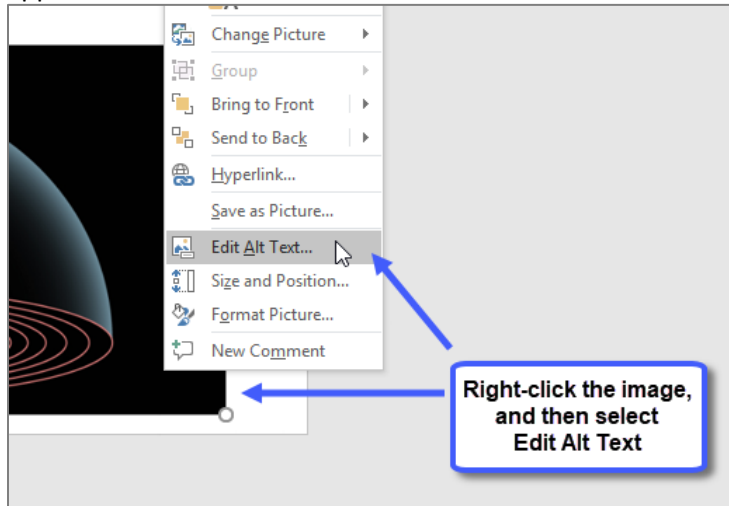
2. The **Alt Text** pane appears on the right. Type the image's text representation in the box. (*Note: Do **NOT** check the box next to Mark as decorative. This feature does not yet work properly.*)
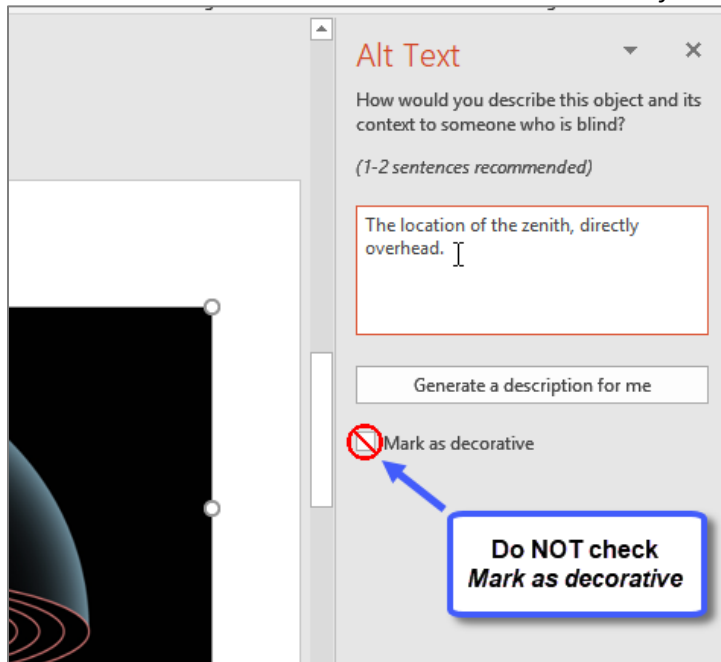
3. Close the Alt Text pane by clicking the **X** in the upper-right corner.
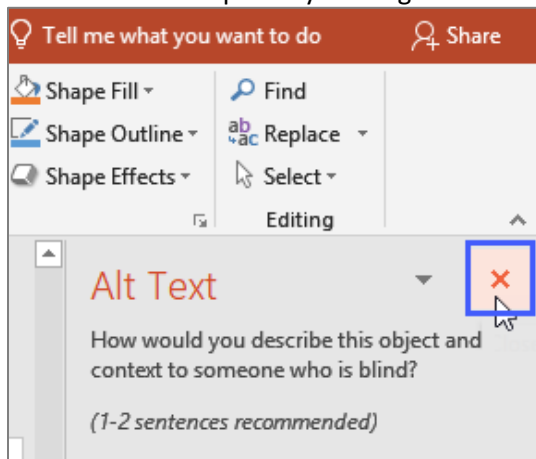
Determining When to Use a Long Description

Often, a long description will be required for more complex or educational graphics. When the information portrayed in an image requires more text representation than what can be provided in its succinct alternative text, a long description will provide the means by which you can further describe an image.

All students can benefit from having access to the long description; they will have access to the information you have decided is important for them to know about the image. (See *Appendix A* for more information on providing long descriptions.*)*

Depending on the amount of space needed for the long description text, the long description can be typed in the Notes area of a slide or included as a list on the slide itself. (If a paragraph is needed, it's best to type the long description in the Notes area.)

IMPORTANT! Type the location of the long description in the image's alt text so any student using screen reading technology will know where to find it.
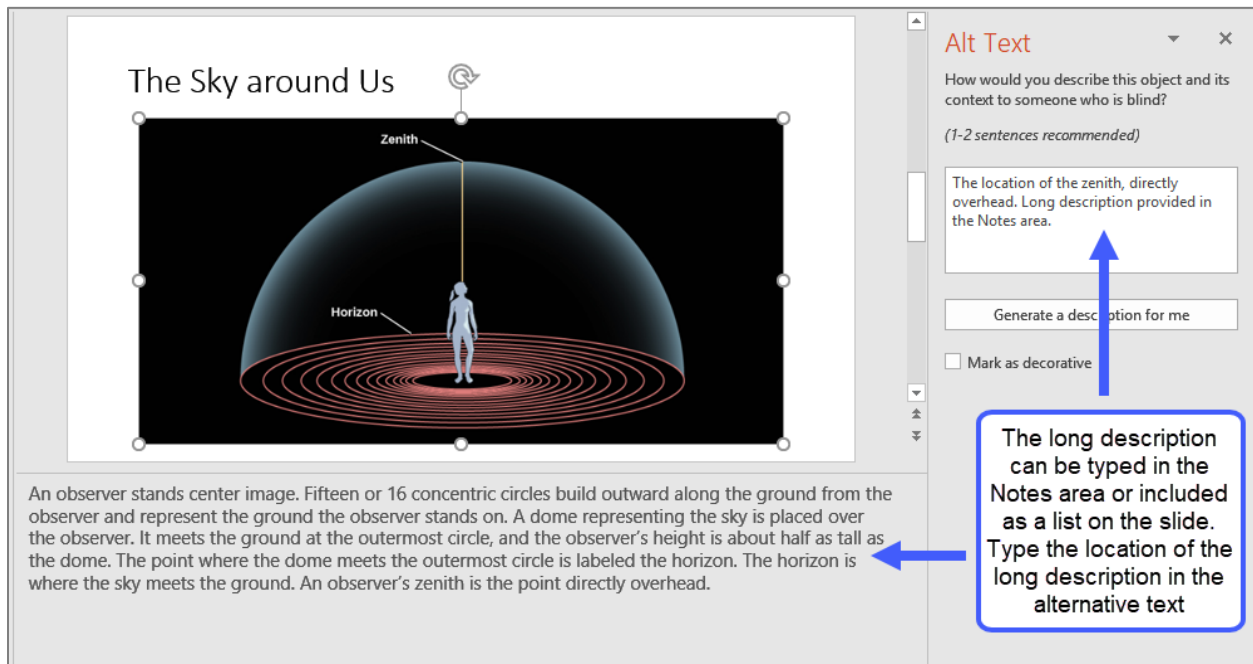
Figure 29: Viewing the long description for an image in the Notes area of a slide, as well as the image's alternative text in the Alt Text pane.

⚓ Step 4: Compose Descriptive Hyperlinks

Hyperlinks in PowerPoint can be tricky, in general, for assistive technology users to navigate. Use **descriptive language** that specifies the purpose of the link. This is usually a few words, or a succinct description, stating where the link leads.

When creating a hyperlink in PowerPoint, first determine whether it is to a **webpage** or for a **downloadable file**.

Creating a Hyperlink to a Webpage

If creating a hyperlink to a webpage, first visit the website and copy the page's address (URL).
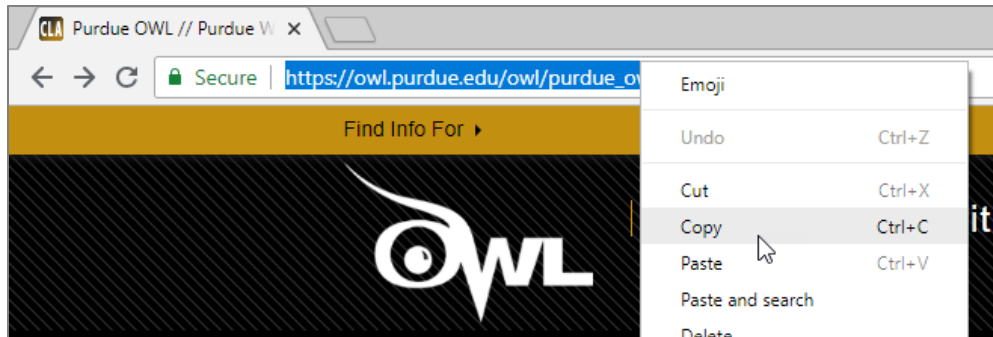
To Create a Hyperlink in PowerPoint:

1. Type the hyperlink text. To help ensure the student is alerted to the presence of a hyperlink to a **webpage**, always include: **(link)** as part of the hyperlink text.
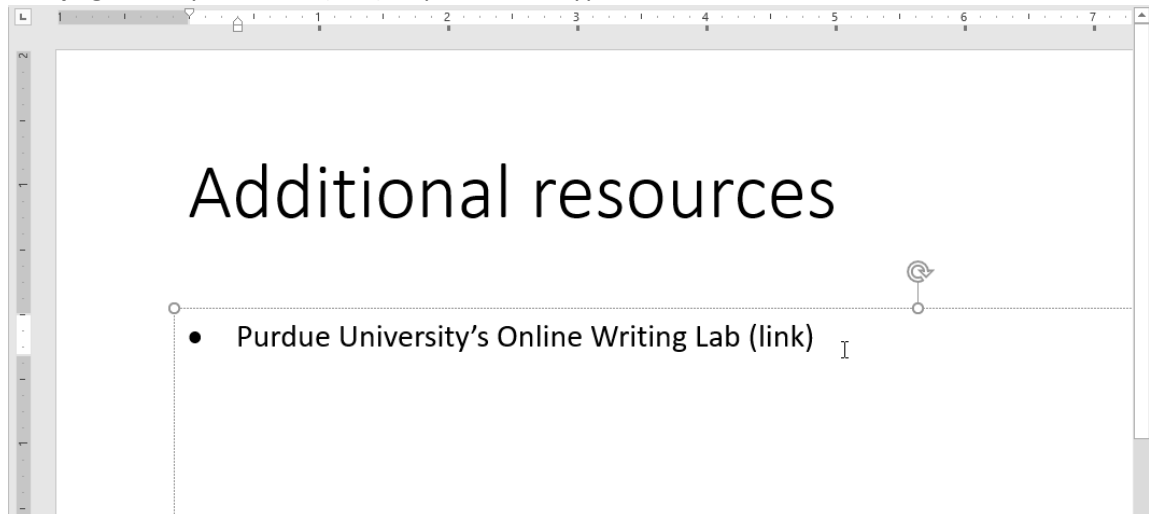
2. **Highlight** the hyperlink text and **right-click**. Select **Hyperlink** from the menu that appears.
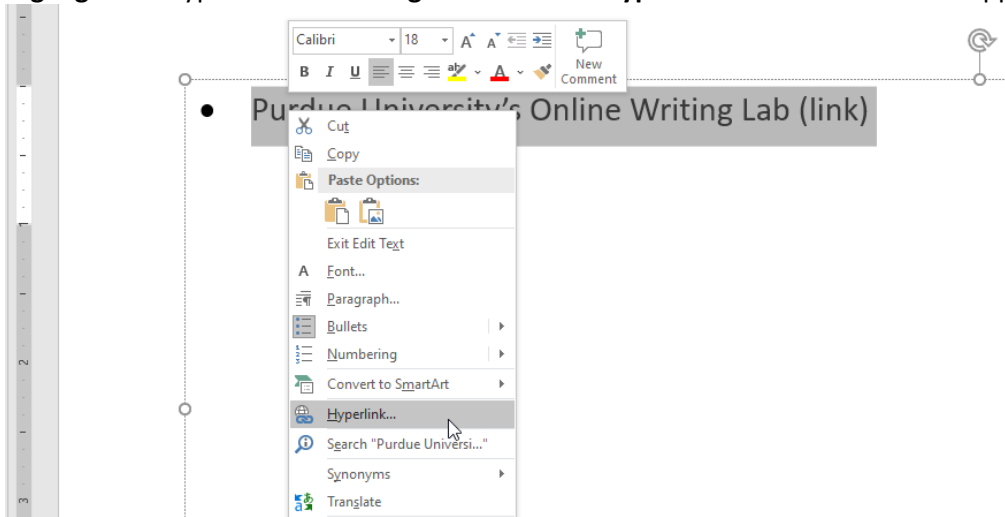
3. A dialog box appears. In the **Address** field, paste the address (URL). Click **OK**.

4. The hyperlink is active (clickable).

- Purdue University's Online Writing Lab (link)
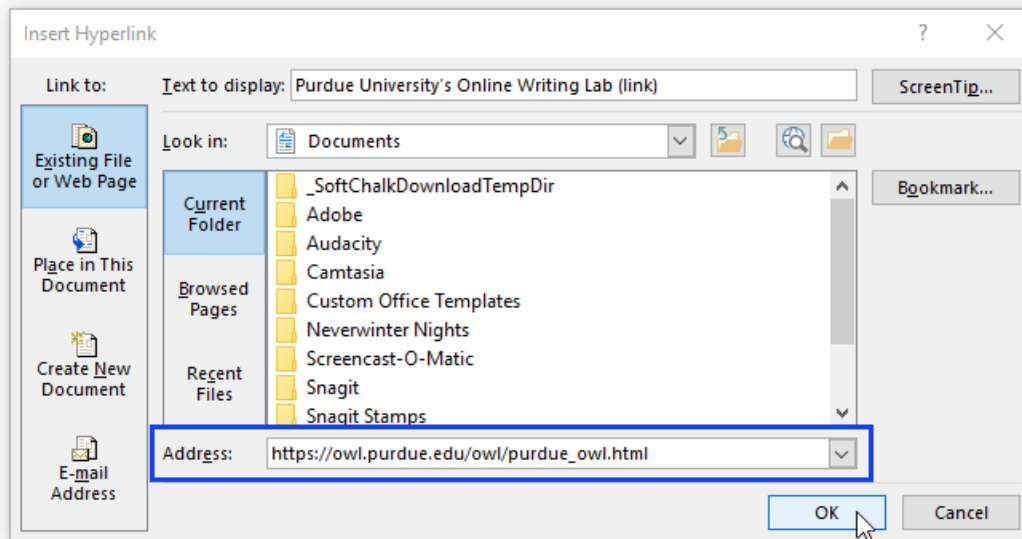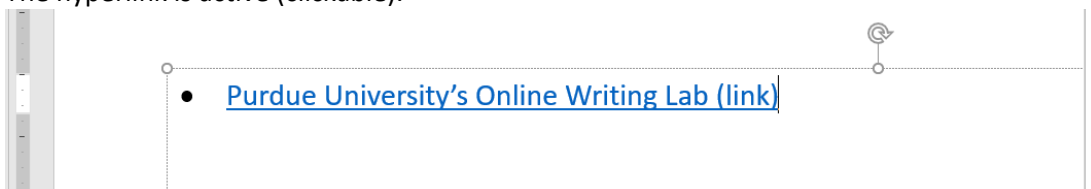
5. If you think the document or presentation will likely be printed, as a courtesy you can **paste the address (URL)** near the active hyperlink. (Pasting the address is not necessary for accessibility compliance; however, it *is* useful when the content is printed, and if the URL is longer, you can shorten it using Bitly.com or shorturl.at.)

- [Purdue University's Online Writing Lab (link)](https://owl.purdue.edu/owl/purdue_owl.html)
  https://owl.purdue.edu/owl/purdue_owl.html

Creating a Hyperlink to a File

If you're creating a link to a downloadable file, indicate the type of file in the active hyperlink text. This helps make students aware that they will be downloading a file.

- If the file is a:
  o Word document, then use (doc or DOC)
  o Adobe PDF file, then use (pdf or PDF)
  o PowerPoint presentation, then use (ppt or PPT)
  o Text file, then use (txt or TXT)
  o For example: [North Carolina Climate Science Report (PDF)](#)

(If you'd like, you can substitute **Word doc** for DOC, **PowerPoint** for PPT, etc. The important measure you are taking is indicating the **type** of file.)

⊞ Step 5: Create Accessible Tables

In PowerPoint, tables work well when they are used to present simple, uncomplicated data or other information, such as a simple schedule. Screen reading software reads the table from left-to-right, top-to-bottom. Keeping this knowledge in mind will help you plan the content of your table so that it is intuitive for all students regardless of how they might access it.

Figure 30 provides an example of an accessible table in PowerPoint
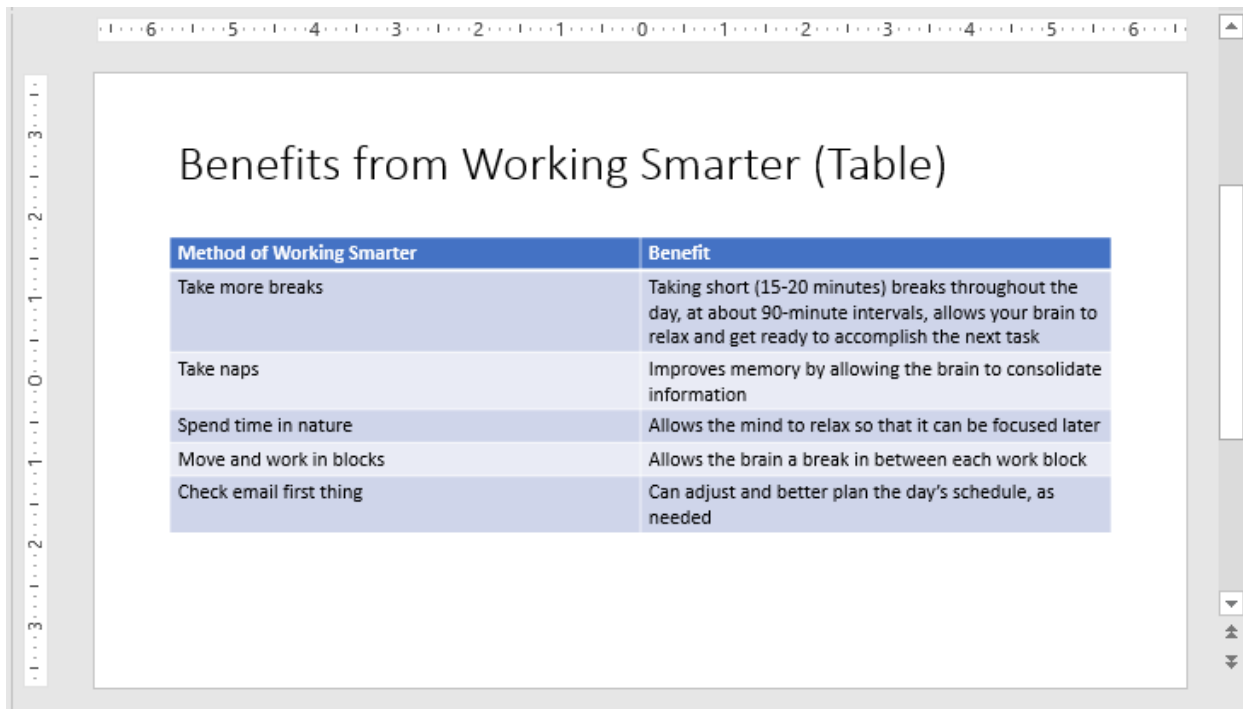
Figure 30: Example of a simple table on a PowerPoint slide

To Create an Accessible Table

1. Select a slide layout template that contains a Title placeholder and at least one content placeholder. In the Title placeholder, type a **title** for the slide that **describes the purpose of the table**. **Include the word** *Table* in the title so that this slide is easy to locate in Outline view.
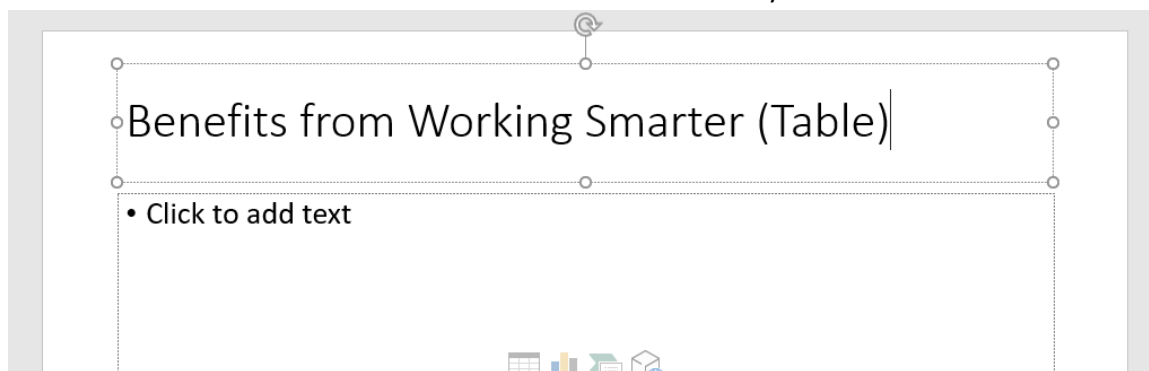
2. Click the **Insert Table** command.
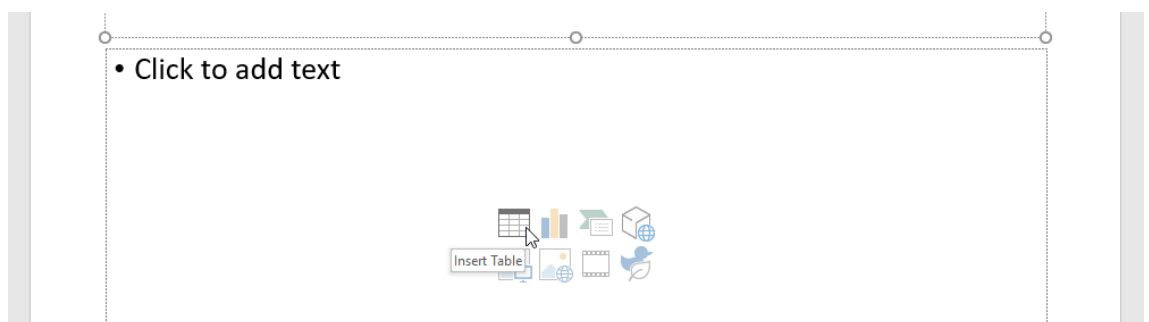
3. The Insert Table dialog box appears. Select the **number of columns and rows** you need and then click **OK**.
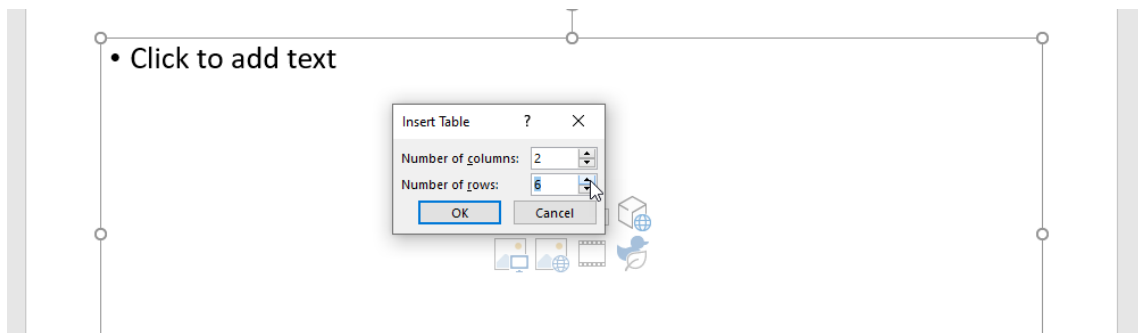
4. A new, blank table appears on the slide. In the **first row**, type a **name** for each **column**. The first row is automatically assigned a header row in PowerPoint.

Method of Working Smarter	Benefit

5. Continue to enter information into the table until all of the cells have been used.

Method of Working Smarter	Benefit
Take more breaks	Taking short (15-20 minutes) breaks throughout the day, at about 90-minute intervals, allows your brain to relax and get ready to accomplish the next task
Take naps	Improves memory by allowing the brain to consolidate information
Spend time in nature	Allows the mind to relax so that it can be focused later
Move and work in blocks	Allows the brain a break in between each work block
Check email first thing	Can adjust and better plan the day's schedule, as needed

A Note about Color Contrast and Tables

If you are using a built-in PowerPoint theme, it's important to check the **color contrast** of the table and adjust the colors, if needed. To change the table's colors, click the **Table Design** tab and select a theme from the **Table Styles** group.
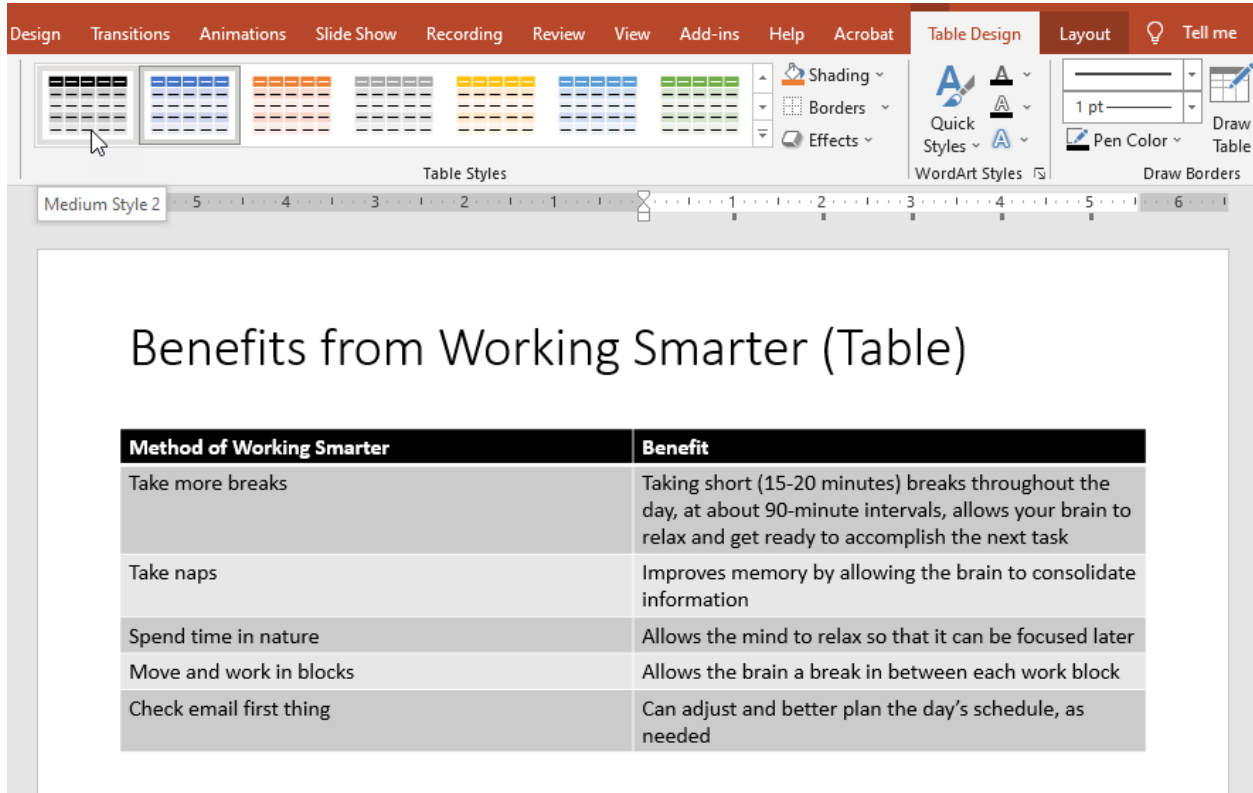
Figure 31: The Table Styles group on the Table Design tab provides a number of formatting options

Other Accessibility Considerations When Creating Tables

- **Avoid Blank Cells.** If a blank cell is needed in your table, type *blank cell* or *data not available* (or another word that makes sense in the context of the table, such as *data unknown*) in the cell. If the visual appearance of a blank cell is desired, you may change the font color of this text to match the cell's background color.

- **Avoid Merging or Splitting Cells.** When merged or split cells are present, the table will become inaccessible by either causing the screen reading software to repeat information or skip around in the table. The result is disorienting for the listener and the table's format can be confusing for other students to interpret.

- **Avoid creating blank rows or columns** to visually control the spacing in your table. Adjust line spacing instead.

✓ Step 6: Running the Accessibility Checker

Microsoft PowerPoint has a built-in **Accessibility Checker** that can help you verify the accessibility compliance of presentations. The Accessibility Checker scans the file and looks for content that could be a potential barrier or issue for people with disabilities.

To Activate the Accessibility Checker:

1. Click the **File** tab to access **Backstage View**.

2. Make sure **Info** is selected on the Backstage View menu, and then click the **Check for Issues** drop-down. Select **Check Accessibility**.
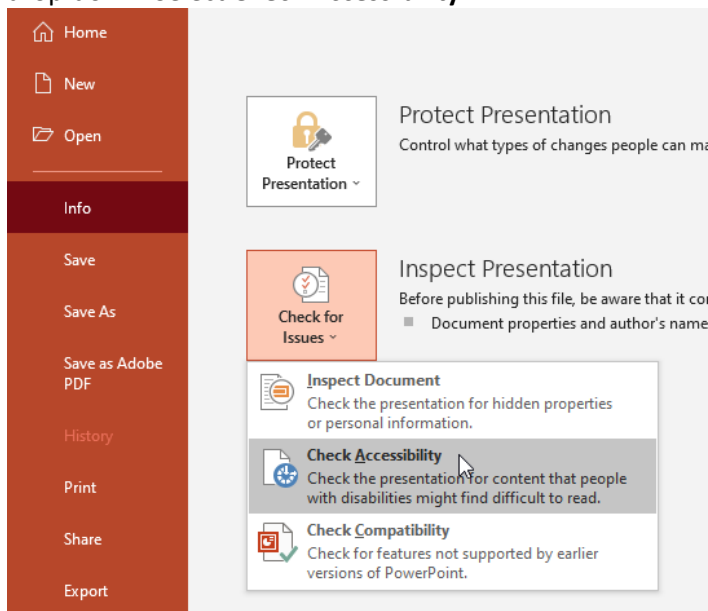
Addressing Accessibility Issues

When the Accessibility Checker detects one or more accessibility issues, a list of **Errors and Warnings** appears in its **Inspection Results**. From the Accessibility Checker's **Inspection Results**, select an **issue**. The inaccessible content becomes **highlighted** in the presentation, and information about how to fix the issue appears under the **Additional Information** area of the Accessibility Checker pane.
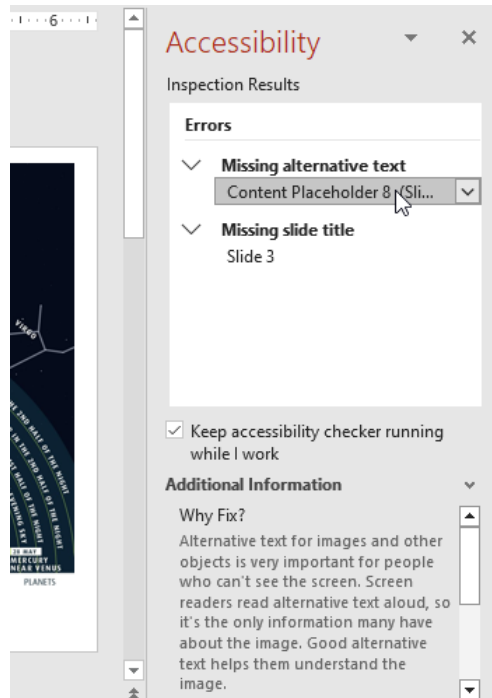
*Figure 32: The Accessibility Pane
in Microsoft PowerPoint*

FAQ: Can I trust the Accessibility Checker to catch everything?

Unfortunately, no. While the Accessibility Checker catches some accessibility issues, it does not take the place of human review. For detailed information on the errors and warnings the Accessibility Checker currently looks for, please visit:

Microsoft's Accessibility Checker Rules page
URL: https://bit.ly/3uvRaht

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Part 6: A Note on Universal Design for Learning

To enhance the learning experience, consider implementing Universal Design for Learning (UDL), which is a framework for curriculum development that gives all individuals equal opportunities to learn. Think of UDL as a blueprint, based on the learning sciences, for creating instructional goals, methods, materials, and assessments that work for everyone.

While comprehensive information about how to implement Universal Design for Learning in your class is outside the scope of this handbook, a lot of great information is provided on the CAST Universal Design for Learning site (opens new window) (see *Part 7* for the URL to this site).

We mention UDL in this accessibility handbook because UDL strongly supports digital accessibility for its instructional benefits. In a nutshell, UDL has three primary principles:

- Provide multiple means of engagement
- Provide multiple means of representation
- Provide multiple means of action and expression

When you ensure the accessibility of your digital content, you readily satisfy many of the checkpoints outlined in the *Multiple Means of Representation* principle. We've included a few instructional strategies below that help further illustrate the relationship between digital accessibility and UDL.

Strategies for Presenting PowerPoint Presentations

Pair an accessible PowerPoint presentation with a typed lecture, video, or a follow-up activity. By doing this, you increase the ways in which your content is represented to students, allowing them a more diverse experience with the material.

- Narrate your presentation directly in PowerPoint. The presentation can be saved as a video, and the video uploaded to YouTube and easily captioned. (A link to instructions on how to narrate a PowerPoint presentation is provided in *Part 7:Resources.*)

- Type your accompanying lecture, accessibly, in Word. Make sure to let students know which slide(s) you are referencing.

- Audio record the lecture and upload it with the accessible presentation and a transcript of the recording. Make sure to let students know which slide(s) you are referencing.

Strategy for Providing Long Description for Complex Instructional Images

Audio record a long description of the image and provide a text transcript of the recording.

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Part 7: Resources

Color and Contrast

- **Download the Color Contrast Analyser by TPGi**
  URL: https://www.tpgi.com/free-accessibility-testing-tools/#colour

  - o **Using the TPGI Color Contrast Analyzer (YouTube video)**
    URL: https://youtu.be/Gtlvc3s2ii8

- *Effective Color Contrast: Designing for People with Partial Sight and Color Deficiencies*
  URL: https://bit.ly/3FbiaaW

PowerPoint Presentations

- **How to Record a Slide Show with Narration and Slide Timings**
  URL: https://bit.ly/2Y8yGHC

Portable Document Format (PDF) Documents

- **Access for All's Free PDF Accessibility Checker (PAC 3)**
  URL: https://www.access-for-all.ch/en/pdf-accessibility-checker.html

- **WebAIM's PDF Accessibility Article** *Converting Documents to PDFs*
  URL: https://webaim.org/techniques/acrobat/converting

Universal Design for Learning

- **Universal Design for Learning in Higher Education**
  URL: http://udloncampus.cast.org/page/udl_landing

VLC Contact Information

- Submit your question or request through the **VLC Contact Us page**:
  URL: https://vlc.nccommunitycolleges.edu/contact/

Other Digital Accessibility Resources

- **NCDAE Accessibility Cheat sheets**
  URL: https://ncdae.org/resources/cheatsheets/

- **WebAIM's Document and Media Accessibility**
  URL: https://webaim.org/articles/#richmedia

- **W3C's Teach and Advocate Overview**
  URL: https://www.w3.org/WAI/teach-advocate/

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Appendix A
Text Representation (alt text) for Complex (STEM) Images

## Understanding Long Description for STEM Images

Alternative text AND a long description are required for more complex educational images, such as Science, Technology, Engineering, and Math (STEM) images. Depending on the type of complex image, use one of three long description strategies: **Linear Description**, **List Description**, or **Table Description**.

Table A1: Complex Image Long Description Strategies

Long Description Strategy	Type of Complex Image	Description of Strategy
Linear Description	- Venn diagrams - Educational illustrations - Comparison illustrations	A linear description is a traditional description of an image. It organizes the content in the graphic by describing it from left to right (or top to bottom). To provide a linear description, begin by selecting a spot, providing a description for it, and then moving in a sequential, logical narrative from that first point to the next spot and beyond. Try to be brief and specific. Linear Description Example
List Description	- Image of a process - Image of a cycle (i.e., a life cycle) - Flow chart	A list description is a numbered (or otherwise ordered, such as alphabetized) list. Start at the beginning of a process (or in the case of a cycle, pick a point within the cycle in which to begin), and type a list of all of the steps involved in the process. List Description Example
Table Description	- Bar charts - Line graphs - Pie charts - An illustration that has an embedded graph or chart - Complex diagram	A table organizes data from images of charts and graphs. In Word, create an accessible table of the data appearing in the chart or graph. Table Description Example

Linear Description Example

In this example, the long description (linear description) of the Venn diagram is provided below the image:
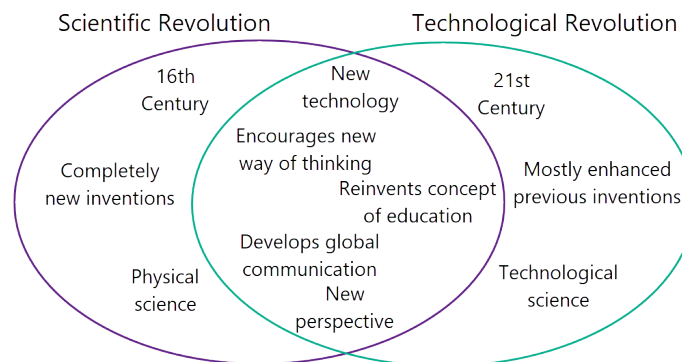
Long description of Venn diagram comparing and contrasting Scientific Revolution and Technological Revolution: This Venn diagram has two overlapping circles. One is labeled Scientific Revolution and the other is labeled Technological Revolution. Scientific Revolution includes: 16th Century, Completely new inventions, and Physical science. Technological Revolution includes: 21st Century, Mostly enhanced previous inventions, and Technological science. The circles overlap in the middle and include: New technology, Encourages new way of thinking, Reinvents concept of education, Develops global communication, and New perspective.

The alt text provided for the image above is:

Venn diagram comparing and contrasting Scientific Revolution and Technological Revolution. Long description provided below image (see Figure 33).
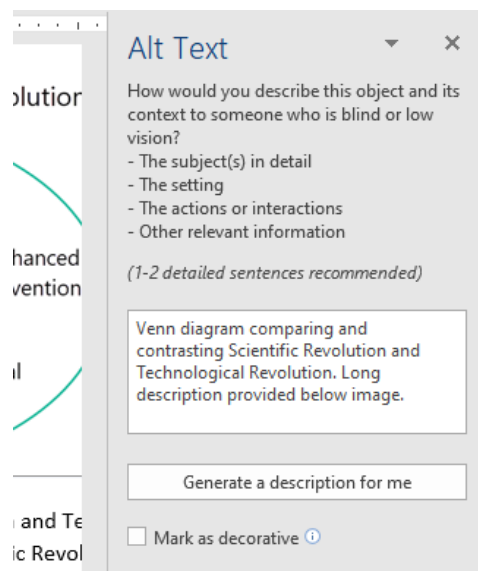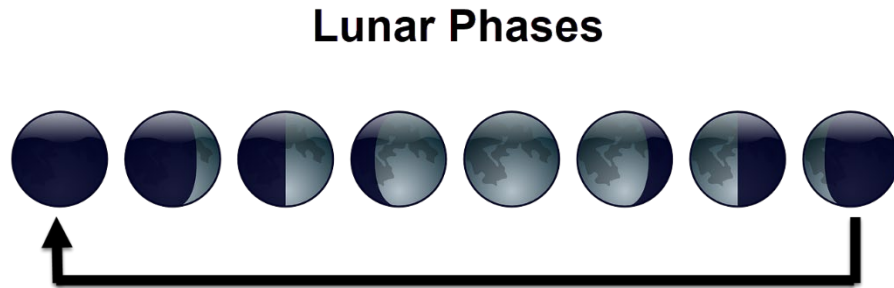

Figure 33: Word's Alt Text pane for the Venn diagram image

List Description Example

In this example, the long description (list description) of the lunar cycle is provided below the image:

Lunar Phases

Long description of lunar phases cycle: 15 photographs of the moon documenting its lunar phases. The list below provides a description of the photographs:
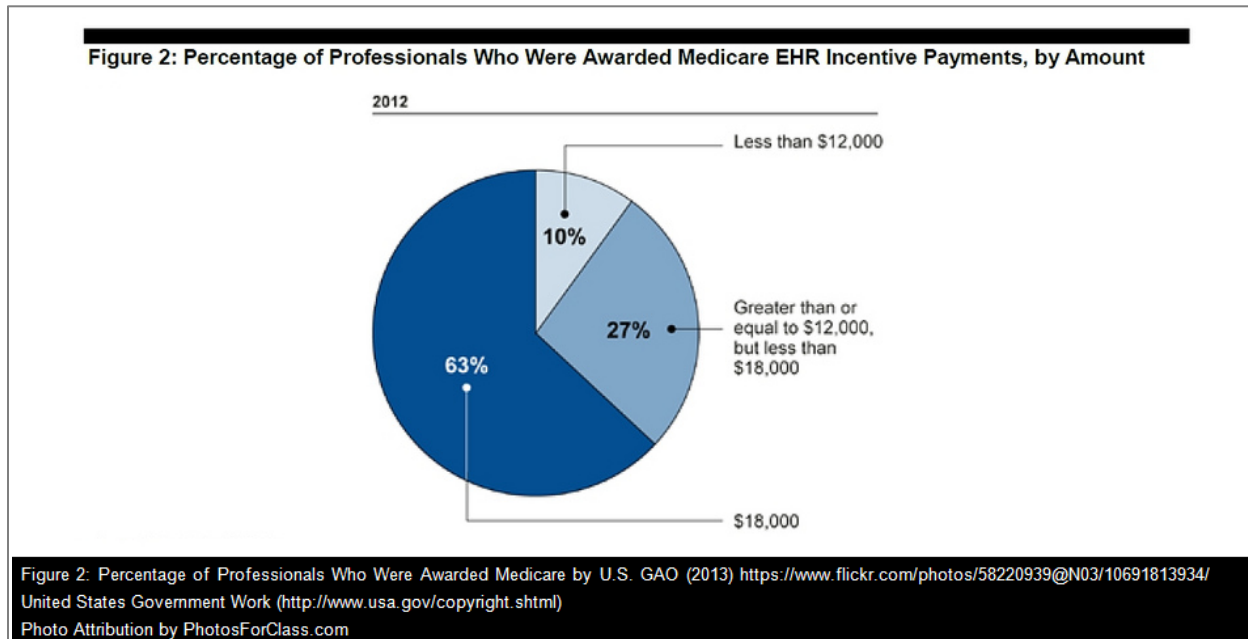
1. The Moon's unilluminated side is facing the Earth. The Moon is not visible.
2. The Moon appears to be partly but less than one-half illuminated by direct sunlight. The fraction of the Moon's disk that is illuminated is increasing.
3. One-half of the Moon appears to be illuminated by direct sunlight. The fraction of the Moon's disk that is illuminated is increasing.
4. The Moon appears to be more than one-half but not fully illuminated by direct sunlight. The fraction of the Moon's disk that is illuminated is increasing.
5. The Moon's illuminated side is facing the Earth. The Moon appears to be completely illuminated by direct sunlight.
6. The Moon appears to be more than one-half but not fully illuminated by direct sunlight. The fraction of the Moon's disk that is illuminated is decreasing.
7. One-half of the Moon appears to be illuminated by direct sunlight. The fraction of the Moon's disk that is illuminated is decreasing.
8. The Moon appears to be partly but less than one-half illuminated by direct sunlight. The fraction of the Moon's disk that is illuminated is decreasing.

The alt text provided for the image above is:

Lunar phases cycle. Long description provided below image.

Table Description Example

In this example, the long description (table description) of the pie chart is provided below the image:

Figure 2: Percentage of Professionals Who Were Awarded Medicare EHR Incentive Payments, by Amount

Figure 2: Percentage of Professionals Who Were Awarded Medicare by U.S. GAO (2013) https://www.flickr.com/photos/58220939@N03/10691813934/ United States Government Work (http://www.usa.gov/copyright.shtml)
Photo Attribution by PhotosForClass.com

Long description of pie chart depicting percentage of professionals who were awarded Medicare EHR Incentive payments, by amount in 2012. The table below provides a description of the data depicted in the pie chart:

Table A2: Data depicted in pie chart

Amount (in dollars)	Percentage
18,000	63%
12,000	10%
Greater than or equal to $12,000, but less than $18,000	27%

The caption below the image provides attribution information:

Figure 2: Percentage of Professionals Who Were Awarded Medicare by U.S. GAO (2013) https://www.flickr.com/photos/58220939@N03/10691813934/ United States Government Work (http://www.usa.gov/copyright.shtml) Photo Attribution by PhotosForClass.com

The alt text provided for the image above is:

Pie chart depicting percentage of professionals who were awarded Medicare EHR Incentive payments, by amount in 2012. Long description provided below image.

Long Description FAQs

FAQ: How do I know when to use a long description?

If the image for which you are providing alternative text is one of the following types of complex images, it will likely require a long description in addition to the alternative text:

- Venn diagram
- Image of a process
- Image of a cycle (i.e., a life cycle)
- Flow chart
- Bar chart
- Line graph
- Pie chart
- An educational illustration
- Comparison illustration
- An illustration that has an embedded graph or chart
- Complex diagram

FAQ: Where do I type the long description?

Determine the format in which you want to provide the long description:

- **Option A (Ideal for instruction and Word documents)**: Typed under (or near) the image.
- **Option B: (A good choice for images embedded in the LMS)**: In a separate Word document or text document. You will upload the long description file to your class site's Resources area, and then create a link to it under the image.
- **Option C: (In PowerPoint ONLY)**: Typed in the Notes area under the image's Slide.

FAQ: Do I have to type an alternative text when I create a long description?

Yes. Assistive technology will access the image's alternative text regardless of whether or not a long description is provided. Use the alternative text to succinctly replace the image and inform the student of where to locate the long description.

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Appendix B
Creating an Accessible PDF File from a Word 2019 Document

Preparing the Word Document

Use Word's Built-in Features

- Headings – nest properly (like an outline)
- Numbered or Bulleted Lists
- Inserting tables
- Table of Contents (for longer documents)

## Create Accessible Tables

If a table is present in the document:
- Perform the "Tab test" on the Table
  - Place the cursor in the first cell and press Tab to make sure the cursor moves to the right, and then automatically down to the next row.
  - If you are unable to place the cursor in the table, the table may be an image (and will require alternative text and a long description)
- Make sure the table has a title (in Word, this is called a caption)
- Denote the Header Row (make sure each of the column headings is descriptive)
- Keep the table simple
- Avoid merging or splitting cells
- Avoid blank cells
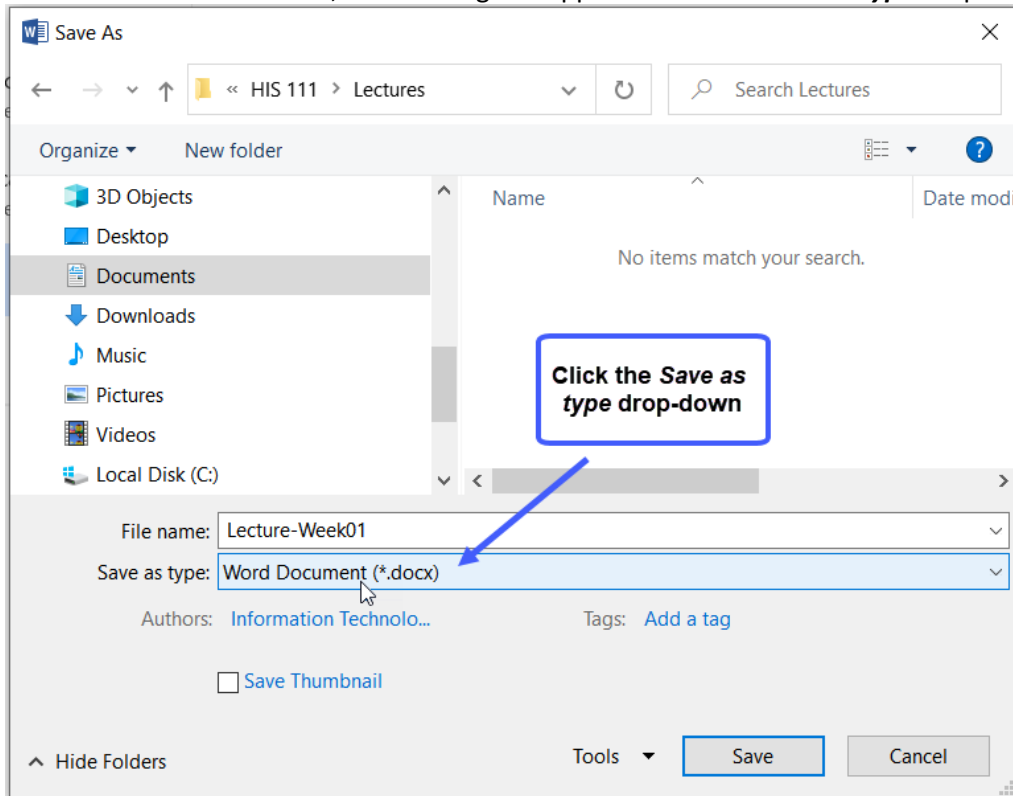
Check for Accessibility

- Ensure **Heading Styles** have been applied to the document's title and section subheadings.
  - Open the Navigation Pane – are the headings descriptive?
- Review any **hyperlinks** to ensure they are descriptive.
- Ensure all images have **alternative text** (and a long description, where needed).
- Use the Accessibility Checker (File > Check for Issues > Check for Accessibility).
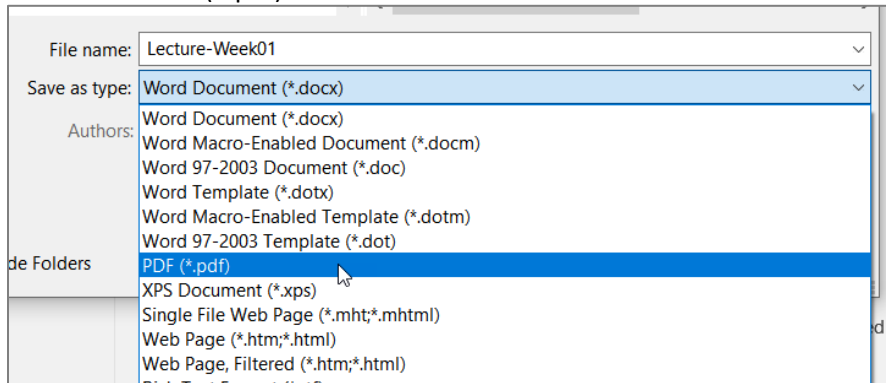
To Create a PDF File

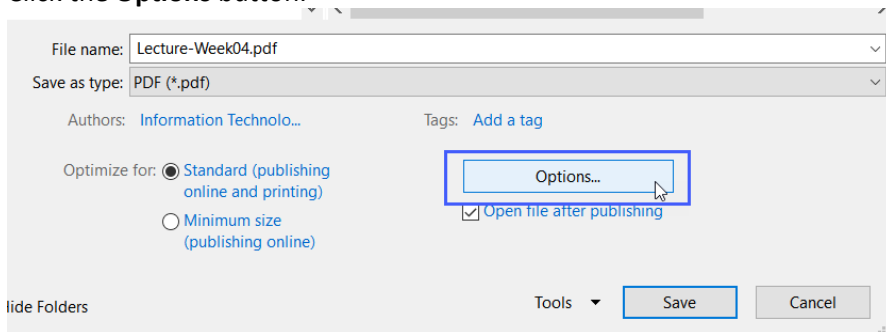1. In Word, click **File.**

2. Select **Save As**.
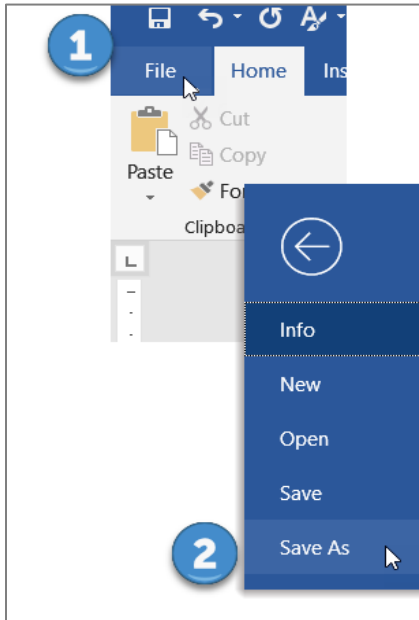
3. Select a location for the file, and a dialog box appears. Click the ***Save as type*** drop-down.
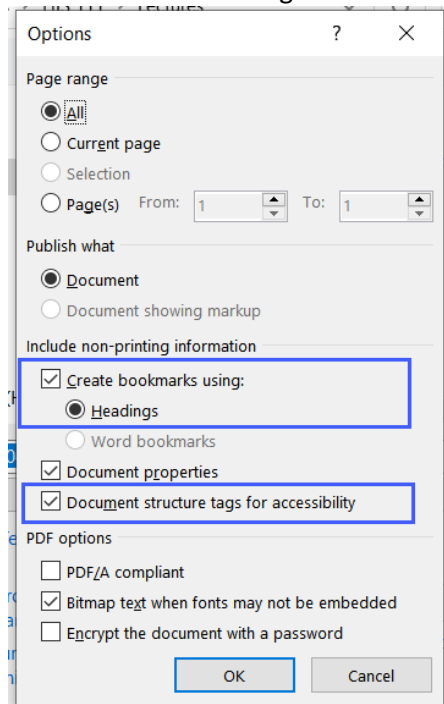
4. Then select **PDF** (*.pdf).

5. Click the **Options** button.

6. A dialog box appears. Place a check next to the following options:
    - ✔ Create bookmarks using – Headings
    - ✔ Document structure tags for accessibility

7. Click **OK** and then **Save**. The PDF file is created.

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Appendix C
Accessible Math using MathType

Introduction

MathType is an equation editor that allows for the rich display of mathematical numbers, symbols, and equations on the Microsoft Windows and Apple Macintosh platforms. MathType expands on the basic equation editor symbol set and provides additional equation and notation options for the display of mathematical content.

MathType is commonly used within Microsoft Office applications (e.g., MS Word and PowerPoint) or the Apple iWork suite (e.g., Pages and Keynote), to author mathematical symbols and other science notation. MathType is also a major component in supporting the conversion of documents into accessible alternate formats that include mathematical content.

## Adding Equations in Microsoft Word

Once MathType has been installed, an additional tab called the MathType ribbon will appear in the Microsoft Word interface. There are two methods to add an equation to a document, the MathType interface equation editor or by using LaTex.

Using the MathType Interface

Select the MathType tab to switch to the MathType ribbon and select either **the Inline Equation** or **Display Equation** option. An Inline Equation will add a MathType object within the same line as the cursor focus. A Display Equation will add a MathType object centered and on a new line.
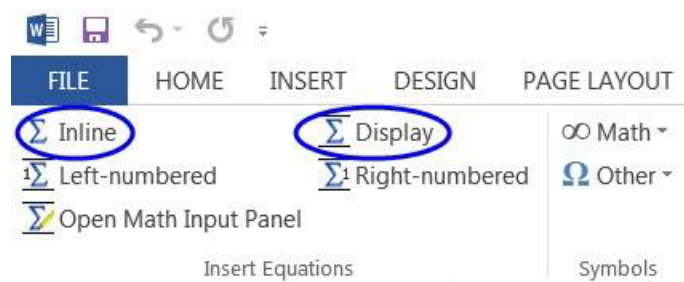
MathType will automatically open the MathType interface. To enter numbers or letters, use the keyboard to enter the relevant characters. MathType automatically adjusts the spacing and formatting for "math" specific content; as a result, the space bar is disabled to prevent unintended spacing in the equations.
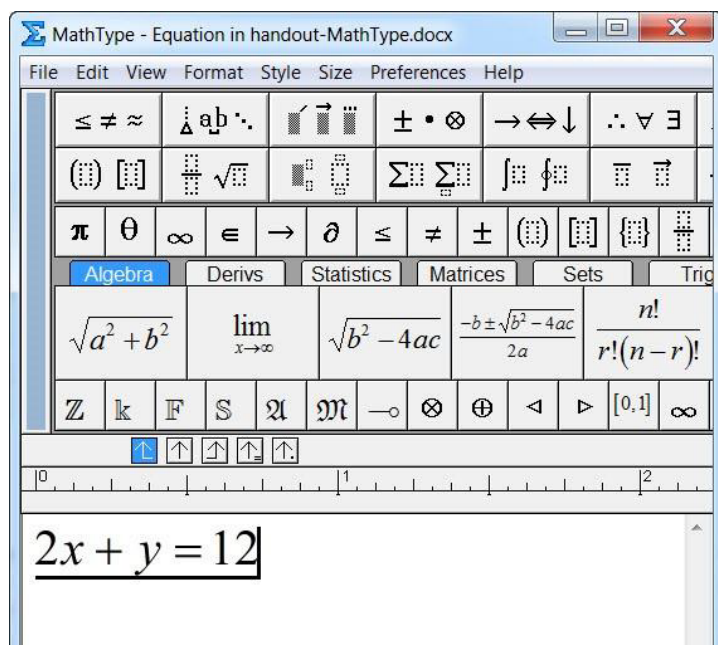
To save the equation back into the Microsoft Word document, choose **File > Close and Return to Document (Ctrl+F4).** This will save the current MathType object and return you back to the original document.

For entering symbols, such as the radical symbol or fraction symbol, use the templates provided just above the MathType editing window. These symbol templates provide a mechanism to control the placement of numbers or other characters in order to properly display the equation.

Example Equations with Fractions

1. To enter an equation with a fraction, use the **fraction template** to establish the numerator and denominator template regions (hotkey command Ctrl+F).
2. Enter the appropriate value for either the numerator or denominator.
3. Switch between the numerator and denominator regions by using the up or down arrow keys.
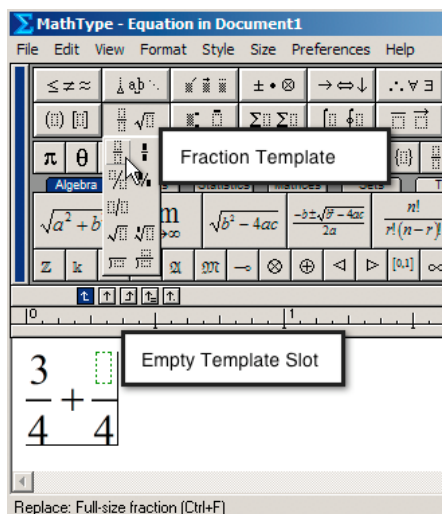
4. To exit the numerator or denominator regions, press the right arrow key to move the cursor focus outside of the fraction.
5. Return to the document by choosing File > Save and Close (Ctrl+F4).

Using LaTex with MathType

You can type LaTeX directly into your Microsoft Word document:

1. Type the TeX and highlight.
2. In the Publish group, click on the Toggle/TeX command.
3. The Toggle/TeX command converts TeX code into MathType objects that can be saved and rendered into MathML.

$\sqrt4$

Σ Equation Preferences   Export Equations   MathType Help

Σ Format Equations   Publish to MathPage   MathType on the Web

Σ Convert Equations   Toggle TeX   Future MathType

Format   Publish   MathType

$\sqrt{4}$

MathType Keyboard Commands

MathType provides a large number of keyboard commands to simplify the authoring or editing of mathematical symbols and equations. For instance, Ctrl+F will automatically include the fraction template whereas Ctrl+R will embed the square root symbol into the editing region.

To review all the keyboard commands or change the current keyboard mapping, in MathType go to **Preferences > Customize Keyboard**. Expand open the menu list of keyboard commands to review the currently established options or to set new keyboard commands.
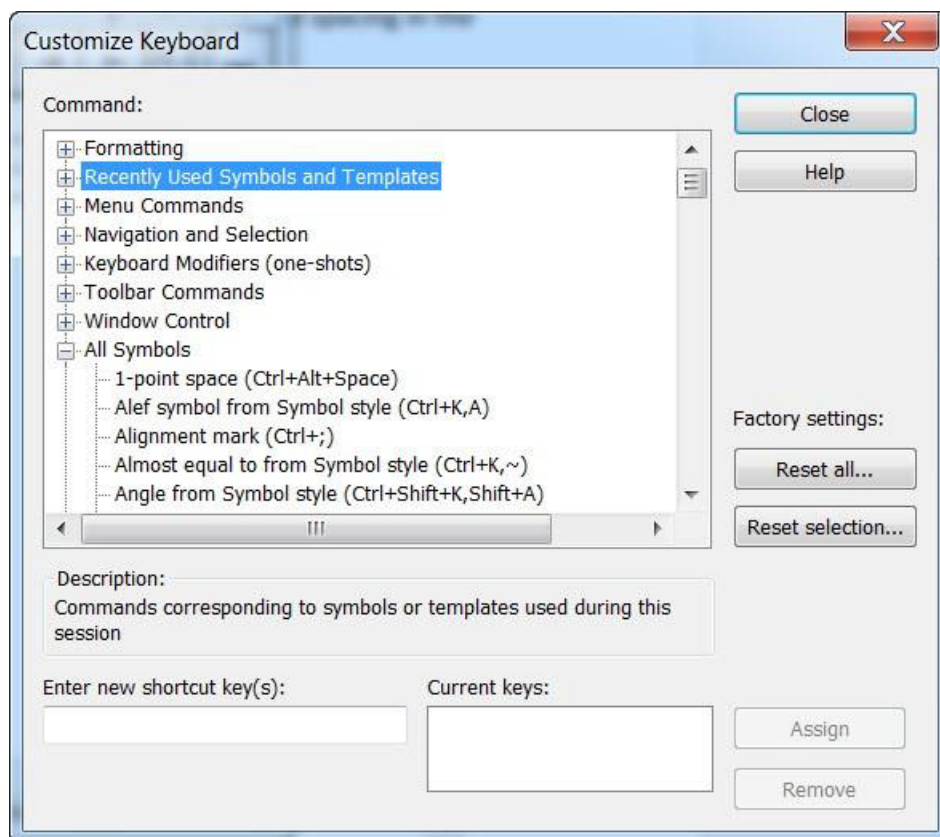
The current shortcut keys will be displayed in the "Current Keys" region. If you wish to return all the keyboard commands to the original settings, press the "Reset All" button. This will reset all the keyboard commands to the default settings when MathType was first installed.

Appearance of Math Content

One challenge when working with MathType is that it can be difficult to discern which parts of the document are text-based and which parts of the document are MathType objects. There are two methods one can use to differentiate between the text content and MathType objects: adjusting the color of MathType objects or browse the equations in the document.

Adjusting the Color of MathType Objects

You can set MathType objects so that they may be a different color than the surrounding text-based information.

1. To change the color of an equation, double-click on the equation to open the MathType window.
2. Select the entire equation (Ctrl-A).
3. Choose **Format > Color**, and then select the color you wish to use to represent the equations. The color you choose will be represented in the final version of the document, so ensure appropriate color contrast.

4. To change all future equations to be of the same color, choose **Format > Color > Edit Color Menu**.

5. Choose your desired color and press the Set as Default button. This will set the color for future MathType equations.
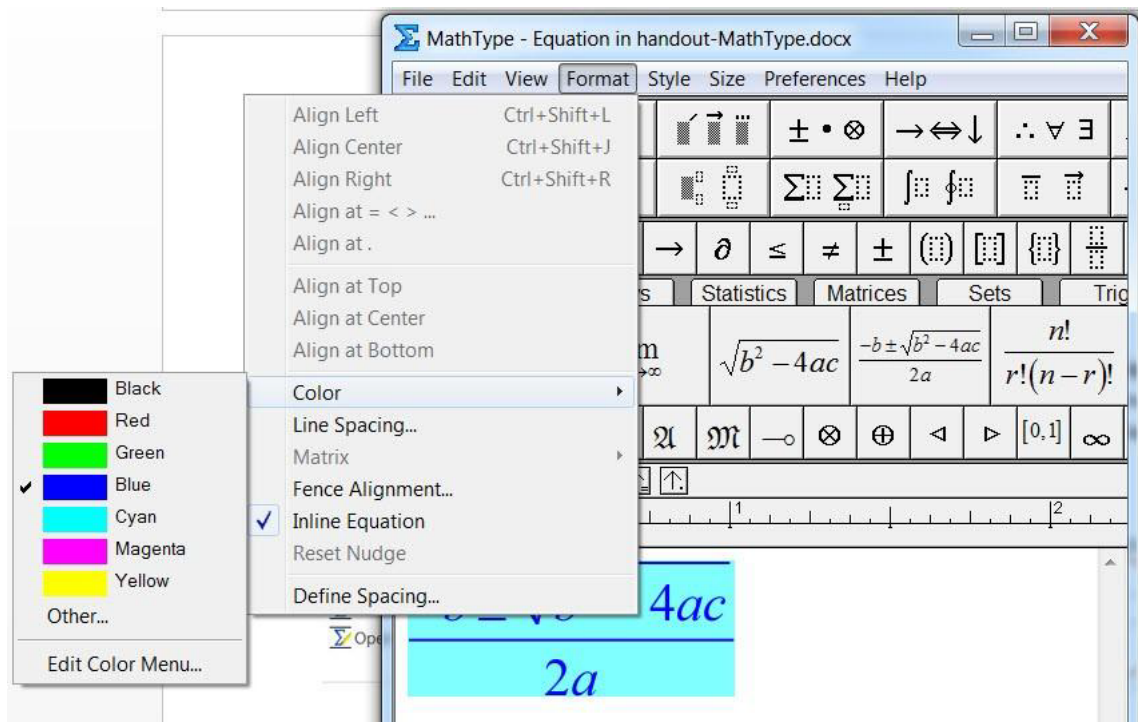
Browse by Equation

In addition to setting the color for a MathType equation, it is also possible to navigate through the document from equation to equation skipping the text-based content. Locate the Equations option in the Browse group. To move from equation to equation, press the Previous or Next button (in the Browse region) to move by MathType objects through the document.
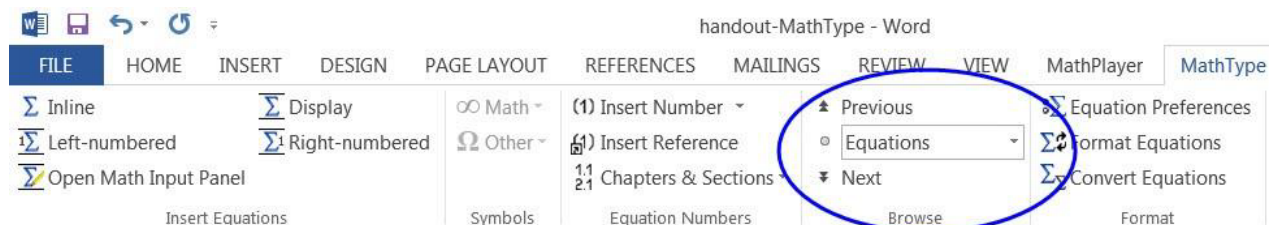

Browsing by equation will allow you to quickly jump from one equation to the next and provide a visual indicator of the equation in the document. This can be useful if you do not wish to change the color of the equation as described in the previous section. This can also be a useful method to evaluate if there are any "empty" MathType objects in the document.

Export to the Web

MathType offers numerous export options for equations authored within the MathType interface. To ensure a version of the document is compatible with assistive technology, it is necessary to use the Publish to MathPage export option. Please note - this is different than using the Save As Web page option from within the Microsoft Office

Example: Exporting as a Web Page

1. Create your document and add the relevant MathType objects.
2. Save the document.
3. Choose Publish to MathPage in the MathType ribbon.
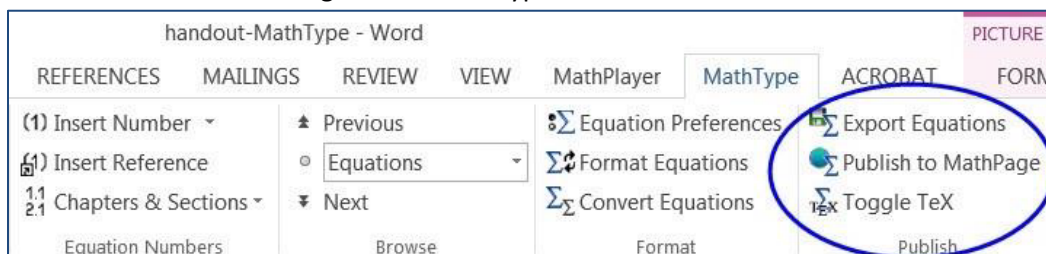
In the Publish to MathPage dialog box, provide a title for the document. This will become the title of the Web page that is displayed at the top of the browser (this creates the <title> tag).

Check the location of where the file will be stored in the File Name region. To change the file save location, press the Browse button and select a new file location.
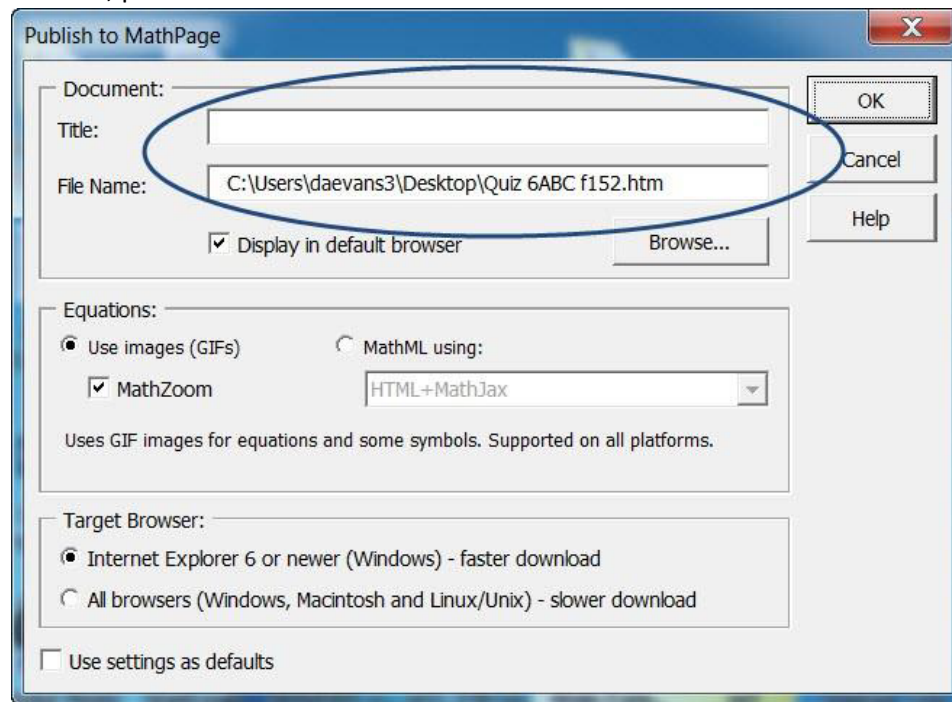
In the Equations section, click the radio button MathML using: and select the option "HTML+Mathjax". This will create a Web page with MathML content compatible with most Web browsers.

Open the resulting file using a Web browser (e.g. Chrome, Safari, Firefox, Opera etc.).