

Note

These slides are for participants of a live WebAIM training and are not for distribution to others. They contain examples of (intentionally) inaccessible content that may not make sense out of context.

Visit webaim.org for articles on many of the topics covered within these slides.

Document Accessibility Training



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WebAIM.org

Slides & resources online at:

webaim.org/presentations/2024/ahg

Training outline

9:00 – 12:00

- Introduction
- Guidelines and Laws
- Evaluating Document Accessibility
- Assistive Technology
- Creating Accessible Documents
 - Headings in Word
 - Slide layouts and order in PowerPoint
 - Images and alternative text
 - Tables, links, lists, columns, language

1:00 – 4:00

- Other Accessibility Principles
 - Contrast
 - Color use
 - Cognitive disabilities
 - Converting to PDF
- Creating Accessible Excel
 - Formatting sheets
 - Images, links, contrast, navigation, tables

Is your electronic content accessible?

WCAG 2

- Web Content Accessibility Guidelines
- Versions 1.0 (1999), 2.0 (2008), 2.1 (2018), and 2.2 (2023)
- Principles based
 - Perceivable
 - Operable
 - Understandable
 - Robust

WebAIM WCAG 2 Checklist

Operable

Interface forms, controls, and navigation are operable.

Guideline 2.1

Make all functionality available from a keyboard.

2.1.1 Keyboard

A **2.0**

- All page functionality is available using the [keyboard](#), unless the functionality cannot be accomplished in any known way using a keyboard (e.g., free hand drawing).
- Page-specified shortcut keys and accesskeys (accesskey should typically be avoided) do not conflict with existing browser and screen reader shortcuts.

2.1.2 No Keyboard Trap

A **2.0**

- [Keyboard](#) focus is never locked or trapped at one particular page element. The user can navigate to and from all navigable page elements using only a keyboard.

2.1.3 Keyboard (No Exception)

AAA **2.0**

- All page functionality is available using the keyboard.

2.1.4 Character Key Shortcuts

A **2.1**

- If a keyboard shortcut uses printable character keys, then the user must be able to disable the key command, change the defined key to a non-printable

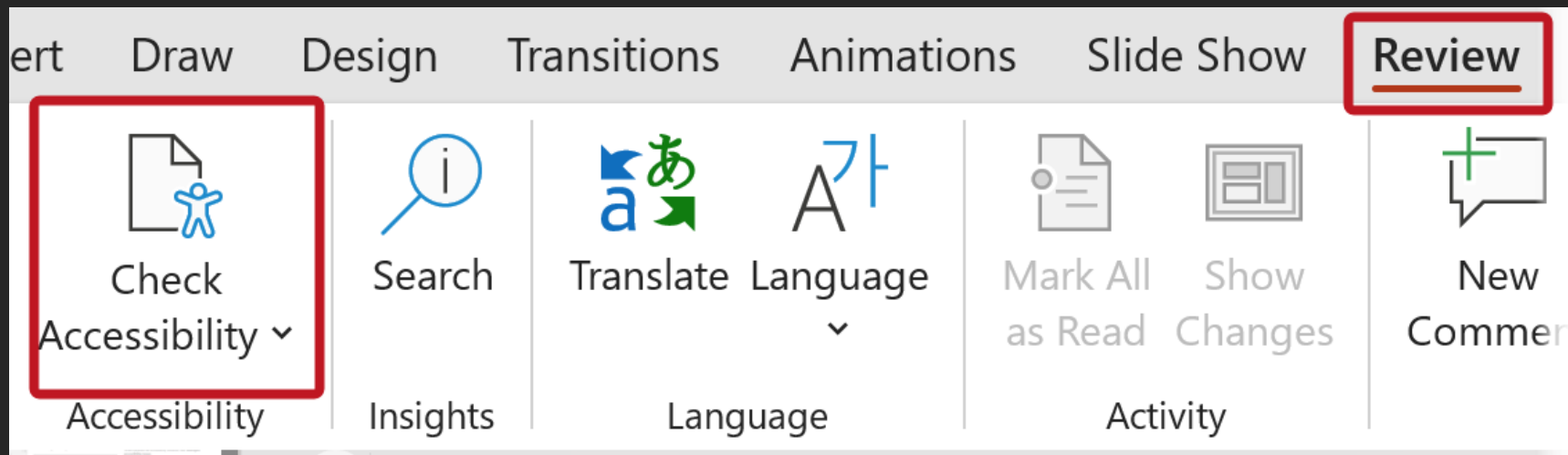
Notable US laws

- Section 508 – WCAG **2.0** A/AA
 - US federal agencies
- Section 504 – WCAG **2.1** A/AA
 - Recipients of federal HHS funds
- ADA Title II (state & local government) – WCAG **2.1** A/AA
 - Title I (employment), Title III (private & commercial) – **Missing** a technical standard
- 504 and ADA changes effective spring 2026

Accessibility > Compliance

Check accessibility

Review tab > Check Accessibility



Word and PowerPoint 365 Accessibility Evaluation Guide



This guide combines automated checks from the Accessibility Checker in Microsoft Office 365 with a series of manual checks to help you evaluate and repair common accessibility issues.

First, run the built-in [Accessibility Checker](#). The *Accessibility* panel will display: **ERRORS**, **WARNINGS**, **TIPS**, and **INTELLIGENT SERVICES**. Click on individual results to go to that issue in the document and make the necessary repairs. Then use the **MANUAL** review steps to identify any additional issues.

Headings (Word-only)

Principle	Review	Repair
Document contains Word Heading Styles (Heading 1, Heading 2, etc.)	TIP: No Headings in Document (Document must be 3+ pages)	Add new headings or apply the correct style to visual headings with Home tab > <i>Styles</i> gallery.
Visual headings USE <i>Word Styles</i> (Heading 1, Heading 2, etc.)	MANUAL: View tab > Navigation Pane > Headings tab (Document Map tab in Mac). Ensure the structure in the panel matches the visual heading structure.	Home tab > <i>Styles</i> gallery. Apply the correct heading style to visual headings.
Headings do not skip levels (e.g., Heading 1 to Heading 3).	MANUAL: Navigation Pane . Check for skipped levels.	Home tab > <i>Styles</i> gallery. Change the heading style to the correct level.
Headings are not empty	MANUAL: Navigation Pane . Check for empty lines.	Delete empty headings.

Section Names (PowerPoint-only)

Principle	Review	Repair
Section names are not generic	ERROR: Default Section Name	Right click section name > Rename

Assistive Technology

“Assistive technology promotes greater independence by enabling people to perform tasks that they were formerly unable to accomplish, or had great difficulty accomplishing.”

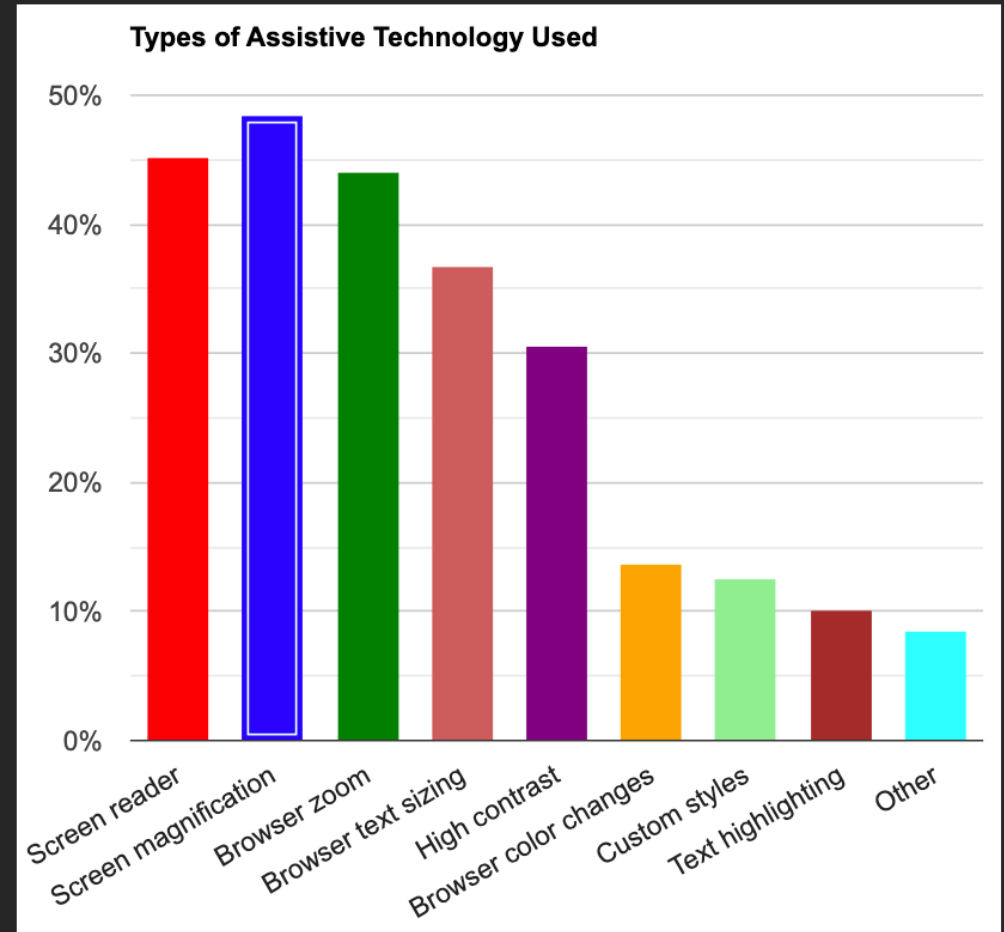
[Wikipedia](#)

Do you use a form of
assistive technology?



Screen Reader Users

- Not all screen reader users are completely blind.
- Most have low vision.
 - 45% of respondents to our low-vision survey use a screen reader.
- Some users have a reading or cognitive disability.
- Focus on structure and semantics.



Test with WAVE

- Run a report at wave.webaim.org. For very complex or non-public pages, use the WAVE Chrome or Firefox extension (wave.webaim.org/extension).
 - Watch the overview video on the WAVE homepage.
- Error icons flag known issues. Other icons identify potential problems or features. Click an icon to highlight the corresponding element and learn more using the **Reference** panel.
- Use the **Details** panel to review page issues. Click an icon to find it in the page. Uncheck icons to hide them.
- Turn off **Styles** to simplify the page view and to check the reading and navigation order.
- Click the **Code** button at the bottom of the page to see the page code with WAVE icons.

Images

- Ensure alternative text (shown in green) conveys the equivalent **content** and/or **function** of the image.
- Look for ways to replace images of text with true text.
- Content conveyed via CSS images must have a text alternative.

Headings and Regions/Landmarks

- Use the **Structure** panel in the sidebar to review.
- The main heading should usually be an <h1>.
- Ensure the headings and regions/landmarks reflect the page structure.
- Look for skipped heading levels (e.g., <h2> to <h4>).

Contrast

- Select the **Contrast** panel.
 - WAVE flags WCAG AA contrast issues in text.
 - Non-underlined links need 3:1 contrast with body text, plus a change, like underlining, on hover and focus.
- Check colors in WebAIM's contrast checker: webaim.org/resources/contrastchecker/.
- Manually check contrast in icons and images.

ARIA

- WAVE flags ARIA with purple icons.
- Check for appropriate use of ARIA roles, states, and properties (presented in green).
- Ensure ARIA labels and descriptions are correct.

Forms

- Ensure form controls have descriptive labels.

Links and buttons

- Ensure links and buttons present descriptive text.

Other common WAVE checks

- Page language is specified (e.g., <html lang="en">).
- If there are data tables, ensure table headers are present and have the correct scope.
- Look for links with ambiguous link text like "click here."
- Ensure the page title is descriptive and succinct.

Use a checklist

- WCAG 2: webaim.org/standards/wcag/checklist/.

Check keyboard accessibility

- The first time testing with Mac, press **Control + F7** to enable full keyboard accessibility.
 - In Safari, select **Preferences > Advanced > Accessibility > Press Tab to highlight each item...**
- Navigate the page using only the keyboard:
 - **Tab**: Navigate interactive elements (links, form controls, etc.)
 - **Shift + Tab**: Navigate backwards.
 - **Enter**: Activate links or buttons, submit most forms.
 - **Spacebar**: Activate checkboxes and buttons, expand a select menu, or scroll the window.
 - **Arrow keys**: Navigate radio buttons, select/dropdown menus, sliders, tab panels, tree menus, etc.
- Look for mouse-only interaction (e.g., rollover menus).
- Confirm every focusable element has a keyboard focus indicator/outline with at least 3:1 contrast.
- Ensure any "skip" links work correctly and are visible to sighted keyboard users.
- Make sure the navigation order is logical and intuitive.
- Test dialog and pop-ups. Can you navigate and close the dialog? Does focus return to a logical place?
 - Modal dialogs must maintain focus until dismissed.
 - Non-modal dialogs must close when focus is lost.
 - **Esc** should also close all dialogs and menus.

Test content scaling

- In **Chrome**, press **Ctrl/cmd** and:
 - **+** to zoom in (larger)
 - **-** to zoom out (smaller)
 - **0** to reset to 100%
- For WCAG 2.0 – Zoom to 200%
- For WCAG 2.1 – Adjust viewport to 1280 pixels wide and zoom to 400%. Avoid horizontal scrolling unless required for the content (e.g., a data table or map).
- Text-only zoom (Recommended) – In **Firefox**, choose **View > Zoom > Zoom Text Only**. Zoom to 130-150%

Test with a screen reader

- WebAIM tutorials:
 - webaim.org/articles/jaws/
 - webaim.org/articles/nvda/
 - webaim.org/articles/voiceover/
- Focus on navigation, forms, and dynamic content.
- Is information presented through ARIA accurate?
- Are forms instructions and error feedback read when navigating a form?
- Are all dynamic changes and updates accessible?

Scan for other issues

- Captions and transcripts for media.
- Information does not depend on color, audio, shape, size, or location.
- Animating or updating content or media can be paused or stopped.
- No strobing content/video that could cause seizures.

Structure & Semantics

WebAIM Quick Reference: Testing Web Content for Accessibility

Test with WAVE

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- Error icons flag known issues. Other icons identify potential problems or features. Click an icon to highlight the corresponding element and learn more using the **Reference** panel.
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Contrast

- Select the **Contrast** panel.
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- Check colors in WebAIM's contrast checker: webaim.org/resources/contrastchecker/.
- Manually check contrast in icons and images.

Equivalent Experience

Creating Accessible Documents and Presentations

Use Headings

Use headings correctly

- Describe sections of content
- Useful reading and navigating with a screen reader
- One Heading 1 per page is usually best (but not required)

h1 EASY SHORTBREAD

h2 Ingredients

- 1 cup butter, softened
- 1/2 cup sugar
- 2 1/2 cups flour

h2 Directions

1. Preheat the oven to 300 F.
2. Cream butter and sugar.
3. Gradually stir flour into the creamed mixture until blended.
4. Pat the dough in the bottom of an ungreased 9x13 baking pan.
5. Bake at 300 F for 30 to 40 minutes, until just lightly browned.
6. Remove from oven and pierce all over with a fork.



Failure – Headings are purely visual

Text is presented visually as a heading, but is not a true heading in document structure

h? **EASY SHORTBREAD**

h? **Ingredients**

- 1 cup butter, softened
- 1/2 cup sugar
- 2 1/2 cups flour

h? **Directions**

1. Preheat the oven to 300 F.
2. Cream butter and sugar.
3. Gradually stir flour into the creamed mixture until blended.
4. Pat the dough in the bottom of an ungreased 9x13 baking pan.
5. Bake at 300 F for 30 to 40 minutes, until just lightly browned.
6. Remove from oven and pierce all over with a fork.



Failure – Incorrect heading hierarchy

Text presented at a lower heading level visually has a higher heading level in the document structure.

h2 EASY SHORTBREAD

h1 Ingredients

- 1 cup butter, softened
- 1/2 cup sugar
- 2 1/2 cups flour

h1 Directions

1. Preheat the oven to 300 F.
2. Cream butter and sugar.
3. Gradually stir flour into the creamed mixture until blended.
4. Pat the dough in the bottom of an ungreased 9x13 baking pan.
5. Bake at 300 F for 30 to 40 minutes, until just lightly browned.
6. Remove from oven and pierce all over with a fork.



Another hierarchy failure

Text presented at a different level visually has the same level in the document structure.

h2 EASY SHORTBREAD

h2 Ingredients

- 1 cup butter, softened
- 1/2 cup sugar
- 2 1/2 cups flour

h2 Directions

1. Preheat the oven to 300 F.
2. Cream butter and sugar.
3. Gradually stir flour into the creamed mixture until blended.
4. Pat the dough in the bottom of an ungreased 9x13 baking pan.
5. Bake at 300 F for 30 to 40 minutes, until just lightly browned.
6. Remove from oven and pierce all over with a fork.



Not recommended – Headings skip levels

- Skipping heading levels is not a WACG failure if the hierarchy is logical
- But it can still be confusing and should be avoided

h1 EASY SHORTBREAD

h3 Ingredients

- 1 cup butter, softened
- 1/2 cup sugar
- 2 1/2 cups flour

h3 Directions

1. Preheat the oven to 300 F.
2. Cream butter and sugar.
3. Gradually stir flour into the creamed mixture until blended.
4. Pat the dough in the bottom of an ungreased 9x13 baking pan.
5. Bake at 300 F for 30 to 40 minutes, until just lightly browned.
6. Remove from oven and pierce all over with a fork.



Failure – Text should not be a heading

Text that does not describe content should not be a heading.

h1 EASY SHORTBREAD

h2 Ingredients

- 1 cup butter, softened
- 1/2 cup sugar
- 2 1/2 cups flour

h2 Directions

1. Preheat the oven to 300 F.
2. Cream butter and sugar.
3. Gradually stir flour into the creamed mixture until blended.
4. Pat the dough in the bottom of an ungreased 9x13 baking pan.
5. Bake at 300 F for 30 to 40 minutes, until just lightly browned.
6. Remove from oven and pierce all over with a fork.



h3

+ Add to my recipe box



Failure – Empty heading

Empty headings are still announced to screen reader users, which can be confusing.



The screenshot shows a recipe page for "EASY SHORTBREAD". The main heading is "EASY SHORTBREAD" (h1). Below it are two sections: "Ingredients" (h2) and "Directions" (h2). The ingredients list includes 1 cup butter, 1/2 cup sugar, and 2 1/2 cups flour. The directions list six steps: preheating the oven, creaming butter and sugar, stirring flour, patting the dough, baking, and piercing the dough. A photo of the finished shortbread is in the top right. At the bottom, there is a dashed red box containing an "h2" label and an "h-" label with a red 'x'. Below this is a button with an "h?" label and a plus sign, followed by the text "Add to my recipe box". A small red circle is in the bottom right corner.

h1 EASY SHORTBREAD



h2 Ingredients

- 1 cup butter, softened
- 1/2 cup sugar
- 2 1/2 cups flour

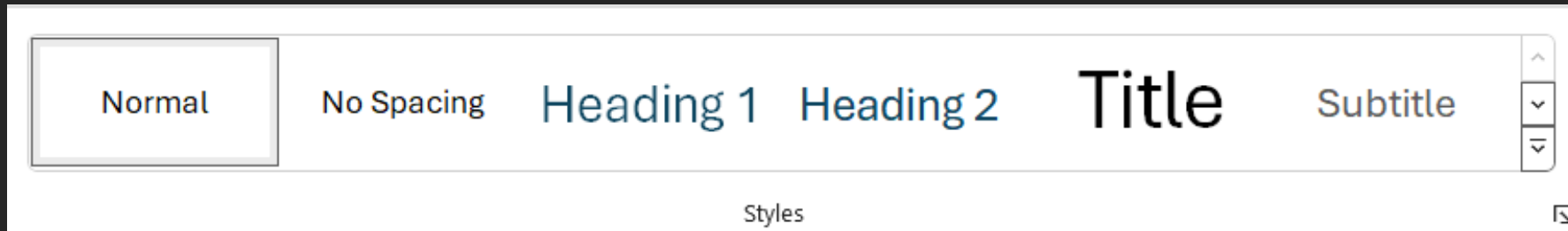
h2 Directions

1. Preheat the oven to 300 F.
2. Cream butter and sugar.
3. Gradually stir flour into the creamed mixture until blended.
4. Pat the dough in the bottom of an ungreased 9x13 baking pan.
5. Bake at 300 F for 30 to 40 minutes, until just lightly browned.
6. Remove from oven and pierce all over with a fork.

h2 h- x

h? + Add to my recipe box

Headings in Word



- Use “Styles” gallery
- Ctrl + Alt + 1, 2, or 3
 - command + option on Mac
- **Title** style does not map to a heading

Demo and Practice – Headings in Word

Images and Alternative Text



WCAG requirement

“All non-text content that is presented to the user has a text alternative that serves the **equivalent purpose...**”

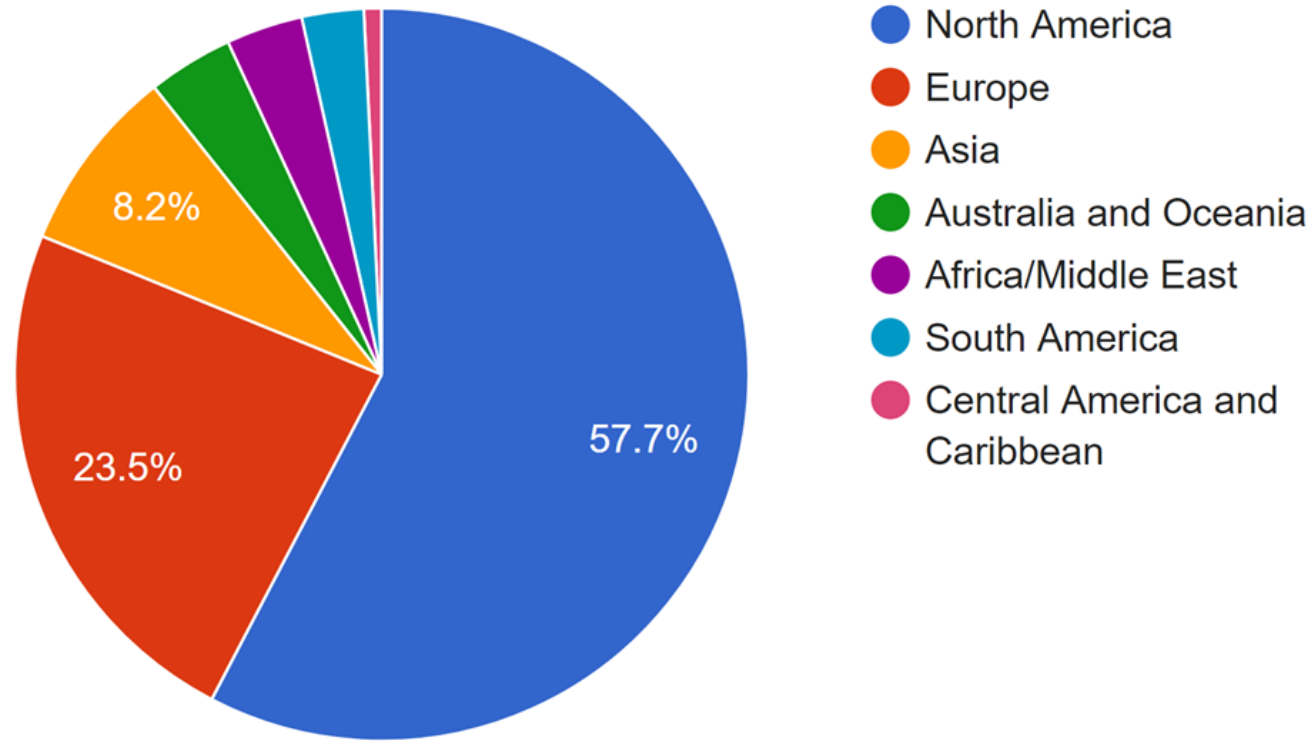
Alternative Text

- Must
 - Be equivalent
- Should
 - Usually be succinct
- Should not
 - Be redundant
 - Start with "image of ..." or "graphic of ..."



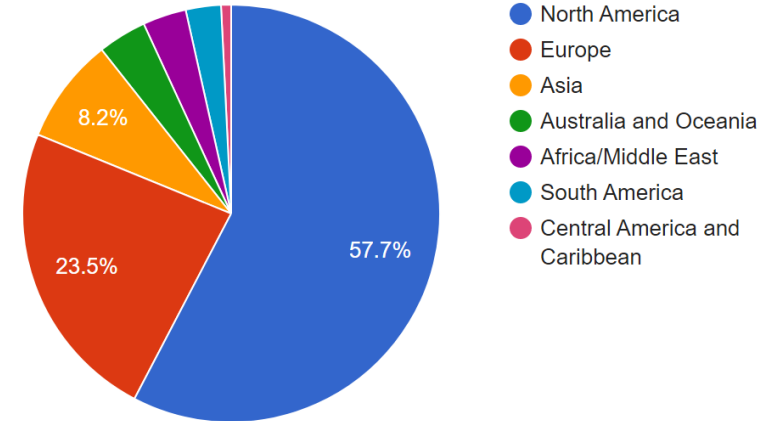
“Students studying under a tree”?

Charts and data



Alt text + description

1. Give the image succinct alternative text
2. Provide a detailed description
 - In context **OR**
 - Link to the information (e.g., an appendix)



Respondent Region

Region	# of respondents	% of respondents
North America	888	57.7%
Europe	362	23.5%
Asia	126	8.2%
Australia and Oceania	58	3.8%
Africa/Middle East	52	3.4%
South America	42	2.7%
Central America and Caribbean	12	0.8%

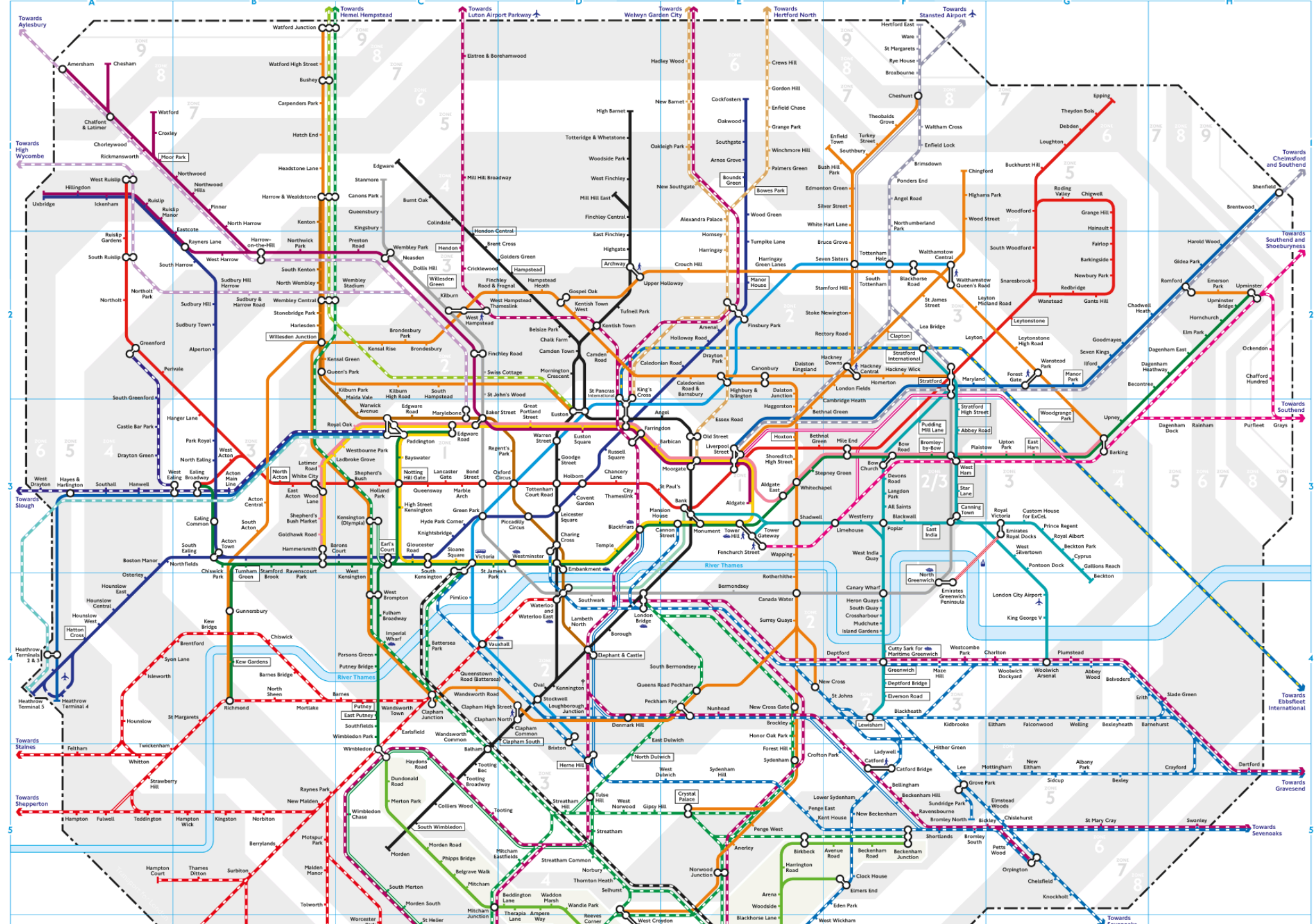
London's Rail & Tube services

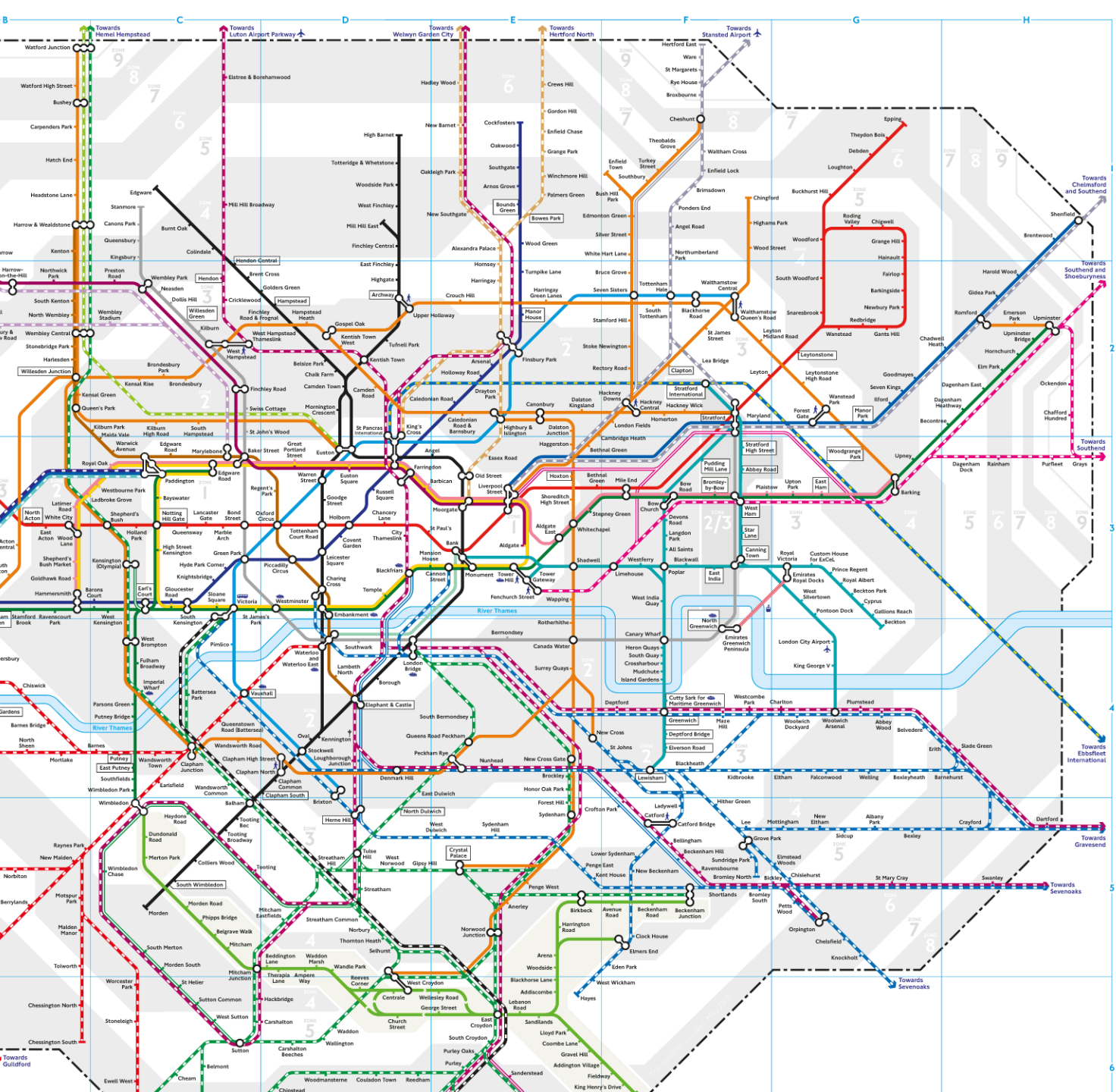
Key to lines and symbols

- Bakerloo
- Central
- Circle
- District
- Hammersmith & City
- Jubilee
- Metropolitan
- Northern
- Piccadilly
- Victoria
- Waterloo & City
- DLR
- London Overground
- London Trams
- TFL Rail
- Emirates Air Line cable car

- Chiltern Railways limited service
- c2c limited service
- Gatwick Express
- Great Northern
- Great Western Railway peak hours only
- Greater Anglia peak hours or limited service
- Heathrow Express peak hours only
- Southern peak hours only
- Southeastern peak hours only
- Southeastern high speed peak hours only
- South Western Railway peak hours only
- Thameslink peak hours only
- West Midlands Trains

- Stratford London Trams fare zone
- Station in both fare zones
- Interchange stations
- Street level transfer between stations
- ✈ Airport
- 🚤 Riverboat services
- 🚐 Victoria Coach Station



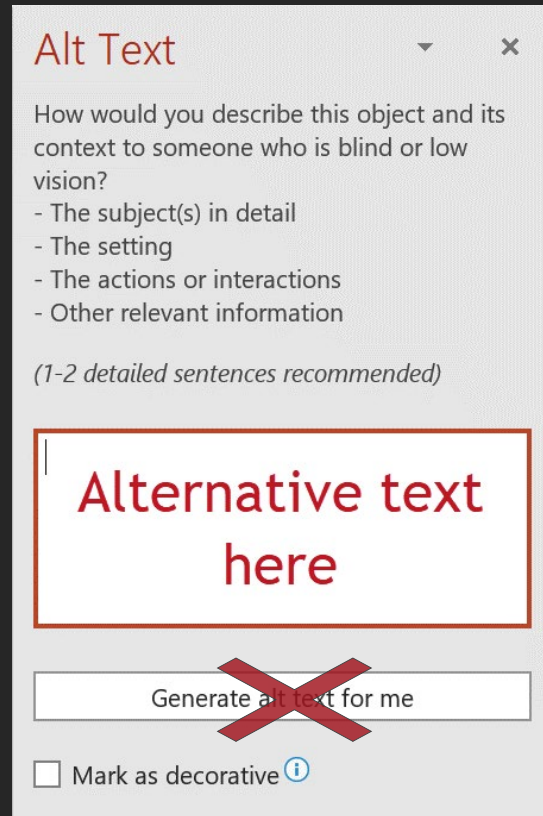


“Sensory” Exception

If “non-text content primarily intended to create a specific sensory experience”

Then “Provide descriptive identification”

Alternative Text in Office



1. Right-click the image and choose **View Alt Text**
2. Enter appropriate alt text in the field.

DO NOT choose
“Generate alt text for me”

Decorative images in Office

Alt Text ∨ ×

How would you describe this object and its context to someone who is blind or low vision?

- The subject(s) in detail
- The setting
- The actions or interactions
- Other relevant information

(1-2 detailed sentences recommended)

Content marked as decorative will not expose a description to screen readers.

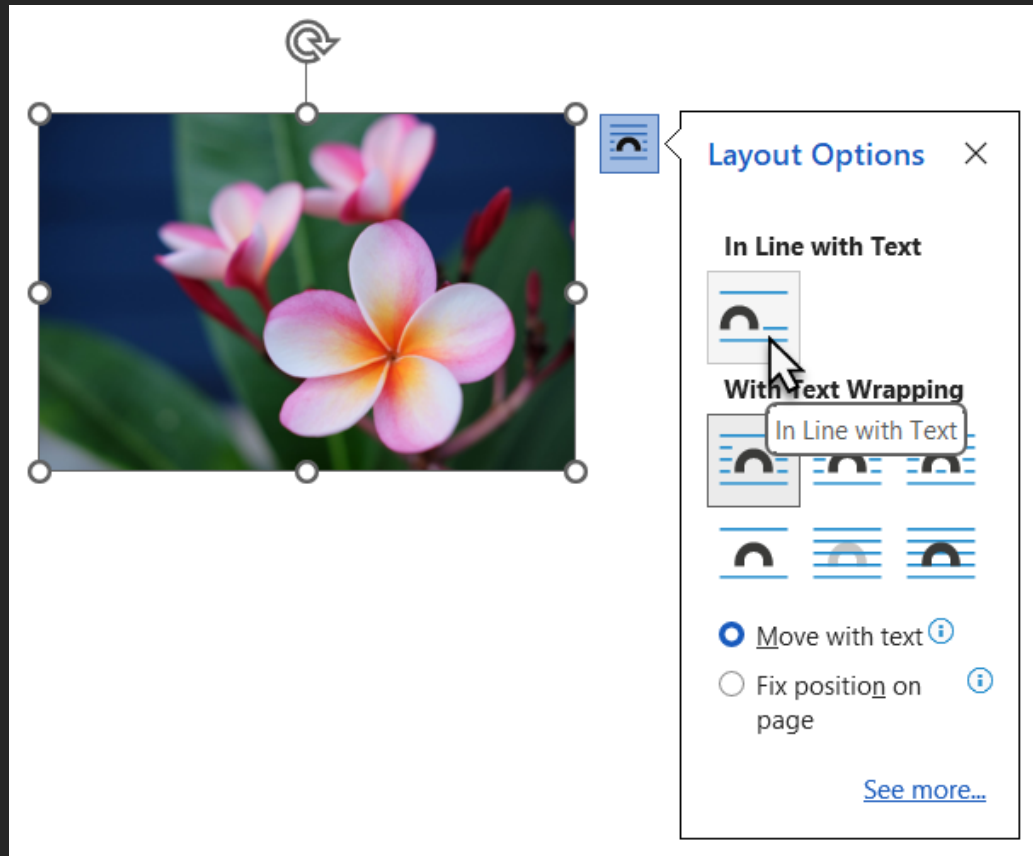
Mark as decorative ⓘ

- Check “Mark as Decorative”
- A screen reader will still read “graphic”
- PDF will hide images...
 - from screen reader users
 - In “Reflow” view

Demo – Adding Alternative Text



Image placement in Word



- Layout Options must be “In Line With Text” to be consistently presented to screen reader users.
- Should be accessible when converted to PDF (but check this in Acrobat Pro).

Practice – Alternative text

Tables

Data tables

Class Schedule

Class Name	Course Number	Location
Advanced Website Development	BIS 5650	B105
Database Management	BIS 3330	B220

Keys to accessible tables

1. Caption (if needed)
 - (or heading if a caption isn't supported)
2. Table headers
3. Table header scope (if supported)
 - Column or row

Assign table headers

Heading (in Word)  Class Schedule

Class Name	Course Number	Location
Advanced Website Development	BIS 5650	B105
Database Management	BIS 3330	B220

Fall Semester		
Class Name	Course Number	Location
Advanced Website Development	BIS 5650	B105
Database Management	BIS 3330	B220
Winter Semester		
Class Name	Course Number	Location
Advanced Website Development	BIS 5650	B105
Database Management	BIS 3330	B220

Fall Semester		
Class Name	Course Number	Location
Advanced Website Development	BIS 5650	B105
Database Management	BIS 3330	B220
Winter Semester		
Class Name	Course Number	Location
Advanced Website Development	BIS 5650	B105
Database Management	BIS 3330	B220

The image shows a comparison of course offerings between the Fall and Winter semesters. In the Fall semester, 'Advanced Website Development' (BIS 5650) is offered in B105 and 'Database Management' (BIS 3330) is offered in B220. In the Winter semester, 'Advanced Website Development' (BIS 5650) is offered in B105, but 'Database Management' (BIS 3330) is not listed. Yellow arrows indicate that the course numbers from the Fall semester are being compared to the Winter semester offerings. A horizontal arrow points from the 'Database Management' class name in the Winter semester row to its course number, BIS 3330.

Fall Semester

Class Name	Course Number	Location
Advanced Website Development	BIS 5650	B105
Database Management	BIS 3330	B220

Winter Semester

Class Name	Course Number	Location
Advanced Website Development	BIS 5650	B105
Database Management	BIS 3330	B220

Demo – Table headers and styles

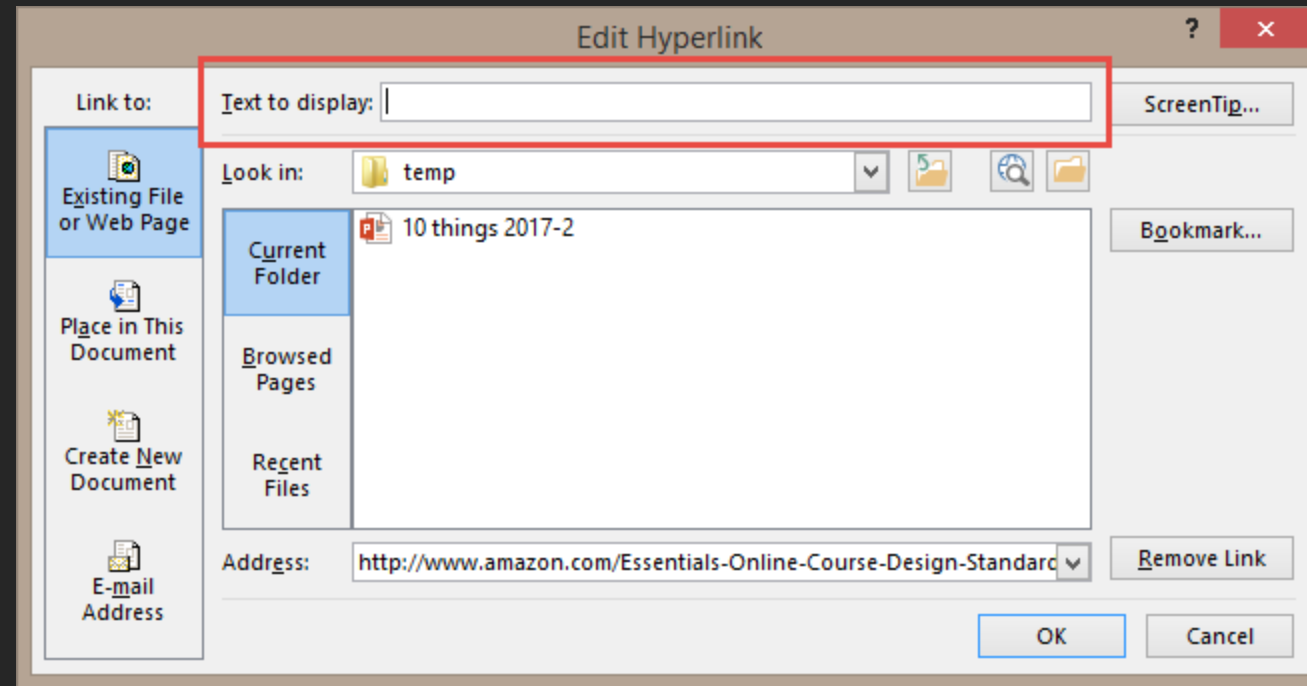
Class Schedule

Class Name	Course Number	Location
Advanced Website Development	BIS 5650	B105
Database Management	BIS 3330	B220

Descriptive Link Text

- [Click here](#)
- [Click here](#) for our campus map
- [Click here for our campus map](#)
- [Campus map](#)

Editing Link Text



Right-click > Edit Link > Text to display

Demo – Link text

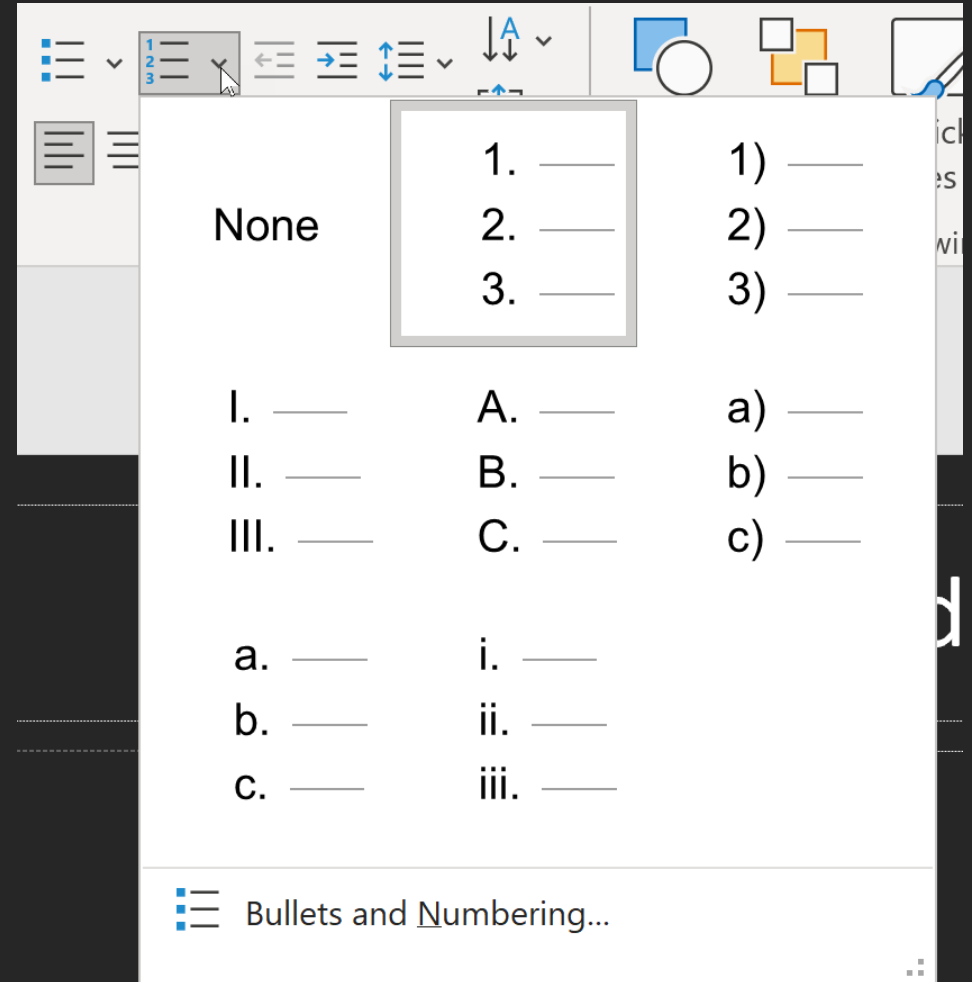
For more information on this topic, read
Essentials of Online Course Design: A
Standards-Based Guide-

<https://www.amazon.com/Essentials-Online-Course-Design-Standards-Based/dp/0415873002>



Lists

- Bullets: Equal importance
 - Can you reorder the items?
- Numbers: Order or hierarchy



EASY SHORTBREAD



Ingredients

- 1 cup butter, softened
- 1/2 cup sugar
- 2 1/2 cups flour

Directions

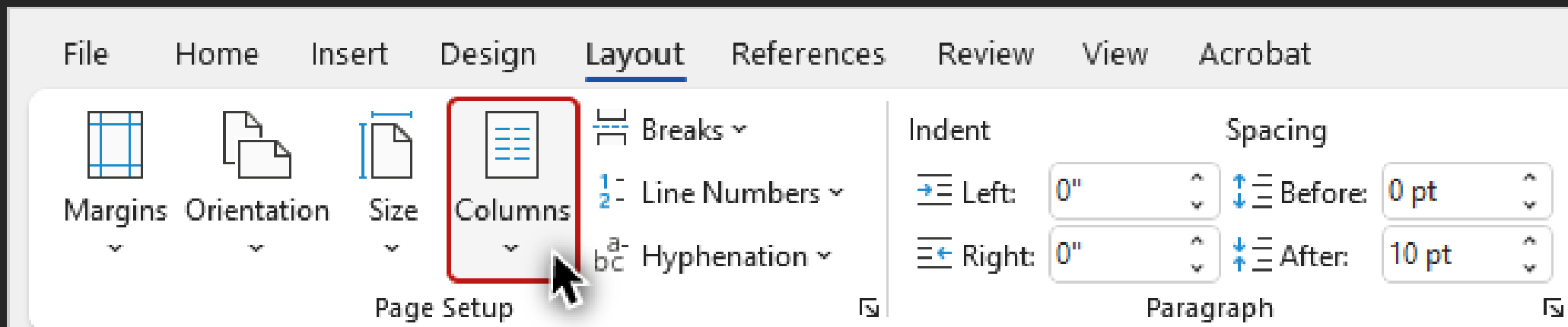
1. Preheat the oven to 300° F.
2. Cream butter and sugar.
3. Gradually stir flour into the creamed mixture until blended.
4. Pat the dough in the bottom of an ungreased 9x13 baking pan.
5. Bake at 300 F for 30 to 40 minutes, until just lightly browned.
6. Remove from oven and pierce all over with a fork.

Demo - 4 Steps to Create Lists in Office:

- Decide what type of list you should use—bulleted or numbered
- Highlight text
- Choose the correct list type
- Spend the 5 minutes fixing auto-numbering 😊

Columns

- Ensures proper reading order
- Word: **Layout** tab > **Columns**
- PowerPoint: **Home** tab > **Columns**
 - or “Two Content” layout instead of inserting a second text box.



Demo - Columns

- Headings
- Alternative text for images
- Links
- Lists
- Tables
- Columns
- Captions
- Text size
- Contrast
- Color reliance
- Language
- Document title
- Forms
- Frames
- Buttons

Identify text language

Most people today can hardly conceive of life without the internet. Some have argued that no other single invention has been more revolutionary since Gutenberg's printing press in the 1400s. Now, at the click of a mouse, the world can be “at your fingertips”—that is, if you can use a mouse... and see the screen... and hear the audio—in other words, if you don't have a disability of any kind.



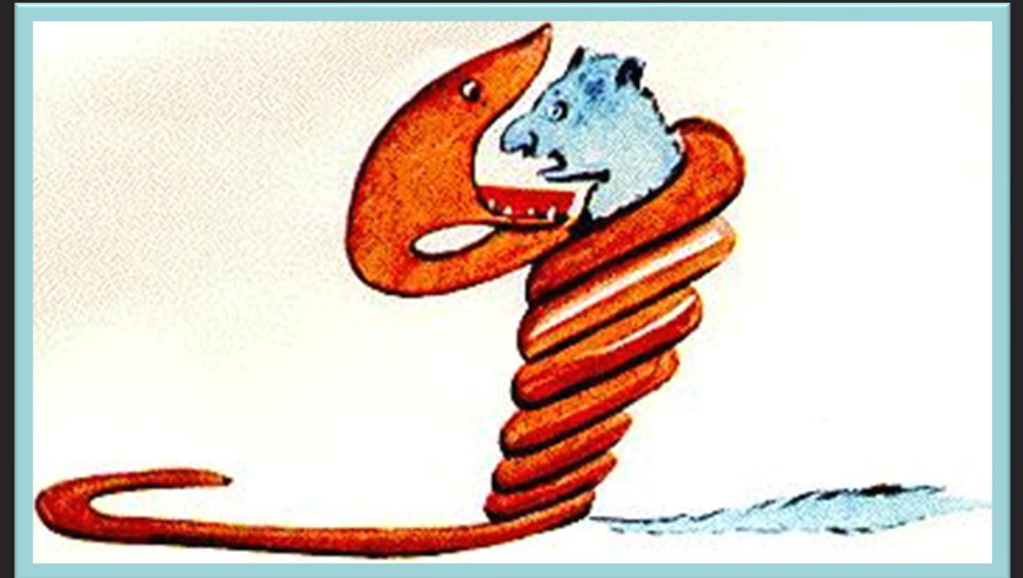
Set correct text language

- Windows: Select the text. On the **Review** tab, select **Language** > **Set Proofing Language**
 - Choose the most “typical” language version (e.g., “Spanish (Spain)”, not “Spanish (United States)”)
- Mac: Select the text. On the **Review** tab, select **Language**
- To set the language of an entire Word Document : Select all (Ctrl/command + A), then follow the above steps.

Demo – Document Language

Highlight the text, **Review** tab > **Language** > **Set Proofing Language**

Lorsque j'avais six ans j'ai vu, une fois, une magnifique image, dans un livre sur la Forêt Vierge qui s'appelait "Histoires Vécues". Ça représentait un serpent boa qui avalait un fauve. Voilà la copie du dessin.

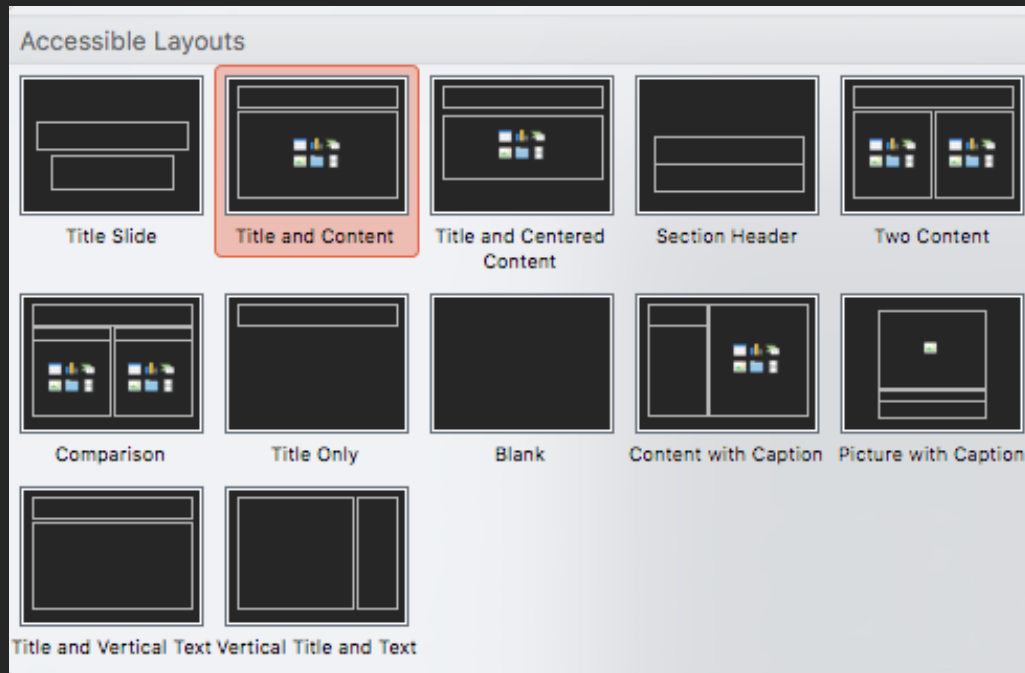


Practice – Tables, links, lists, columns, and language

Where are the Headings in PowerPoint?



Use layouts

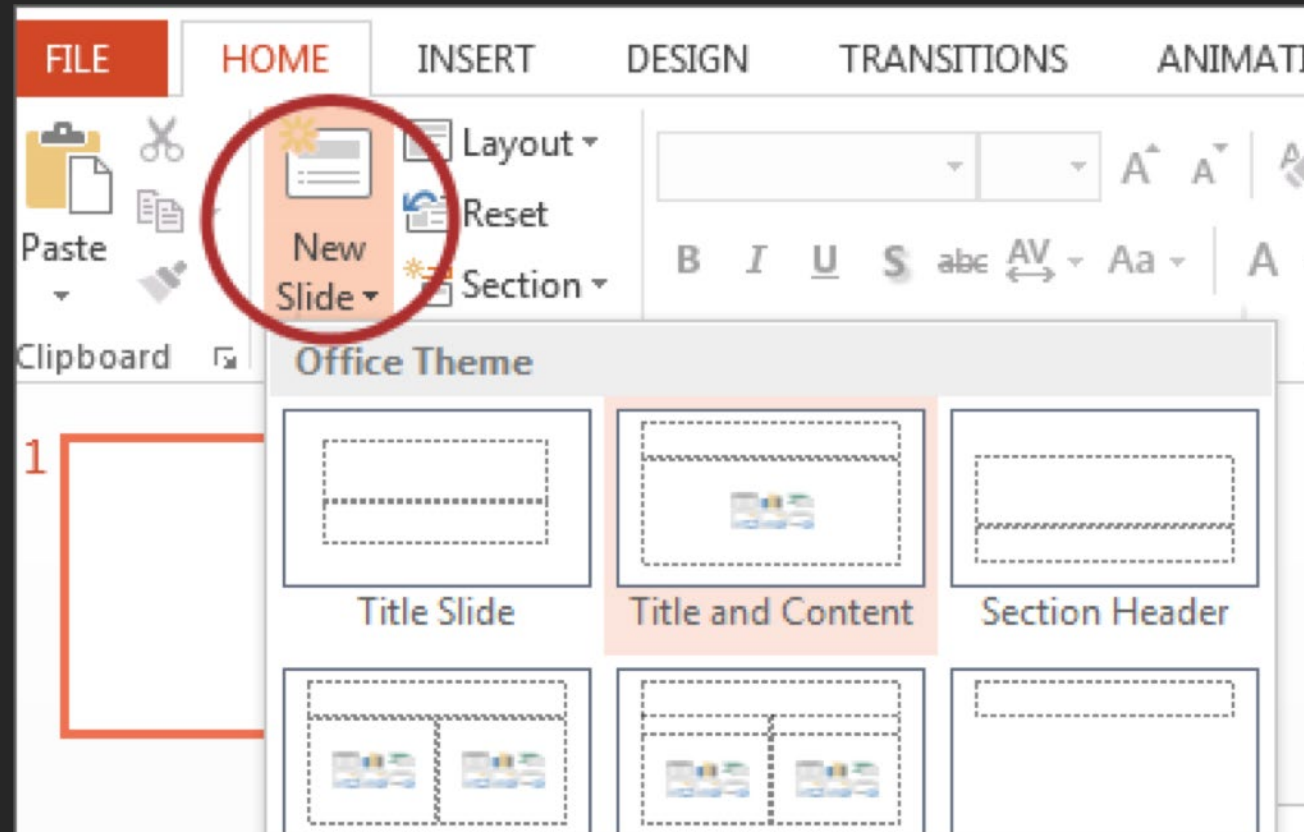


- Correct reading order
- Consistent presentation
- Easy navigation in PowerPoint
- Slide “title”= PDF heading

Slide titles and PDF headings

- Only 1 title per slide
- PDF Heading 1
 - “Title Slide” layout
 - “Section Header” layout
 - The first title in a new section
- PDF Heading 2
 - Any other slide title

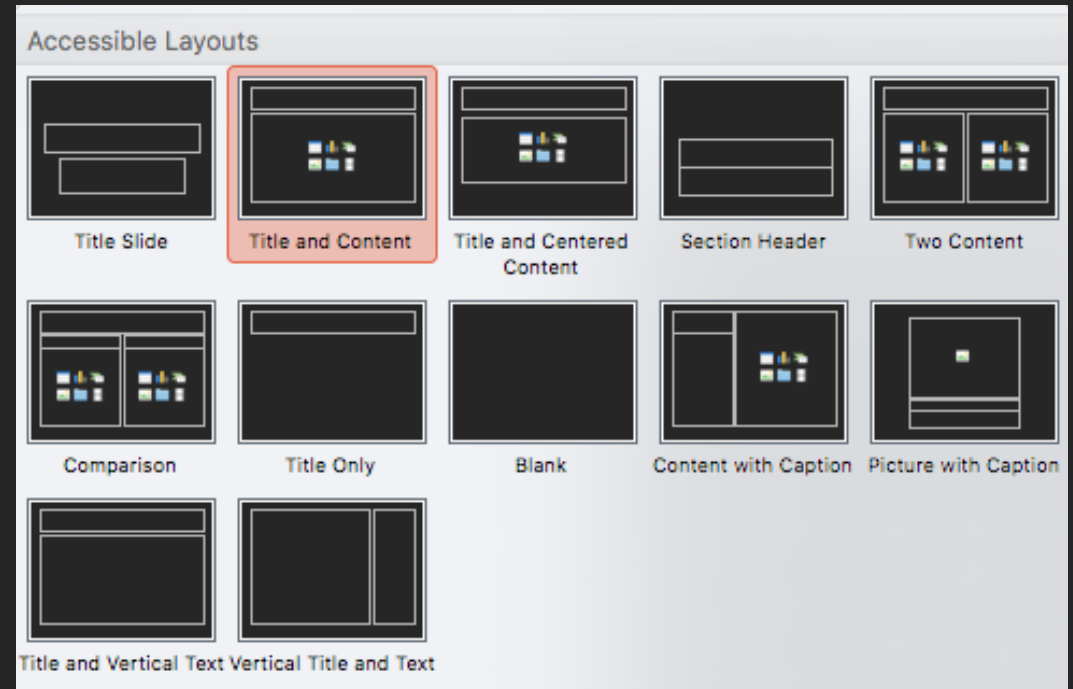
New Slide > Layout



Demo – New Slide

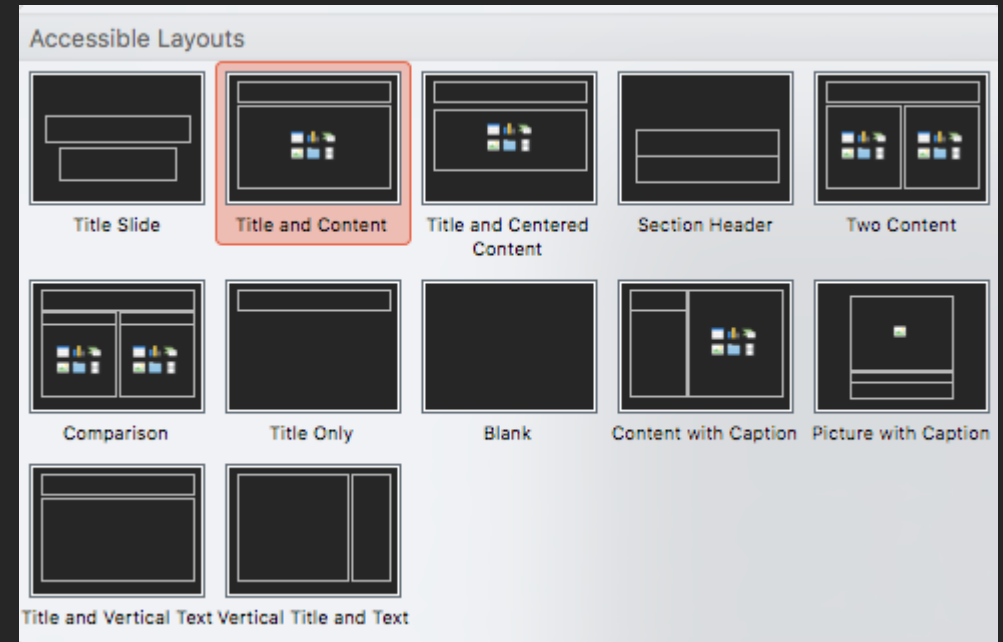
Demo – Apply slide layout

1. Select correct layout
2. Put “heading” text in the title placeholder
3. Move content into the content placeholder



Demo – Apply slide layout

1. Select correct layout
2. Put “heading” text in the title placeholder
3. Move content into the content placeholder



View & change object order

Reading Order Pane (Windows-only)

Accessibility [Close] [Help]

Inspection Results

Errors

- > Missing alternative text (4)
- > Missing slide title (12)

Warnings

- > Use captions for audio and video (2)
- > Table has merged or split cells (3)
- ▼ Check reading order
 - Slide 21 [Dropdown]
 - Slide 40 [Dropdown]
 - Slide 134
 - Slide 145

Tips

- > Duplicate slide

Recommended Actions

- Verify object order

Other Suggestions

- Learn more



Reading Order [Close] [Expand] [Collapse]

- ✓ 1 Title 3: Demo – Reading Order
- ✓ 2 Content Placeholder 12: From t...
- ✓ 3 Content Placeholder 14: Selecti...
- ✓ 4 Arrow: Right 15: This will open...

Demo – Reading Order Pane

Accessibility [Close] [Help]

Inspection Results

Errors

- > Missing alternative text (4)
- > Missing slide title (12)

Warnings

- > Use captions for audio and video (2)
- > Table has merged or split cells (3)
- ∨ **Check reading order**
 - Slide 21 [Down Arrow]
 - Slide 40 [Down Arrow]
 - Slide 134
 - Slide 145

Tips

- > Duplicate slide

Recommended Actions

- Verify object order

Other Suggestions

- Learn more



Reading Order [Close] [Up Arrow] [Down Arrow]

- ✓ 1 Title 3: Demo – Reading Order
- ✓ 2 Content Placeholder 12: From t...
- ✓ 3 Content Placeholder 14: Selecti...
- ✓ 4 Arrow: Right 15: This will open...

Content Order in the Selection Pane

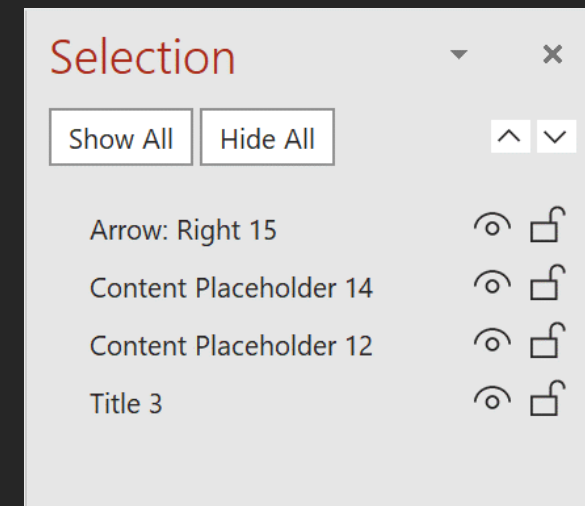
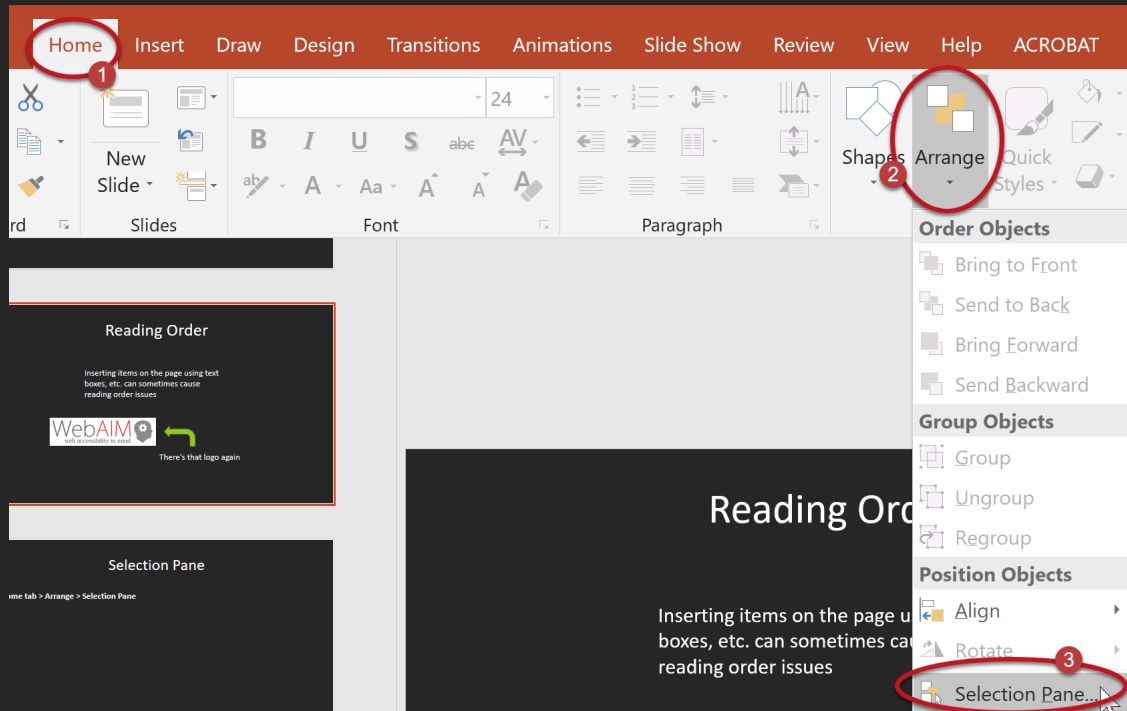
The object on a slide's

bottom layer

...is **read first** by a
screen reader.

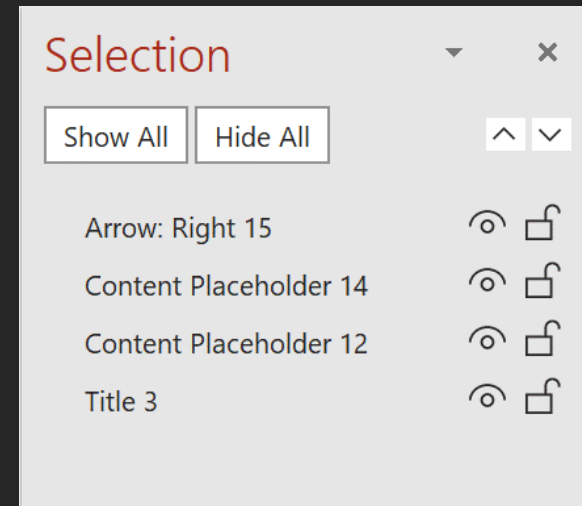
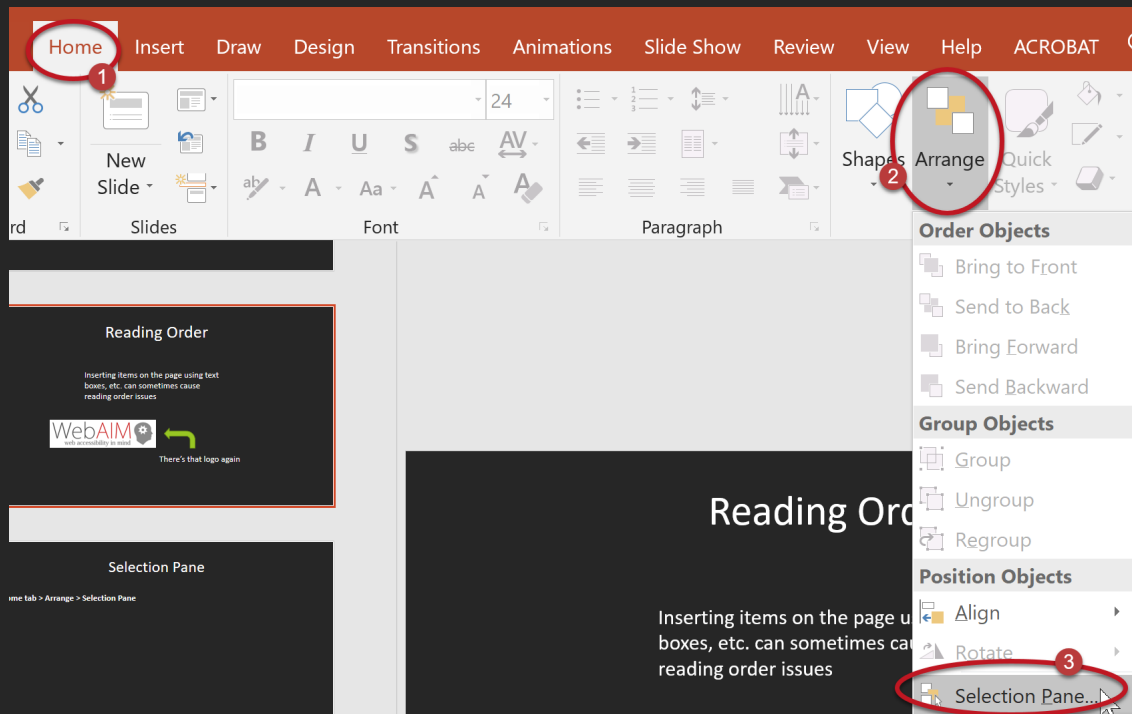


Mac/Online Option – Selection Pane



(Also available on Windows)

Demo – Selection Pane



Slide Master

- View tab > Slide Master
- Master – All slides
- Create new “Layout”
- Include title placeholder
- Check reading order



Practice – Layouts and reading order

Other accessibility principles

Low vision

Images of Text



Provide Sufficient Contrast

[WebAIM contrast article](#)

WCAG Contrast Formula

$$(L1 + 0.05) / (L2 + 0.05)$$

where

$$L = 0.2126 * R + 0.7152 * G + 0.0722 * B$$

where

R, G, and B =

$$R_{sRGB} \leq 0.03928 \text{ then } R = R_{sRGB} / 12.92$$

$$\text{else } R = ((R_{sRGB} + 0.055) / 1.055) ^ 2.4$$

where

$$R_{sRGB} \leq R_{8bit} / 255$$

21:1

21:1

Level AA Contrast Examples

4.5:1

Gray on White

Purple on White

Red on Yellow

3:1 – “Large” text

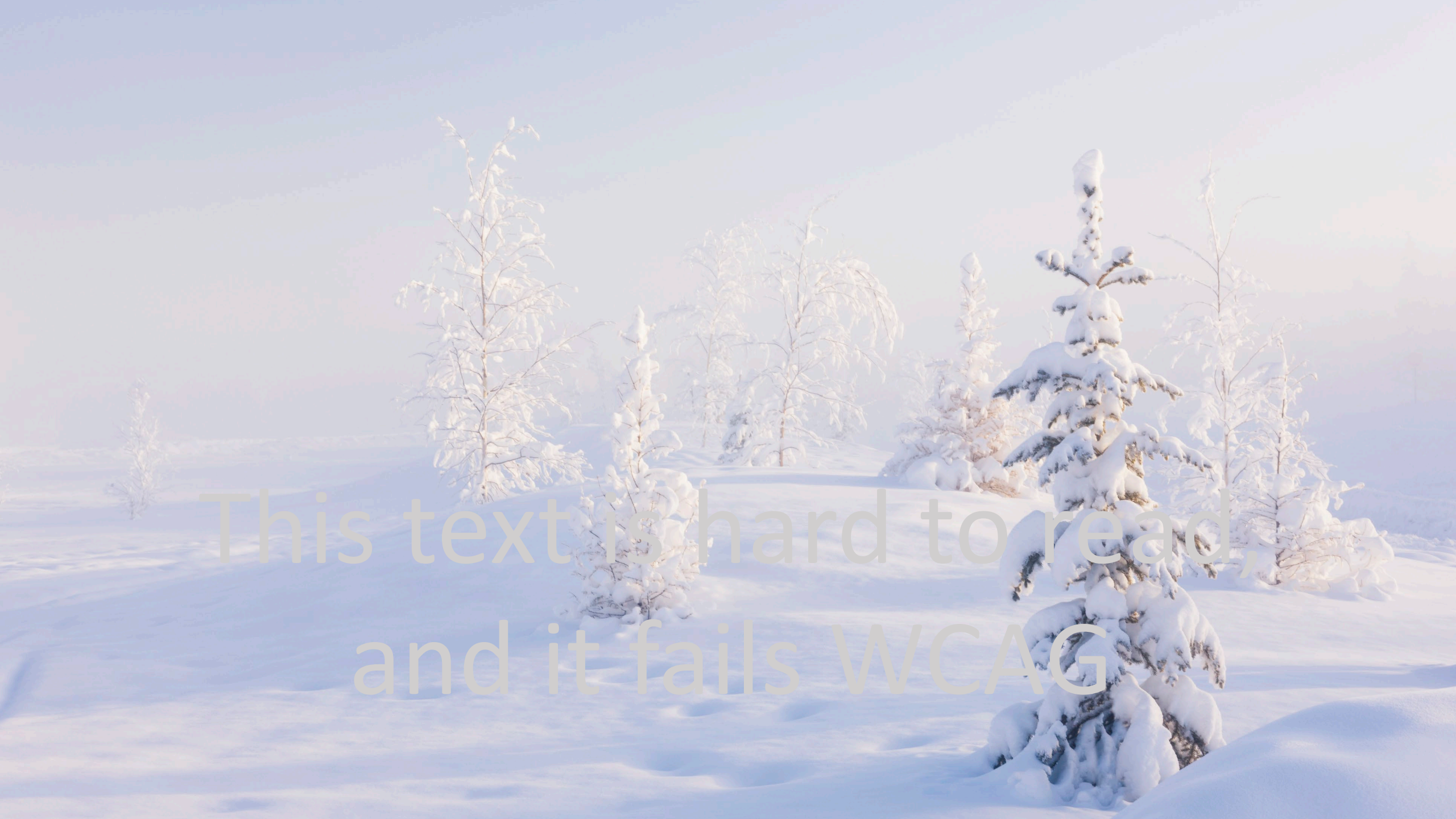
≥18pt

BOLD: ≥14pt

“Images of text”

50 most played
songs by genre





This text is hard to read,
and it fails WCAG

A serene winter landscape featuring a snow-covered field with several trees heavily laden with snow. The sky is bright and clear, suggesting a sunny day. The overall scene is peaceful and picturesque.

This text is hard to read,
~~and it fails WCAG~~

Exceptions

“Pure decoration”



“Logotypes”

50 most played
songs by genre

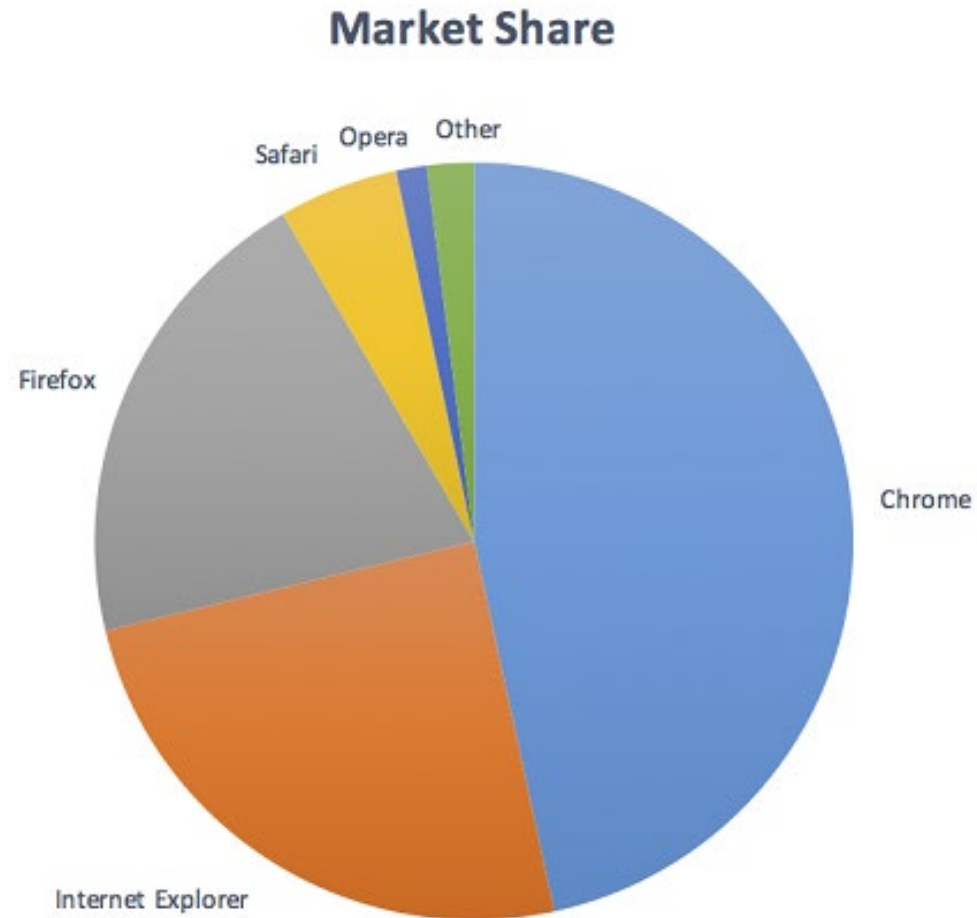


Screenshots

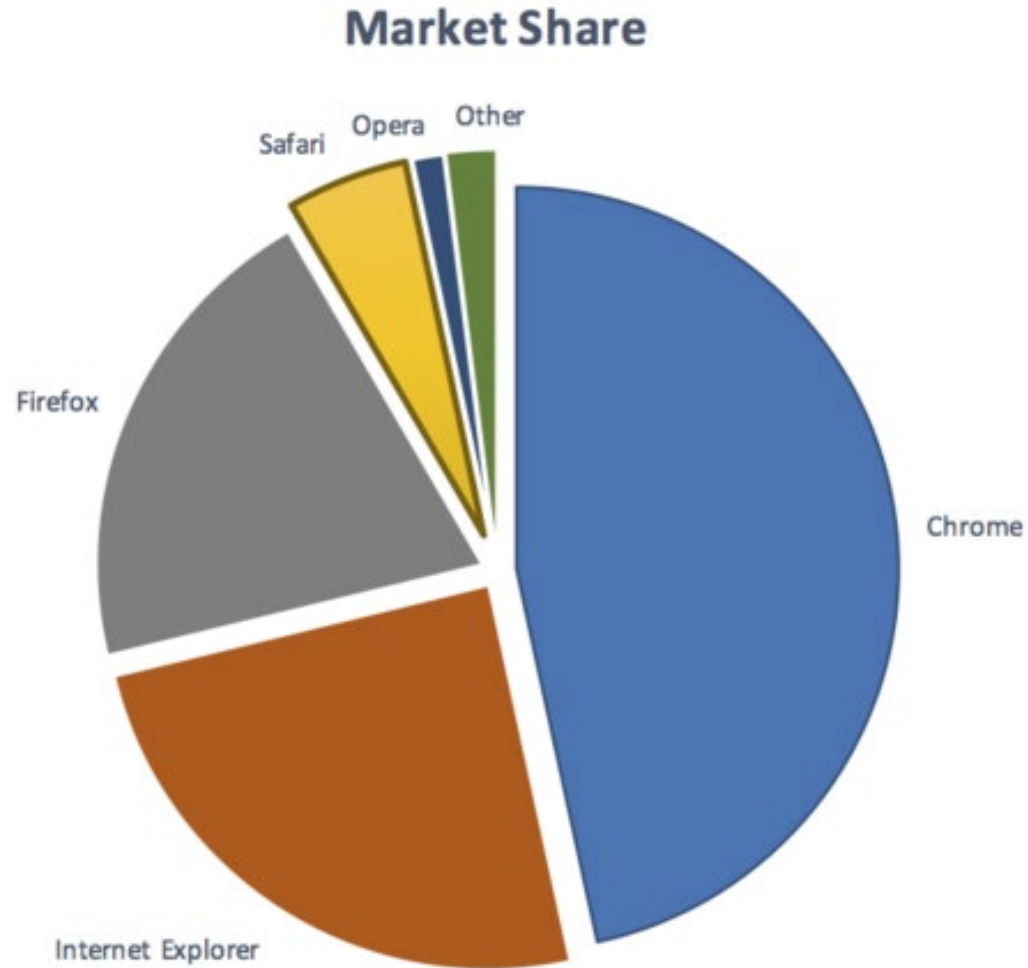
The screenshot displays a collection of cell styles and formats organized into several sections:

- Good, Bad and Neutral:** Includes a 'Normal' style and three colored boxes: 'Bad' (pink), 'Good' (green), and 'Neutral' (yellow).
- Data and Model:** Includes 'Calculation' (orange), 'Check Cell' (grey), 'Explanatory ...' (grey), 'Input' (orange), 'Linked Cell' (orange with underline), and 'Note' (yellow).
- Output:** Includes 'Warning Text' (red).
- Titles and Headings:** Includes 'Heading 1' (blue with underline), 'Heading 2' (blue with underline), 'Heading 3' (blue with underline), 'Heading 4' (blue with underline), 'Title' (blue with underline), and 'Total' (blue with double underline).
- Themed Cell Styles:** A grid of 24 cells showing combinations of percentages (20%, 40%, 60%) and accents (Accent1 to Accent6) in various colors.
- Number Format:** Includes 'Comma', 'Comma [0]', 'Currency', 'Currency [0]', and 'Percent'.

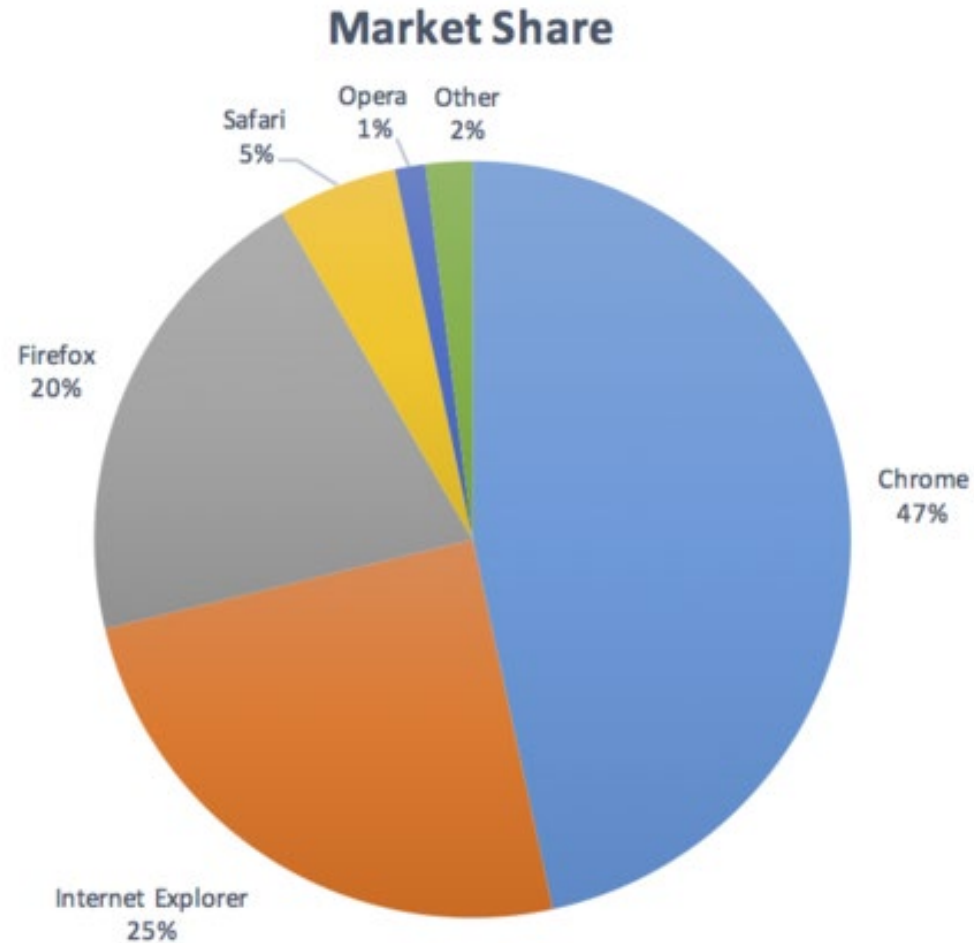
WCAG 2.1 – 3:1 Contrast of “Graphical Objects”



“Against Adjacent color(s)”



“...required to understand”



“...required to understand”



“Use of Color”

The green mushrooms listed here are okay to eat. The red mushrooms are poisonous.

- Amanita
- Chanterelle
- Porcini
- Shiitake
- Tylopilus

How can we fix this?

The green mushrooms listed here are okay to eat. The red mushrooms are poisonous.

- Amanita
- Chanterelle
- Porcini
- Shiitake
- Tylopilus

Icons (with alternative text)

- Amanita 
- Chanterelle
- Porcini
- Shiitake
- Tylopilus 

Separate lists

Safe

- Chanterelle
- Porcini
- Shiitake

Poisonous

- Amanita
- Tylopilus

Bold or Italicized text?

- *Amanita*
- Chanterelle
- Porcini
- Shiitake
- *Tylopilus*

Two separate requirements

1. Ensure enough contrast
2. Do not rely on color alone
 - Don't remove underline from links

Multimedia

Captions



PULL THE LEVER, KRONK.

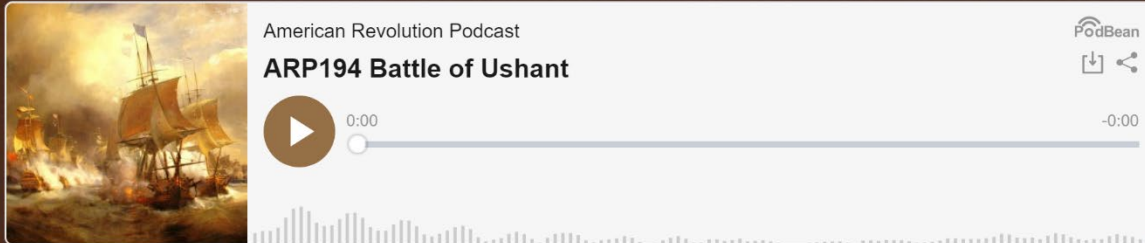
Captioning Methods

- Type, then sync
- Captioner
- Automated
(speech recognition)



Descriptive Transcript

ARP194 Battle of Ushant



After Britain and France went to war in the spring of 1778, America became a sideshow to the main event. Britain and France had been traditional enemies for centuries. Part of it was the whole Catholic-Protestant rift that had divided Europe. Part of it was conflicting claims over each other's countries. King George III still held the title of King of France, a claim that dated back more than 400 years. Although the British Channel kept the two kingdoms separated, there was a continuing rivalry between the two countries that simply would not end.

In the prior decades most of the fighting had been fought over colonies around the world. Britain and France traded colonies in wars back and forth. North America was only one pawn in that larger game of chess.

In the hundred years prior to this war, Britain and France had faced off in at least five major wars, totaling 39 years of fighting. These were a continuation of centuries more fighting between the two kingdoms.

In the Seven Years War, the British Navy had dominated the French at sea. That was a big reason why France lost North America. In the intervening years, France focused on rebuilding her navy to compete with the British. France, which had three times the population of Britain, thought that



Battle of Ushant

- Called “Alternative for Time-based Media” in WCAG
- Text-based presentation of important audio and visual information
 - Does not have to be text-only
- Not synchronized

Deaf-blind

- Content accessible to blind users will generally be accessible to users who are deaf-blind
 - With the exception of media
- Descriptive transcripts provide media accessibility



WCAG Requirements

Level A

- Captions
- Transcript for audio-only or video-only content
- Audio description OR transcript (if needed)

Level AA

- Audio description (if needed)
- Live audio – Captions

Level AAA

- Descriptive transcript
- Sign language
- Live audio – Transcript

Our recommendation

Level A

- Captions
- Transcript for audio-only or video-only content
- Audio description OR transcript (if needed)

Level AA

- Audio description (if needed)
- Live audio – Captions
- **Descriptive transcript**

Level AAA

- Sign language
- Live audio – Transcript

Cognitive/Learning Disabilities

- Largest disability group.
- Most of the earlier principles can make content more understandable.
 - Captions, contrast, color, headings, lists, simple tables, etc.
- Because users' needs vary greatly, we will focus on general recommendations.

Make Content “Understandable”

- Use plain language
 - “readable to users with a lower secondary reading level” (WCAG AAA)
 - Write for your audience
- Small text negatively impacts readability
 - WCAG has no min. text size requirement
- Choose legible fonts

Typefaces and Fonts

C vs O

C vs O

e vs o

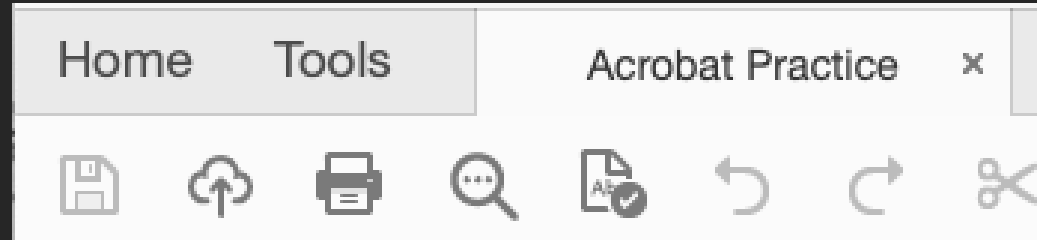
e vs o

I vs I vs I

I vs I vs 1

Each new typeface **INTRODUCES**
additional cognitive overhead.

Descriptive Document Title



- Office uses Filename instead of title. Make it descriptive when you can.
 - E.g., descriptive-title.docx
- Titles required in PDF. Add them in Office and they *may* be added when converting to the PDF.
 - Mac: **File** application menu (not tab) > **Properties** > **Title**
 - Windows: **File** tab > **Info** > **Title**

Document Title | Windows

The screenshot shows the Microsoft Word interface with the 'Info' pane open. The title bar reads 'Document1 - Word'. The left sidebar contains navigation options: Info (highlighted with a red box), New, Open, Save, Save As, Print, and Share. The main area is divided into three sections: 'Protect Document' (with a padlock icon), 'Inspect Document' (with a checklist icon), and 'Properties' (with a dropdown arrow). The 'Properties' section lists document statistics: Size (Not saved yet), Pages (1), Words (0), and Total Editing Time (0 Minutes). The 'Title' field is highlighted with a red box and contains the placeholder text 'Add a title'.

Document1 - Word

Info

Protect Document

Control what types of changes people can make to this document.

Inspect Document

Before publishing this file, be aware that it contains:

- Document properties and author's name

Properties ▾

Size	Not saved yet
Pages	1
Words	0
Total Editing Time	0 Minutes
Title	Add a title
Tags	Add a tag
Comments	Add comments

Document Title | Mac

Document1 Properties

General Summary Statistics Content Custom

Title:

Subject:

Author: WebAIM

Manager:

Company:

Category:

Keywords:

Comments:

Hyperlink base:

Template: Normal.dotm

Save preview picture with this document

Cancel OK