



MISSOURI OFFICE
of ADMINISTRATION

Web Accessibility Awareness, Document & Image Accessibility



Target Audience for Course

- ✓ All State of Missouri Employees
- ✓ Focus on those who create web content or documents for State of Missouri websites, social media platforms and intranet sites



Agenda

Module 1: What is Web Accessibility and Who Is It For?

Module 2: Assistive Technology & Examples

Module 3: Accessibility Law, Standards and the POUR Concept

Module 4: Document Accessibility

Module 5: Image Accessibility

Module 6: Summary, Next Steps & Being an Accessibility Champion



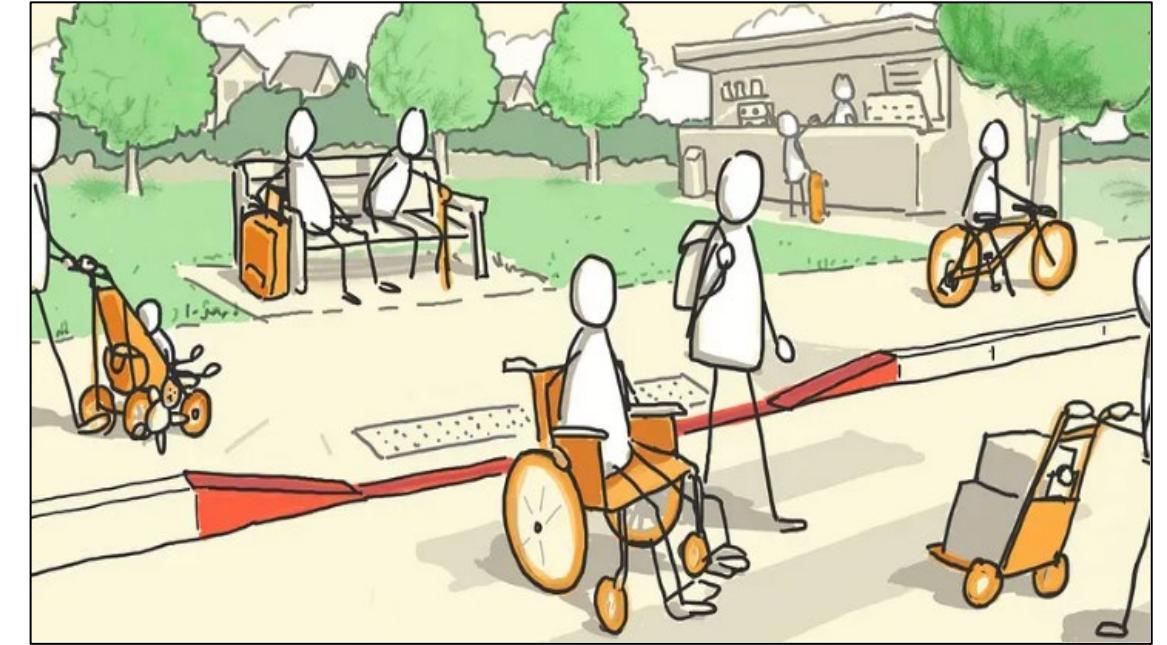
Module 1: What is Web Accessibility and Who Is It For?



What is Web Accessibility?

The practice of creating usable and understandable websites, applications and digital documents for ALL people.

Physical “Curb Cut”



Digital “Curb Cut”



Who is Web Accessibility For?

Adults identifying as having some type of disability

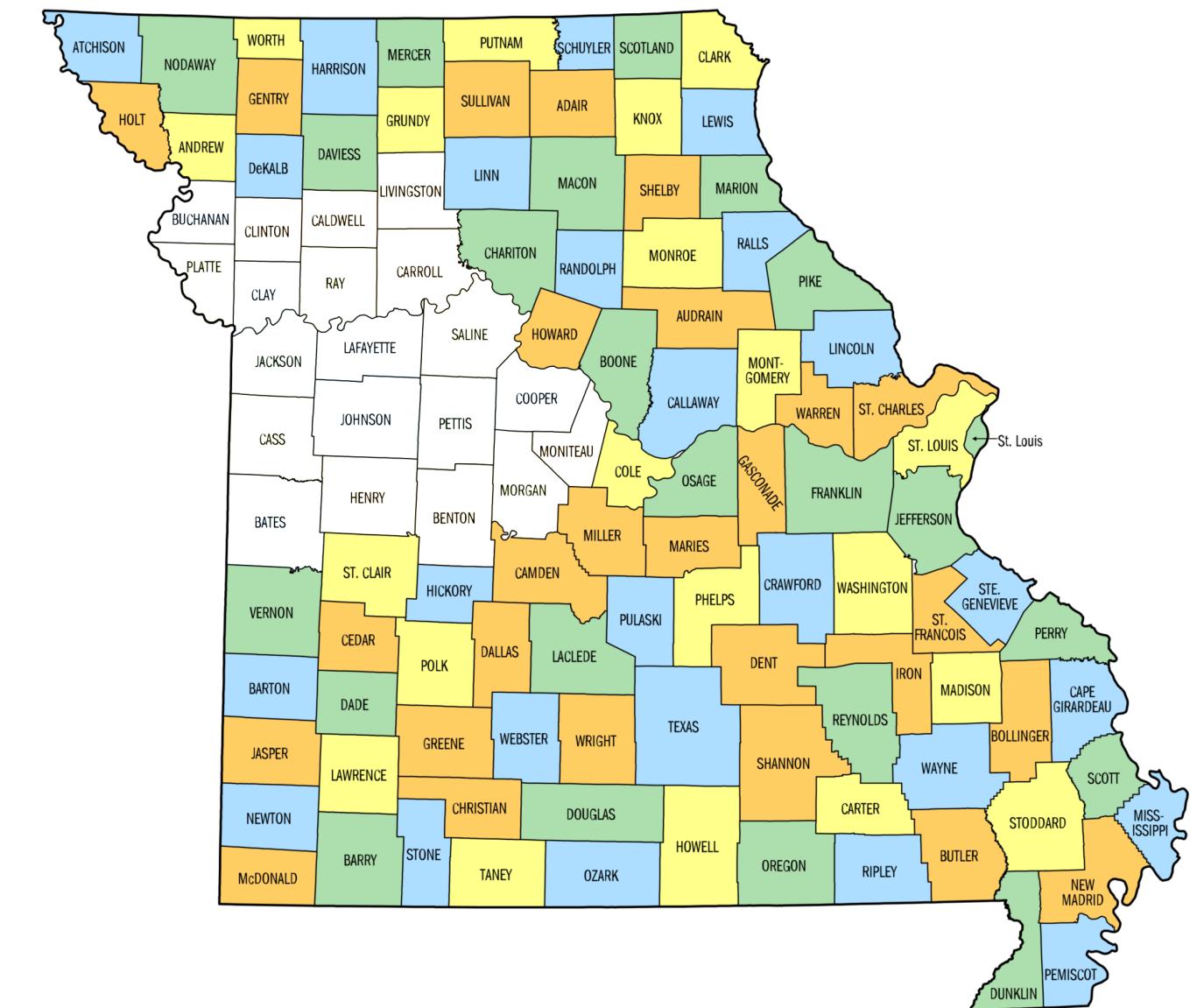
1 in 4
(28.7%)
American Adults
(73.4/244.5 million)

Almost 1 in 3
(31.3%)
Missouri Adults
(1.5/4.65 million)

Think About the Impact...



- ✓ If you were to exclude 1.5 million Missouri citizens from accessing websites, it would be like blocking access to Kansas City and the surrounding area (20 total counties).



Disability Types



Visual Impairments

Blind, Low Vision, Colorblind, Glasses/Contact Users



Hearing Impairments

Deaf, Hard of Hearing, Hearing Aid Users



Motor Disabilities

Physical Weakness/Limitation



Cognitive/Learning Disabilities

Affects Processing of Information

Cognitive & Learning



Examples:

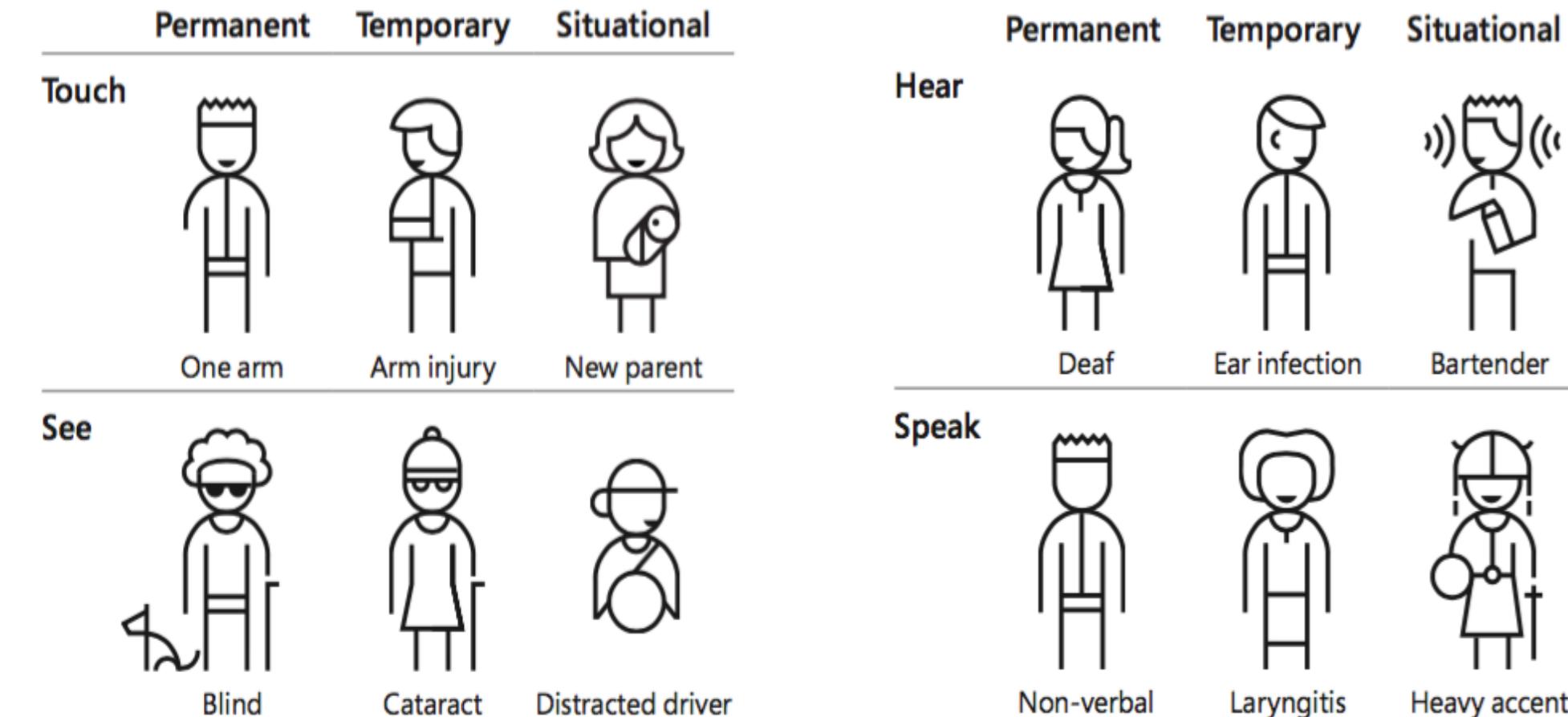
- ✓ Attention deficit hyperactivity disorder (ADHD)
- ✓ Autism
- ✓ Dyslexia
- ✓ Learning disabilities like reading comprehension
- ✓ Brain injury
- ✓ Aging



Did You Know?



Effective web accessibility positively affects everyone!
Users with temporary and situational disabilities
also benefit from accessible websites!



Module 2

Assistive Technology & Examples



What is Assistive Technology?



It's common for those with disabilities to use **assistive technology**

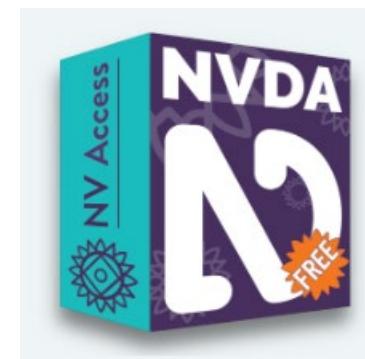
“**Assistive Technology** is any tool, device, or product that helps people with disabilities perform tasks that they might not be able to do without it.”

Visual: Blind

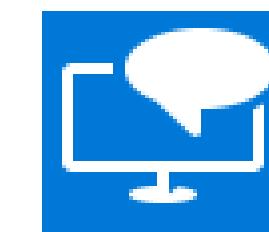


Screen Readers (Narration Software)

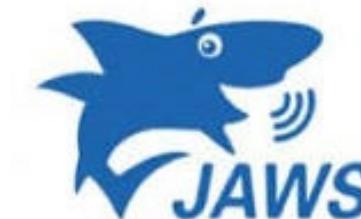
- ✓ Screen readers are used to navigate a website by reading out loud what is on the screen to the user.
- ✓ Used in combination with a keyboard or braille display, but not a mouse.



Voiceover



Narrator



Visual: Low Vision

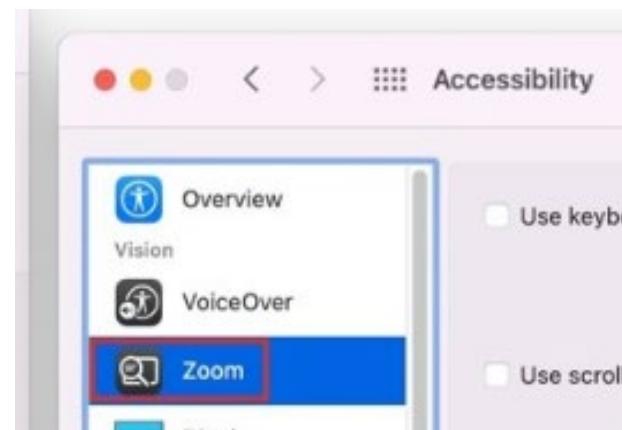


Screen Magnification

- ✓ Magnification programs help the user enlarge everything that is found on the screen.



Apple Zoom



Windows Magnifier



ZoomText and JAWS



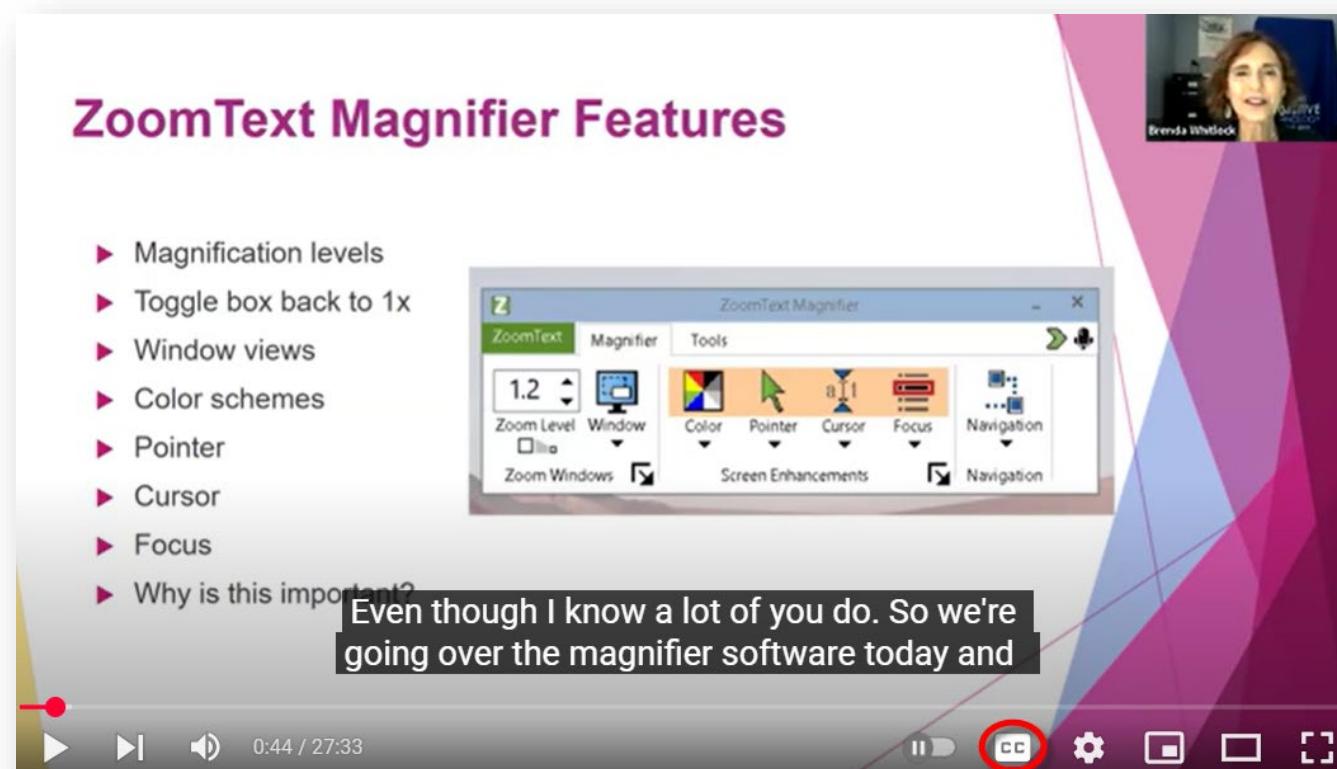
Deaf & Hard of Hearing



Closed captioning of videos and text transcripts of audio-only content allow users to read information that would otherwise be inaccessible.

ZoomText Magnifier Features

- ▶ Magnification levels
- ▶ Toggle box back to 1x
- ▶ Window views
- ▶ Color schemes
- ▶ Pointer
- ▶ Cursor
- ▶ Focus
- ▶ Why is this important?



Even though I know a lot of you do. So we're going over the magnifier software today and

Podcast on Knowledge Commons

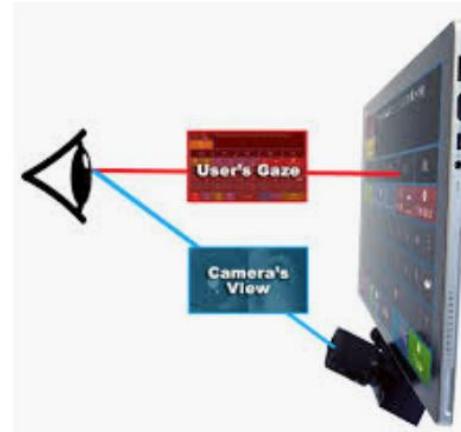
[Podcast Audio \(MP3\)](#) | [Text Transcript](#)

Motor & Physical Disabilities



Motor or physical disabilities are weakness and limitations of muscular control

Eye Gaze Technology



Mouth Movement



Speech to Text



Head Mouse



Switch



Cognitive & Learning



Impacts how people process information

Users will:

- ✓ Navigate web content using different strategies
- ✓ Access information using speech-to text, screen readers, captions or other formats
- ✓ Change the presentation of the content according to needs and preferences

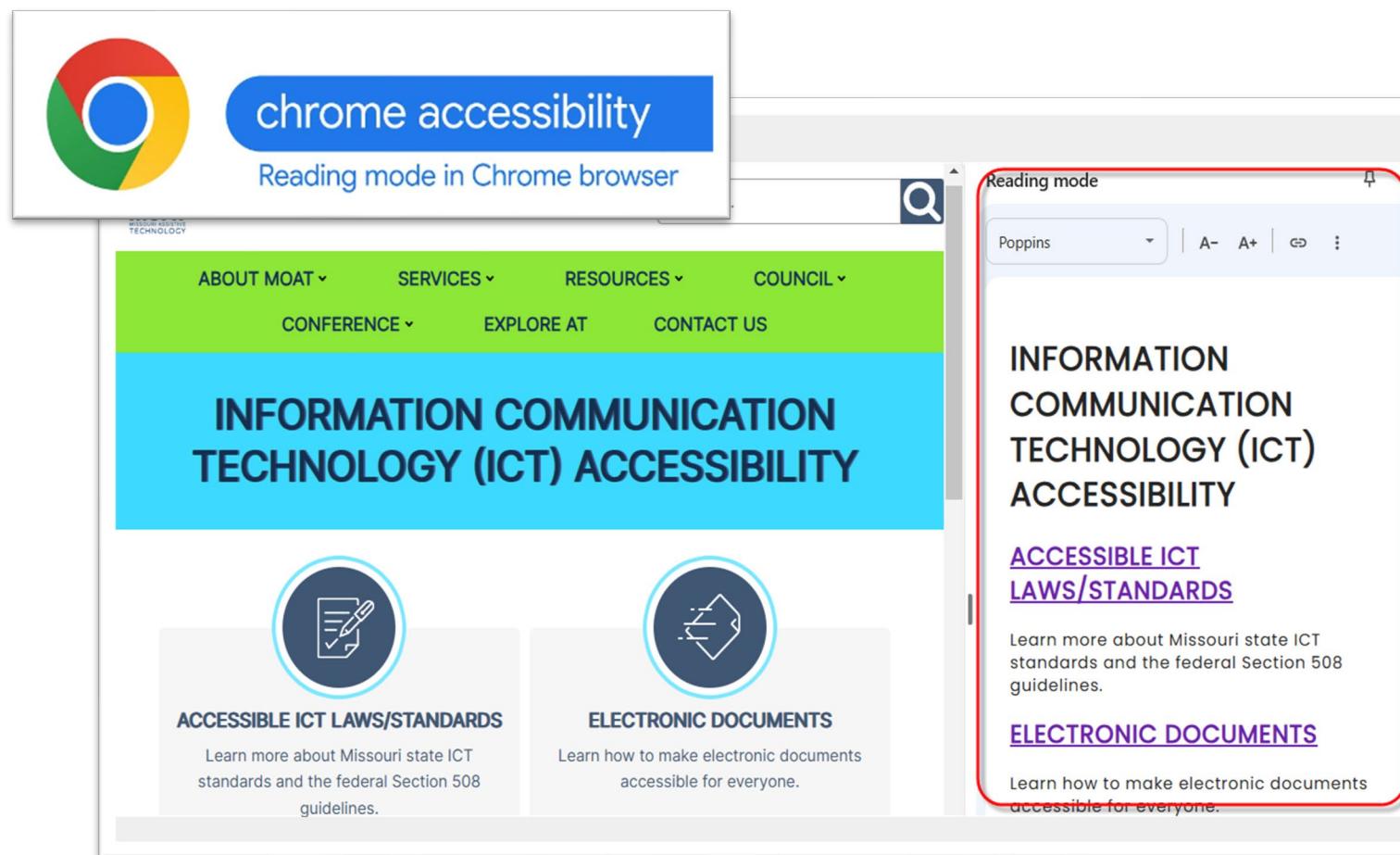
Content creators can:

- ✓ Use plain language at 6th-8th grade reading level
- ✓ Include white space between major thoughts or important points
- ✓ Use bulleted or numbered lists to simplify content

Cognitive & Learning Tool Examples



Chrome Reading Mode located under Chrome Settings – More Tools



[Helperbird](#) Browser Extension



Module 3

Accessibility Law, Standards and the POUR Concept



Federal Laws



Rehabilitation Act of 1973

✓ [Section 504](#)

Federally funded govt. agencies and projects, postsecondary institutions (2024 Update)

✓ [Section 508](#)

Federal government

Americans with Disabilities Act

✓ [Title II](#)

State and Local Government (2024 Update)

[Individuals with Disabilities Education Act \(IDEA\)](#)

Missouri State Law



- ✓ Missouri State Statute – effective 1999
- ✓ Missouri State Standard – effective 2003
 - Agency public sites
 - Like accessing information about a local state park
 - Web applications (interactive websites)
 - Like applying for a job on <https://jobs.mo.gov>
 - Contracted sites/licensed web software
 - Contracted site like mocareers.mo.gov
 - Licensed web software like Wufoo form creator
 - Intranet sites
 - Like accessing personnel policies on your agency's intranet
 - Social media content
 - Like a Facebook post with image

INFORMATION COMMUNICATION TECHNOLOGY (ICT) ACCESSIBILITY



ACCESSIBLE ICT LAWS/STANDARDS

Learn more about Missouri state ICT standards and the federal Section 508 guidelines.



ELECTRONIC DOCUMENTS

Learn how to make electronic documents accessible for everyone.

Missouri State Law



Web Content Accessibility Guidelines (WCAG)

- ✓ International standard developed by the World Wide Web Consortium (W3C)
- ✓ Each guideline includes a list of testable success criteria to help create accessible content.

Missouri Standard

- ✓ WCAG Version 2.1 compliance began March 2025
- ✓ WCAG Version 2.2 implemented October 2025, compliance deadline April 2026

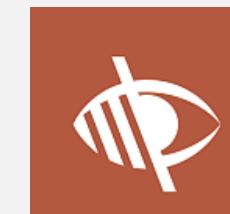
Accessibility Principles



POUR

Perceivable

Users can identify content by way of sight, sound, and/or touch, regardless of device or operating system.



Operable

A website should work correctly whether visitors are using a mouse, a keyboard, voice commands, or other device.



Understandable

Navigation and design should be predictable and consistent, content is written clearly and simply and tasks are easy to complete.



Robust

When content is well-designed/well-planned, it doesn't matter what technology a citizen uses to access it.



Accessibility Principles



POUR

Perceivable

Review and apply accurate and descriptive alternative text for images (visual impairments)



Operable

People can fully operate your website or application using keyboard alone. (visual or motor impairments)



Understandable

Review your content for clear and simple language using guides like the [Plain Language Quick Reference Guide](#).

Proofread using this checklist:

Check structure and organization

- Is there a logical structure the reader can follow?
- Did you put the most important information at the start?
- Is text broken down into short paragraphs?

Robust

Webpage content is automatically more accessible versus formatting as a document. Ensure you have a need to offer content as a document/PDF.



Module 4

Document

Accessibility

Features



Document Accessibility Features

1. Text & Non-Text Color Contrast
2. Alternative Text for Images
3. Structured Headings
4. Structured Data Tables
5. Descriptive Hyperlinks
6. Descriptive Title within Document Properties
7. Other Accessibility Tips



Text & Color Contrast



- ✓ Contrast is a measure of the difference in perceived “luminance” or brightness between two colors.
- ✓ Minimum 4.5:1 ratio for regular sized text (<18pt+ or <14pt+ bold)
- ✓ Minimum 3:1 ratio for large sized text (18pt+ or 14pt+ bold)
- ✓ Exception: Logos

Users impacted: Low vision, colorblindness, aging, cognitive impairments, those in bright environments.

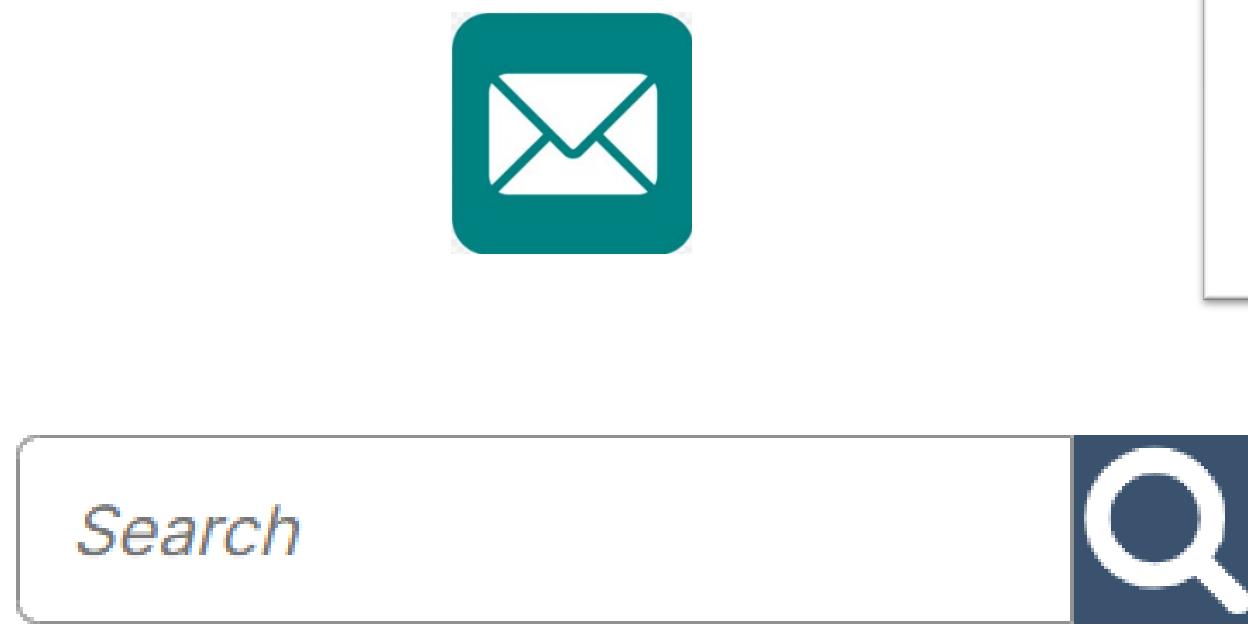
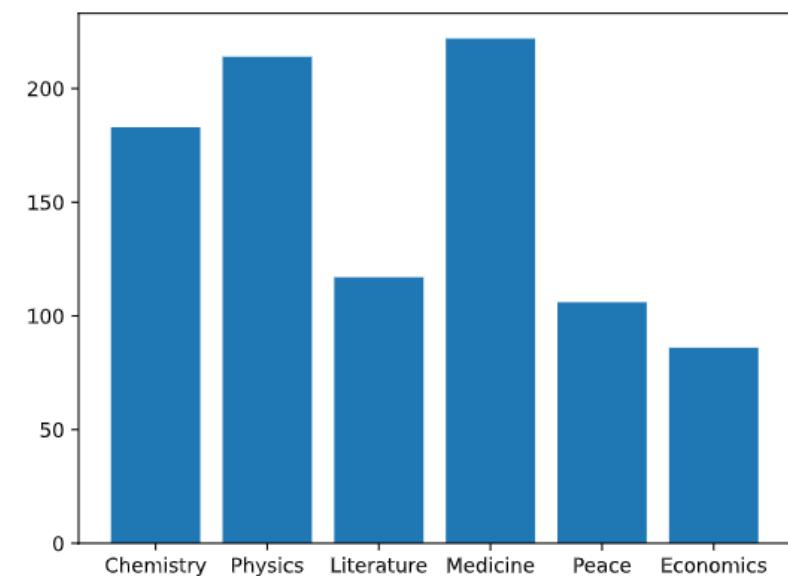
Free tools to test color contrast



Non-Text Color Contrast



- ✓ Non-text examples include:
 - ✓ Form field outline or a checkbox
 - ✓ Graphical object like a print icon button or bars in a bar chart
- ✓ Minimum 3:1 Ratio



WebAIM Contrast Checker
Home > Resources > Contrast Checker

Foreground
Hex Value: #FFFFFF
Color Picker
Alpha: 1
Lightness: 100%

Background
Hex Value: #008181
Color Picker

Eyedropper
Contrast Ratio: 4.71:1
permalink

Normal Text
WCAG AA: Pass
WCAG AAA: Fail
The five boxing wizards jump quickly.

Large Text
WCAG AA: Pass
WCAG AAA: Pass
The five boxing wizards jump quickly.

Graphical Objects and User Interface Components
WCAG AA: Pass
The five boxing wizards jump quickly.

Heading Structure



- ✓ Create a uniform heading structure through use of styles. This allows screen reader navigation.
- ✓ This also gives the ability to quickly create a table of contents.

Web Accessibility Language for Proposals, Contracts and Other Procurement Processes

Accessibility

Contractor shall comply with and the Work Product provided under this Contract in compliance with all applicable provisions of RSMo 161.925 and the Missouri

Table of Contents

Provide an overview of your document by adding a table of contents.

Text using a heading style will be included automatically. To include more entries, select the text and click Add Text. The table will be refreshed when you click Update Table.

uri Graduation Toolkit4

uri High School Minimum Graduation Requirements and the Missouri Coordinating Board for Education (CBHE) Coursework Recommendations5

ouri Graduation Requirements by Units of Credit6

dual Career and Academic Plan (ICAP) – (§167.903, RSMo)7

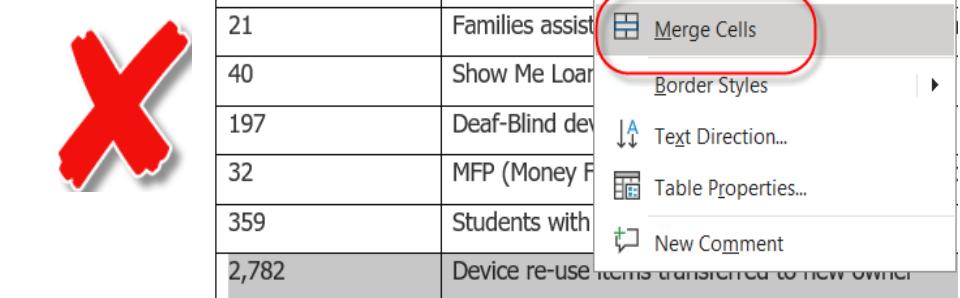
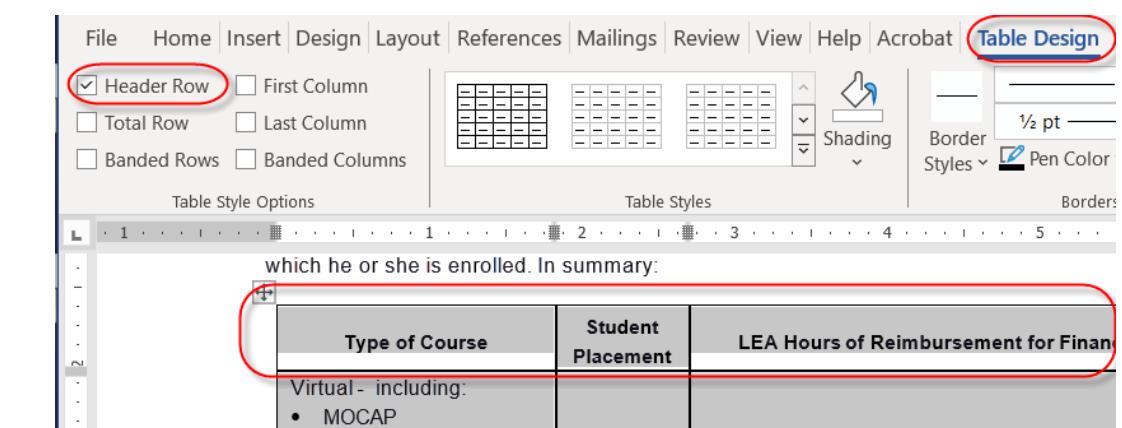
nce on Transfer Students and Variances to the State Minimum Graduation Requirements8

Students Transferring Between Local Education Agencies with Significantly Different Schedules and Graduation Requirements9

Data Tables



- ✓ Accessible data tables need a clear table structure and table headers to help guide a screen reader user.
- ✓ To add headers to the first row, highlight the table, select Table Design > Table Style on the ribbon, then choose the Header Row.
- ✓ Avoid complex tables.
- ✓ Avoid merging or splitting cells.
- ✓ Avoid tables for layout purposes.



Descriptive Hyperlinks



- ✓ Link text should convey clear and accurate information about the destination
- ✓ Avoid “click here”, “more information”, or long web addresses
- ✓ Create unique links (January 2024 Agenda vs. Agenda)

News and Updates

GI Bill® is a registered trademark of the U.S. Department of Veterans Affairs (VA). Please [click here](#) for more information about education benefits offered by VA.

Month	Link Text	Notes
December 6, 2024 (Fri)	Agenda/Handouts	
September 6, 2024 (Fri)	Agenda/Handouts	
June 14, 2024 (Fri)	Agenda/Handouts	

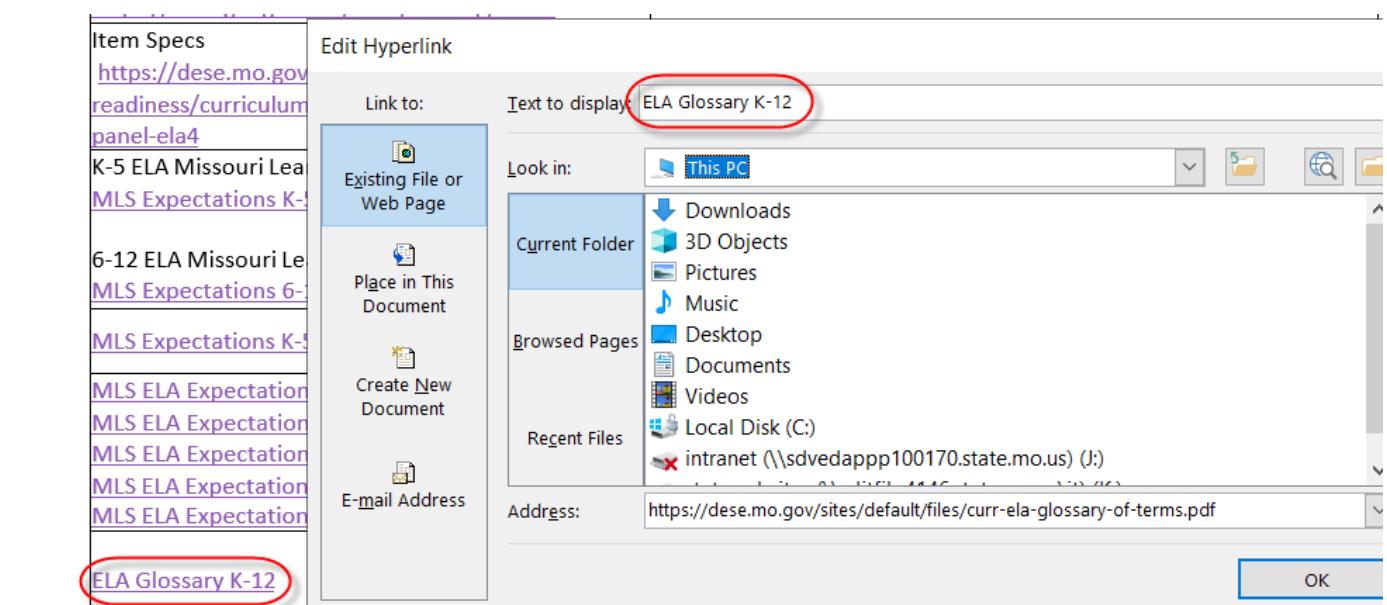
2024

December 2024

- December 2024 Council Agenda [link](#)

September 2024

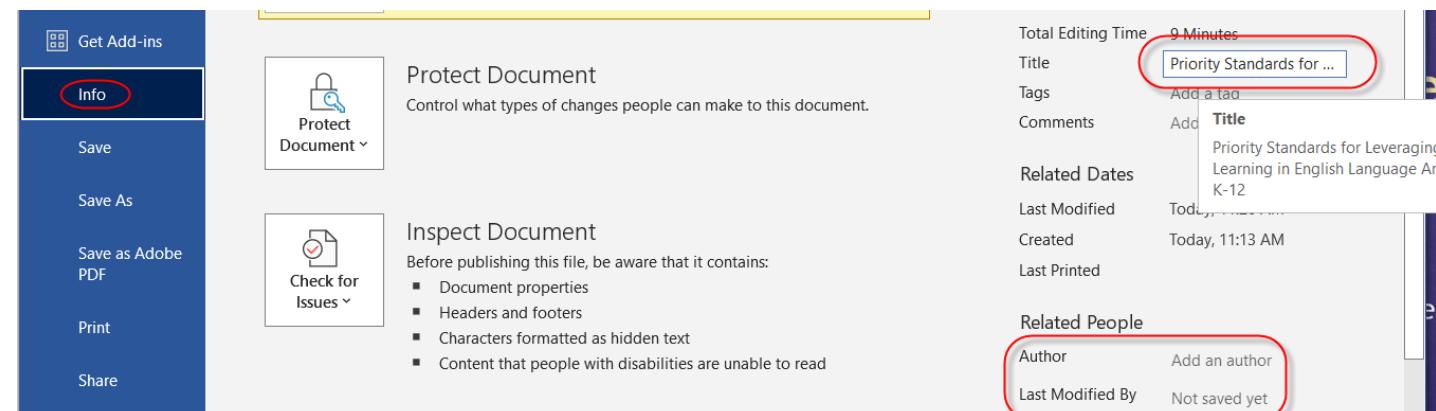
- Sept 2024 Council Agenda [link](#)
- Sept 2024 Council Minutes [link](#)



Document Properties - Title



- ✓ File > Info
- ✓ Add descriptive title for document
- ✓ Review Author section to see if it needs to be deleted or updated



Microsoft Word - Missouri May 2009.doc

A Guidebook for Incarcerated Veterans VISN 15 MISSOURI FACII
Columbia, MO 65201 573-814-6000 Kansas City 4801 Linwood R



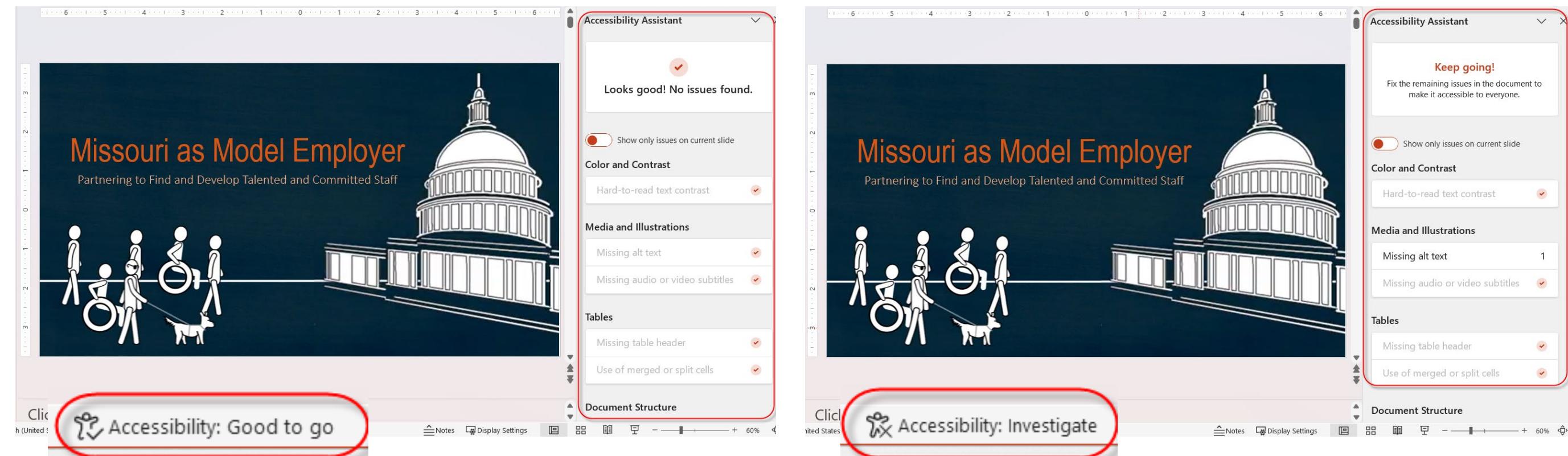
ELEMENT 1:

State of Missouri Nondiscrimination Plan In
Concerning Nondiscrimination and Equal O

Microsoft Accessibility Assistant



- ✓ Alert located in bottom task bar – Accessibility: Good to Go or Investigate
- ✓ Checker does check: Text contrast, presence of alt text, table headers
- ✓ Checker does not check: Image color contrast, vague link text, missing headings, missing document title



Plain Language



Use [**plain language**](#) (plain writing) to better manage “cognitive load”

- ✓ Recommended 6th-8th grade reading level for most content
- ✓ Identify your audience
- ✓ Keep content meaningful and to the point
- ✓ Keep sentences as short as possible and paragraphs 2-3 sentences
- ✓ Use active voice, not passive voice
- ✓ Use common, everyday words, using a conversational style
- ✓ Organize information -- important information first and use headings for easy scanning
- ✓ Simplify content with bulleted/numbered lists and simple data tables
- ✓ Ask others to review your content for feedback



Counts	
Words	1,048
Characters	5,410
Paragraphs	117
Sentences	59

Averages	
Sentences per Paragraph	1.5
Words per Sentence	9.4
Characters per Word	4.5

Readability	
Flesch Reading Ease	67.8
Flesch-Kincaid Grade Level	6.1
Passive Sentences	5.0%

Review the Editor feature under the Review option

Other Accessibility Tips



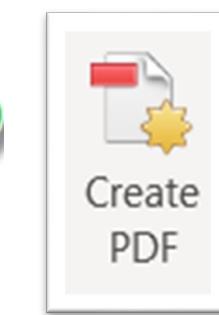
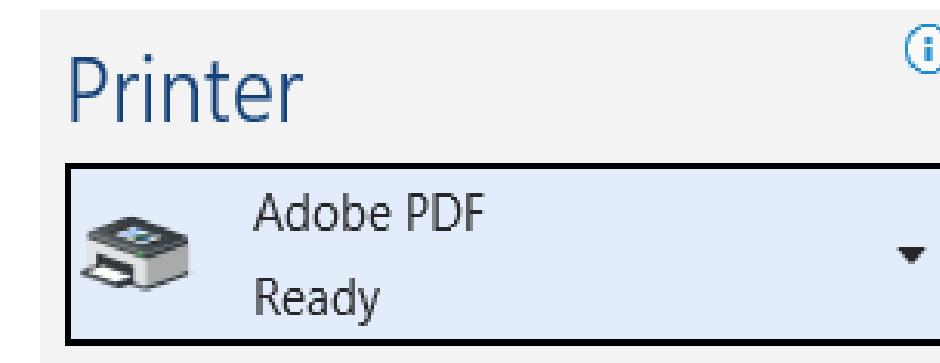
- ✓ Do not use underlined text unless it's a link

existing text description location.

- ✗ 4. **If the full text cannot fit within the alt text**, use one of the below options:
 - ✗ Place the full text (data table, text outline, etc.) above or below the image.

Saving to PDF format

- ✓ Do not use File > Print to create a PDF
- ✓ Use File > Save As > PDF



Other Accessibility Tips



First, ask yourself, "Does this *have* to be a document?"

Reasons for a document or PDF

- ✓ Primary purpose: Printing or printing in a precise layout (brochure or form)
- ✓ You are offering the document as a reusable template.
- ✓ The content is exceptionally long
(Even manuals can become webpage content!)

Benefits as webpage content

- ✓ Easier to apply accessibility guidelines
- ✓ Predictable, consistent user experience
- ✓ Easily responsive to different screen sizes
- ✓ Quicker to load

A Document is Forever

- Post a document on your site and anyone can download it.
- It becomes tricky when posting a new version, or document is deleted.
- Users might continue to use old versions.
- Include clear version numbers or dates in updated document

Module 5

Image Accessibility



Document Accessibility Features

1. Alternative Text (“Alt Text”)
2. Types of Images
3. Use of Color (See Module 4 for Color Contrast)
4. Keep Complex Images (Data Visualizations) Understandable
5. Tips Specific to Charts and Graphs



Types of Images

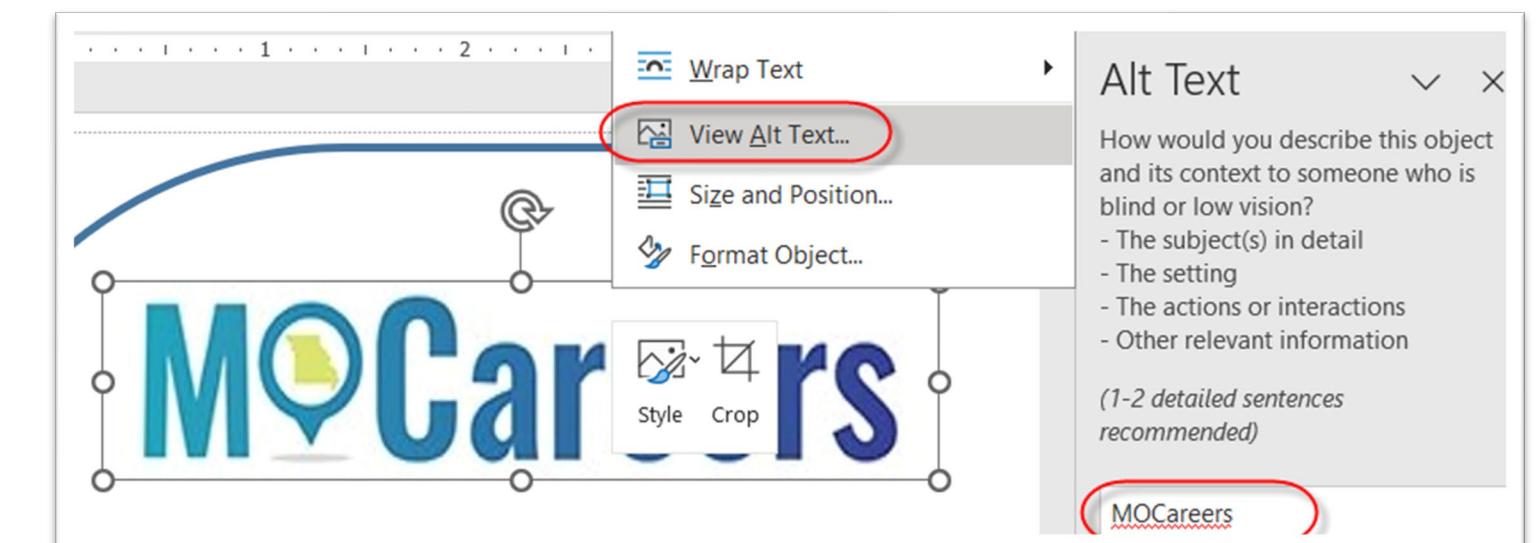
- 1. Informative images:** Pictures, photos and illustrations of people, scenery or objects.
- 2. Images of text:** Logos, some complex images.
- 3. Decorative images:** Decorative icons, horizontal lines.
- 4. Functional images:** Image used as a link or button like a print, delete or email icon.
- 5. Complex images:** Charts, graphs, maps, infographics, dashboards (data visualizations).



Image Alternative Text (“Alt Text”)



- ✓ Text alternatives are used by people who do not see the image
- ✓ Alternative text: Conveys the purpose of an image
- ✓ Represents the image function
- ✓ Provides an equivalent user experience



mailto;john.smith@mo.gov
Ctrl+Click to follow link

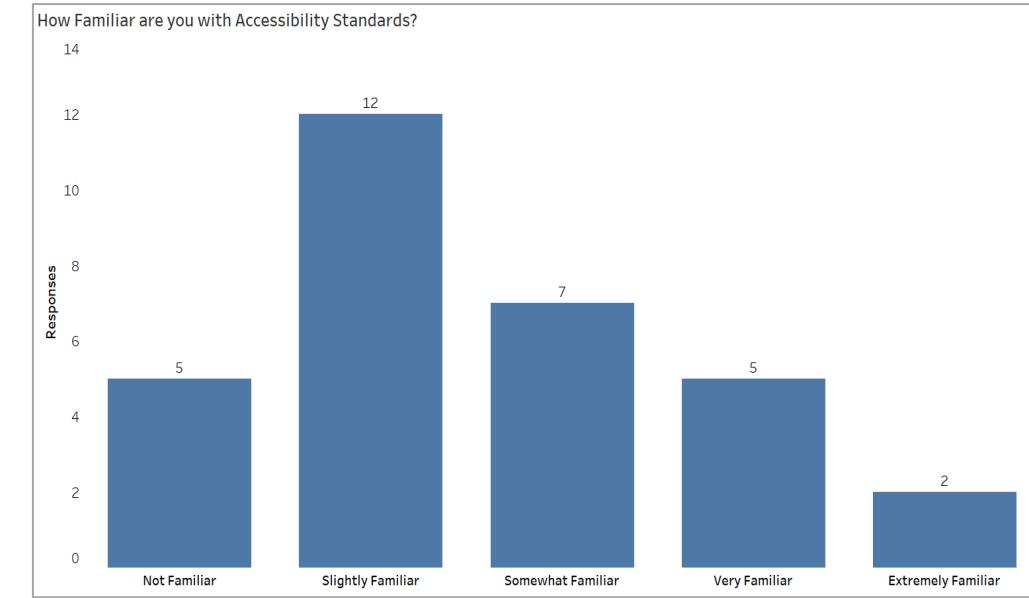
How Long Should Alt Text Be?



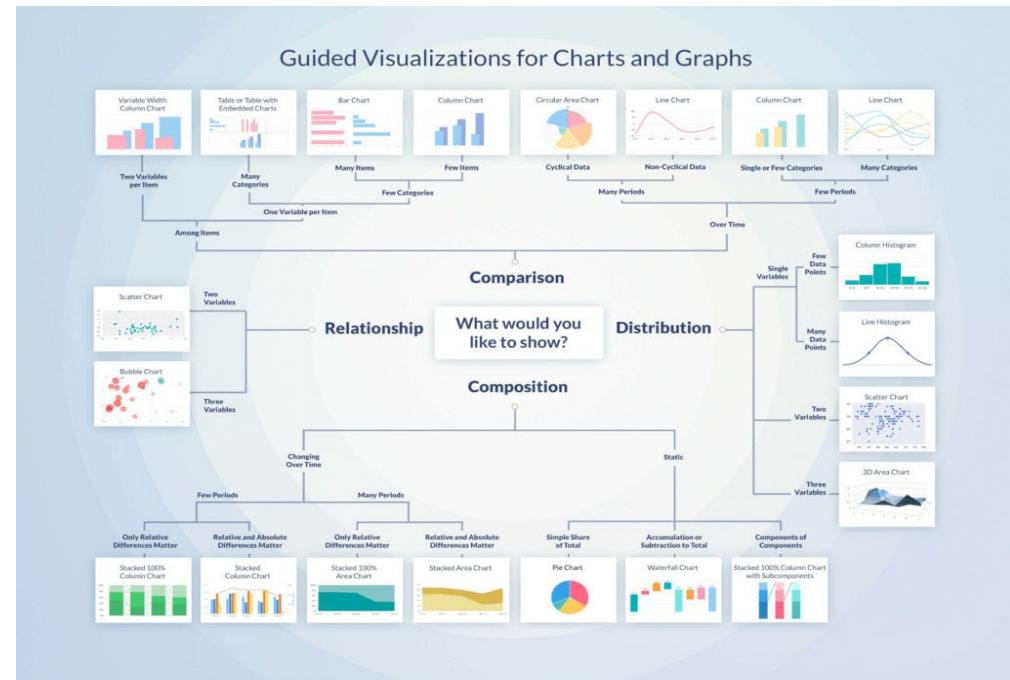
- ✓ 150 characters maximum, roughly 30 words
- ✓ Assistive tech devices have limited reading control within long alt text (can't pause, stop, or easily resume reading if interrupted)



Alt="Bar chart of how familiar are you with accessibility? 5: not familiar, 12: familiar, 7: somewhat familiar, 5: very familiar, 2: extremely familiar"



Alt="Flowchart of Guided Visualizations for Charts and Graphs. 1. Composition, 1A. Changing over time, 1A1. Few Periods, 1A1a. Only relative differences matter..."



Alt Text: Informative Images



- ✓ Informative alternative text can be summarized in a short phrase or a few sentences.



 *LaBarque Creek Watershed*



 *Pickle Springs overlook*

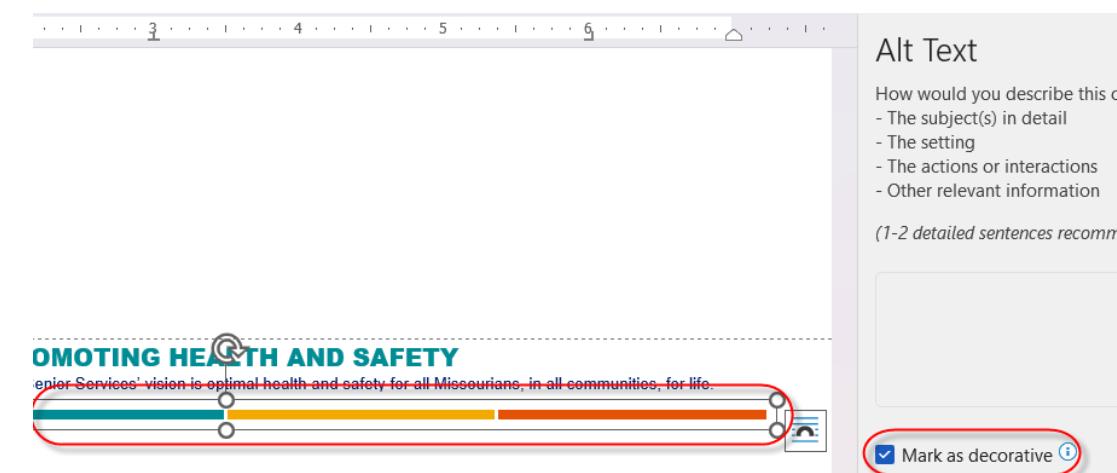


 *The Pinnacles*

Alt Text: Decorative Images



- ✓ Image that does not convey meaningful information or to further understand the surrounding content. alt=""
- ✓ Using generic stock photos don't automatically mean decorative image
- ✓ Review how the image is being used. Don't indicate an image as decorative because you are unsure what it should include.



Job Component

- 4 hours per day, during the school day
- **Unpaid** job shadowing
- Students rotate through different jobs

Classroom Component

- Life skills that support independence
- Practical academic curriculum
- Post-secondary training

Community Outings

- Field trips that focus on students' educational goals
- Visit agencies that support job placement after graduation

WORK REAL JOBS

GAIN LIFE SKILLS

MAKE CONNECTIONS

Alt Text: Complex Images

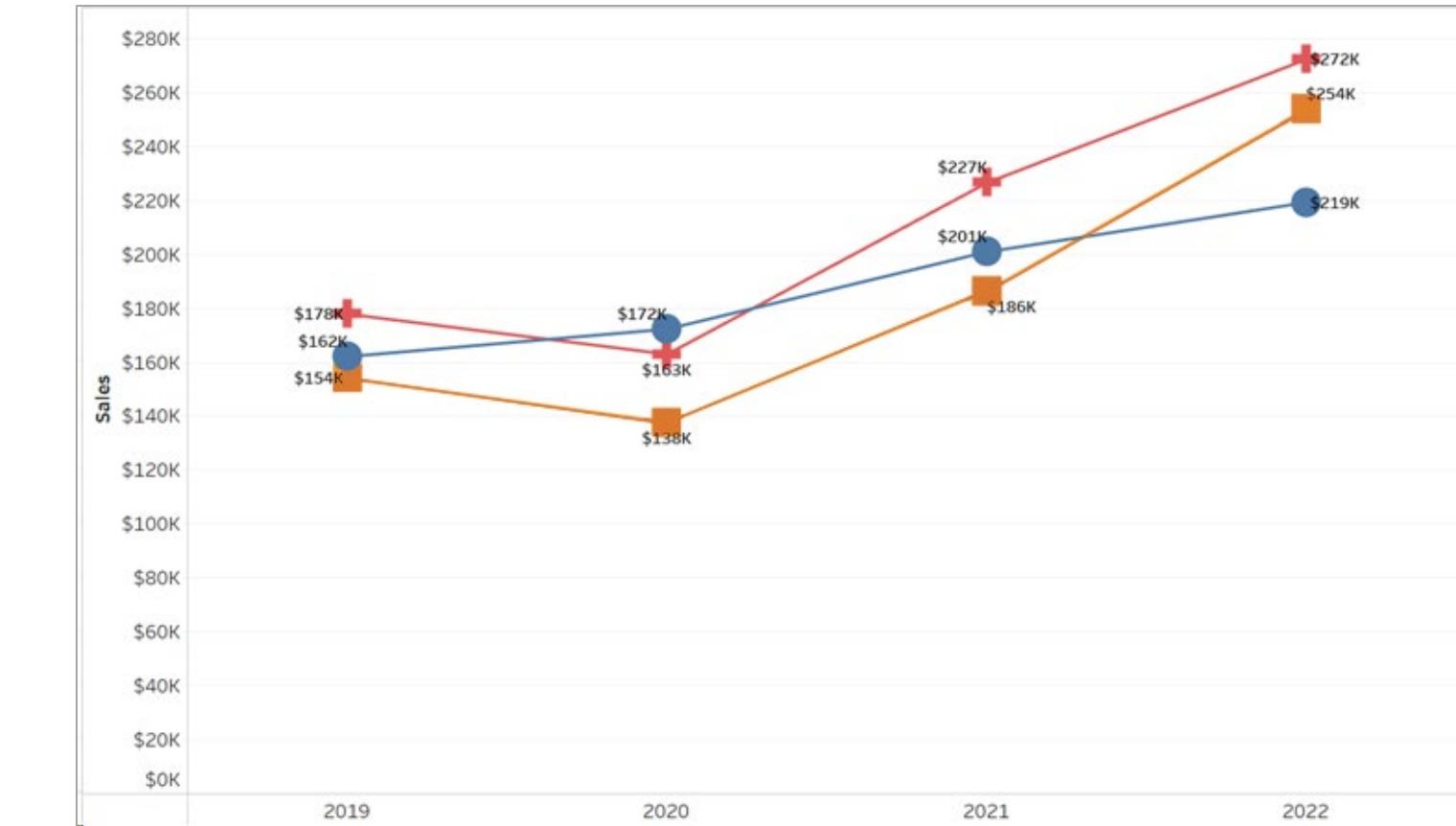
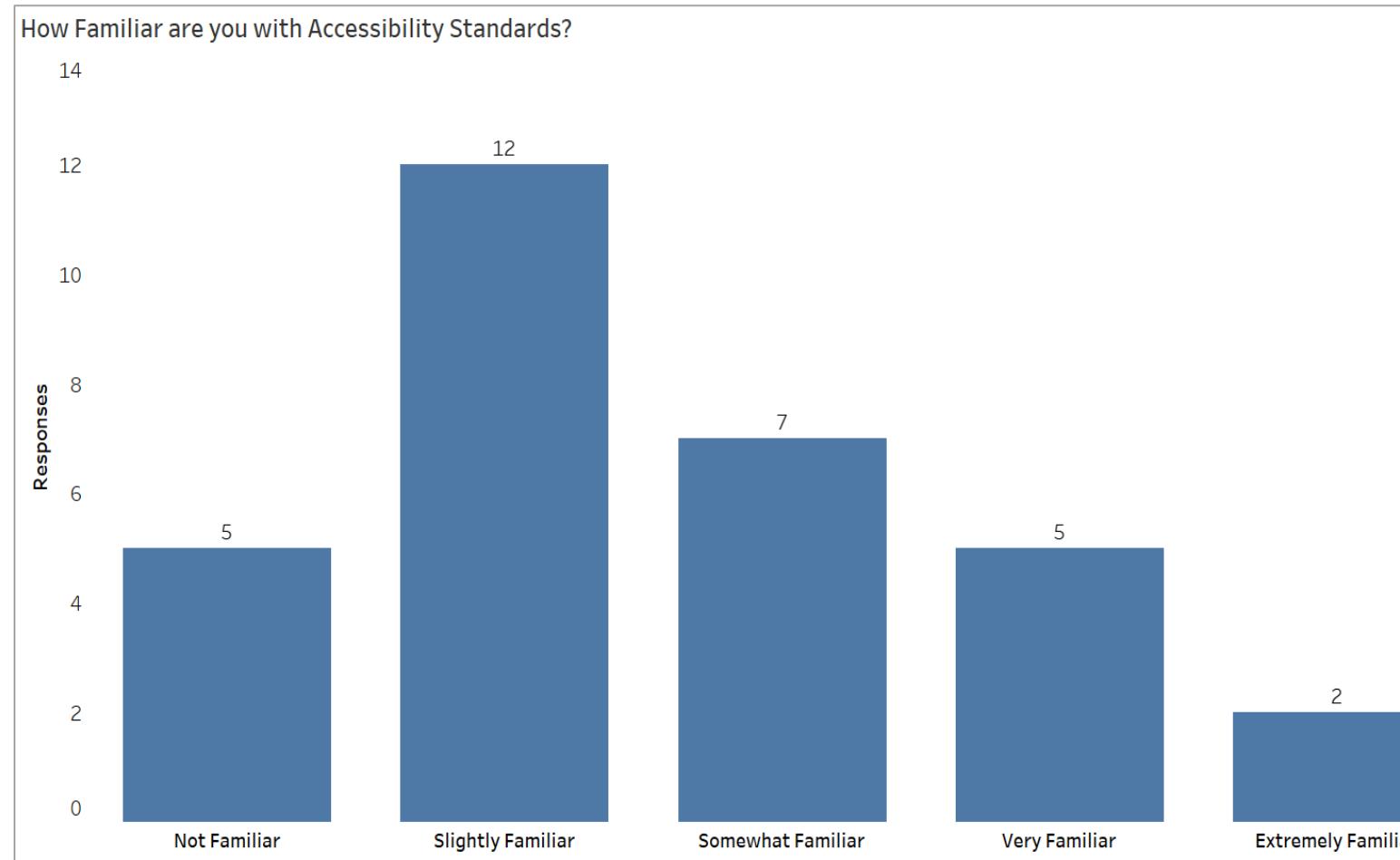


Graphical representation of information and data, also known as “data visualizations”.

Examples:

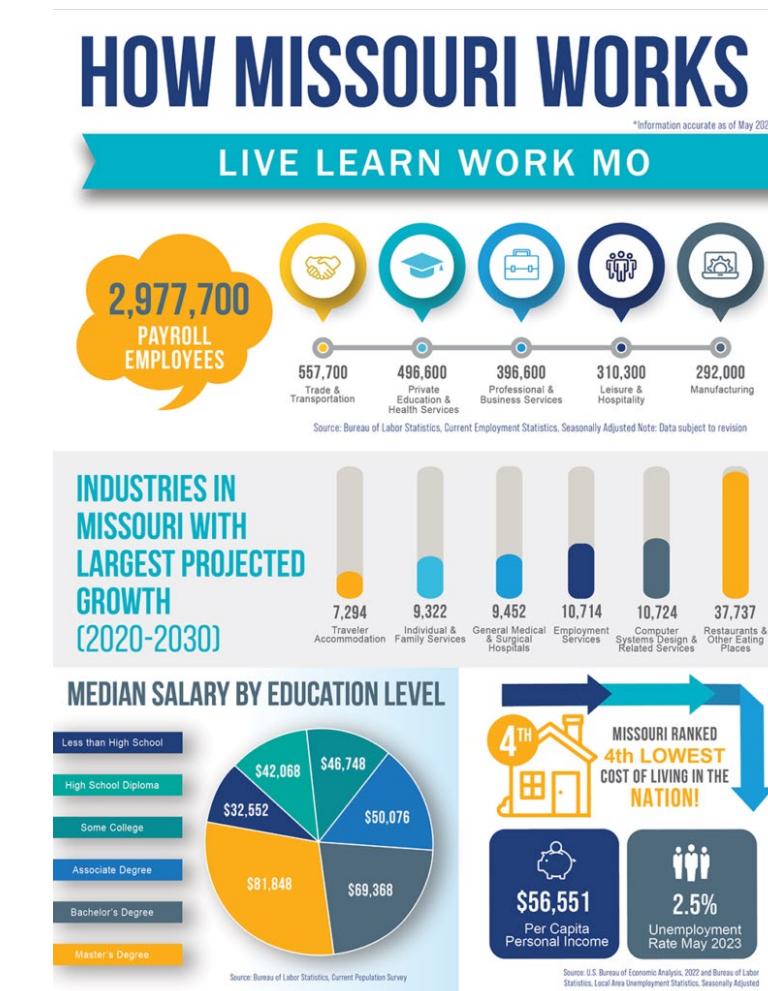
- ✓ Charts
- ✓ Graphs
- ✓ Infographics
- ✓ Workflows
- ✓ Dashboards
- ✓ Illustrations
- ✓ Dynamic/static maps

Data Visualization Examples



- ✓ Charts feature in Excel, Word, PowerPoint
- ✓ Exported images from Tableau, Microsoft Power BI, etc.

Data Visualization Examples



- ✓ Infographic or static map created in design software such as Adobe InDesign
- ✓ Interactive maps from software like ArcGIS or Google Maps

Determine What to Include in Data Visualization Alt Text



If the information is partially described within the surrounding text, alt text should include the portion not described and refer to the remaining text location.

If the information is fully described within the surrounding text, alt text should refer to the existing text description location.

- Validation
Ensure accessibility and usability with screen readers and automated checkers.
- Error Resolution
Fix any errors
- Delivery

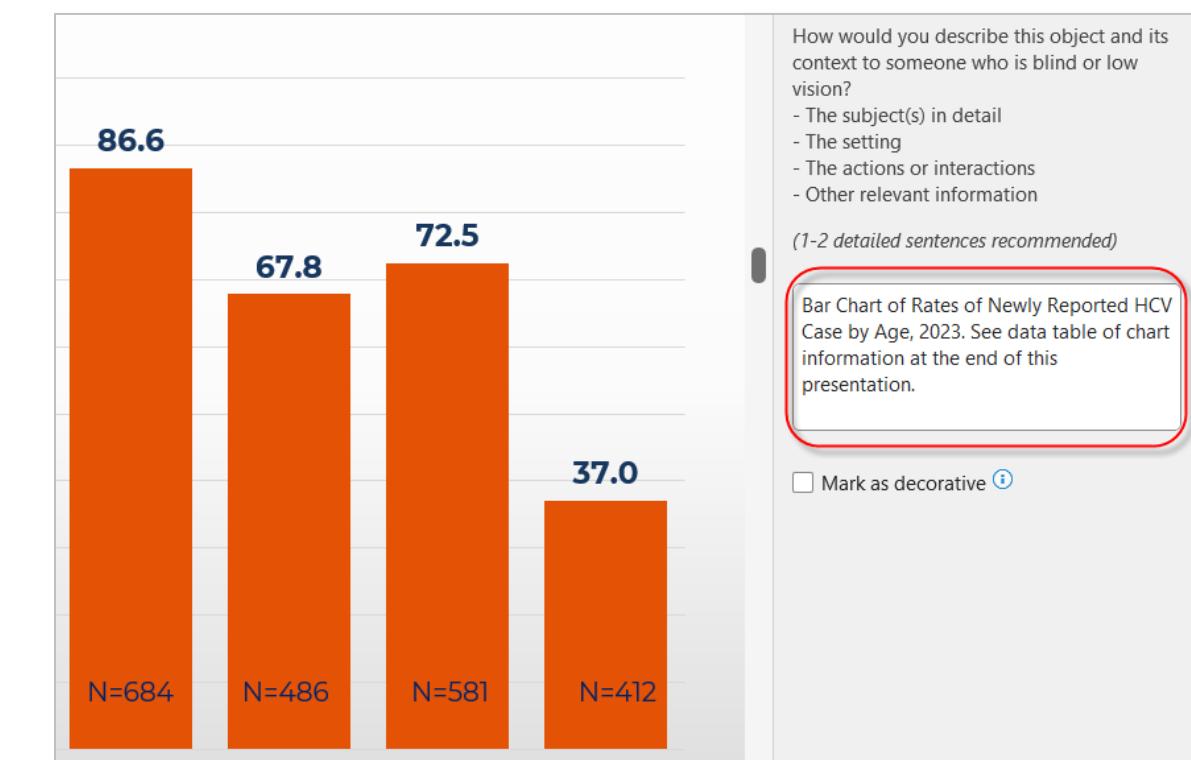


Determine What to Include in Data Visualization Alt Text



If the full text cannot fit within the alt text, use one of the below options:

1. Place the full text (data table, text outline, etc.) above or below the image. Alt text should refer to the text location.
2. Place the full text on another page or other document and link to it underneath the image. Alt text should reference the link.
3. Place the full text at the end of the document, clearly labeled. Alt text should reference the location.



Alt Text Examples – Graphs & Charts



- ✓ Incorporate data summaries into the alt text.
- ✓ Format: “**(Chart type)** of **(type of data)** where **(reason for including chart)**”
- ✓ Alt=“Bar graph of favorite cereals by vote. Life 6 votes, Cornflakes 4 votes, Kix 3 votes, Cheerios 2 votes.” (full text fits within alt text)
- ✓ Alt=“Line graph of average student grades over time, where grades improve gradually over the semester. Refer to the data table which follows.”
- ✓ Alt=“Line graph of number of bananas sold per day in the last year where the winter months have more banana sales. Refer to the labeled data table at the end of this presentation.”

Alt Text Examples – Flowcharts, Organizational Charts and Infographics



- ✓ Alt="Organizational chart of Agency Human Resources staff. Refer to the outline which follows."
- ✓ Alt="Flowchart to determine whether content should be a PDF document or a webpage. Refer to the linked outline which follows."
- ✓ Alt="Infographic of tourism impact facts and figures across Missouri, 2025. Refer to the linked details which follow."

Alt Text Examples – Static Directional and Regional Maps

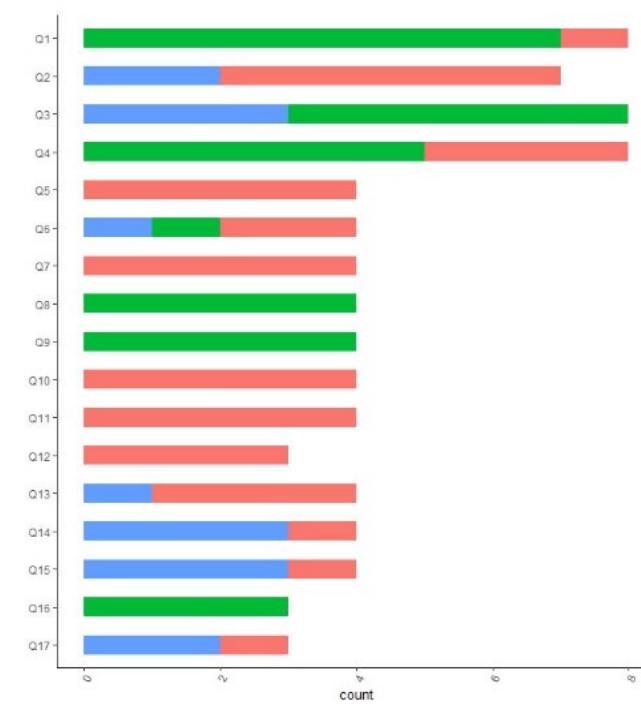


- ✓ Static Directional Map:
Alt="Map of the course for a marathon. Start at the intersection of Jefferson St. and Stadium Dr. Make the second right onto Jackson Street. Turn right at the fifth intersection."
- ✓ Static Regional Map:
Alt="Map of Missouri career centers by region. Refer to the region dropdown selection which follows"

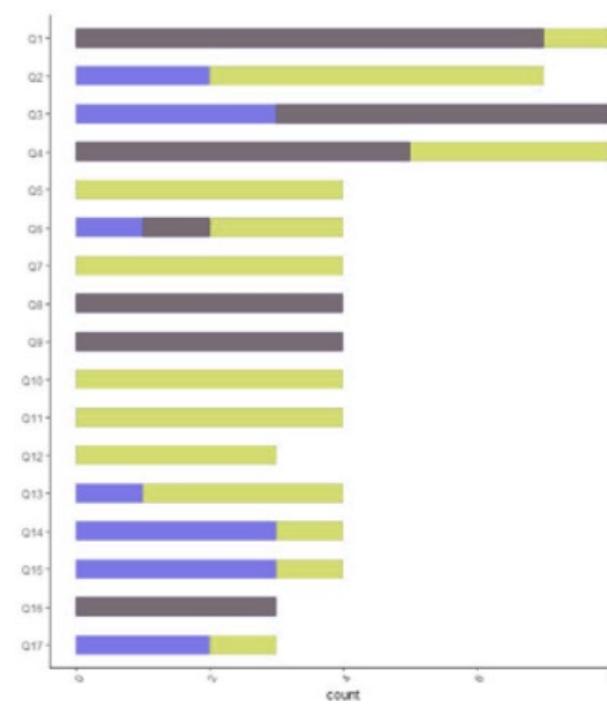
Use of Color



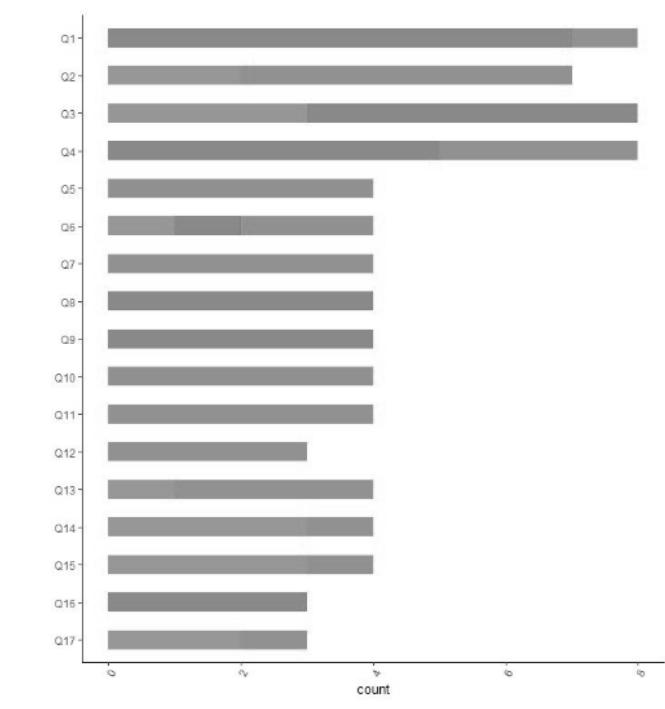
- ✓ Do not rely on color to convey information.
- ✓ If color-coding information, use color plus another element to get your message across
- ✓ Shapes, patterns, numbers, text, etc.



Original



Red-Green Blindness



Full Color Blindness

Use of Color



- ✓ Determine if using multiple colors is meaningful. If meaningful, use no more than 7 colors to reduce cognitive load.
- ✓ Color meaning: Keep [color symbolism](#) in mind
 - ✓ Western societies typically have higher regard for blue over yellow, red sometimes has negative symbolism.
 - ✓ Eastern societies prize the color yellow and don't see red as alarming.
- ✓ Use neutral and consistent backgrounds when using color.

Keep Visualizations Understandable

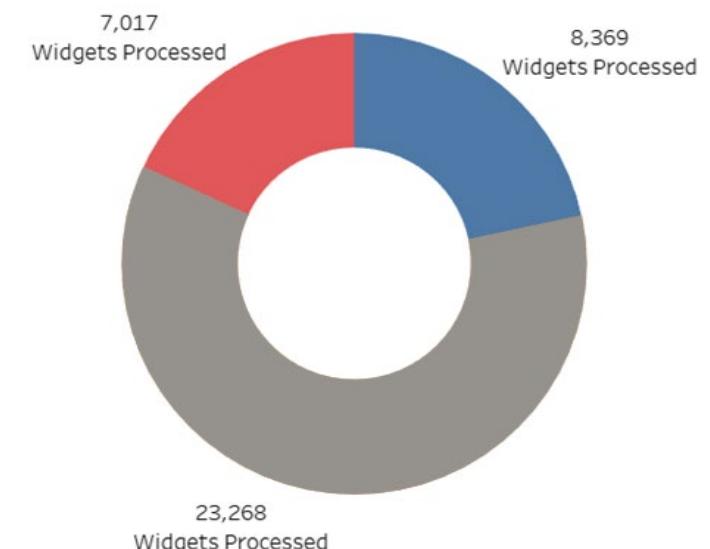
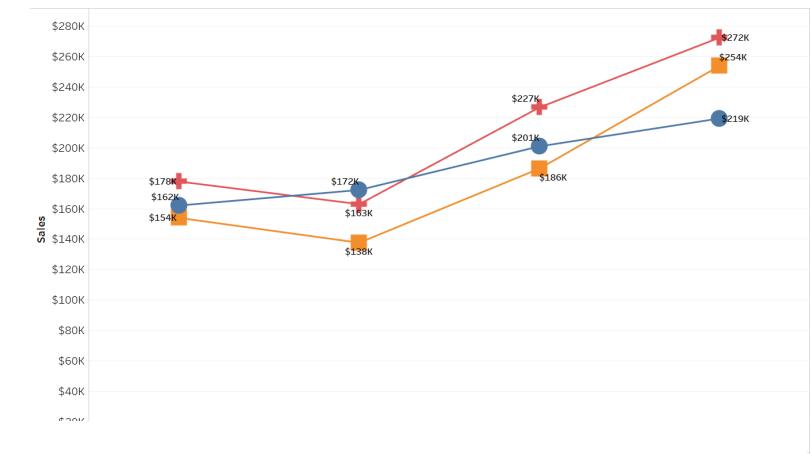
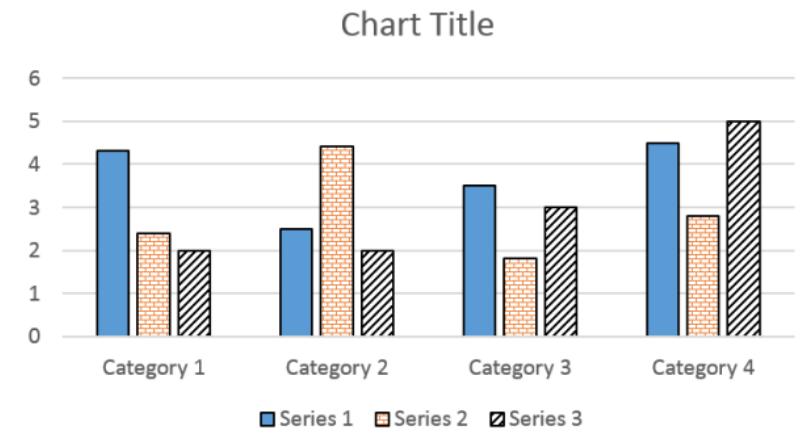


- ✓ Use plain language (6th-8th grade reading level). Take advantage of the Editor feature in MS Word.
- ✓ Create simple, easy to understand titles to describe your visualizations
- ✓ Use 11 pt. font or larger, sanserif fonts like Tahoma or Verdana
- ✓ Don't use unnecessary words and abbreviations
- ✓ Don't overload, balance with whitespace

Charts and Graphs – Choose an Appropriate Type



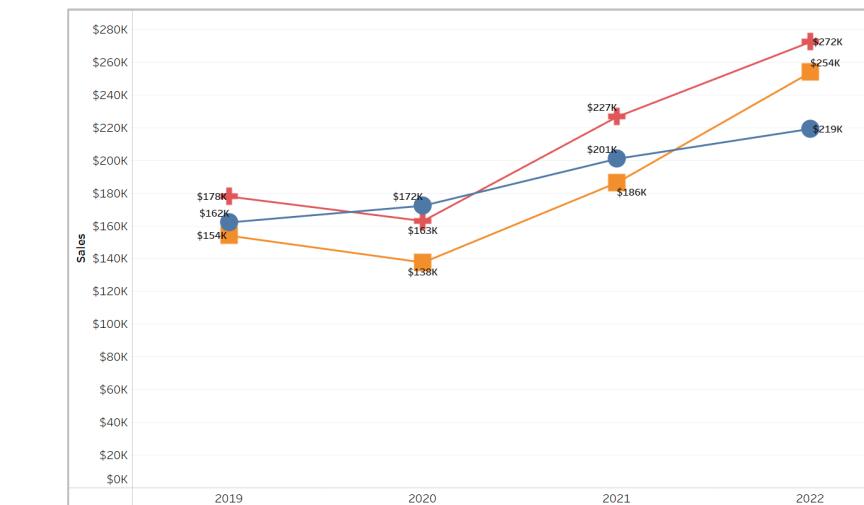
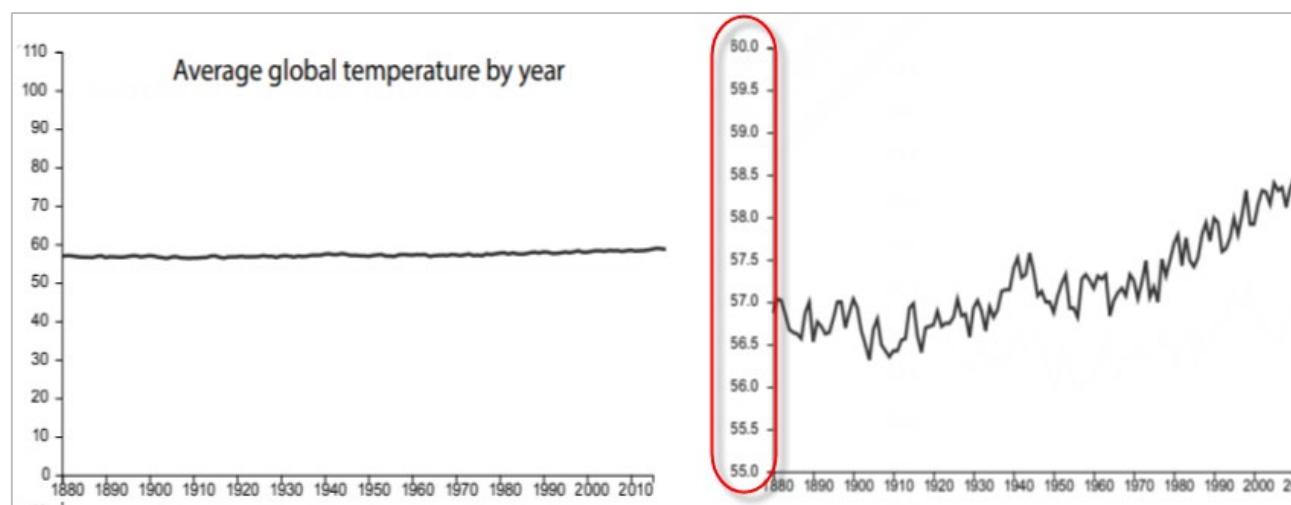
- ✓ Bars/Stacked Bars – Quantities across categories. They provide clear distinctions between data points and are generally easy to interpret.
- ✓ Line/Area Graphs – Patterns over time.
- ✓ Pie/Donut Charts – Proportions within a whole. They can be challenging for some users to interpret accurately, especially when segments are similar in size. Stacked bar charts accomplish the same goal.



Charts and Graphs – Axes, Shapes and Labels



- ✓ Y axes should almost always start at zero
- ✓ Certain cases should truncate (trim) axes
- ✓ Use both shapes and labels that are clear and distinctive
- ✓ Redundant encoding is key! (i.e., specific point along a line and numeric labels)

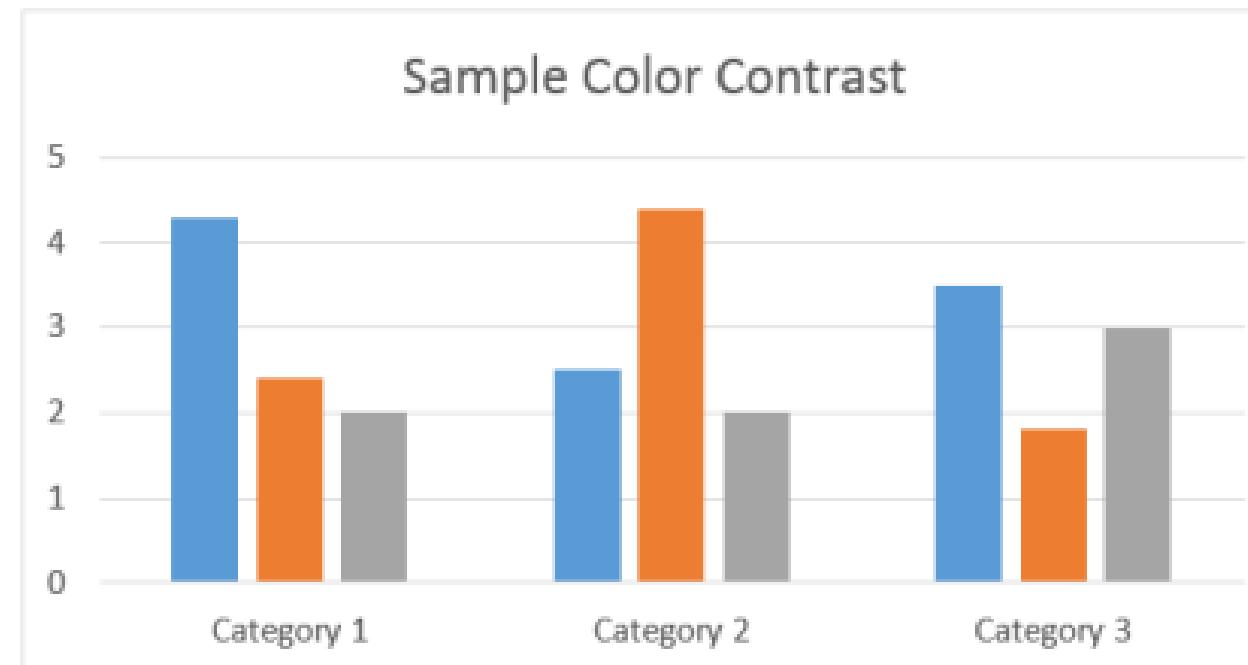


Charts & Graphs – Solutions for Non-Text Contrast



Example 1: Bar Chart

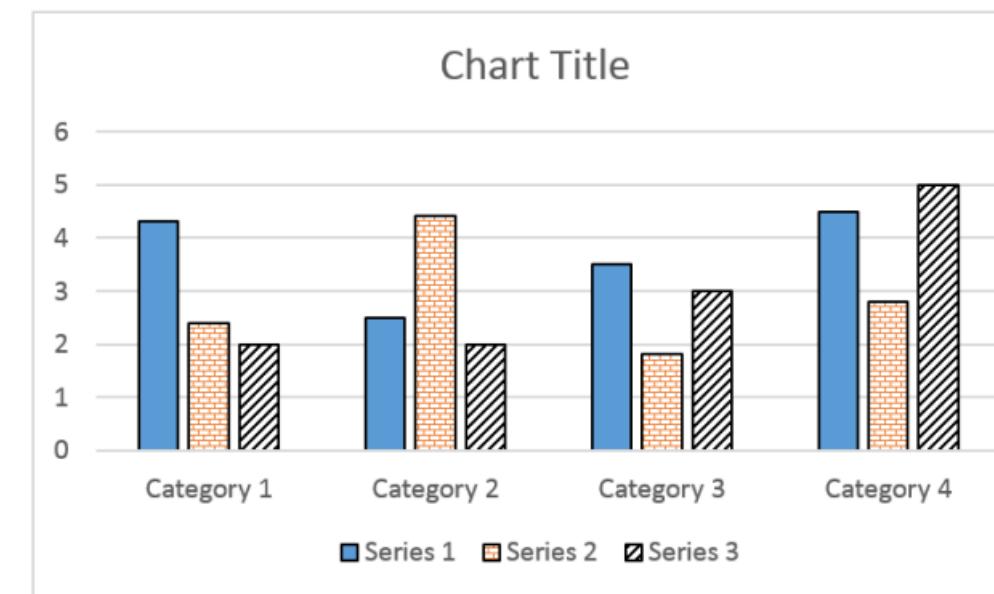
- ✓ In the following example, we have a 3-color bar chart. When testing the contrast, the blue, orange and gray colors don't pass 3:1 contrast with the background (white).



Charts & Graphs – Solutions for Non-Text Contrast



- ✓ **Bar Chart Solution 1: Darken the bars.** Darken the three colors till they pass 3:1 contrast with the white background.
- ✓ **Bar Chart Solution 2: Apply a dark outline.** Outline each element (bar) in a dark color, like black. The black now becomes the contrast color for each colored bar. See example below.

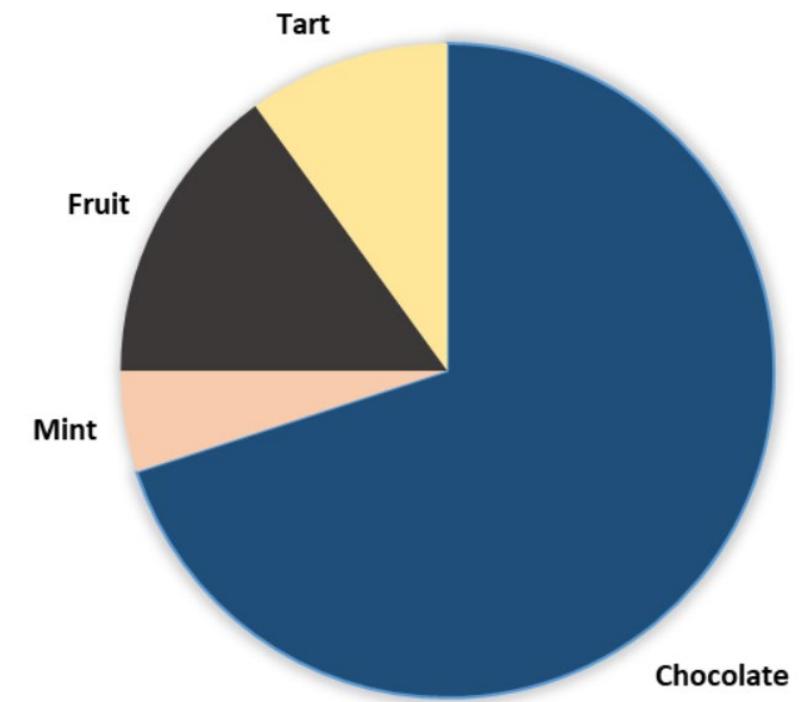


Charts & Graphs – Solutions for Non-Text Contrast



Example 2: Pie Chart

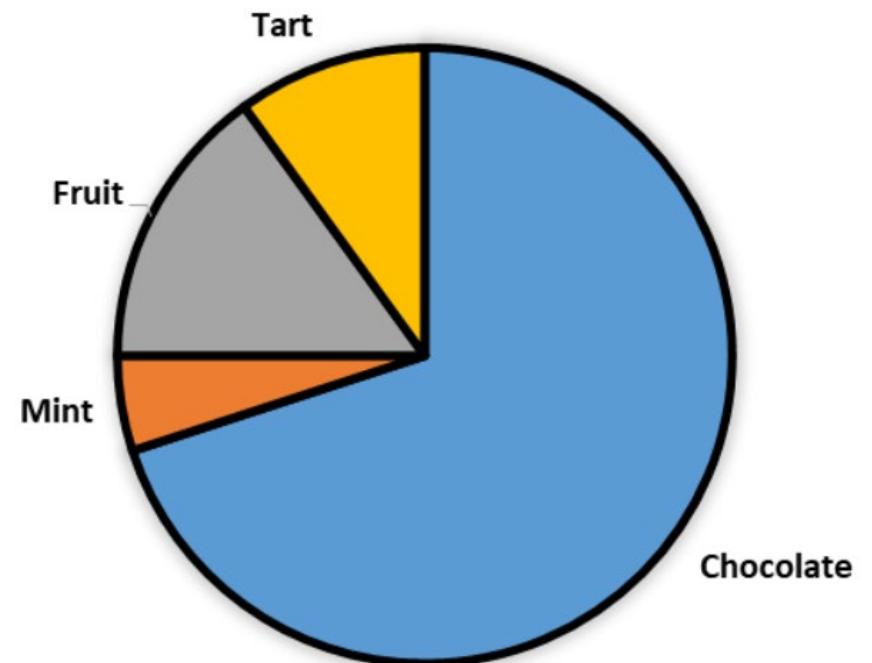
- ✓ In the case of pie charts and maps, the contrast check involves testing adjoining elements (or elements that touch each other).
- ✓ **Pie Chart Solution 1: Alternate the contrast in each pie piece.**
You'll notice in the following 4-color pie chart, the pie pieces alternate with light and dark colors. The adjoining pie pieces are tested and they pass 3:1 color contrast.



Charts & Graphs – Solutions for Non-Text Contrast



- ✓ **Pie Chart Solution 2: Apply a dark outline.** In the following 4-color pie chart, the color contrast does not vary. Instead of changing the pie piece colors, a black outline was applied to each pie piece. All pie piece colors now pass the 3:1 contrast against the black outline.



Module 6

Summary, Next Steps and Being an Accessibility Champion



Web Accessibility Benefits



1. Improved User Experience

Accessible websites are easier to use for people with permanent disabilities as well as temporary and situational challenges.

2. Search Engine Optimization (SEO)

Accessible sites perform better in search engines, resulting in content that is easier to find.

3. Positive Business Reputation

Organizations that prioritize accessibility are often seen as more socially responsible, with a commitment to inclusion and equal opportunity.

Web Accessibility Benefits



4. *Privacy and Security*

Some compare accessibility's importance to that of privacy and security. It is not like privacy and security.

Web accessibility is privacy and security.

- ✓ Consider examples like banking, shopping, and accessing medical information.
- ✓ Inaccessible technology may force individuals with disabilities to reveal personal information.
- ✓ An accessible experience ensures independence — and the human right to privacy and security.



Recap: What is Web Accessibility?

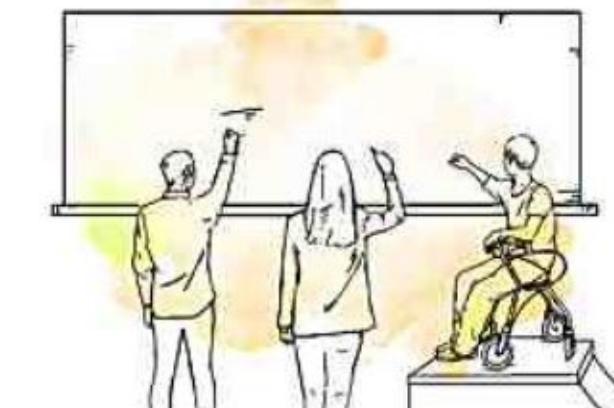


The practice of creating usable
and understandable websites,
applications and digital documents
for ALL people.

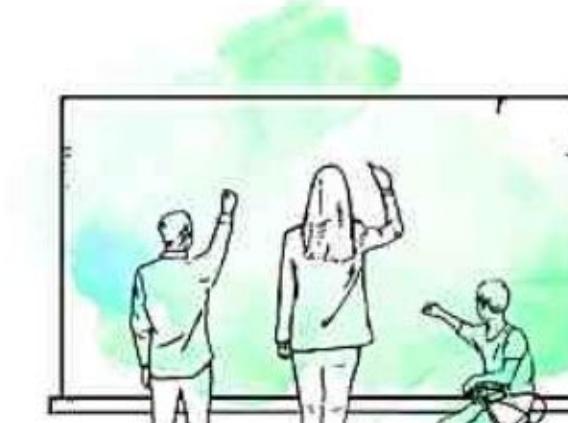
Equality



Accommodation



Accessibility



How Can You Play a Part in Web Accessibility?



Be an Accessibility Champion!

If you notice accessibility issues:

1. Fix as a content creator, or
2. Report content you see.

Typically, you can report issues through
your agency's Communications office.

Accessibility: Progress, Not Perfection



1. One step at a time.
2. One piece of content at a time.
3. PROGRESS is what's important, not perfection.

Next Steps! Thank you.



[State Employee Web Accessibility Toolkit](#)

Includes:

- ✓ Information about web accessibility law
- ✓ Checklists and guides for Microsoft documents, PDF, plain language, etc.
- ✓ Effective accessible content planning
- ✓ Image accessibility references
- ✓ Color contrast references
- ✓ Expand accessibility skills – advanced PDF accessibility and other topics
- ✓ Copy of this presentation
- ✓ Toolkit link is included in the MOVERS Learn course description

Thank YOU for your time



- ✓ You become an important part of the state's commitment to inclusion and equal opportunity.
- ✓ Result: A positive impact to both citizens and state employees.



Agency Digital Accessibility Questions?

Contact your agency digital accessibility coordinator
(see toolkit page)

General Accessibility Questions?

oa.digital.accessibility@oa.mo.gov