Using color and sufficient color contrast

In this module, you'll learn:

- What color contrast is.
- Why color contrast is important.
- How to ensure sufficient color contrast.
- Best practices for color contrast and using color to convey information

What is color contrast?

Color contrast is the difference in light or brightness between colors in the foreground (e.g. text) and colors in the background of a document, webpage, or application.

Example: The foreground color in this document is the black text and the background is the pink box.

What are WCAG color contrast standards?

There are two levels of contrast ratio requirements for WCAG that you'll need to meet:

- AA - This level applies to regular-size text, large text, graphics, and user interface components. MURAL aims to meet this level of compliance.
- AAA - This level applies to regular text and large text.

WCAG Level AA requires:

- A contrast ratio of 4.5:1 for regular-size text, defined as text that is 9 to 13 points or 12 px to 17 px. Keep in mind the varying shades in background gradients need to also pass contrast checks.

Example:	
This color of text may not be readable for some people when paired with a white background. The contrast ratio is 2.4:1.	This black, regular-size text meets the required minimum for contrast. The contrast ratio is about 9:1, using a representative pixel sample.

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- A contrast ratio of at least 3:1 for large text, defined as text that is 14-point (typically 18.66px) and bold or larger, or 18-point (typically 24px) or larger.

Watch out: Text within graphics also need to meet these standards.

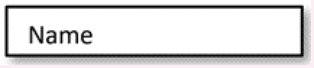
Non-text contrast requirements:

WCAG 2.1 Level AA also requires a contrast ratio of 3:1 for non-decorative graphics and user interface components with their surrounding background. This includes things like button backgrounds, form element borders, and focus indicators.

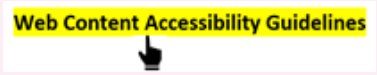
Example: If a user can interact with an element, it needs a color contrast of at least 3.1. Examples of interactive elements include:

Checkboxes 

Radio buttons 

Form fields 

Mouse hover style 

Touch or click style 

Keyboard focus 

Designers at MURAL should always aim to achieve Level AA compliance. However, keep in mind this helpful information for Level AAA, which requires:

- A contrast ratio of at least 7.1 for regular text.
- A contrast ratio of 4.5:1 for large text.

There are no color contrast requirements for decorative elements, including logos and logo text.

Resource: Find accessible colors for a MURAL canvas in our Keyboard Optimized Accessibility Modeling Mural.

Why is color contrast important?

People perceive color in many different ways. Some of us rely on color to understand information while others may not perceive it at all. For example, some people may have low contrast sensitivity. People who are color blind can't distinguish between certain colors, such as red and green.

Example: Various vision impairments can make it difficult to participate in online activities such as shopping or, in our case, contributing to meetings with a mural that doesn't provide sufficient color contrast.

Color contrast is a way to make color accessible to people with disabilities. Contrast helps color become more **perceptible**, which is one of the four POUR principles referenced in the introduction to this training: Perceptible, Operable, Understandable

Resource: Watch the following video,
Web Accessibility Perspectives: Colors with Good Contrast
to learn about practical uses of color contrast and the importance of it in everyday life.

How can I ensure sufficient color contrast?

As a designer, you play a crucial role in ensuring color is accessible. Accessible color meets, at a minimum, Web Content Accessibility Guidelines for contrast.

To ensure these requirements are met, you'll want to use WCAG-approved contrast checkers, such as the Color Contrast Analyzer application or the WebAIM Contrast Checker.

Let's watch a demonstration.

[Demo Video]

Checking contrast ratios

Use the WebAIM Contrast Checker to compare the contrast ratios of background and foreground elements. Contrast checkers let you choose or input a color sample from each element. Select a representative sample of pixels to compare.

A good sample is usually found somewhere in a vertical or horizontal bar within text or background elements. For example, examine the vertical bar of the letter 'F' or the horizontal bars of the letter 'E' when you use a color contrast dropper to retrieve a sample.

Resource: Find more information on using contrast checkers in this color contrast tutorial from

Michigan State University.

Don’t use color alone to convey information

While color is helpful for differentiating information, avoid using only color due to differences in how people perceive it. One way to do this is to provide additional identifiers. Here are some examples:

- Use patterns and shapes to distinguish information.
- Use a text as an alternative to convey the same information.
- Allow collaborators to change colors and contrast.

Example: Using only color to convey meaning.

The following demonstrates how color is used to convey information: “Click the red button to submit the form.”	A textual identifier helps more end-users distinguish the purpose of the button. Remember to check the contrast:
	

Best practices in a nutshell

Here’s a summary of what you can do to follow WCAG contrast standards:

- Check color contrast using a WCAG-approved contrast checker.
- Ensure regular text, text on images, and background gradients have a contrast ratio of 4.5:1.
- Ensure large text, icons, links, inputs, and other interactive elements have a contrast ratio of 3:1.
    - Ensure links are underlined or sufficiently contrast with the background.
- Ensure color is not the only identifier of information. Pair it with text, patterns, and shapes, and allow the end-user to change colors.

Test your knowledge

Use the WebAIM Contrast Checker to compare the contrast of the circles below and choose one or more answers to the following questions.



1. Which of the numbered circles meets the minimum contrast ratio (level AA) when compared with the white background of this document?
    A. 1.
    B. 2.
    C. 3.
2. Which of the numbered circles meets the minimum contrast ratio (level AA) when compared with the color of the 2 in the second circle?
    A. 1.
    B. 2.
    C. 3.

Test your knowledge

Which bar graph is the most accessible in terms of color contrast and how data is presented?

A. Figure 1.
B. Figure 2.

Figure 1. Comparison of pet preferences between 100 survey participants, including Crazy Cat Ladies and Everyone Else. Crazy Cat Ladies prefer, in order from most preferred to least preferred, cats, rabbits, hamsters, and dogs. Everyone Else prefers dogs, hamsters, cats, and rabbits.

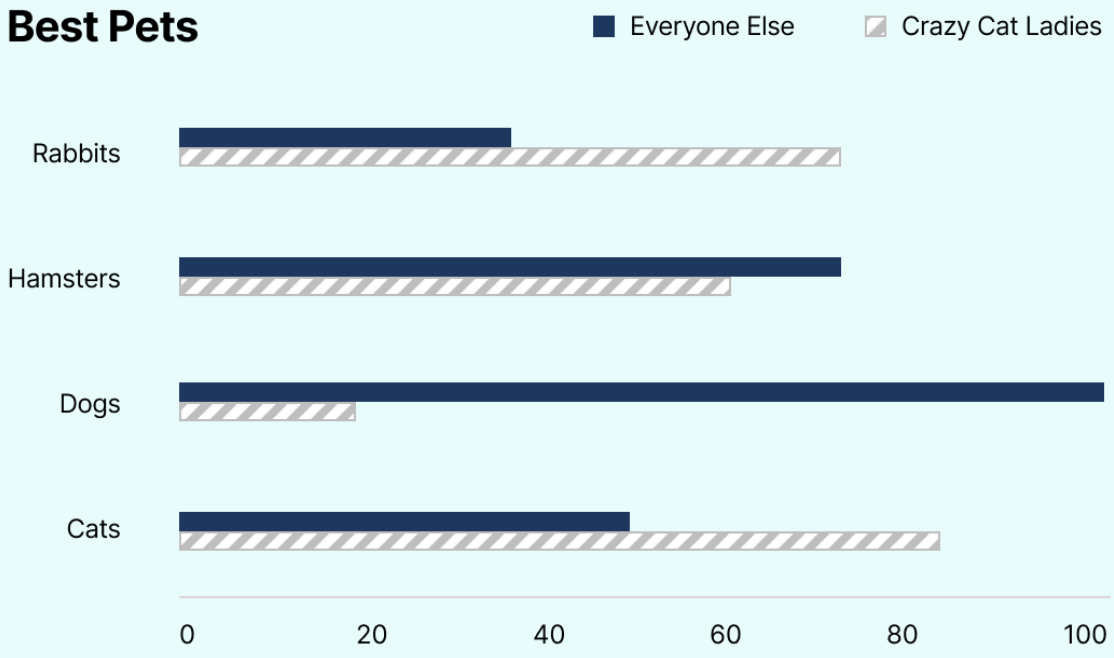


Figure 2. Comparison of pet preferences between Crazy Cat Ladies and Everyone Else.

