Understanding and Evaluating WCAG Contrast Requirements

Jon Whiting
WebAIM.org
@jonwhiting
Color Contrast
Color Contrast
Color Contrast
Luminance Contrast
Relative Luminance Contrast
Pure red is hard to read
Pure green is even worse
Pure blue is pretty good
Pure red is hard to read
Pure green is even worse
Pure blue is pretty good
WCAG Contrast Formula

\[
\frac{(L_1 + 0.05)}{(L_2 + 0.05)}
\]

where

\[
L = 0.2126 \times R + 0.7152 \times G + 0.0722 \times B
\]

where

\[
R, G, \text{ and } B =
\]

\[
R_{\text{SRGB}} \leq 0.03928 \text{ then } R = \frac{R_{\text{SRGB}}}{12.92}
\]

\[
\text{else } R = \left(\frac{(R_{\text{SRGB}} + 0.055)/1.055}{1.055}\right)^{2.4}
\]

where

\[
R_{\text{SRGB}} \leq R_{\text{8bit}}/255
\]
Contrast ratio
21:1
1.4.3 Contrast (Minimum) – Level AA

4.5:1
Gray (#767676) on White

Red (#E30000) on Yellow (#FFFFFF)

Purple (#CC21CC) on White

3:1 – “Large” text
≥18pt (24px)

BOLD: ≥14pt (18.67px)
WebAIM Contrast Checker

webaim.org/resources/contrastchecker/
“Images of text”

50 most played songs by genre
“Background color is the specified color of content over which the text is to be rendered in normal usage”
Gradients and background images
Gradients and background images
“For text displayed over gradients and background images, authors should ensure that sufficient contrast exists for each part of each character in the content.”
For text displayed over gradients and background images, authors should ensure that sufficient contrast exists for each part of each character in the content.
Gradients and background images
We have the same contrast ratio
We have the same contrast ratio
Test contrast in WAVE

wave.webaim.org
Colorzilla

colorzilla.com
Exceptions
“Pure decoration”
"Inactive"
“Not visible to anyone”
“Logotypes”

50 most played songs by genre

music
1.4.11 Non-text Contrast – WCAG 2.1, AA

• 3:1 contrast of:
  • User Interface Components
    • Including states (focus indicators, hover states, etc.)
  • Graphical Objects
UI “Boundaries”

I have read and agree to the Terms of Use
UI “States”

I have read and agree to the Terms of Use
...except when “determined by user agent”

First Name
You break it you buy it

First Name

First name
Follow your interests.
Differences Between States

- input
- input:hover
- input:focus
3:1 between default and :focus

- input
- input:hover
- input:focus (Probably)
...or another visual cue

- input
- input:hover
- input:focus
Chrome Developer Tools (DevTools)
1. Go to twitter.com
2. Check contrast of the “Log In” button
3. Check its contrast with a hover state
4. Bonus – Find an element that can’t be tested with DevTools

See webaim.org/articles/contrast/devtools for help
“Graphical objects”
“Required to understand”
Colour Contrast Analyser

1. Download and install the Colour Contrast Analyser
2. Use the Eyedropper to choose colors
3. Click the sliders button
4. Check “Synchronize colour values”
5. Use sliders to find a color with sufficient contrast
1.4.1 Use of Color – Level A
Requirements for color-reliant links

1. A 3:1 contrast ratio between link text and non-link text
2. An “additional visual cue” (typically underline) on mouse hover AND keyboard focus
You must read the Terms and Conditions.
WebAIM Link Contrast Checker

1. Go to webaim.org/resources/linkcontrastchecker/
2. Enter link color and body text color
3. Adjust levels to meet all 3 requirements:
   1. 4.5:1 – Link to background
   2. 4.5:1 – Body to background
   3. 3:1 – Link to body
You must read the Terms and Conditions.
You must read the Terms and Conditions.
You **must** read the [Terms and Conditions](#).
Lightning Round
What issues do you need to check?

- 4.5:1 – Body text
- 4.5:1 – Link text
- 3:1 – Link to body
- Link underline on mouse hover and keyboard focus

- 3:1 – Checkbox
- 3:1 – Checkbox states
- 3:1 (or outline) – Focus state to default state
- 3:1 – Focus outline

Subscribe to our email newsletter
Don’t forget!
Don’t forget
Don’t forget
Don’t forget to watch out for squirrels
Thank you!

Jonathan Whiting
@jonwhiting