

# A closer look

## Designing with good color contrast

The Web Content Accessibility Guidelines (WCAG) are a set of rules for creating accessible electronic documents. They help content authors design their materials with principles of universal design that makes them more usable by everyone, including people with disabilities. One of the key components of good content is that it must be Perceivable, or able to be accessed by sight or sound. WCAG specifies minimum contrast guidelines that ensure sighted users can use the information. Contrast is defined as the difference in brightness between the background color and the color of the text or content.

### Measuring contrast

When the original WCAG 1.0 standards were published in 1999, they included contrast guidelines. These guidelines are the same in versions 2.0, 2.1, and 2.2 which are in use today. The ratios are based on the luminescence (brightness) of the foreground and background colors. WCAG 2.0 requires a ratio of 4.5:1 for normal text and 3:1 for large text and interface components. In other words, the text color of the page should be 4.5 times as bright as the background color (or vice versa).

WCAG 3.0, currently in the Working Draft phase, proposes replacing the contrast ratio system with the Advanced Perceptual Contrast Algorithm (APCA). APCA is based on newer technology that allows it to 'see' color like humans do. It combines luminescence with other factors like color hues, saturation, text weight, and font size to create a more realistic measurement. Instead of a ratio, APCA contrast is a single Lightness contrast ( $L^c$ ) number between -108 and 106, with  $L^c$  0 being text that is the same color as the background (and therefore invisible).  $L^c$  60 is approximately the same as 4.5:1. Adopting the more nuanced and flexible APCA standards now gives designers more options while also overcoming some of the limitations of the fixed contrast ratio system.

### Examples

Background color	Foreground color	Sample (16pt)	Ratio	APCA
White	Black	<i>puppy</i>	21:1 PASS	$L^c$ 106.0 PASS
Blue	White	<i>puppy</i>	2.9:1 FAIL	$L^c$ -60.7 PASS
Blue	Black	<i>puppy</i>	7.1:1 PASS	$L^c$ 48.7 FAIL
Black	Gold	<i>puppy</i>	7:1 PASS	$L^c$ -45.4 FAIL
Green	White	<i>puppy</i>	3.7:1 FAIL	$L^c$ -76.0 PASS