

# The Web Accessibility Handbook

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## Chapter 1: Colors

Created by Boldium

We love feedback: [hello@boldium.com](mailto:hello@boldium.com)

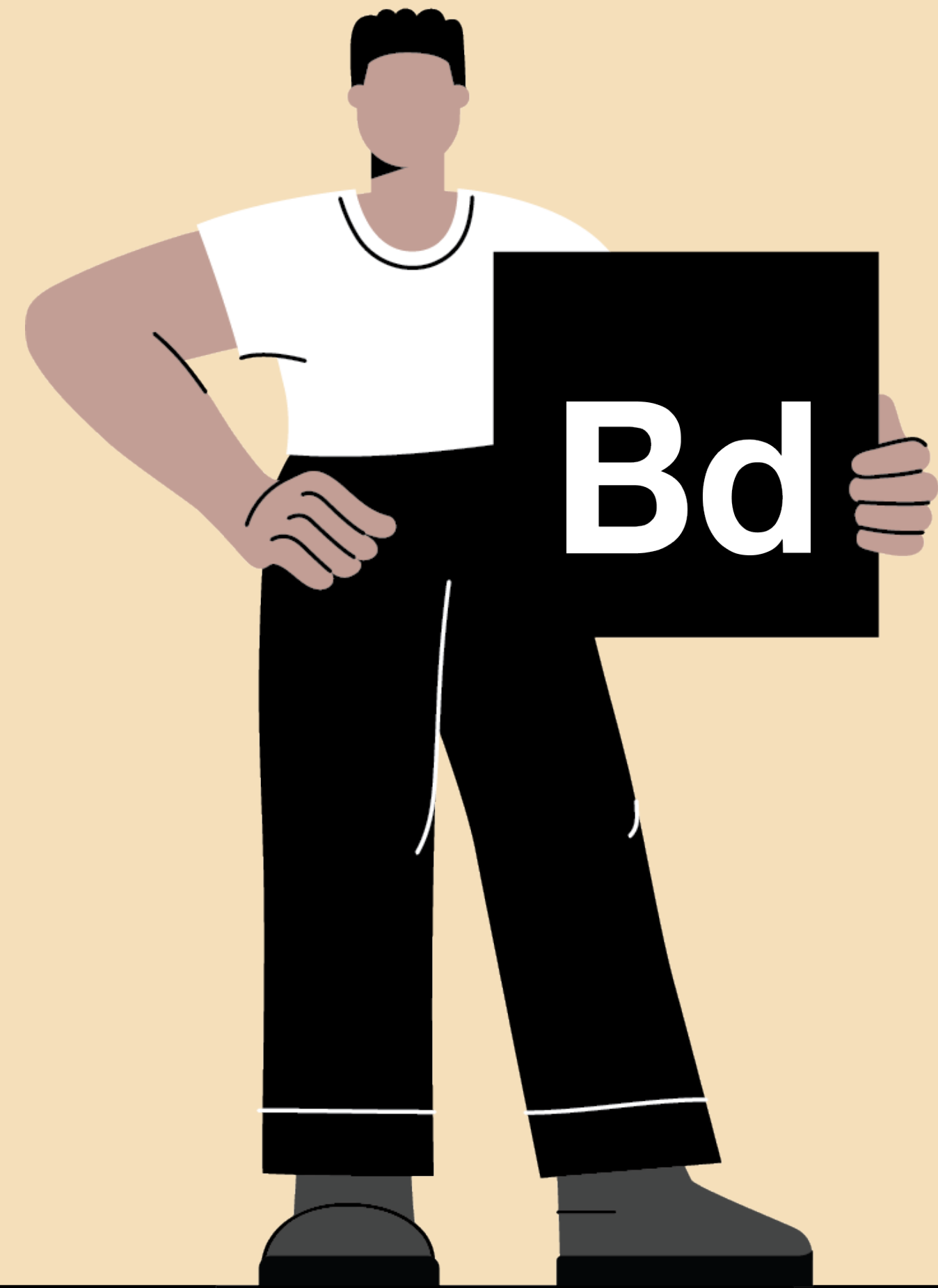
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# Introduction

Over the past few years, our agency has become increasingly aware of the way digital experiences exclude people. We've thus worked hard to learn, understand, and execute the WCAG guidelines, creating experiences that are both compelling and inclusive.

Because the WCAG guidelines can be difficult to follow, we created this handbook in order to help others learn, understand, and execute on the guidelines more easily.

While we've done our best to follow the WCAG 2.2 AA guidelines for this handbook as closely as possible, this is not a legal document and we recommend consulting with the guidelines for any decision that may impact accessibility.



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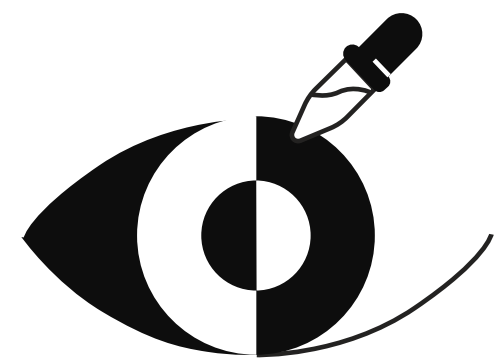
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# Background



# What is color contrast?



Color contrast is the difference in perceived brightness between elements in the foreground (e.g. text or graphics) and background. There are many parts of color that impact contrast, such as opacity, hue, saturation and lightness.

We measure contrast as a ratio between the brightness of elements in the foreground and background. For example, the maximum contrast ratio, black on white, is 21:1. The minimum, white on white, is 1:1. The recommended contrast ratio depends on several factors, e.g. the font size and weight.

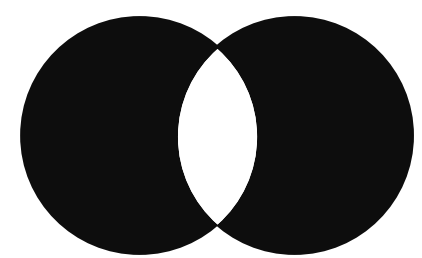
# Why is it important?

Some of us don't see color contrast as well as others. For example, about 1 in 12 men are color blind (8%) and about 1 in 200 women (0.5%). In addition, sometimes we are in situations where color contrast is diminished, like in bright sunlight.

Thus, quite a large percentage of people will have difficulty interacting with a digital experience if we don't design with adequate color contrast.



# Common types of color blindness



## **Red-green color blindness:**

This is the most common type of color blindness. It makes it difficult to see different shades of red, green, and yellow. For some, it is difficult to distinguish red from green. Thus, when red and green are used as the only status indicators, people with red-green color blindness will likely not be able to tell the difference.

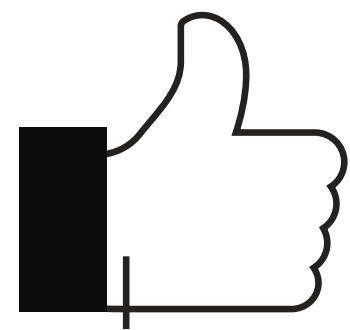
## **Monochromacy:**

People with monochromacy can't see colors at all—only black, white, and shades of grey. Thus, when hyperlinked text is a different color, with no additional indicator, people with monochromacy will not be able to recognize that the text is hyperlinked.

## **Tritanopia:**

Tritanopia is a form of color blindness where people can't tell the difference between blue and yellow. Thus, if you just use blue and yellow to distinguish data in an infographic with no additional explanation, people with tritanopia will not be able to understand the information properly.

# Benefits of good color contrast ratios



- Increase in the number of visitors to your digital experience who are able to find what they are looking for

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- Increase the number of visitors who can take full advantage of your digital experience

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- Compliance with the law in many countries



# Basic principles

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PRINCIPLES

# Color contrast for text

The minimum color contrast required for text depends on several factors, including size and weight of the font and the color of the background being used.



# Standard text

Standard text is the most common. It applies to text that's 23 pixels or less with a regular font weight. It requires a color contrast ratio of 4.5:1.

Weight: **Regular**

Size: **23 pixels (17pt) or less**

Contrast: **4.5:1**

## Best practice

Use dark text on lighter colors in order to comply with the minimum contrast ratio of 4.5:1.



## Common error

Light color text on light color backgrounds, especially in the orange and yellow range, usually have too low of a contrast ratio.



# Large regular text

Large regular text is 24 pixels or more with a regular font weight. Because it is larger than regular text, it requires a lower color contrast ratio of 3:1.

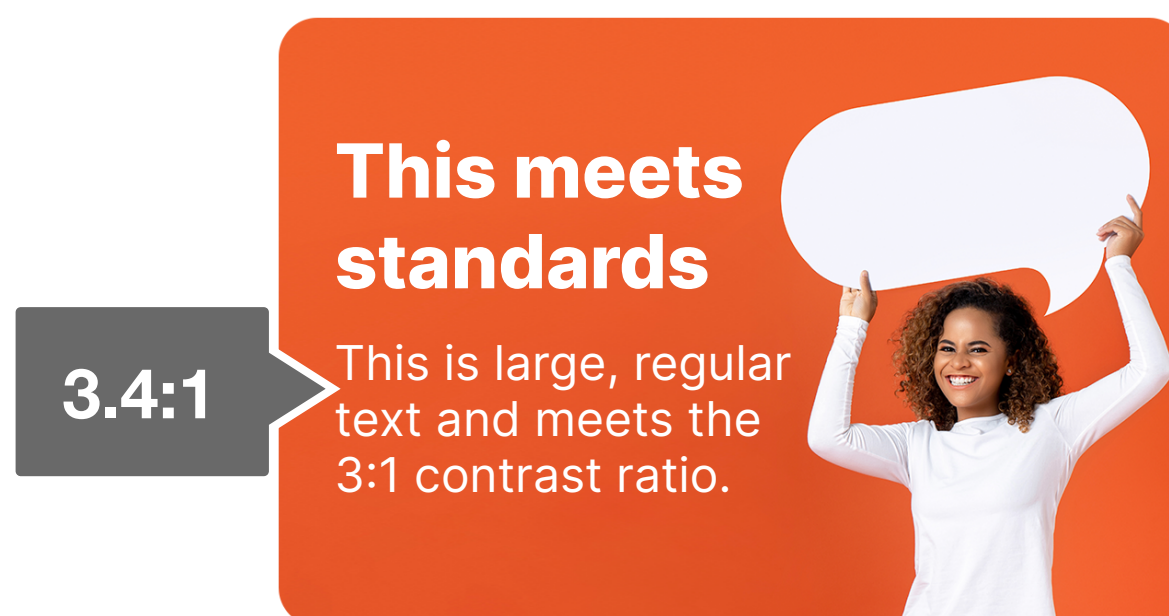
Weight: **Regular**

Size: **24 pixels (18pt) and larger**

Contrast: **3:1**

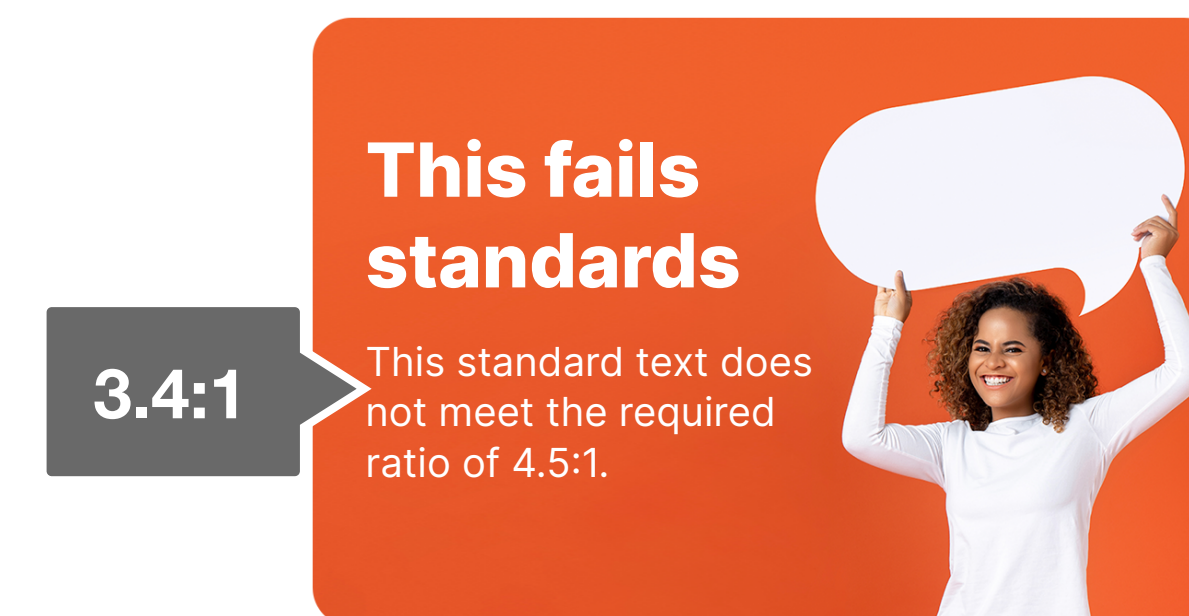
## Best practice

Use larger text (24 pixels or more) when you are not able to meet the contrast ratio with standard text.



## Common error

When text is 23 pixels or less, it can be difficult to meet the required 4.5:1 ratio, especially with white text on orange.



# Large bold text

Large bold text is 19 pixels or more with a bold font weight. Because it is bold, it can be 5 pixels smaller than large regular text (19 pixels instead of 24 pixels) in order to require a 3:1 ratio.

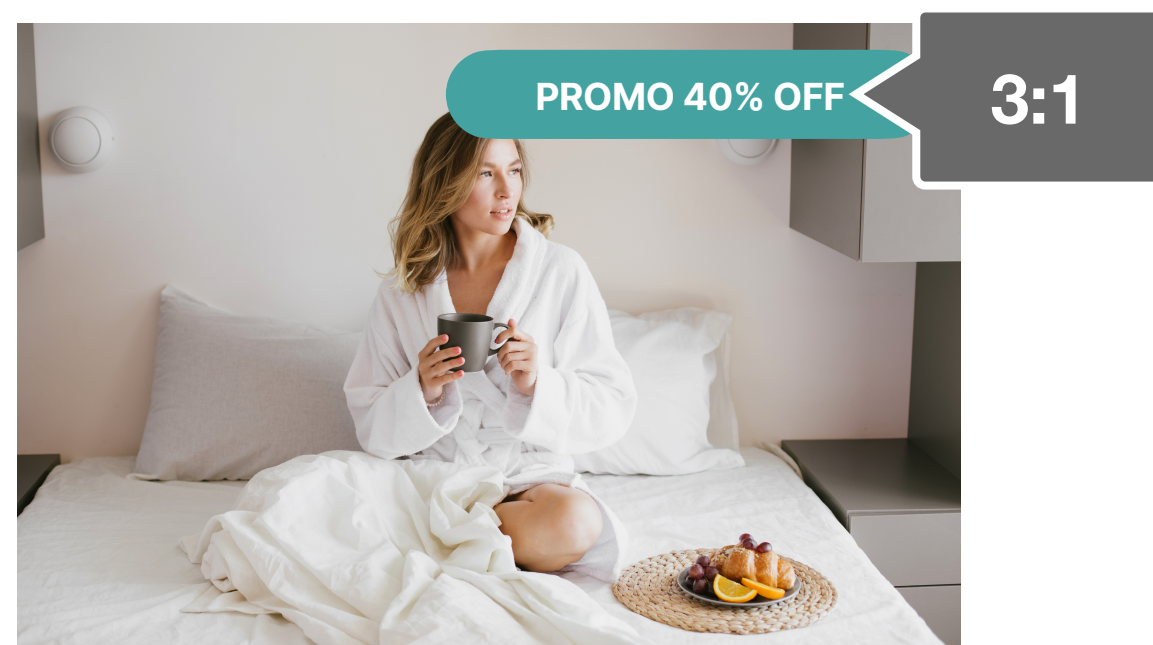
Weight: **Bold**

Size: **19 pixels (14pt) and larger**

Contrast: **3:1**

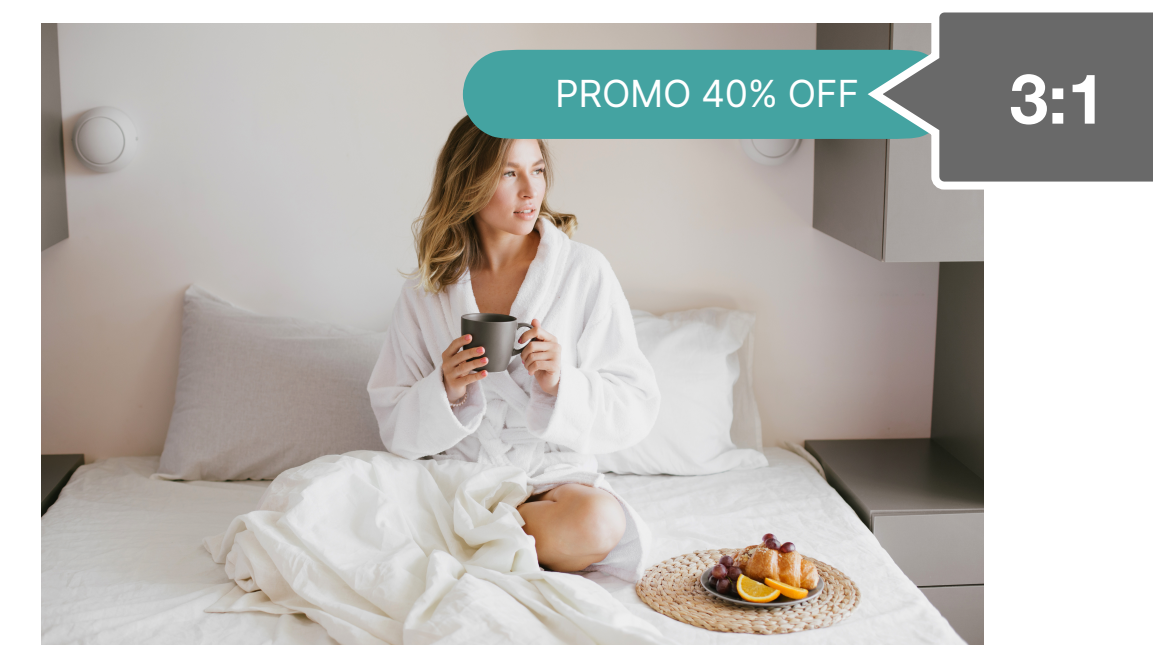
## Best practice

Use bold text when you are not able to meet the contrast ratio with large standard text.



## Common error

It's easy to get confused with the difference between large and standard text. If text is 19 pixels (like in this example) and is not bold, it still requires the 4.5:1 ratio.



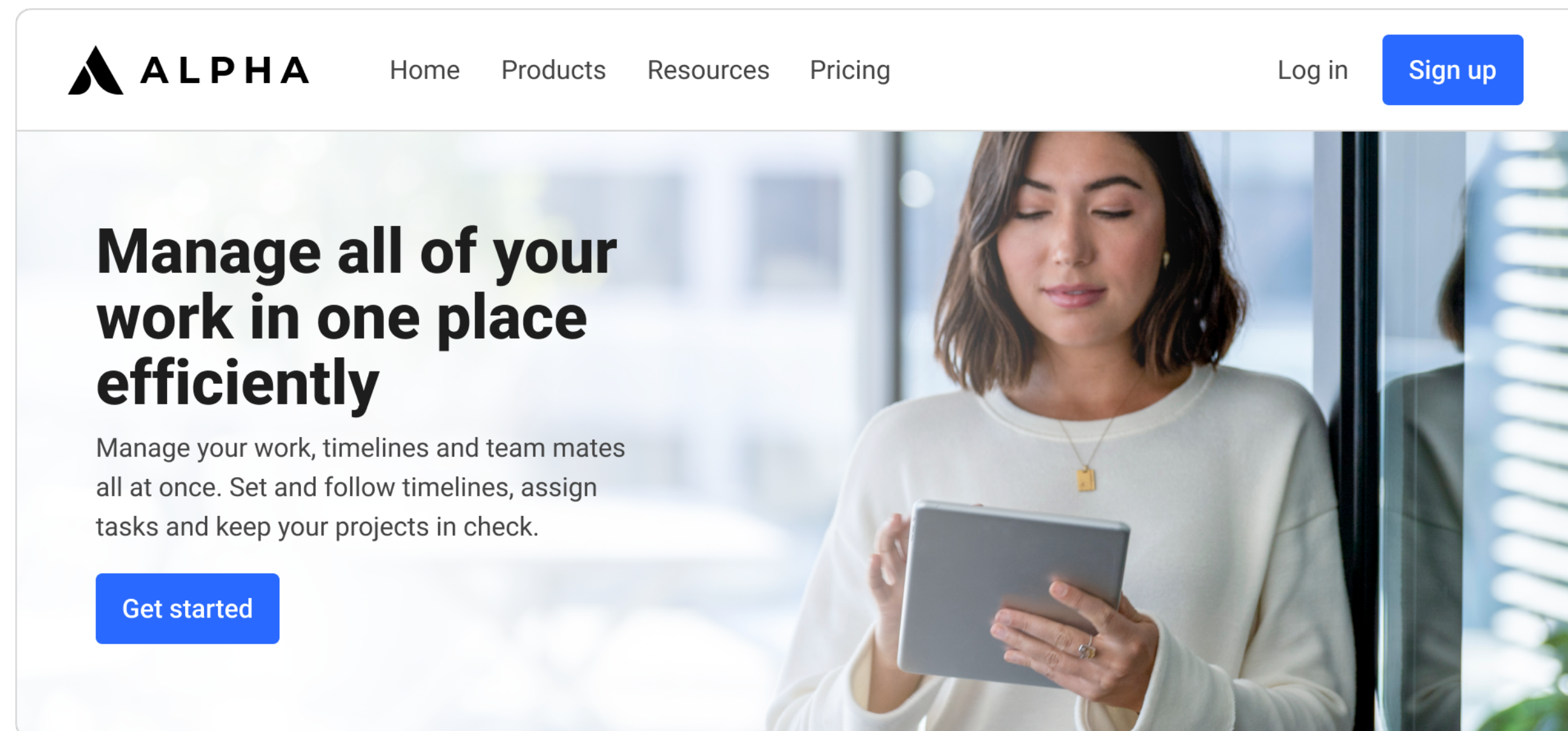
# Background images

## Overlays

When using text over a background image, you can add a semi-transparent dark or light overlay to the image to increase the contrast.

It's helpful to start the gradient at 80% on the left, ending at 0% in the middle, adjusting for differences in each image.

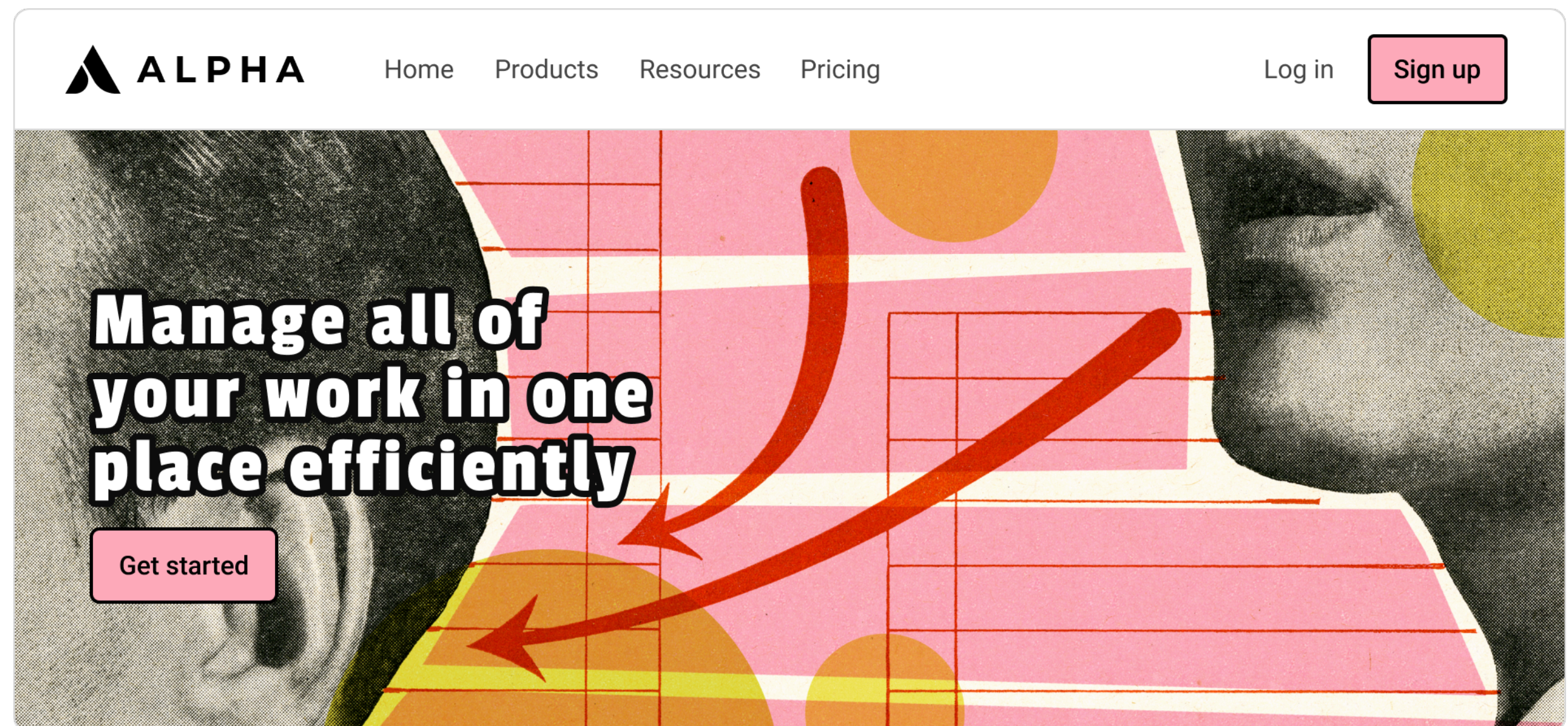
It's also helpful to choose images where the visual focus is on the right.



# Busy backgrounds

## Outlines for busy backgrounds

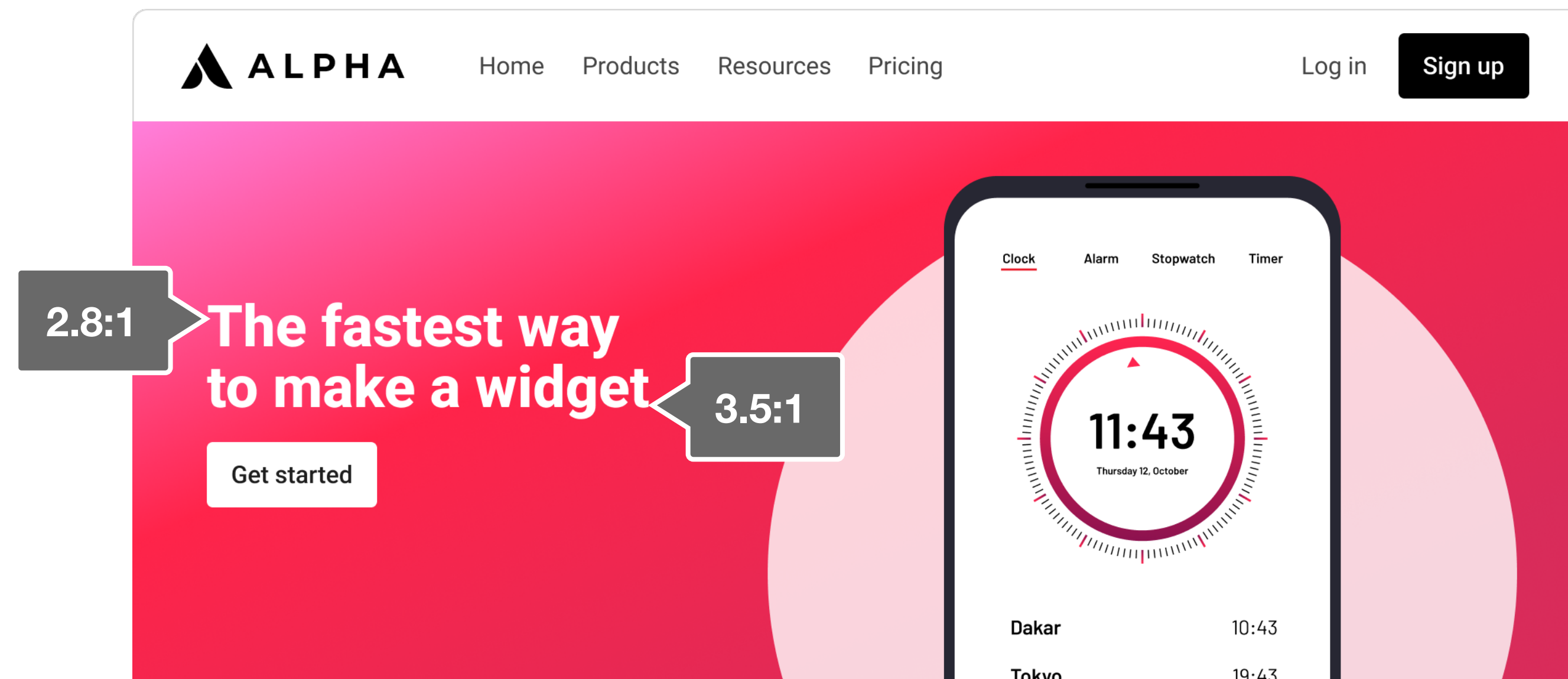
While it is better to have a simple background image, if you have a very busy and/or contrasty image that needs to be in your hero, you can use outlines around the letters. Use a color that is opposite in brightness from the color of your letters.



# Checking backgrounds

## Check the entire background

Check the lightest and darkest part of the background to be certain that the contrast ratio meets the minimum requirement.



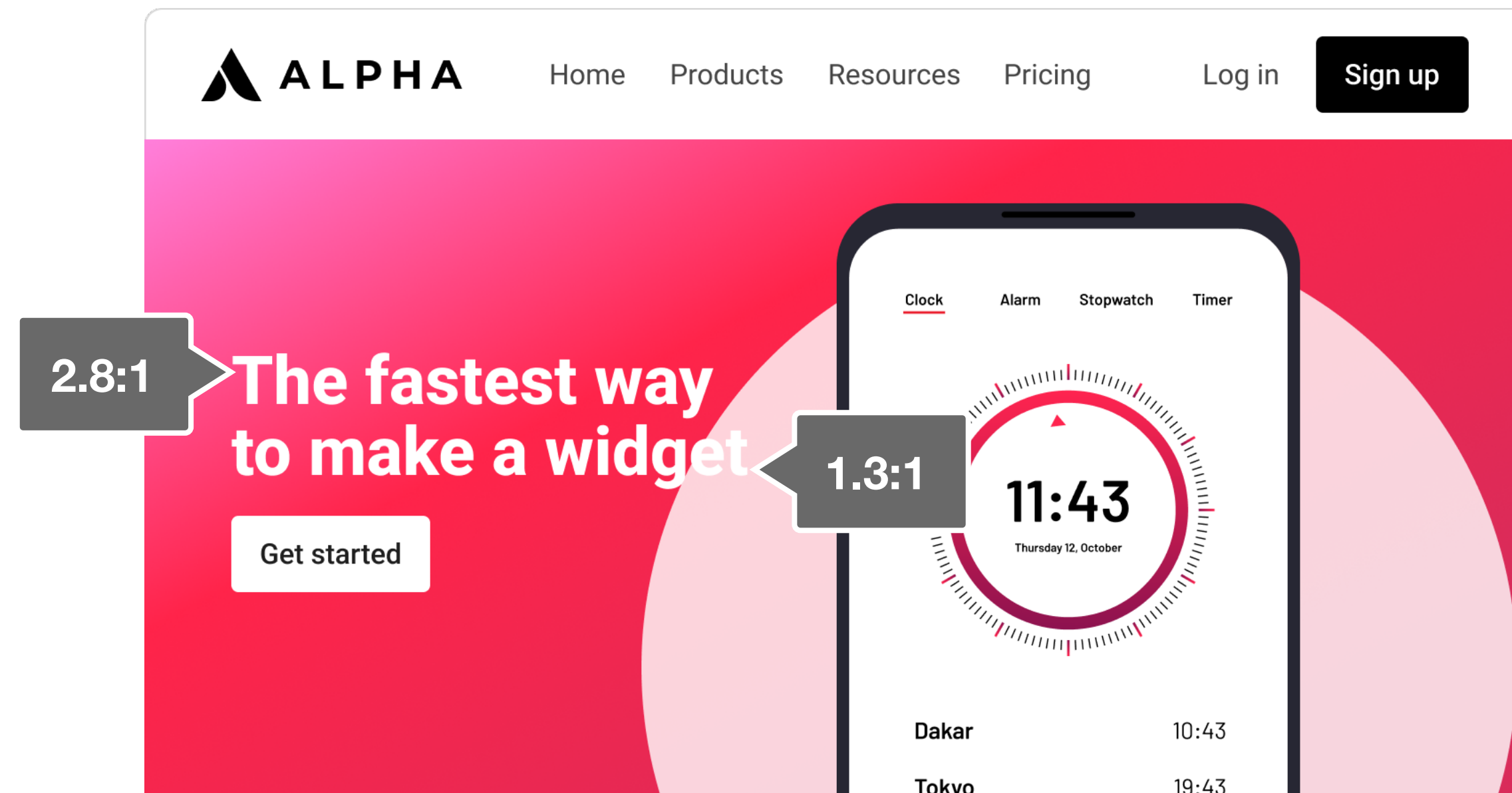


# Checking responsive

## Check all breakpoints

As the website scales down, the part of the image that is behind the text might also change, so check all areas of the image that will at any point serve as a background.

Also, remember that the font size also scales down, so the required contrast ratio may change.



# Non-text elements

There are many non-text elements, such as user-interface components, that communicate essential information. These non-text elements need to have a strong color contrast ratio to be easily understood.



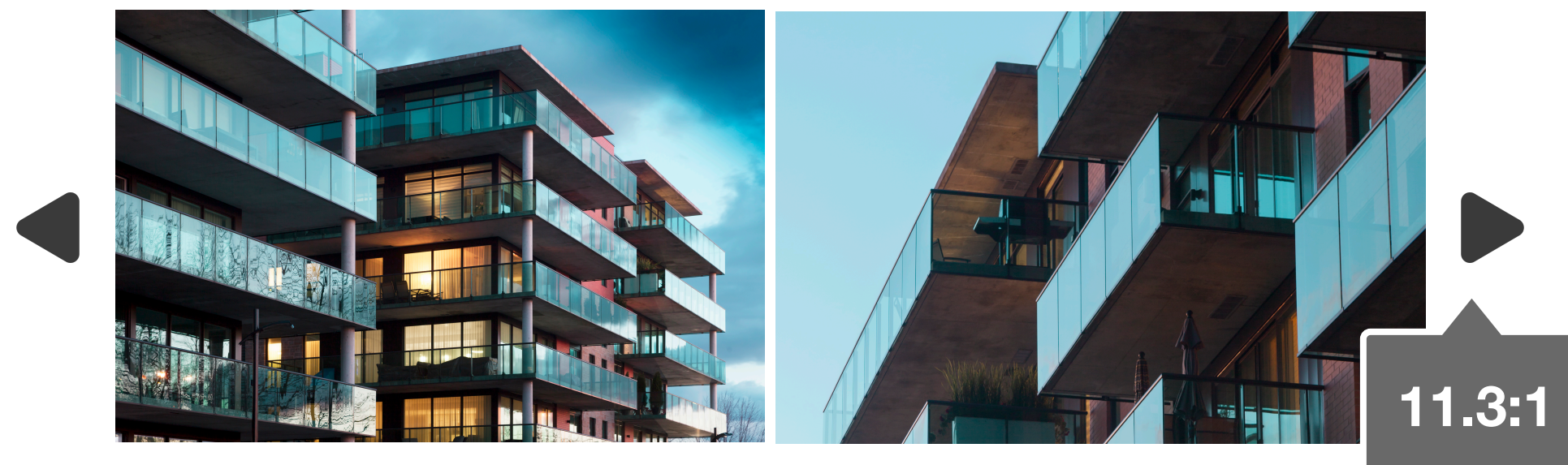
# User-interface components

Contrast: **3:1**

A user-interface component is any element that allows a user to interact with it, e.g. inputs, buttons backgrounds, interface icons, or social media icons. These elements must have at least a 3:1 contrast ratio.

## Best practice

The contrast between the background color and the arrow meet the required 3:1 color contrast.



## Common error

Because the arrows are on top of the images, they do not always comply with the required contrast ratio.



# Universal user-interface icons

Contrast: **3:1**

While you should always add supporting text to user-interface components, there is an exception for icons that have a globally accepted meaning, like a search icon or a heart.

## Best practice

Universal icons need to have a 3:1 contrast ratio. Also, always be sure to add the supporting text to your HTML so it will get picked up by a screen reader.



This universal icon (the heart) meets the color contrast requirement.



13.8:1

## Common error

While it is nice to use a primary brand color for universal icons to reinforce the brand identity, they must meet the minimum contrast ratio of 3:1.



This universal icon (the heart) is not compliant as it doesn't offer enough contrast.



1.5:1

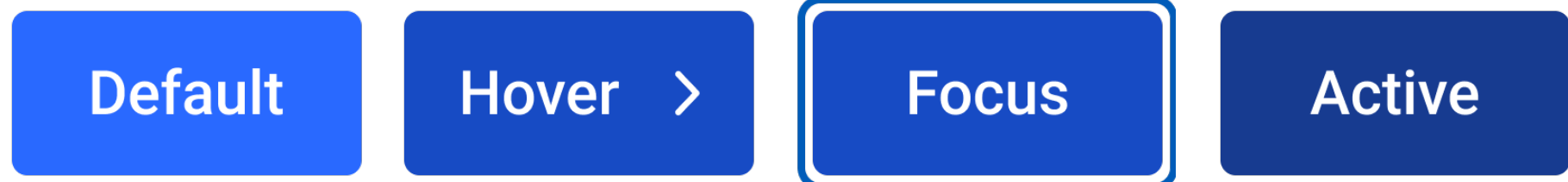
# Button states

States are temporary changes, usually due to a user interaction, for example hover. All states should have a contrast ratio of 3:1 between the foreground color and the background color, except for the inactive state.

Contrast: **3:1**

## Best practice

All the states below should have a contrast ratio of 3:1. Remember to check each one of them.



## Exception

The inactive state is the only state that does not require any contrast ratio.



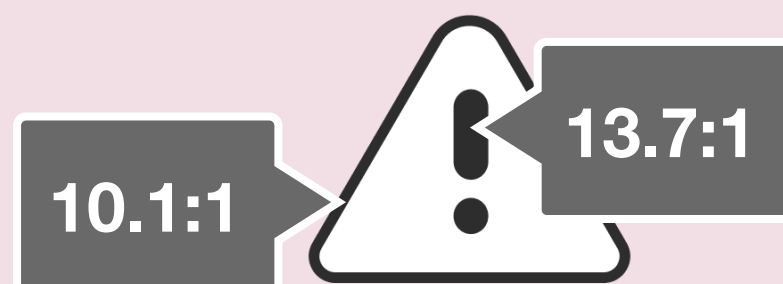
# Multiple layers

With buttons and other non-text elements that have multiple layers, make sure all the layers meet the contrast ratio. Be especially careful with buttons, where the contrast between both the text/button and button/background need to be compliant.

Contrast: **3:1**

## Best practice

The contrast ratio is correct between the exclamation point and its background and the triangle and its background.



## Common error

While the outside triangle has the correct contrast ratio, the exclamation point does not have enough contrast with its background.



# Additional indicators

If you only use color to indicate information, many people will not understand the information you are trying to convey. Thus, use additional indicators, such as icons, written content, and other visual elements to make sure the content is communicated very clearly.



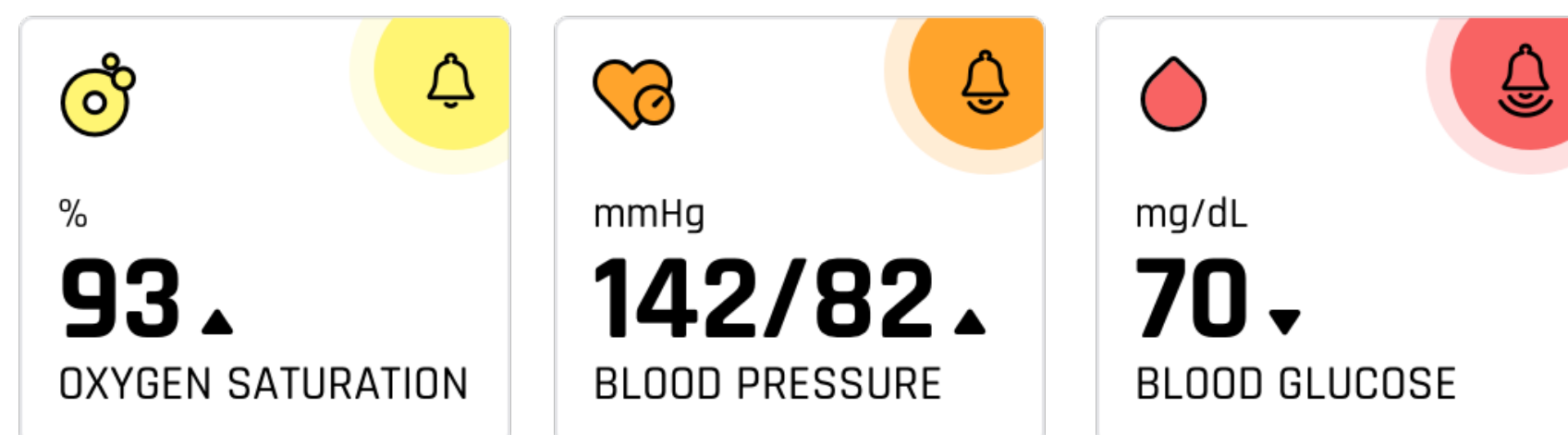
# Overview

Additional indicators help people see essential information, in case the color does not stand out enough for them to see. Additional indicators should have a 3:1 contrast ratio.

Contrast: 3:1

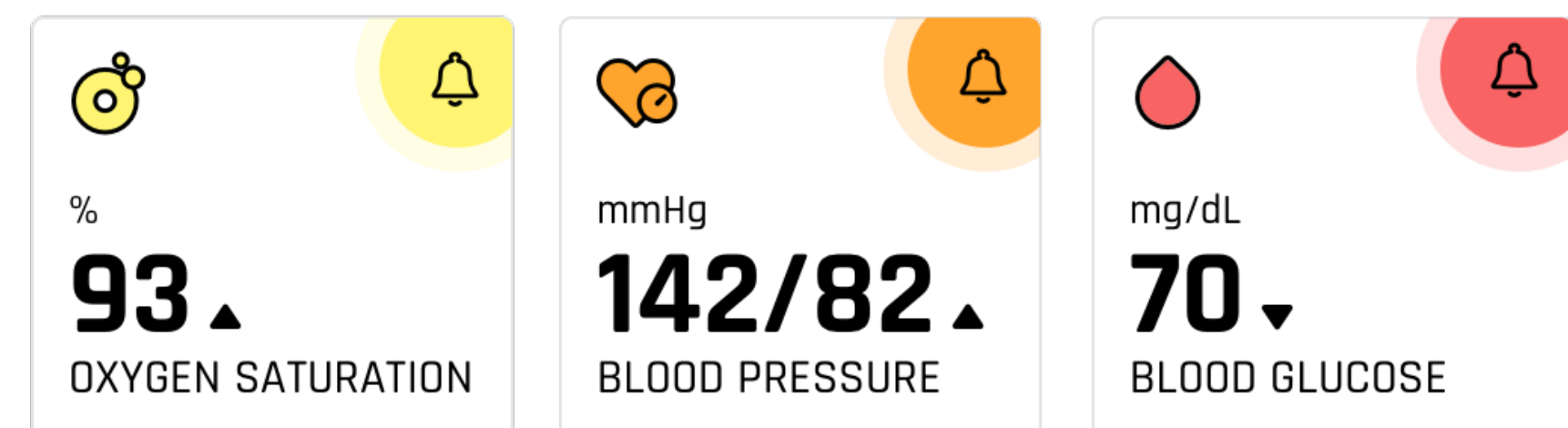
## Best practice

In order to help people see the different levels of alerts, we added 3 lines around the bell for high alert, 2 lines for medium, and 1 line for low.



## Common error

This design relies on color alone to communicate the levels of alerts. If you can't see the differences in color, you won't be able to see the different levels.





# Links

Add an underline or icon to call attention to linked text. If the only difference between static and linked text is color, some readers will not notice the difference.

Contrast: **3:1**

## Best practice

The most common visual indicator for links is an underline. However, icons can also be used.

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## Common error

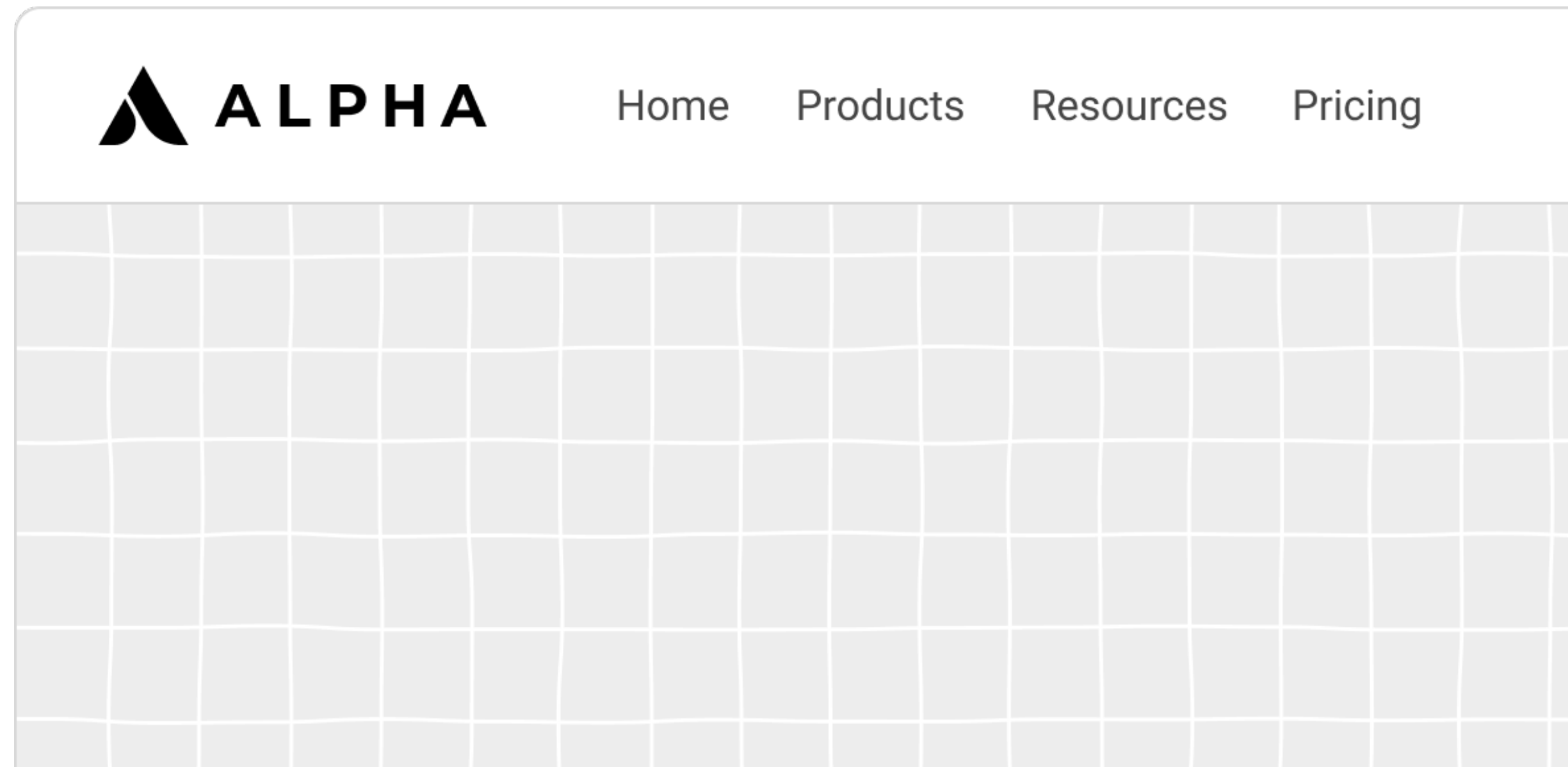
When color is the only way to indicate that text is linked, some people will not be able to access the linked content (since there is no other visual indicator).

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# Exceptions

## When links are obvious

You do not need to use an additional visual indicator with links that are easily understood to be links. For example, the position in the page can suffice to make the link obviously a link. Some examples include navigation links in the header of a webpage, sub-navigation links, and fat footer links. Please always keep in mind to maintain enough clear space between links.



# Error states

Use an additional indicator to accompany text for error states. Because error states are so important, using an additional indicator is worthwhile to help decrease the number of people who will miss it.

Contrast: **3:1**

## Best practice

While the text box outline and the text changed to red in order to alert the user, it is helpful to add an icon to help users become aware of the error.

Email \*

 Please enter a valid email address.

## Common error

Often there is no icon to accompany the change of color for error messages, making them more difficult to recognize.

Email \*

Please enter a valid email address.

# Line thickness

For error states, increase the thickness of the stroke around the text box, in addition to the color change and additional indicator. This will increase the number of people who will notice the error.

Contrast: **3:1**

## Best practice

In order to make sure the color change is obvious in an error state, increase the line thickness of the text box.

Name \*

 Please enter Name

## Common error

If the line thickness remains the same thickness for the focus or error state, it may be difficult for some people to notice the difference.

Name \*

Please enter Name

# Design tips

DESIGN TIPS  
DESIGN TIPS  
DESIGN TIPS

# Creating a color palette

## Accessible color combinations

Choose primary and secondary colors and then a selection of grays, blacks and whites.

Then use a tool like [this](#) to check which combinations of colors are accessible. Make sure you have enough accessible color combinations.

Then include documentation in your guidelines for which combinations are accessible.

#3559C7  
R53 G89 B199

**Text Passes AA**  
16px Regular

#3559C7  
R53 G89 B199

**Text Passes AA**  
16px Regular

#007E85  
R0 G126 B133

**Text Passes AA**  
16px Regular

#007E85  
R0 G126 B133

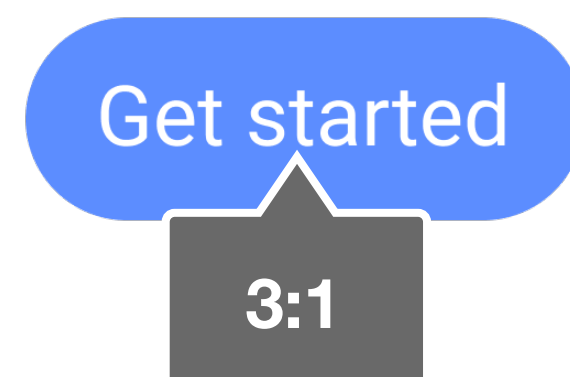
**Text Passes AA**  
16px Regular

# Increase font size and weight

If you're working with an existing palette and the color contrast between text and background is too low, one of the best ways to meet the standards is to increase the font size and weight, so that the required contrast ratio drops from 4.5:1 to 3:1.

## Before

Although the contrast ratio of this button is 3:1, because the text is “standard” (i.e. regular weight and 23 pixels), it requires a 4.5:1 contrast ratio. Hence it does not comply with standards.



## After

By making the font weight bold, the text is now considered “large and bold” and so the required contrast ratio is reduced to 3:1. It now complies with standards.

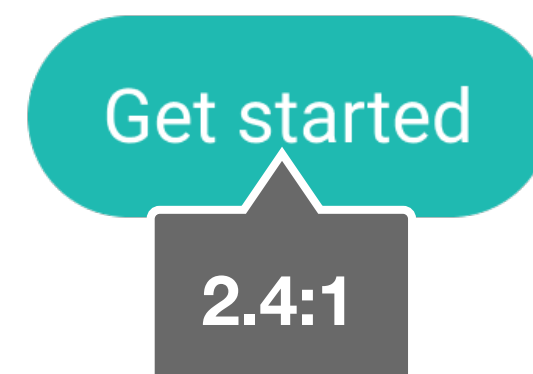


# Adjust text brightness

If the color contrast is too low, another way to meet standards is to darken (or lighten) the text. While in the examples below it looks like the color of the background has also changed, this is an optical illusion.

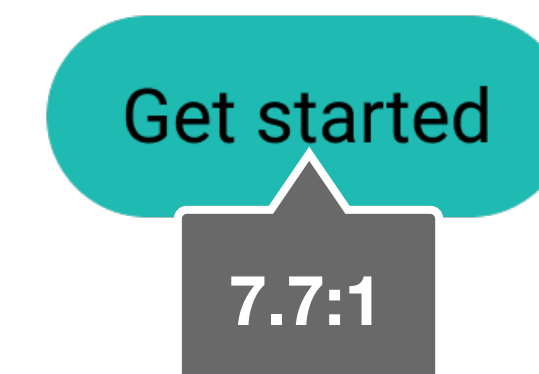
## Before

The contrast ratio is only 2.4:1 because the text is too light. It does not comply with contrast standards.



## After

By making the text darker, the contrast ratio went up to 7.7:1. It now meets the required contrast ratio.



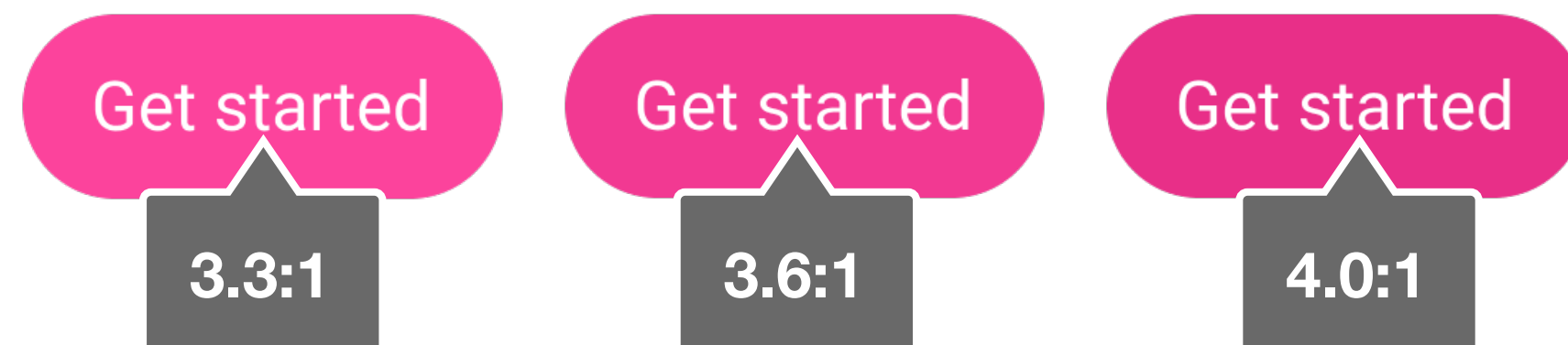


# Adjust background brightness

If the color contrast is too low, you can also adjust the brightness of the background color to meet the required contrast ratio. We recommend very gradually adjusting the brightness of the color and checking with a color contrast tool until it meets the standard. Often a small change can make a big difference.

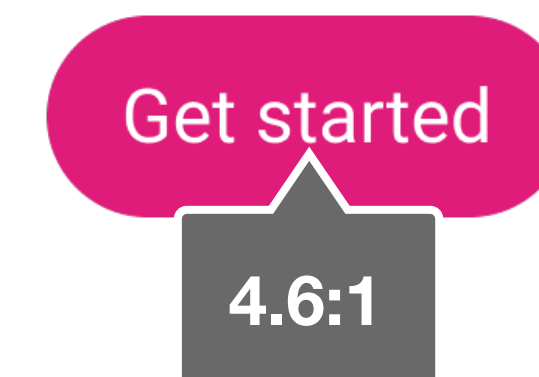
## Before

We gradually darkened the color, searching for the moment in which it meets the required 4.5:1 ratio.



## After

By slightly adjusting the color, it now has enough contrast.



# Decorative color

If your color contrast ratio is too low and none of the above solutions work, it's best to use your desired color in a decorative way only, and use a different color for interactive elements.

## Before

Increasing the font weight or size will not provide enough contrast; making the text black feels too much like Halloween; and darkening the orange makes it feel muddy. None of the above solutions work.



## After

By choosing a completely different color for the user-interface component and using the orange as a decorative element, this design is now compliant.



# Color combinations to avoid

Avoid certain color combinations that are particularly difficult for people to see.

## Avoid

Red/green color blindness is the most common type of color blindness. Whenever possible, avoid green on red or red on green.

Lorem ipsum dolor sit amet, consectetur adipiscing Suspendisse et augue justo. Nulla aliquam felis gravida

Lorem ipsum dolor sit amet, consectetur adipiscing Suspendisse et augue justo. Nulla aliquam felis gravida

## Avoid

Stark contrast can result in blurred or moving text for people with Irlen syndrome. Slightly temper the contrast between your text and background color. We recommend using #111111 or brighter with pure white, or #EEEEEE or darker with pure black.

Lorem ipsum dolor sit amet, consectetur adipiscing Suspendisse et augue justo. Nulla aliquam felis gravida mauris blandit, in ultricies nulla ornare. Fusce at vulputate ligula. Aliquam erat volutpat. Nullam facilisis nibh id mi venenatis molestie.

# QUESTIONS?

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**We'd love to chat.**

**[hello@boldium.com](mailto:hello@boldium.com)**



# THANK YOU

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