

Design for Developers

Colours

Introduction

Introduction

Colour theory is a collection of rules and guidelines that designers use to make decisions about what colours to use.

In practice, it is a huge topic and many people make a career out of it as colour or brand consultants!

We'll be going over some key points of colour theory in the context of screen design, which is what we'll be working with as developers.

Introduction

We first learned about colours when we started our educational journey; kindergarten for most of us. In our early years we learned that red, blue, and yellow could be mixed together to make purple, green, and orange.

That was our first exposure to colour theory.

Let's get a bit of vocabulary in before we go any further.

Introduction

- Hue: basically, another word for colour
- Chroma: how pure a colour is. A hue with a high chroma has no white, black or grey added
- Value: has to do with how dark or light the colour is, ranging from black to white
- Saturation: refers to the intensity of the colour
- Tone: created when gray is added to a hue
- Shade: created when black is added to a hue
- Tint: created when white is added to a hue

Introduction

Why should we care so much about colour?

The answer is, because colour is part of how we can communicate with a user and communication is a big part of what design is all about.

Whether we like it or not, people are conditioned to associate colours with certain feelings. What colours you choose will influence how people feel about what you make.

Colour Psychology

Colour Psychology

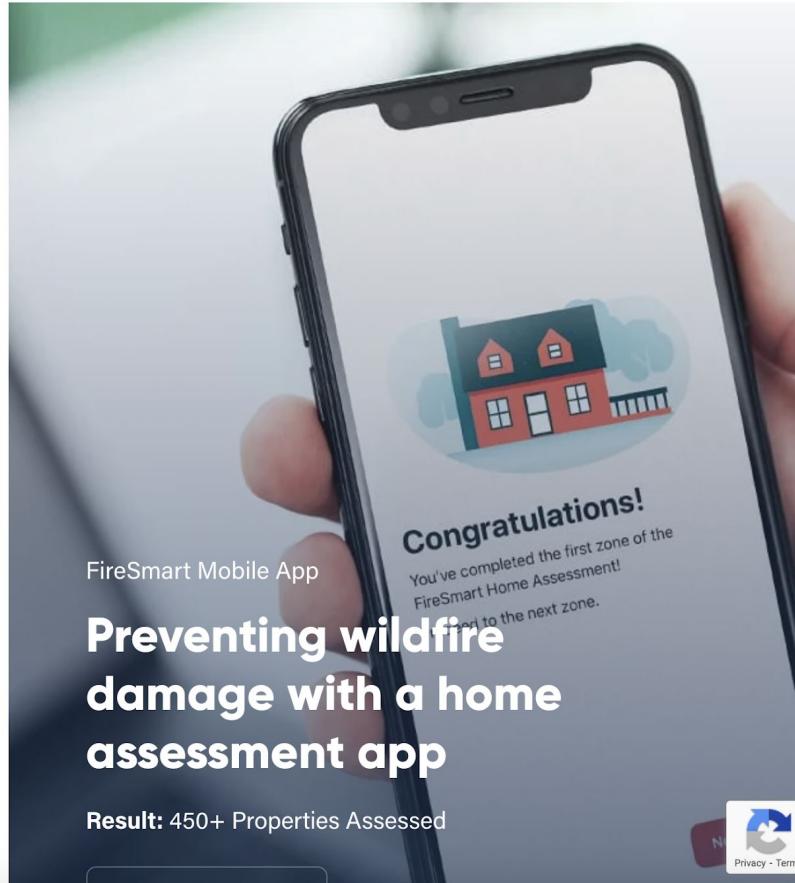
Blue

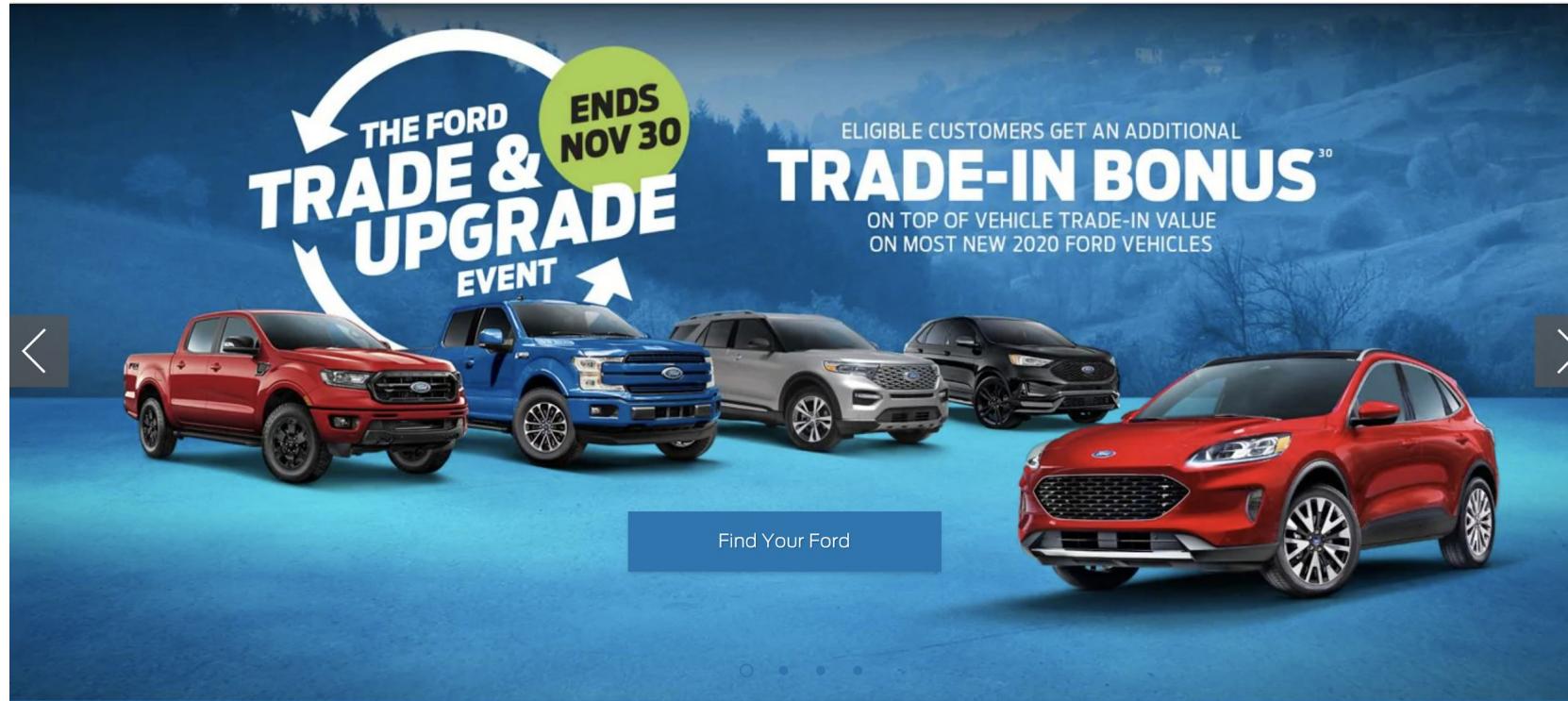
- Confidence
- Stability
- Professionalism
- Trust
- Honour



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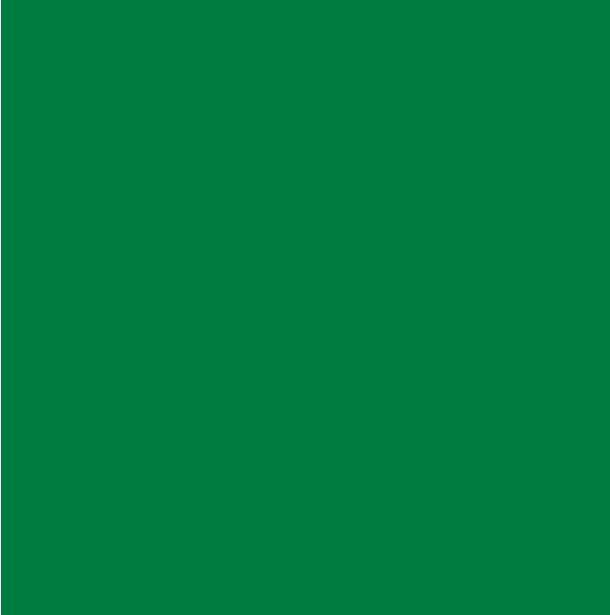
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Colour Psychology



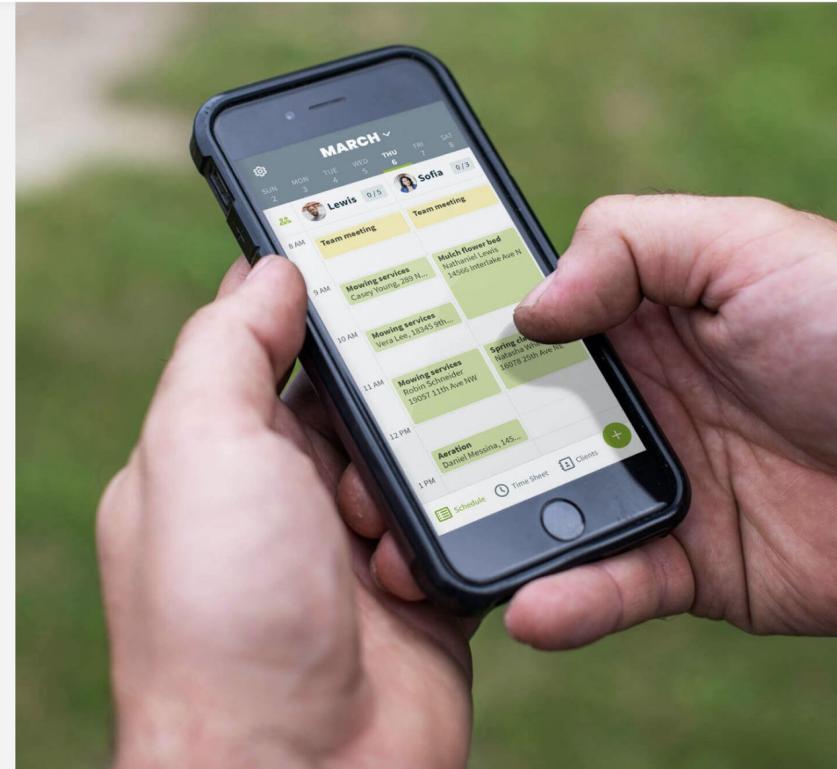
Green

- Growth
- Nature
- Harmony
- Wealth
- Optimism

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Celebrating the Graduating Class of 2020

We'd like to invite you, the University of Alberta community, to join in celebrating our graduates in a virtual convocation ceremony.



Colour Psychology

Purple

- Royalty
- Luxury
- Creativity
- Wisdom
- Peace
- Magic



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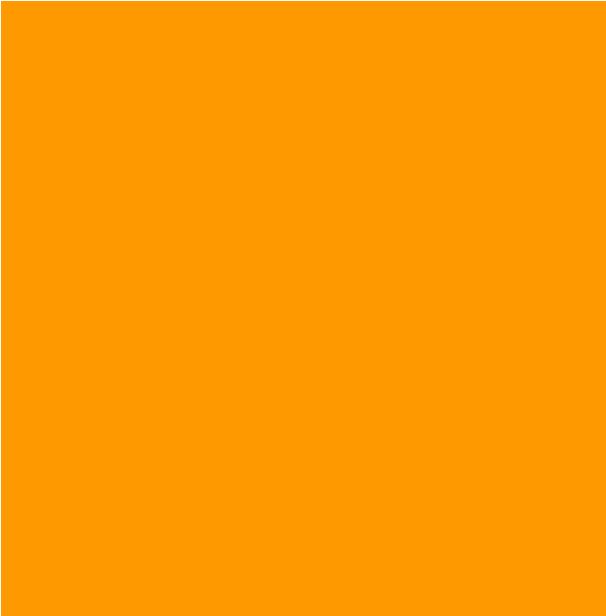
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Colour Psychology



Orange

- Enthusiasm
- Fascination
- Happiness
- Creativity
- Success
- Encouragement

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Colour Psychology

Red

- Power
- Love
- Violence
- Danger
- Emergency
- Strength
- Courage





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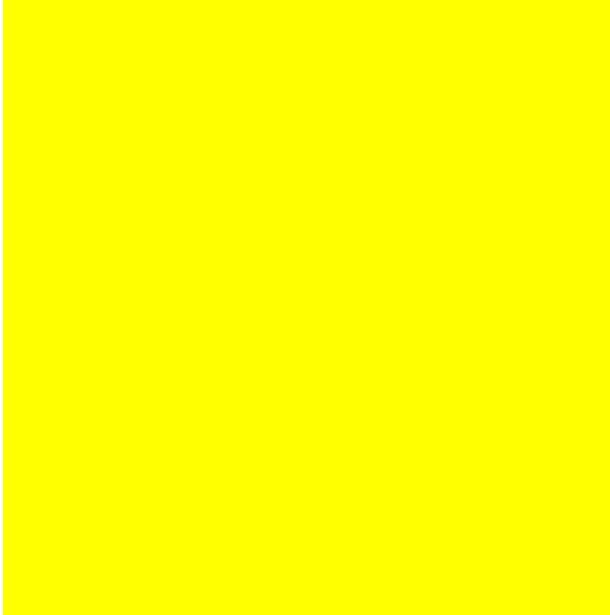
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Colour Psychology



Yellow

- Joy
- Hope
- Excitement
- Warning
- Illness (depending on hue)
- Cowardice
- Deceit

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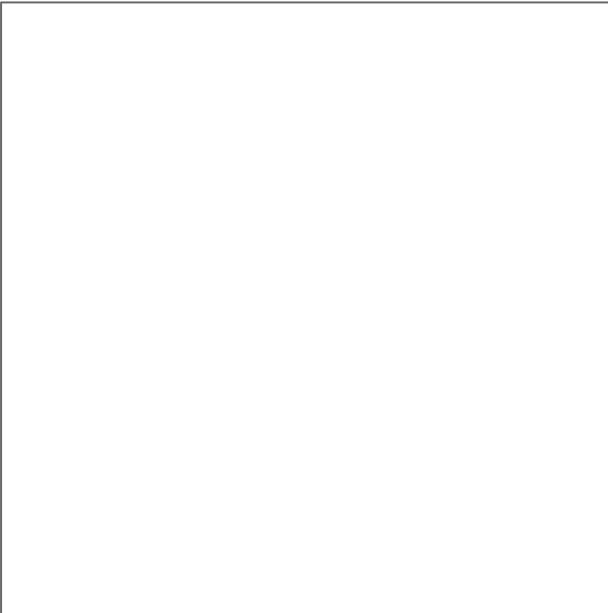
Colour Psychology

Black

- Mystery
- Strength
- Authority
- Rebellion
- Sophistication
- Formality
- Death



Colour Psychology



White

- Purity
- Innocence
- Safety
- Sincerity
- Cleanliness
- Faith
- Softness

Colour Psychology

Colours and the moods that they invoke are different across cultures. In Western cultures, red is associated with danger. In some Eastern cultures, it is a lucky colour. And in some African cultures, it is the colour of mourning.

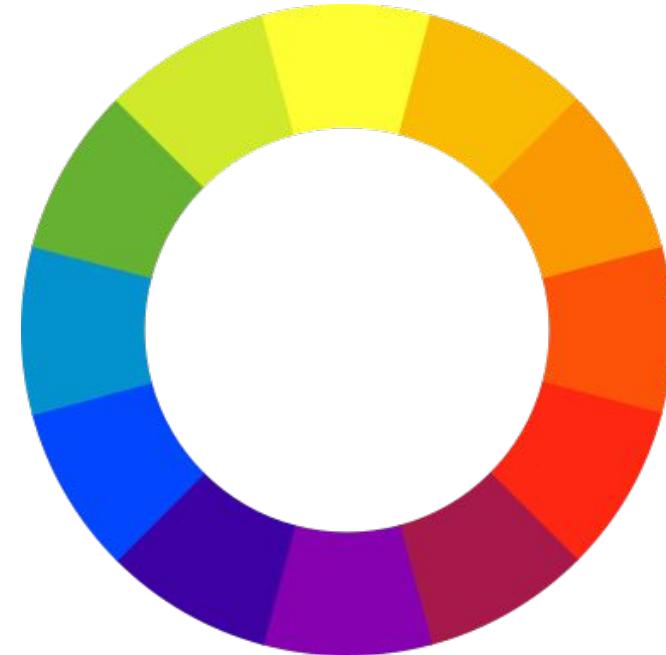
Be aware of your audience and what they might take away from your colour choices.

Colour Wheels

Colour Wheels

Colour wheels help illustrate the relationships between colours and by using a colour wheel we can create colour schemes or palettes.

Primary, secondary, and tertiary colours combine to make a colour wheel.

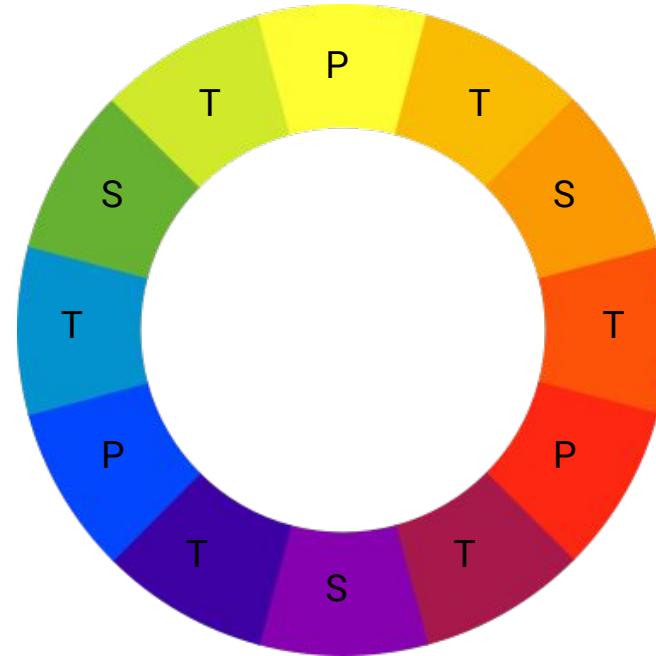


Colour Wheels

Primary colours: red, blue, yellow

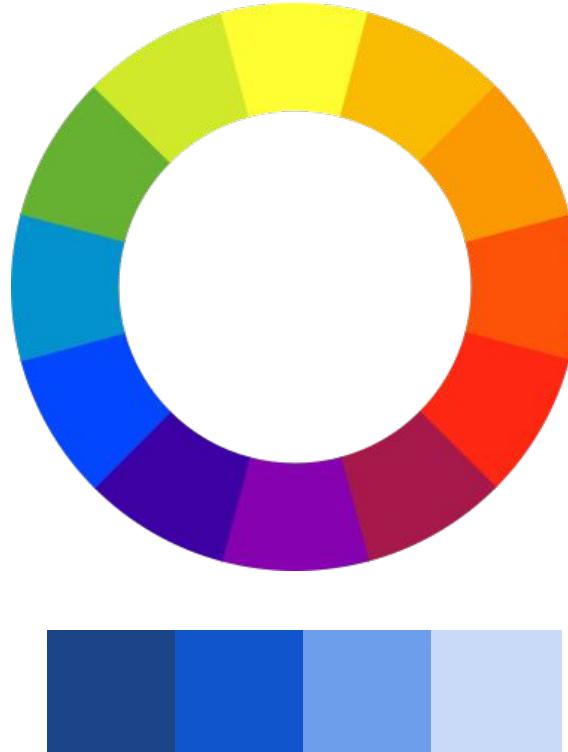
Secondary colours: mixes of primary colours; purple, orange, green

Tertiary (or intermediate) colours: mixes of primary and secondary colours



Colour Wheels

The easiest palette to make is **monochromatic** because it only uses one hue (colour) with different saturation and values. The best thing about a monochromatic colour scheme is that the colours are guaranteed to match!



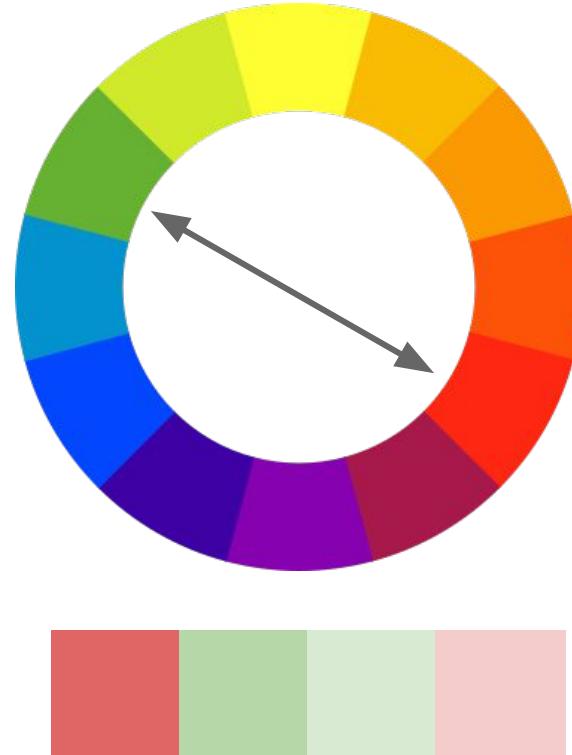
Colour Wheels



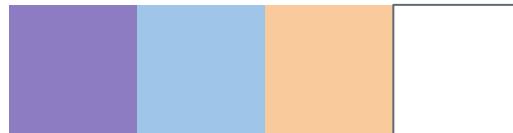
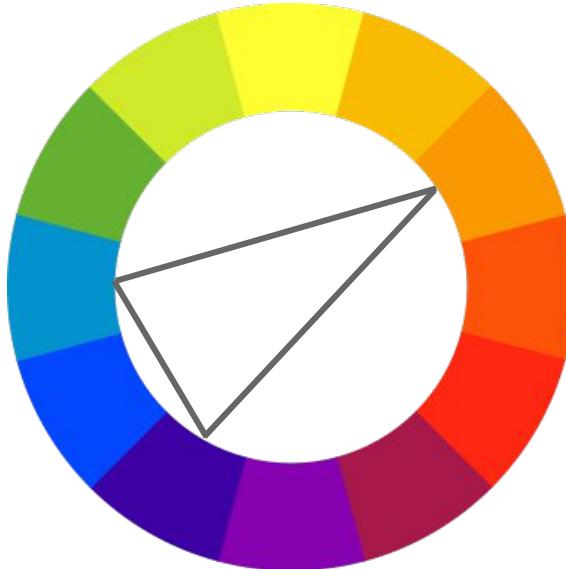
Analogous colour schemes use colours that are next to each other on the wheel. Reds and oranges or blues and greens or blues and purples!

Colour Wheels

Complimentary colours are opposite each other on the colour wheel. To avoid looking too primary or simple, introduce different values and saturations. Use a complementary colour scheme to maximize contrast.



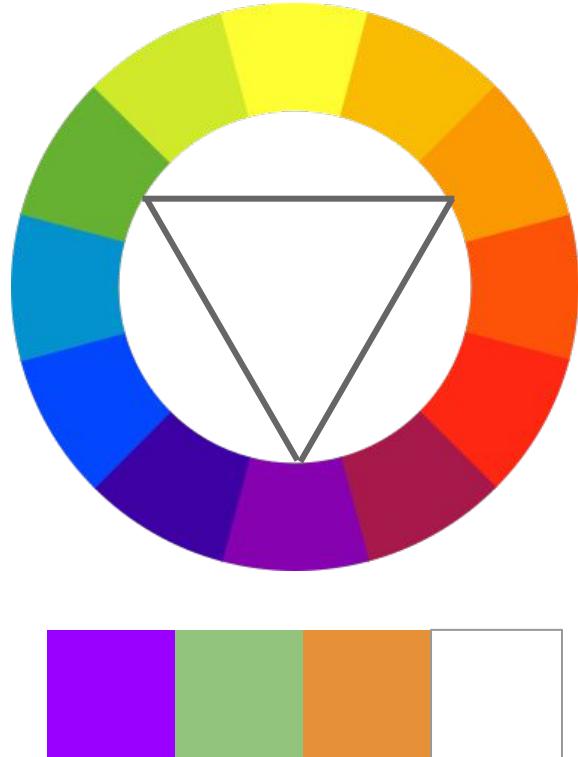
Colour Wheels



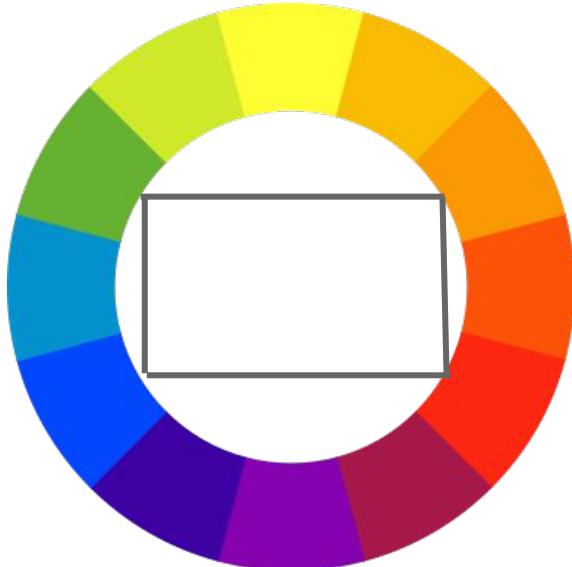
Split Complementary uses the colours on either side of the complimentary colour. This gives you the same level of contrast but more colours to work with.

Colour Wheels

Triadic colour schemes uses three colours evenly spaced on the colour wheel so if you join them with imaginary lines it would form an equilateral triangle



Colour Wheels



Tetradic colour schemes use four colours and form a rectangle on the colour wheel if you were to draw lines between the colours. It uses two complementary colour pairs. This colour scheme works best if you allow one colour to dominate and use the other three as accent colours.

Colour Wheels

Now that we're familiar with colour wheels, we have a tool for helping us pick out colours.

How would you use a colour wheel?

Usually you'd pick a dominant colour, usually one from a logo or brand guideline, then use a colour wheel to pick your secondary colour(s). You don't need as many colours as you might think for a webpage. A couple contrasting colours plus neutrals is all many webpages use!

Picking Your Colours

Picking Your Colours

Colour conveys a message. It is important to consider what your project is about and what message you are trying to send. The tone of your project needs to be taken into account when picking colours.

Desaturated colours are often considered more 'business' like.

Bright colours are fun, playful, and modern.

Picking Your Colours

When you're picking your colours it's really easy to get carried away. Remember that less is more.

Usually you'd pick your dominant colour from your logo. If you don't have a logo, think about the meaning of colours before you choose your dominant colour.
(Google is your friend when it comes to looking up the meaning of colours!)

Picking Your Colours

You'll want to pair up the dominant colour with supporting colours or use neutral colours; you rarely can go wrong with a neutral.

There are plenty of websites that use neutral colours with a single dominant colour. Twitter, Spotify, and Dribbble immediately come to mind!

-  Follow your interests.
-  Hear what people are talking about.
-  Join the conversation.

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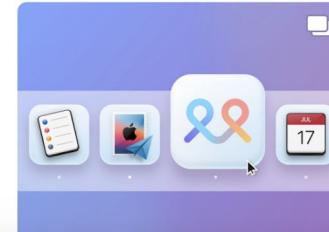
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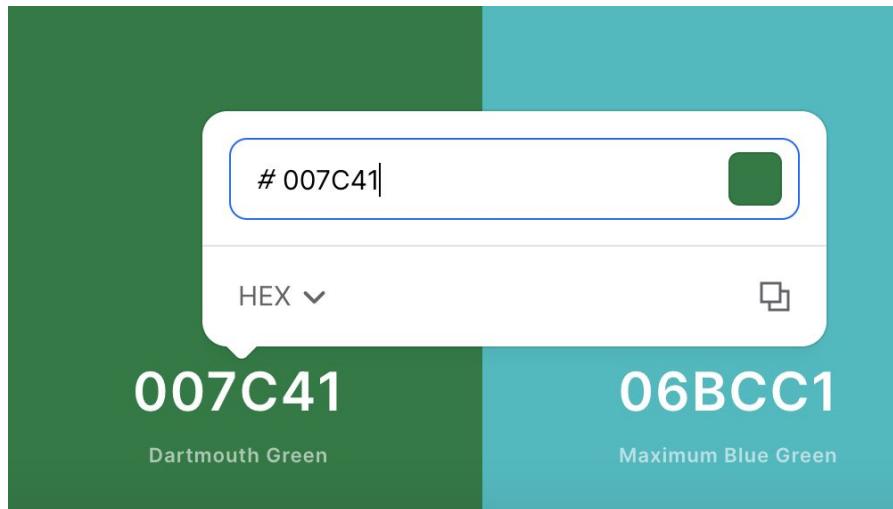
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Picking Your Colours

Now that you know a bit about the psychology of colour and how the colour wheel works, let's work on picking out some colours.

1. Choose a dominant colour that connects with your brand
2. Pick one or two accent colours that contrast your dominant colour
3. Pick your neutral colour(s)

Let's build a palette on <https://coolors.co/> together!



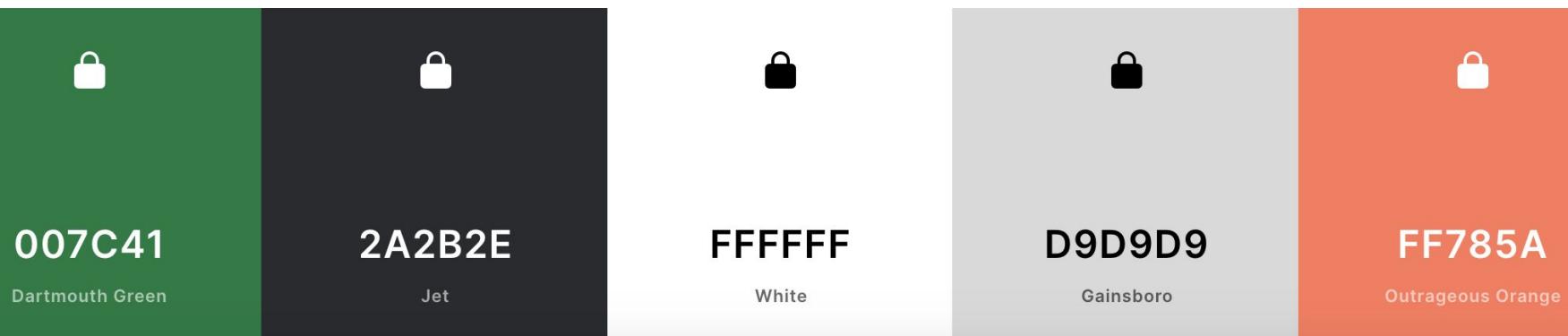
We're going to build a palette for the University of Alberta.

The official brand colour for the green is #007C41 so let's enter that in the first column and lock the column so it can't change.

Now hit the spacebar and see what the site suggests for colours. Keep going until you have 5 colours picked.

Picking Your Colours

Of course, you don't have to use all five colours in your palette. Here I have three neutrals, green is my dominant colour, and orange is a secondary colour.



Picking Your Colours

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In-Class Exercise

Let's go to <https://coolors.co/> and build a palette!

Remember:

1. Choose a dominant colour that connects with your brand
2. Pick one or two accent colours that contrast your dominant colour
3. Pick your neutral colour(s)

When you're done your palette, you'll share it with the class using your coolors.co link.

Picking Your Colours

Be consistent with how you use your colours.

If you're going to make your body links a colour, make all of your body links the same colour. If you're going to make your headings a colour, make sure every time that heading comes up, it's the same colour.

You can break this rule but you need to be a good designer to break rules and still pull off a good design!

Picking Your Colours

There are MANY online tools that can help you put together a colour palette

<https://color.adobe.com/create/color-wheel>

<http://colormind.io/>

<https://colors.co/>

<https://colors.muz.li/>

Accessibility

Accessibility

Colour can be a bit of a trap for web designers. The internet is for all kinds of users and that includes people with vision impairments such as colour blindness. Be sure to pay attention to colour contrasts!

1. We should not rely on colour as our only way to convey important information
2. There should be sufficient contrast between background and foreground colours. Use a colour contrast checker to be sure!
<https://webaim.org/resources/contrastchecker/>
3. Your focus state should also have sufficient contrast

Accessibility

Colour blindness affects, roughly, 1 in 12 men and 1 in 200 women. With colour blindness, much of the power of colour is lost when someone can't perceive it or sees it differently than intended.

This article does a great job illustrating what colour blindness is like for some of the population:

<https://uxdesign.cc/the-importance-of-colorblind-friendly-design-case-study-among-us-dcd042c87b9>

Let's take a look!



PINK



PURPLE



BLUE

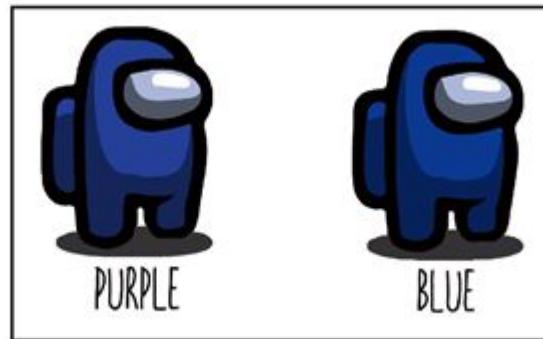


CYAN

Vision with no colour weakness



PINK



PURPLE



BLUE



CYAN

Deuteranomaly, or green-weak vision

Accessibility

Never rely on colour as the only indicator. Integrate messaging or icons as a second way to tell what is going on.



USING A SYMBOL IDENTIFIER
ALONG WITH PLAYER NAME



DISPLAYING AVATAR COLOR
ALONG WITH PLAYER NAME

Accessibility

“...color should not be used as the only visual means to convey information, indicate an action, or distinguish an element” [Source](#)

This means that, like in Among Us, if colour is your ONLY means of conveying important information you need to pair it with something else.

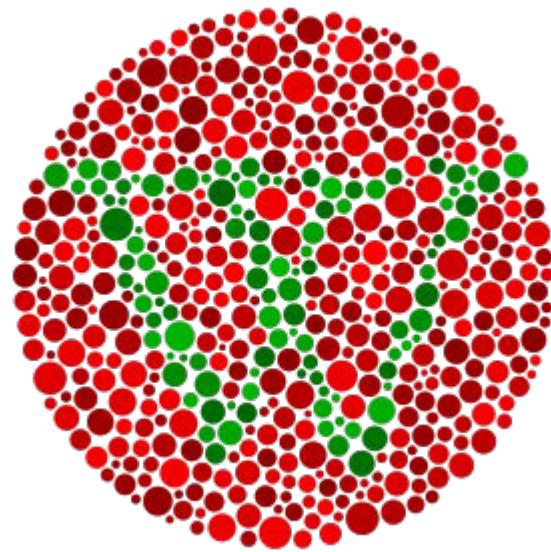
An example would be pass/fail indicators using green/red. You'll also need to include a checkmark/X or the word ok/fail to somehow convey that a user has passed or failed. In a form, for example, it isn't enough to outline an input with red if there is a problem with the field, you should indicate a second way that there's something wrong with the field.

Accessibility

Contrast is very important for accessibility when you're picking colours. (Remember the C from CRAP?)

But, red and green are complementary colours on the colour wheel, shouldn't they be okay to layer?

If in doubt, use a colour contrast checker!



Accessibility

<https://color.a11y.com/>

Background Color
Enter a Hex Code or pick a color
`#FF0000` 

Foreground Color
Enter a Hex Code or pick a color
`#00E639` 

Contrast Ratio
2.35:1

Normal Size Text

WCAG AA: 4.5:1 

WCAG AAA: 7:1 

The quick brown fox jumps over the lazy dog

Large Size Text

Font size 18pt+, or bold & 14pt+

WCAG AA: 3:1 

WCAG AAA: 4.5:1 

The quick brown fox jumps over the lazy dog

User Input & Graphical

WCAG AA: 3:1 

User Input Text

Choice 1 ▾



Accessibility

Try layering a neutral over a colour.

Background Color
Enter a Hex Code or pick a color

Foreground Color
Enter a Hex Code or pick a color

Contrast Ratio
5.15:1

Normal Size Text

WCAG AA: 4.5:1 Pass
WCAG AAA: 7:1 Fail The quick brown fox jumps over the lazy dog

Large Size Text

Font size 18pt+, or bold & 14pt+

WCAG AA: 3:1 Pass
WCAG AAA: 4.5:1 Pass The quick brown fox jumps over the lazy dog

User Input & Graphical

WCAG AA: 3:1 Pass User Input Text Choice 1

Accessibility

Dark neutrals over light colours. Light neutrals over dark colours.

Background Color

Enter a Hex Code or pick a color

#007C41 

Foreground Color

Enter a Hex Code or pick a color

#FFFFFF 

Contrast Ratio

5.3:1

Normal Size Text

WCAG AA:	4.5:1	 Pass
WCAG AAA:	7:1	 Fail

The quick brown fox jumps over the lazy dog

Large Size Text

Font size 18pt+, or bold & 14pt+

WCAG AA:	3:1	 Pass
WCAG AAA:	4.5:1	 Pass

The quick brown fox jumps over the lazy dog

User Input & Graphical

WCAG AA:	3:1	 Pass
User Input Text	Choice 1	★

Accessibility

Gold on green is only accessible for large text and user input/graphical application

Background Color
Enter a Hex Code or pick a color
 

Foreground Color
Enter a Hex Code or pick a color
 

Contrast Ratio
3.88:1

Normal Size Text

WCAG AA:	4.5:1	✗ Fail
WCAG AAA:	7:1	✗ Fail

The quick brown fox jumps over the lazy dog

Large Size Text Font size 18pt+, or bold & 14pt+

WCAG AA:	3:1	✓ Pass
WCAG AAA:	4.5:1	✗ Fail

The quick brown fox jumps over the lazy dog

User Input & Graphical

WCAG AA:	3:1	✓ Pass
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User Input Text Choice 1 

Accessibility

White on green and dark grey on light green works!



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#999999 on white does NOT pass. It does get darker on hover, but still poor a11y.

Find a Person ONEcard Bear Tracks Maps Email & Apps eClass Library



Accessibility

<https://www.toptal.com/designers/colorfilter/>

The image displays two versions of the University of Alberta's website side-by-side, illustrating the effect of color filtering. Both versions have a dark green header bar at the top.

Left Screenshot (Standard Colors):

- Header:** Find a Person, ONEcard, Bear Tracks, Maps, Email & Apps, eClass, Library, a search icon.
- Logo:** UNIVERSITY OF ALBERTA with a crest icon.
- Main Navigation:** Prospective Students, Current Students, Faculty & Staff, Alumni & Friends, Home, Admissions & Programs, Faculties, Research, Campus Life, News, About U of A, COVID-19 Information.
- Content Area:** Features a photo of a woman sitting on a couch, a yellow callout box with the text "Who Am I to Talk About Impostor Syndrome?", and a "Learn more" button.
- Footer:** STUDY WITH US, text about the university being a Top 5 Canadian university, and a "Find out what makes our student experience so rich, meaningful and life-changing." button.

Right Screenshot (Color Shifted):

- Header:** Find a Person, ONEcard, Bear Tracks, Maps, Email & Apps, eClass, Library, a search icon.
- Logo:** UNIVERSITY OF ALBERTA with a crest icon.
- Main Navigation:** Prospective Students, Current Students, Faculty & Staff, Alumni & Friends, Home, Admissions & Programs, Faculties, Research, Campus Life, News, About U of A, COVID-19 Information.
- Content Area:** Features a photo of a woman sitting on a couch, an orange callout box with the text "Who Am I to Talk About Impostor Syndrome?", and a "Learn more" button.
- Footer:** STUDY WITH US, text about the university being a Top 5 Canadian university, and a "Find out what makes our student experience so rich, meaningful and life-changing." button.

Accessibility

More tools

<https://accessible-colors.com/>

<https://webaim.org/resources/contrastchecker/>

Assignment

Create your own palette using what was discussed in today's class.

In Github Classroom you'll find starter files waiting for you. There will be an HTML file and a CSS file called style.css. Style.css has CSS variables set up to make it easy for you to apply your colours but if you know CSS please feel free to overwrite the default CSS entirely and use your own.

Resources

<https://medium.com/tap-to-dismiss/color-within-constraints-d6f777a3b72d>

<https://uxdesign.cc/the-importance-of-colorblind-friendly-design-case-study-among-us-dcd042c87b9>

<https://www.smashingmagazine.com/2018/04/designing-accessibility-inclusion/>

<https://www.smashingmagazine.com/2016/04/web-developer-guide-color/>

<https://uxmovement.com/buttons/the-myths-of-color-contrast-accessibility/>