UXPin

Color Theory in Web UI Design

A Practical Approach
to the Principles

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A Practical Approach to the Principles
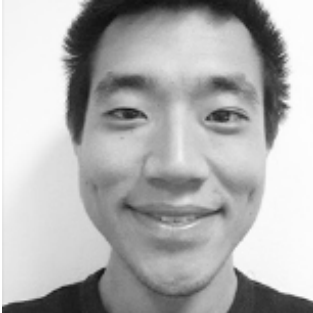
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Jerry Cao is a content strategist at UXPin where he gets to put his overly active imagination to paper every day. In a past life, he developed content strategies for clients at Brafton and worked in traditional advertising at DDB San Francisco. In his spare time he enjoys playing electric guitar, watching foreign horror films, and expanding his knowledge of random facts.
Follow me on Twitter

Co-founder and head of product, Kamil previously worked as a UX/UI Designer at Grupa Nokaut. He studied software engineering in university, but design and psychology have always been his greatest passions. Follow me on Twitter @ziebak

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With a passion for writing and an interest in everything anything related to design or technology, Matt Ellis found freelance writing best suited his skills and allowed him to be paid for his curiosity. Having worked with various design and tech companies in the past, he feels quite at home at UXPin as the go-to writer, researcher, and editor. When he's not writing, Matt loves to travel, another byproduct of curiosity.

A Few Quick Words

Feeling blue? Perhaps painting the town red will get you to the other end of the rainbow. The impact of colors extends far beyond our sense of sight – they create scientifically proven connections with our emotional state (hence the use in common phrases) and can even cause physiological changes.
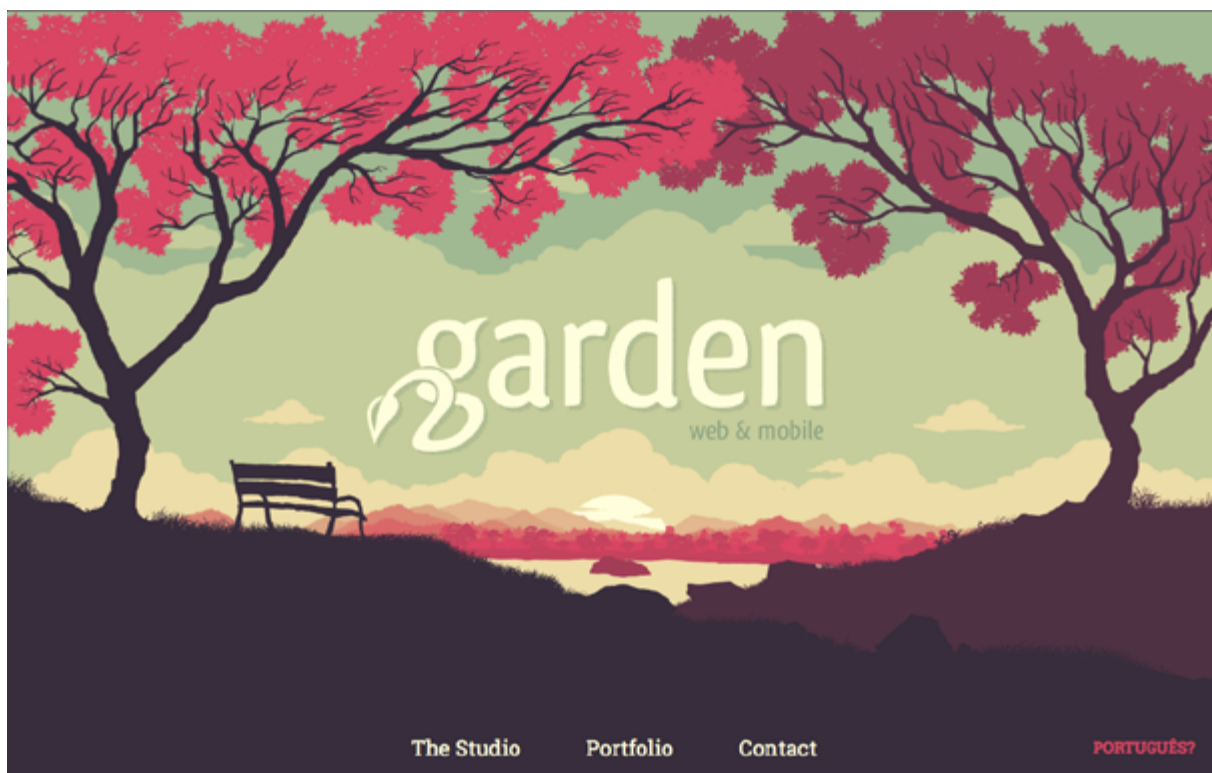
Source: Garden Estúdio

As far back as the middle ages, researchers have been documenting the impact of colors. In the intervening centuries, they devised the same useful best practices that apply not only to web design, but also the worlds of art, architecture, advertising, and almost every other visual industry.

This pocket guide will explore the basics of color theory, and how it applies specifically to web design. We'll cover the effects of the individual colors, how they're best combined, and then provide links to some of our favorite tools for mastering color.

If you find this book helpful, feel free to share with others.

For the love of web design,

Jerry Cao

co-written by Kamil Zieba, Krzysztof Stryjewski, and Matt Ellis

The Emotional Impact of Each Color

Scientists have studied the physiological effects of certain colors for centuries, but you don't need a textbook to know that certain colors make you feel differently than others. Looking at certain pieces of art can make you feel a certain way, and this ability to manipulate our emotions is at the heart of color theory in web design.

In short, colors are divided into warm colors (reds, oranges, and yellows), cool colors (blues and purples), and neutral colors (black, white, gray). Warm colors are more stimulating, while cool ones feel more calming.

Of course, each individual color includes its own unique signals and properties, and below we'll give a brief overview of the common emotions elicited by the main color groups:

- **Red**

  The most stimulating color, red is used to catch attention and raise alarm. As an energizing color, and it be used to symbolize power

and even youth, but this makes it ill-advised for sites striving for a relaxed feel.

Source: No Way NSA

- **Orange**

    Orange retains some of red's energizing properties, but to a lesser degree, making a bit calmer. It's commonly used to show cheerfulness and playfulness.
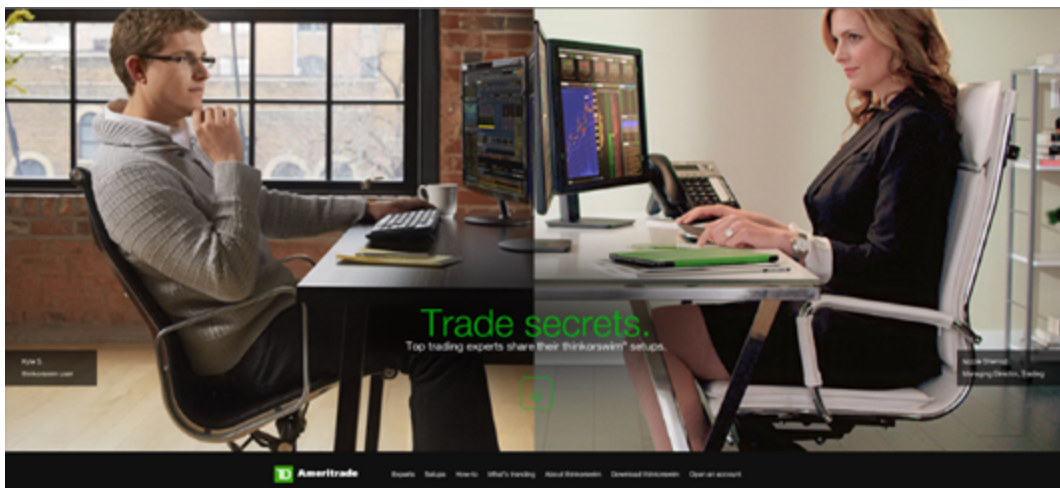

Source: Fanta

- **Yellow**

  The impact of yellow varies with its vibrancy (light or dark shades), but in general it is usually warming and energetic. Bright yellow is extremely stimulating, middle shades are more welcoming, and darker shades (such as gold) give an air of antiquity and timelessness.


Source: Flash Media

- **Green**

  The bridge between warm and dark colors, green is a pleasing mix of energy and relaxation. It typically signifies positive growth, and in Westernculture represents money and environmental themes.

Source: Ameritrade

- **Light Blue**

  The first of the cool colors, light blue is friendly and inviting, but also safe. Popular social sites like Facebook and Twitter both take advantage of this welcoming color.
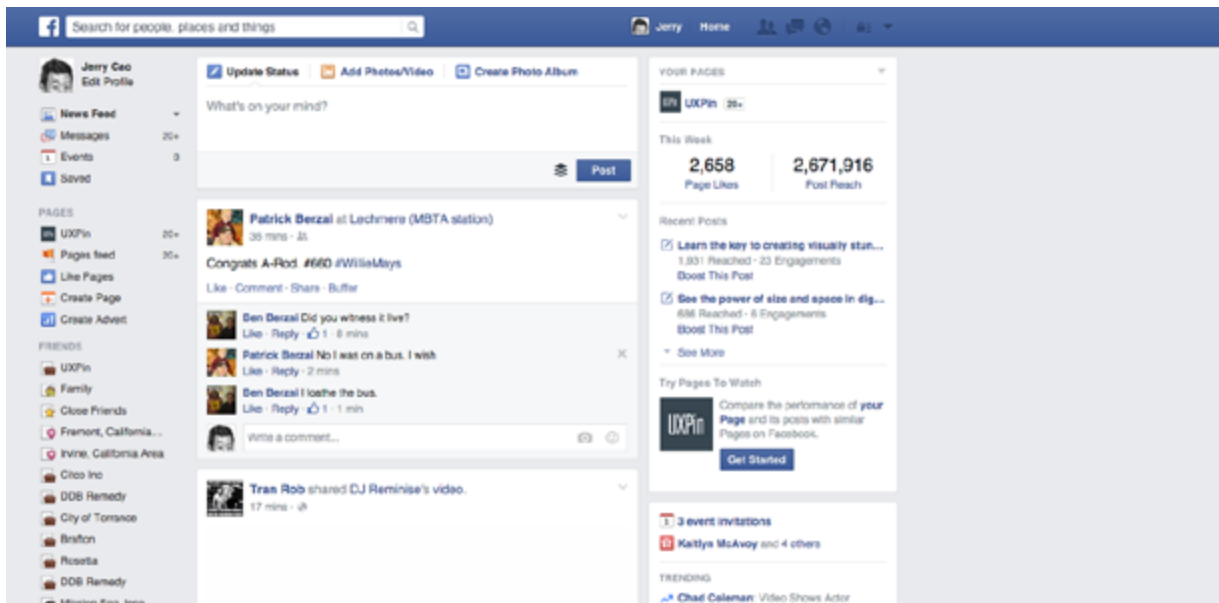

Source: Facebook

- **Dark Blue**

  Dark blue is still calming, but it tends to be more somber and reliable than light blue – a more down-to-earth color favored by companies known for professionalism.

Source: Van Vliet & Trap

- **Purple**

   The color of royalty, purple conjures sensations of luxury, sometimes even decadence. Lighter shades exude romance, while darker ones can represent more mysterious elements.
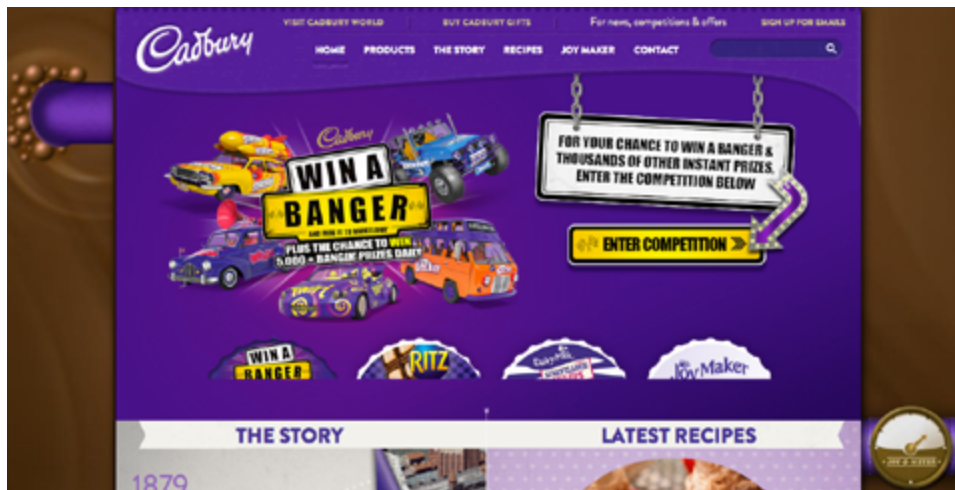
Source: *Cadbury*

- **Black**

   Black is the strongest of all colors, which is why it's almost always used for the font color of text. While it will support the other colors used around it, on it's own it can create feelings of power and sophistication.

Source: *Earth Hour*

- **White**

    As a primary color, white gives off an air of cleanliness, purity, and virtue. As a secondary color, it draws attention to more stimulating elements, making it ideal for supporting roles. If you're curious about the color white (especially as it relates to white space), check out our free ebook *White Space in Web UI Design*.

Source: *Rogue Society*

- **Gray**

    Just like its intermediary role between black and white, gray gives the impression of neutrality. However, in an expert's hands, changing its shade can give it varying degrees of black's attention-drawing and white's attention-repelling qualities, making it a uniquely powerful tool to the master designer.
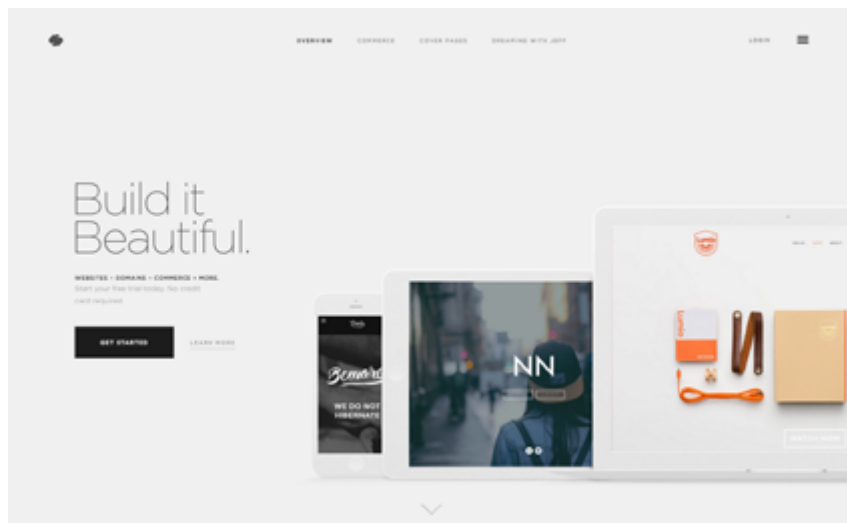
Source: Squarespace

With each color having its own strengths and weaknesses, which ones you choose will depend on the project – no one color is inherently better than others in all situations.

- **A Quick Case Study**

03 July makes excellent use of the emotional connection of different backgrounds. While scrolling through the product features, the background color changes to suit the description. In the above example, the playfulness of the orange-red background certainly complements the "Easy to USE" headline.
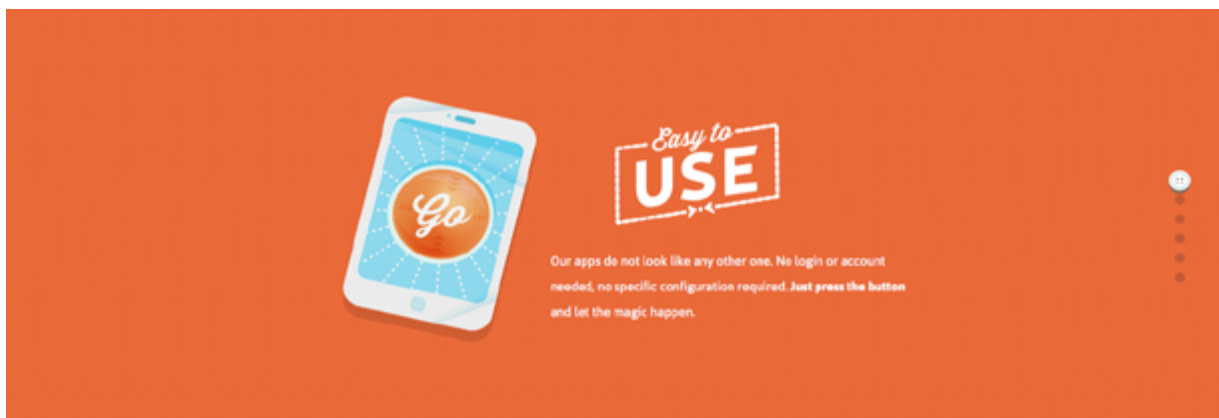
Source: 03 July

As you scroll down the page, the more professional dark blue trades the playfulness for security, perfectly matching the "Reliable" headline.
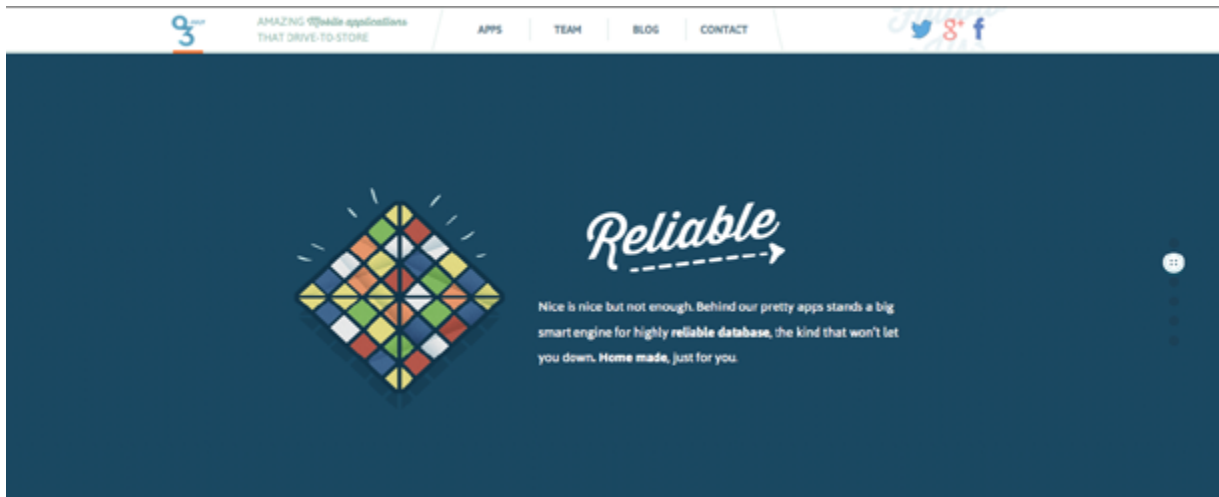
Source: 03 July

Lastly, the decadent purple allows for a luxurious interpretation of the description "A care for DESIGN." This was no accident, as you can see by the designer's choice to have a diamond icon – another common signifier of luxury – depicted in the phone's screen in the graphic. (That the phones rests on a pillow is yet another subversive cue towards luxuriousness.)
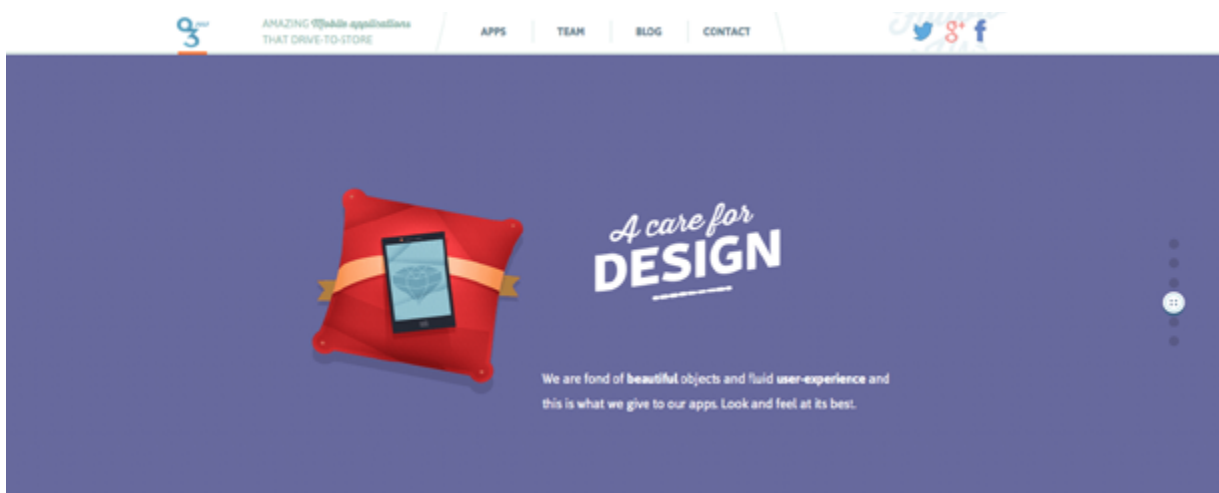
Source: 03 July

Contrast & Complements: The Art of Combining Colors

Understanding how to combine colors is just as important as understanding how they work on their own, which is why we'll explain the two main connections between colors.

As anyone familiar with fashion will tell you, some colors go well with each other, while others will clash. What the fashion insiders may not tell you, though, is that there are definitive rules for how they will interact that can be best observed on a color wheel:

Source: Ray Trygstad. Wikimedia Commons. GNU Free Documentation License.

1. Contrasting Colors

Colors with contrast clash with the colors roughly 3 steps away from them on the wheel. For example, green contrasts with orange, yellow with red, and so on. Unlike in fashion, clashing colors can be useful to attract attention or set an element apart, perfect for calls-to-action.

Source: Ray Trygstad. Wikimedia Commons. GNU Free Documentation License.
Edited from original.

Above, you can see how Glyde takes advantage of contrasting colors by alternating the background and button colors with the same blues and greens.
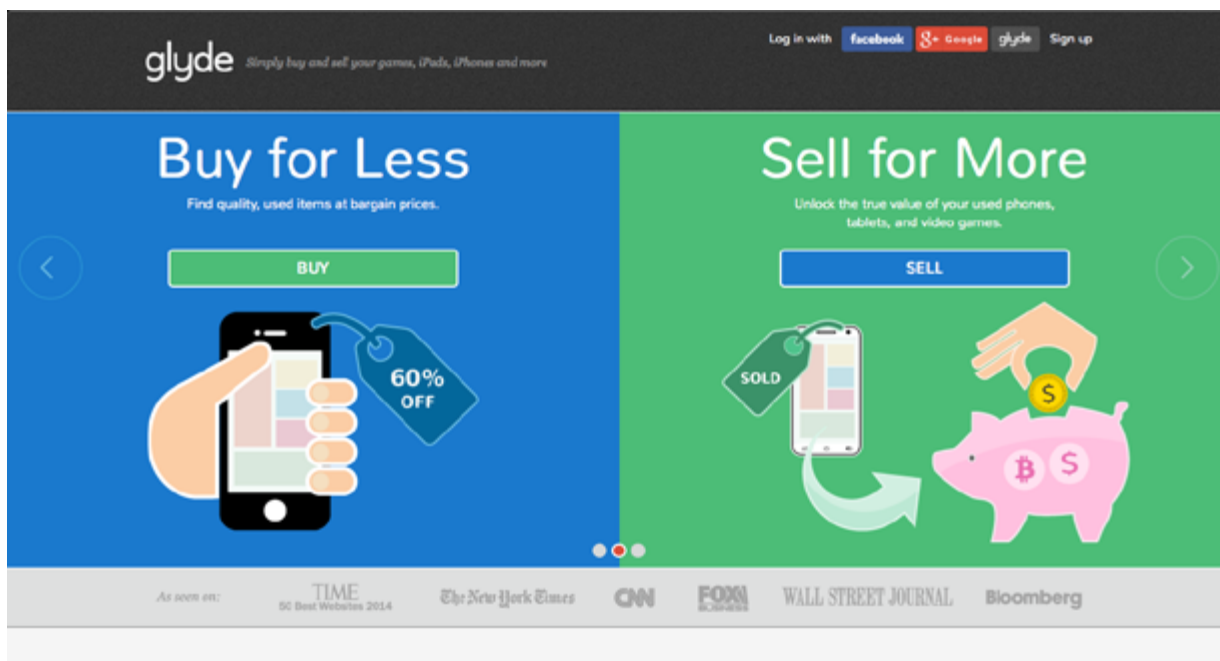
Source: Glyde

2. Complementary Colors

Additionally, colors can complement each other, drawing out their natural appeal and creating a more eye-pleasing aesthetic (though

not as attention-drawing). Complementary colors are those that are **opposite** each other on the color wheel.

Source: Ray Trygstad. Wikimedia Commons. GNU Free Documentation License
Edited from original.

Blue's complements yellow, purple's is green, etc. Moreover, different shades of the same color are complementary, so light green and dark green go well together, just like deep purple and lighter purples.

When two complementary colors are juxtaposed, they push each other farther into their extremes, at least in how the user perceives them. Thus, when placed next to green, red will appear more "red," meaning it will appear more stimulating, more aggressive, and more powerful (likewise, the green will appear more comforting, etc.). This works also with vibrancy, so dark shades will appear even darker when complemented with lighter shades. A master of color can use this to create some powerful illusions, and manipulate not just what we see, but how we see it.

Source: TV Safety.org

Look how, in the example above, the red buttons are hard to miss against the green background, drawing the eye, and almost enticing a click. Next to green, they appear more alarming and important – against any other background, some of this vitality would be lost.

Color Schemes: Best Practices for Mixing Colors

While experimenting with colors can have huge payoffs for a particularly artistic designer, in general most websites follow common color schemes – or at least, common structures for color schemes. Each site needs a handful of dominant colors to build an aesthetic color scheme. Because colors can interact predictably on the wheel, the popular structures for creating colors schemes have emerged, as we'll describe below.

1. Monochromatic
The most basic color scheme is nonetheless effective.

A monochromatic scheme uses only one dominant color, or different shades of the same color, which you'll remember from above complement each other well. Monochromatic schemes look visually pleasing and intensify the emotional responses of the color involved, however, there can be some difficulty in setting certain elements apart.

Monochromatic color schemes are quite common in *minimalist design* since they naturally emphasize the content and make even the simplest of typefaces appear bold and dramatic. In fact, minimal and monochromatic designs feed into each other well: both emphasis one or two singular elements, both inherently suggest a theme of elegance, and both create an easy, less-distracting interface.
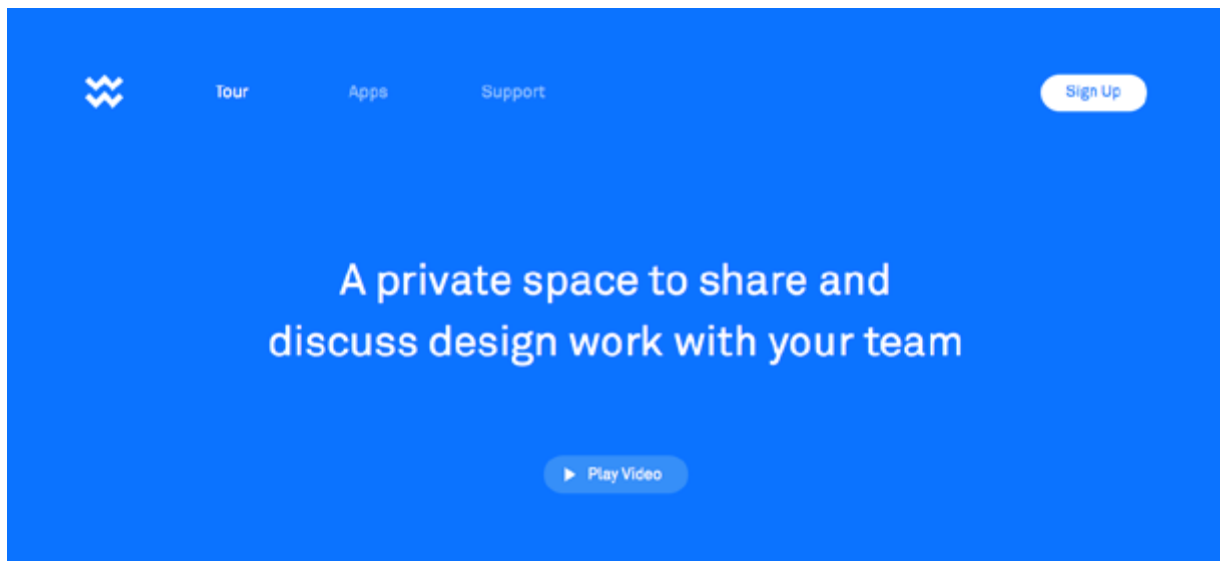
Source: *Wake*

Wake uses a blue monochromatic scheme with white flourishes. Their dominant blue background – with a middle shade that's representative of the properties of both light and dark blue – emphasizes the color's relations to both friendliness and professionalism, a perfect choice for a company that aids business communications and collaborations. Adding another rival color would only dilute this message, so a monochromatic scheme highlights the one central impression they wish to make.

Notice the variant shades of blue in the above navigation bar and "Play Video" button, to help separate these elements without deviating from the color theme.

2. Analogous

Analogous color schemes rely on colors next to each other on the color scheme. This creates a more attractive design that's easy on the eyes.

Source: Ray Trygstad. Wikimedia Commons. GNU Free Documentation License.
Edited from original.

Analogous themes present more diversity than monochromatic themes, making it easier to differentiate elements, though they're not as attention grabbing as sites that rely heavily on complementary colors. Instead, sites with analogous color schemes feel more calming and harmonious, and it's no surprise that this color combination is often found in nature.

When using an analogous color scheme for web design, designers often choose one color to be the most dominant. This color's emotional connections will be the most powerful, and overshadow the others. A second color is just that: secondary, and is commonly used to differentiate certain elements, or for typeface. If a third color is used, it is often only for accenting.

Source: Do a Backflip

In the example above, the dominant color is clearly a slightly dark shade of yellow, which gives off an energizing and friendly tone. The secondary color, a red-orange hybrid, continues this theme, though it's distinct enough so that users can read the text clearly. Notice how, if the red and the yellow were switched, the site would take a far more aggressive and stimulating tone, as the red would dominate the emotional connection.

3. Complementary

A complementary color scheme takes advantage of opposite colors, creating a dynamic and emotionally stimulating page. The advantage to this scheme is that elements are clearly distinct from one another, creating an instantly comprehensible layout. However, its intense nature can work against you if you're aiming for a more relaxed atmosphere.

Just as with analogous color schemes, one color is dominant while another secondary, with the dominant color setting the majority of the tone. When using complements, it's advised to avoid desaturated colors, as they will weaken the potency.

Ondo plays heavily on contrast for their site. A red-orange background dominates, setting a playful and energetic tone, while the blue-green secondary color marks the clickable navigation options, brand name, and graphical flourishes.
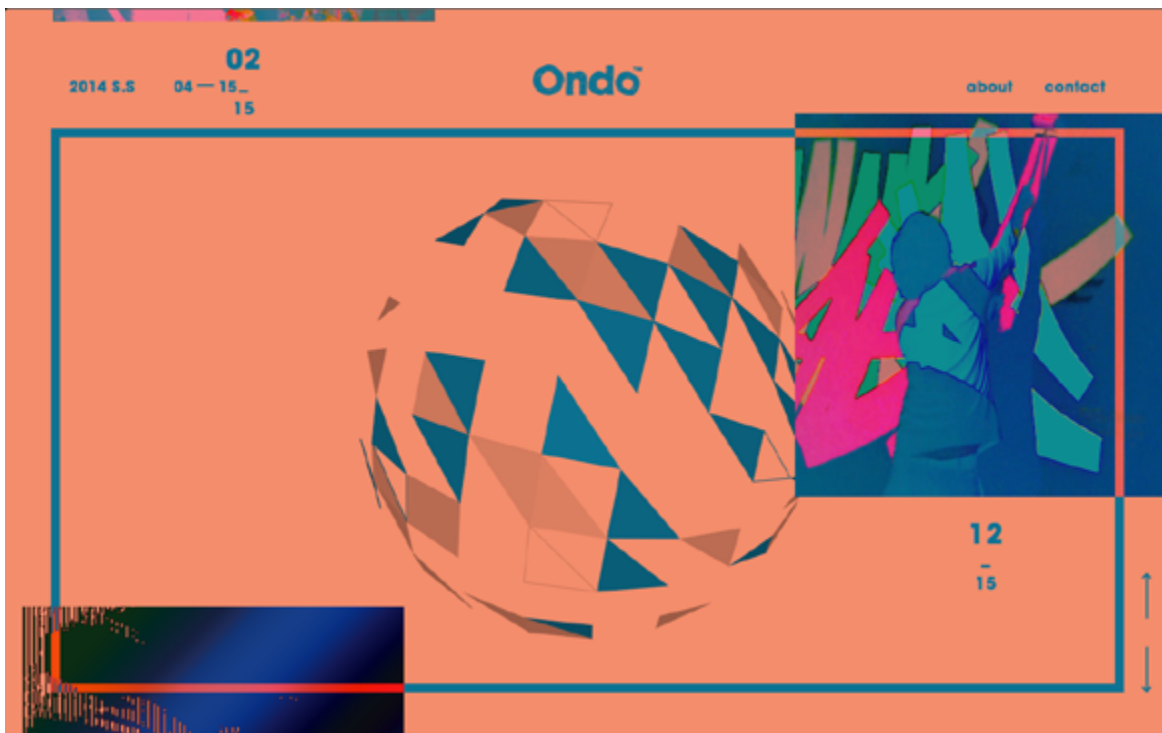
Source: Ondo

The result is that the eye dances around the screen, from element to element, never quite settling one place for long. This effect is heightened by the moving images, which slide up the screen bottom-to-top, creating even more eye candy. Notice how the border switches color when the image passes through it.

4. Triadic

The triadic is the safest of the color schemes, implementing three perfectly balanced colors joined by an equilateral triangle on the wheel.

Source: Ray Trygstad. Wikimedia Commons. GNU Free Documentation License. Edited from original.

While more diverse than the one- or two-colored themes, the triadic scheme is still the most basic of the color schemes with three or more colors. Triadic schemes take no risks in creating a visually secure site look, but offer no outstanding reward except security and some diversity.

Many designers consider this to be the best color scheme, although it really depends on the project. The triadic scheme is an excellent choice for sites appealing to a broad range of users, as its safety makes it a "crowd pleaser," while allowing enough diversity and creativity to keep it from appearing dull. However, the lacking direct opposites makes it less effective at drawing attention to one

single element over others (like a call-to-action), and likewise the stability means it's difficult to make it "edgy," a style which lends itself to sites in fashion, music, etc.
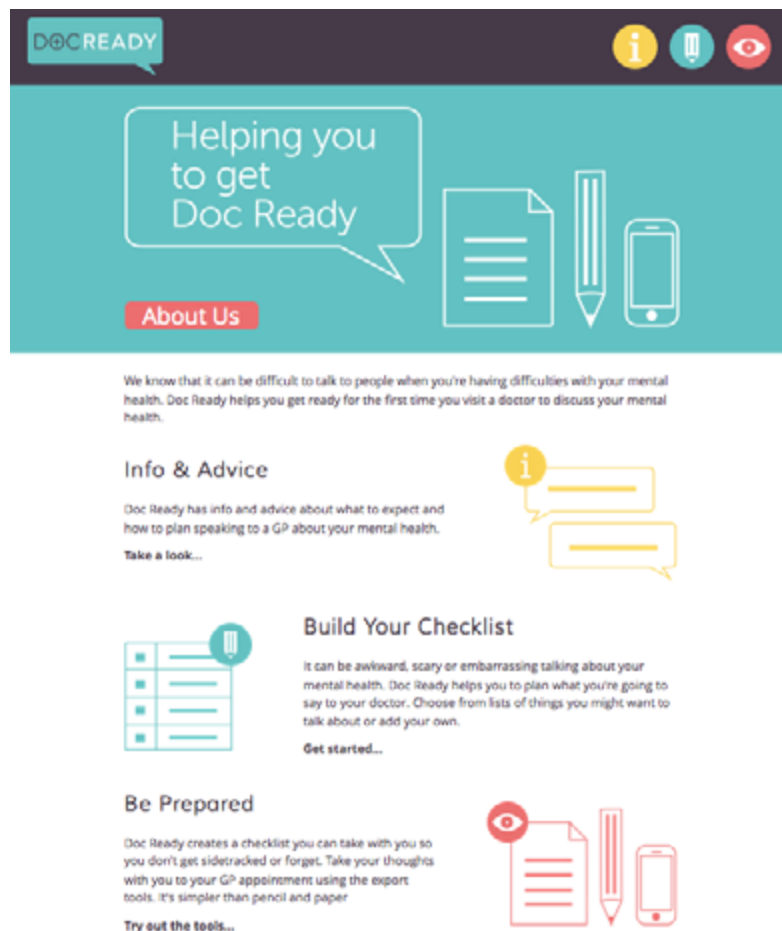
Source: DocReady

As a site that helps calm people before doctor's visits, the security and stability of a triadic scheme work perfectly for DocReady. The use of pastels also furthers this theme of safety. The choices of red, yellow, and turquoise are common in the triadic scheme, although on this page the turquoise is dominant, encouraging a calmer vibe than the more stimulating red or yellow. Notice the use of red for the "About Us" button, which signals clickability in comparison to the white etchings around it.

5. Split-complementary

The split-complementary color scheme has the attention-drawing power of the basic complementary scheme, but with the added diversity of an extra color. This creates a more grounded site than if you were to use intense complement, while still allowing for more creative use of color. The flexibility of the third color, too, opens up a lot of new design options.
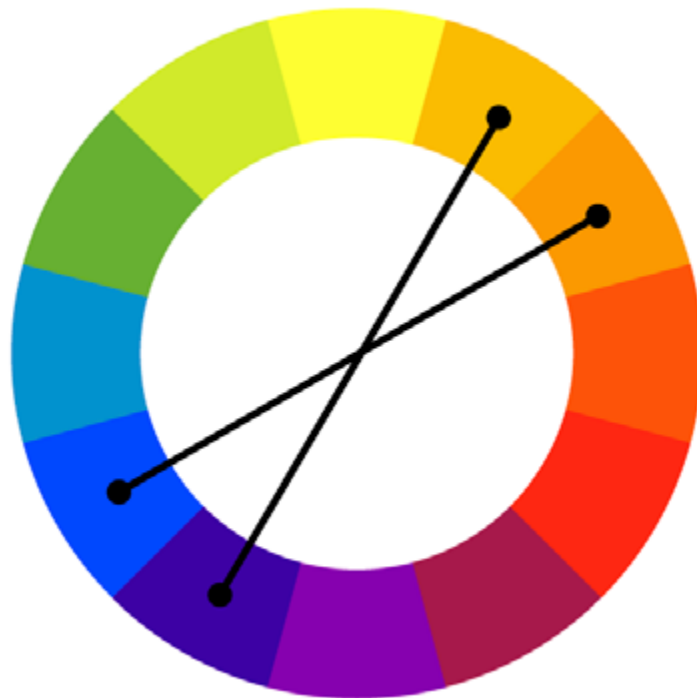
Source: Ray Trygstad. Wikimedia Commons. GNU Free Documentation License.

Browsing the web nowadays, you see a lot of the split-complementary theme. Most common is a site using dominant blacks and whites, with a splash of a third color used sparingly to highlight an individual element (usually an attention-grabbing red or green). This works fine, but tends to be simplistic. For a more stylized look, three primary colors can add more depth both visually and emotionally, though are more difficult to apply.

Source: *Shopify (2014 Commerce Report)*

At first glance, Shopify's 2014 Commerce Report may not appear colorful – which is a sign of its clever application of color. The text and graphics are really a dark blue, but they appear almost black thanks to the complementary yellowish cream in the background. (The yellow background makes the dark blue appear even darker – and since it's already fairly dark, it has no where else to go in our perception except closer to black.)

To break up what would be an otherwise dualistic scene, the green in the main title acts as a visual centerpiece, tying the two complementary colors together and creating a unified image. This illustrates the difference between split-complementary and basic complementary – an extra element to take some of the "sting" out and stabilize the whole screen.

6. Rectangular Tetradic (Compound Complementary)

One of the more complicated color schemes, the rectangular tet-radic scheme is nonetheless rewarding if done right.

Source: Ray Trygstad. Wikimedia Commons. GNU Free Documentation License.
Edited from original.

It consists of two complementary pairs of colors, allowing for the stimulating visuals from the opposites, while enjoying the diversity of four main colors. The design appears grounded and stable, but with certain areas more enticing than others – the complexity is why this scheme can also be somewhat difficult to apply well. Extra care must be taken when choosing colors. As a general rule, try to balance the use of warm and cool colors.
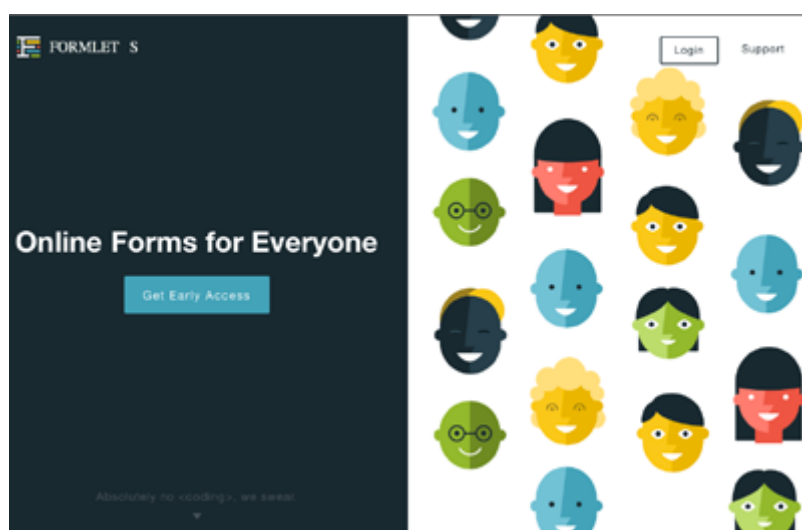
Source: Formlets

The home page for Formlets has a veritable rainbow of colors –
two shades apiece for red, yellow, green, blue, and black, plus a
heavy dose of white – though through proper application it seems
rather simple.

While there is a lot of color usage at play here at an expert level,
for now we'll just point out the colors of the faces on the right:
red, yellow, green, blue, and black. These color choices are not
random, but play off both the red-green and yellow-blue natural
complements.

The distribution itself is done skillfully – there are only two each
of the red and black faces, as these two colors are more powerful
than the others, and would dominate the scene if there were more.

Style Guides: Ensuring Color Consistency

By now you probably realize just how intricate colors can be for web design. When dealing with contrasts, complements, and varying shades, precision is absolutely essential.

While this piece uses umbrella terms like "red" or "purple" for the sake of simplicity, when it comes to the actual application of colors in design, you must start dealing with specific hues to most accurately pinpoint their contrasts and complements.

Imagine the madness of trying to remember every CMYK, Pantone, RGB, and HEX value for each hue of your site. Even if your site is mono-chromatic, you'll still probably apply different hues of the same color.

Luckily, style guides help designers keep track of the technical details for colors. The color section will list for the entire team where and when to use each specific color, and that color's numeric properties for easy duplication. Naturally, a consolidated reference guide will improve visual consistency.

Source: Mozilla

The style guide for Mozilla Sandstone displays the specifics behind their color regulations without overloading the reader with information. They include a small description to the side, with visual samples and all the relevant color data, plus a link to the suggested gradient tool.

Colour Palette

Find closest color

This is the primary and secondary colour palettes as described in the PSD styleguide and in colour_palette.sass

GRAY PALETTE

#2c3643	#3b444f	#67747c	#99a9b3	#dbe6ec
$darkgray	$titlegray	$bodygray	$lightgray	$subduedgray

PRIMARY PALETTE

#142b44	#1d50fd	#297CBB	#2f8ad6	#0FDE8D
$darkblue	$navblue	$lpblue	$linkblue	$teal
#16c98d	#feef6d	#ffc83f	#fa5e5b	#bf538d
$green	$yella	$orange	$red	$plum

SECONDARY PALETTE

#684e79	#ff708e	#47a899	#8abee5	#c7e6aa
$mauve	$pink	$darkcyan	$softblue	$softgreen
#cfcbaf	#582c2b	#841e1b		
$beige	$maroon	$darkred		

Source: Lonely Planet

The style guide for Lonely Planet gives more options, but stays specific about the hues. Their color scheme is categorized by hierarchy, and those familiar with the site will know how to apply them (or they can check the separate PSD style guide, which is linked in the description). Notice the search box at the top, allowing the reader to easily search by color to find the proper hue in accordance to the brand's preferences.

Our Favorite Color Tools

Like we said, color theory is a topic with a lot of depth, and even the basics are a lot to digest at once. That's why we've included this list of external resources to aid in your use of color, whether you're a beginner or an expert.

Stylify Me – A reverse-engineering device, this calculates the color codes of any other site by entering the URL at the top, allowing you to discover the specific colors used on your favorite sites.

Adobe Color CC – An old standard in color assistance tools (though formerly known as Kuler), years later its still considered one of the best and most reliable tools for identifying the numeric values of hues.

Flat UI Color Picker – A quick and convenient tool for color selection, as long as you're using a flat UI.

Paletton – Great for beginners, this is an easy-to-use tool for identify corresponding colors in a number of different schemes.

Material Palette – Input two colors, and this tool will determine the range of recommended colors, with specific values.

Coolors – This versatile tool helps you generate color schemes with more complexity and range than other tools, but can be a bit more complicated.

Color Combos – A forum for color-related themes in web design, here you can read blogs, browse samples, and gain access to other resources.

We hope this book was helpful. If you'd like to start putting your knowledge to practice, feel free to give UXPin a try (free for 7-30 days) and start playing around with your next web or mobile design.

Start free UXPin trial
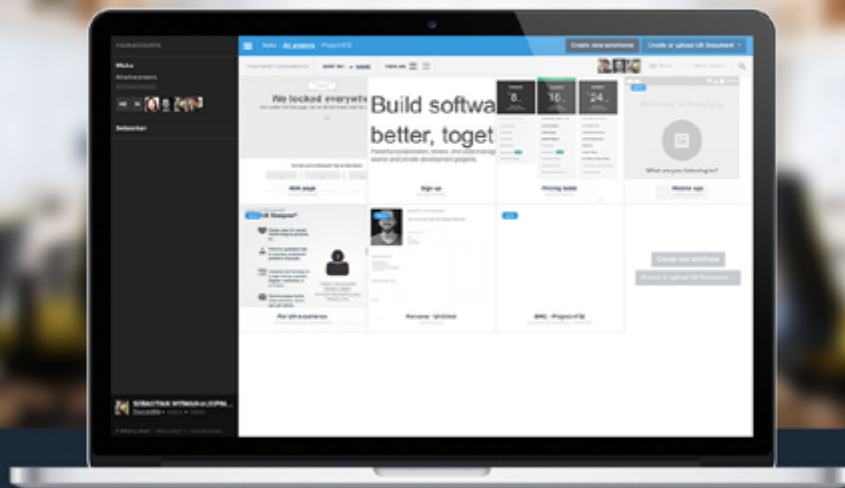
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✔ Integration with Photoshop and Sketch

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