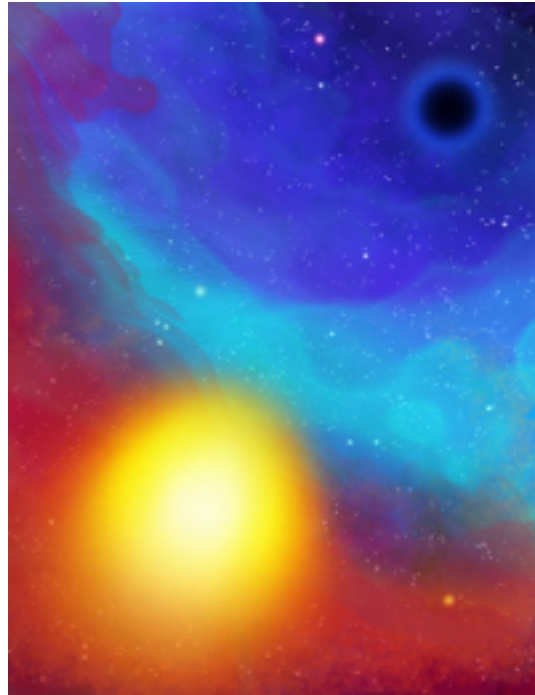


# Design

Making things usable.

# Color Temperature



Color temperature is about how color makes you feel. We have warm colors and cool colors.



How does this picture make you feel?



How about this one?

# Color meanings

- Red
- Green
- Black
- Yellow
- Blue
- White

Red: Love, Rage, Anger

Green: Envy, Sickness,  
Nature, Freshness

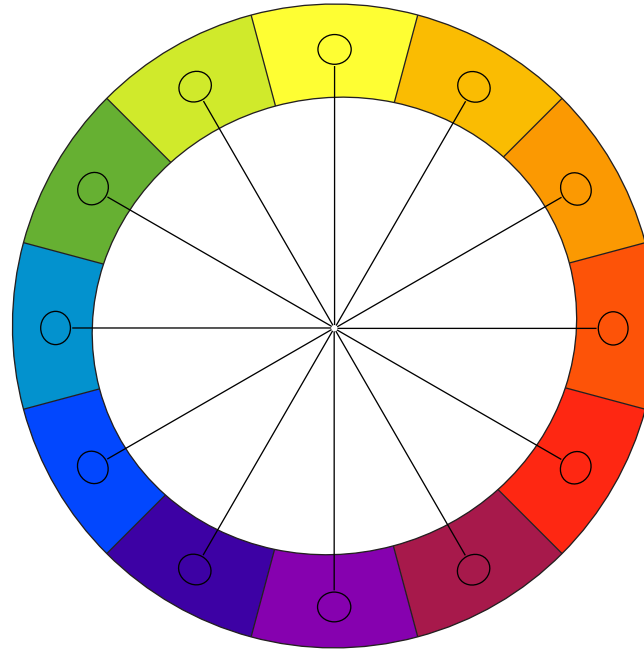
Black: Mourning, elegance

Yellow: happiness, caution

Blue: sadness, calm, trusting

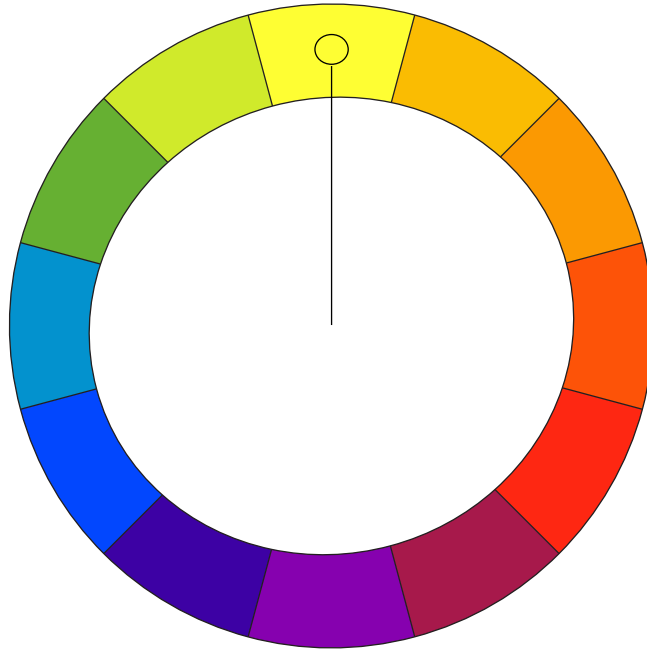
White: purity, clean

# The Color Wheel



This is the RYB color wheel. This is the one you're probably familiar with from art class in grade school. You have three primary colors. What are they? Yellow, Blue, and Red. From these colors you can make the secondary colors. Well, it turns out that we can use color wheels to create some nice looking color schemes for our sites. All we have to do is follow some simple rules.

# Monochromatic



A monochromatic scheme uses different shades of the same color.

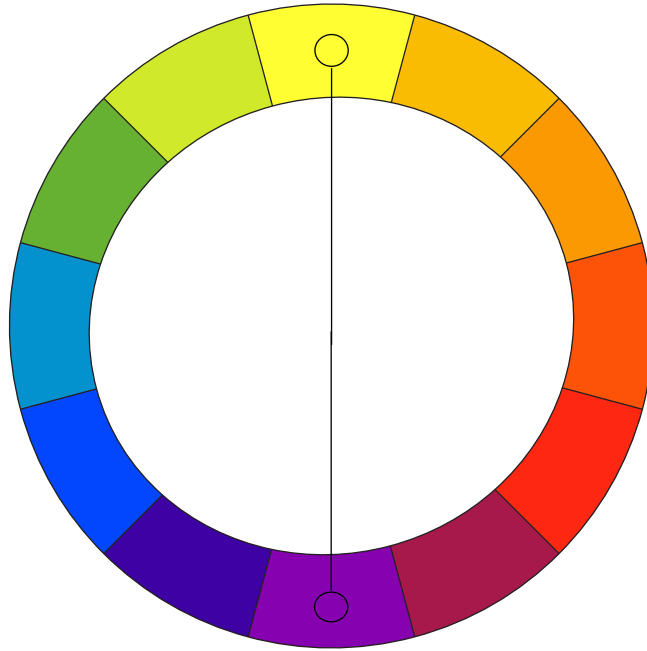
# Analogous



An analogous scheme has the features of the monochromatic color scheme, but gives you accent colors.

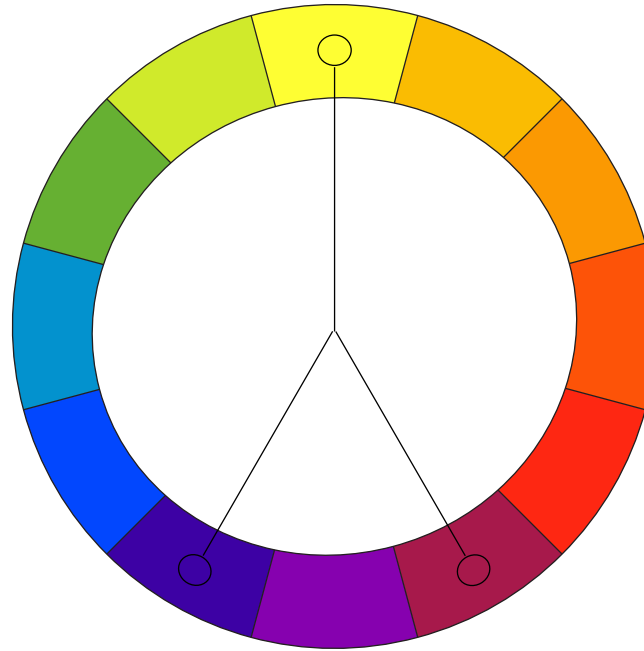


# Complementary



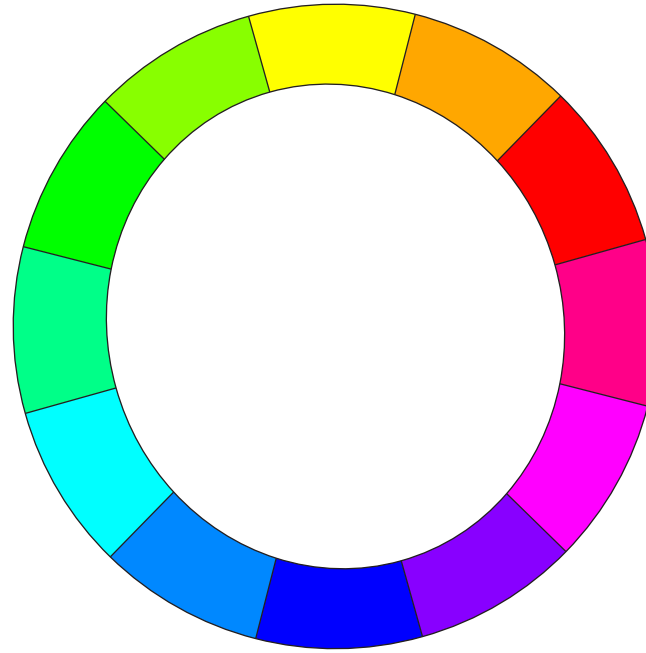
The complementary scheme is harder to wrangle. Opposing colors can create contrast issues. However, if handled right, the colors can be stunning.

# Split Complementary



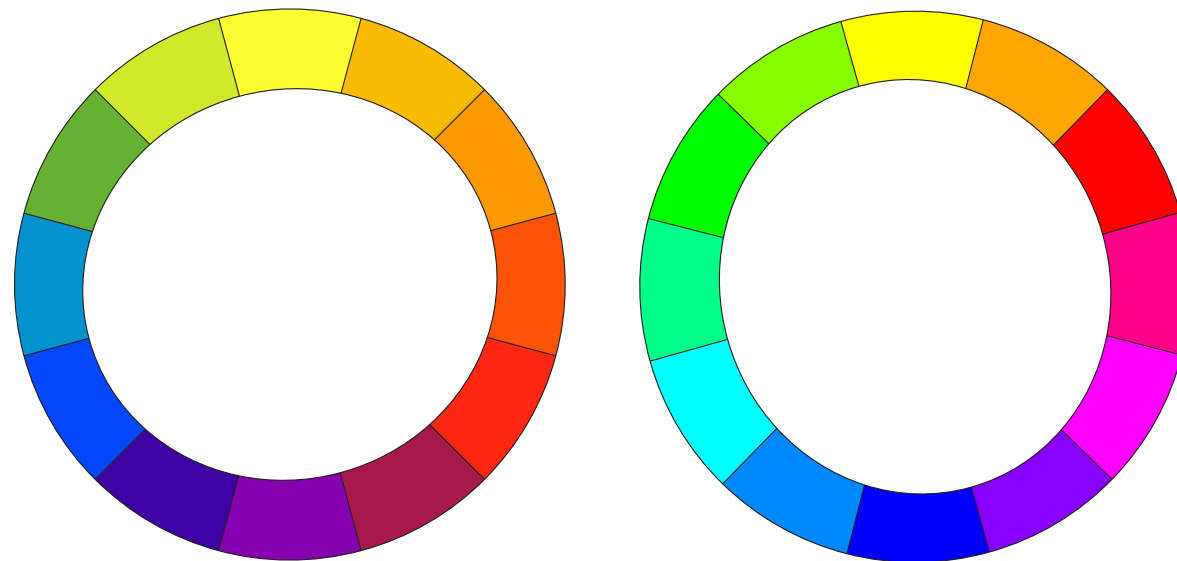
Split complementary is really hard to manage but give you even more flexibility because you get the accent color you need as well as good adjacent colors.

# RGB color wheel

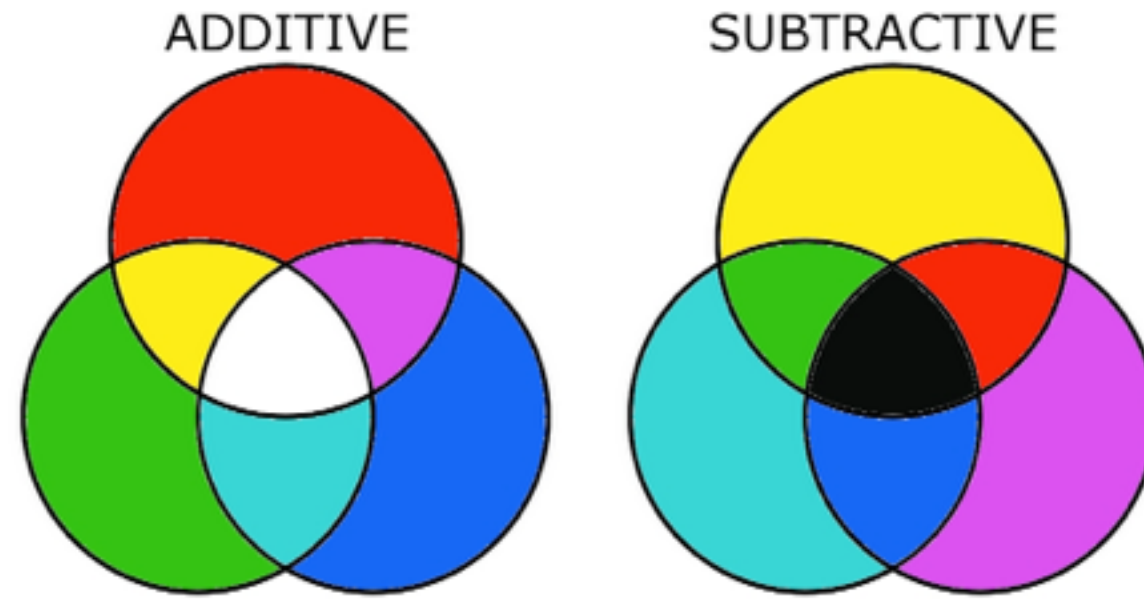


The color wheel we use on computers has different primary colors though.

# RYB vs RGB



See the difference?



That's because there are two different methods for mixing color. Subtractive color mixing is what you're used to with paints. If you mix all colors together you get black.

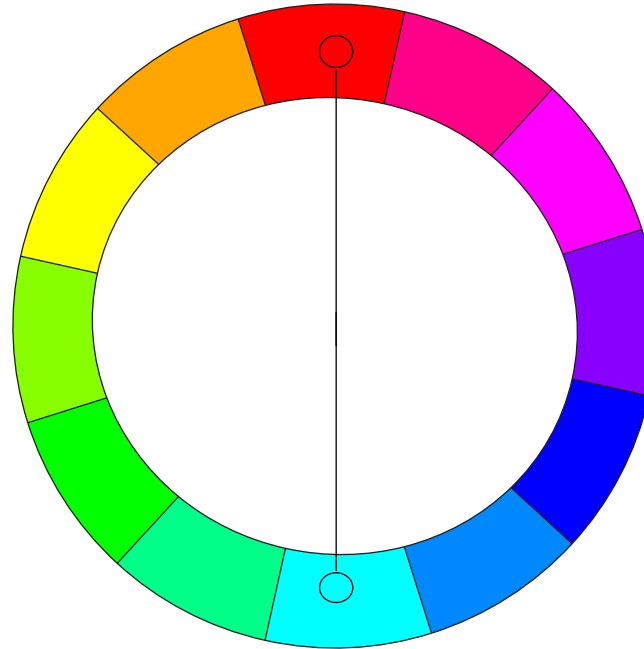
But with light it's the opposite. You mix all colors together and get white.

# RGB Analagous



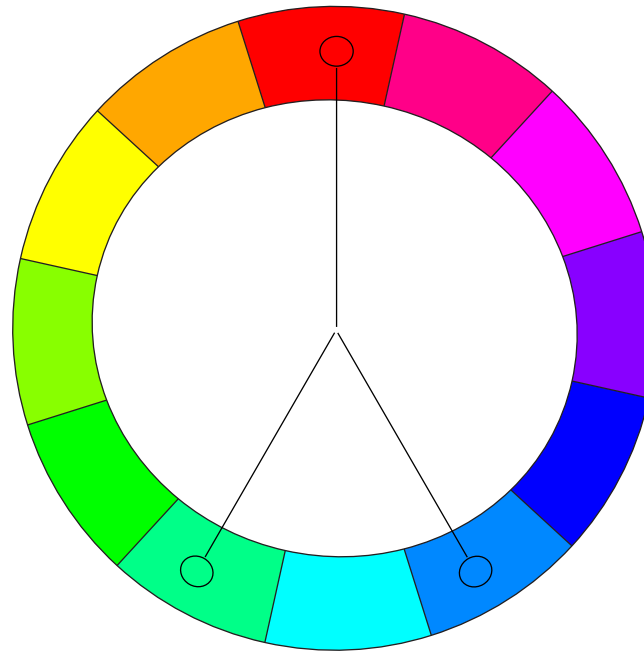
And so the color schemes are still the same.

# RBG Complementary



But the complements are not. Green and red are complements on the RYB wheel, but red and cyan are complements on this wheel. So it's very important to think carefully when blending colors.

# RGB Split Complementary





# <http://paletton.com>

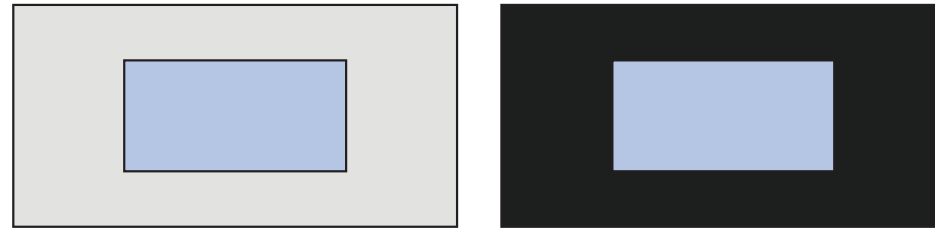
- Pick a base color
- Pick a color scheme
- Look at the light preview
- Look at the dark preview

# Fluting



Color fluting is an optical illusion created by gradually changing the colors. The more gradations, the smoother the change looks.

# Color Contrast



Which of these blue boxes is darker? They're the same color, but the surrounding color can change how we perceive the color. So not only is choosing colors important, but so is ensuring that the colors we choose don't change the colors of things around them.

# Contrast is important

make sure people  
can read your  
content.

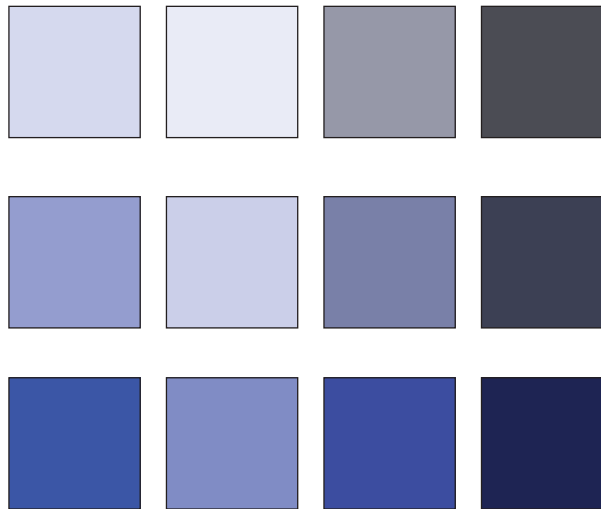
This is harder to read...

# Contrast is important

make sure people  
can read your  
content.

Than this..

# Saturation



We can alter color schemes by changing the saturation of the colors in the scheme.

# Normal saturation



Saturation is the amount of color. A normally saturated image might look like this.

# Desaturated



If we remove the saturation, this is what we get.



# Oversaturated



And if we have too much, here's the result.

# Adjust Hue and Saturation

- Revisit your color scheme
- Adjust the saturation and hue and see how it affects the scheme.

# “Natural” method



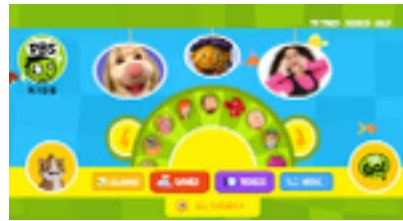
We’ve just done a very scientific method of color scheme design. But there’s also the “natural method. Take a look at the colors we can find in nature. The colors in nature are going to “feel” right to people. We can use a photograph as our color source and start pulling the colors out of the picture to make a color scheme.

<https://html-color-codes.info/colors-from-image/>



In fact there are even tools that will do this for us. And you could even combine this method with the more scientific method of the color wheel. Just take one of these colors and plug it back into the color scheme generator.

# Target Audience!



The color choices you use make a huge difference. They should reflect the audience you are engaging with. On the left, we have a site that's got vibrant colors. It's aimed at kids. On the right, we've got a site aimed at young adults, with its dark colors. And on the bottom? We've got something aimed at people in their 40s and 50s. Be mindful of the color choices you make. Make sure your color choices are really appropriate.

# This is not about you.

This is not about you. Design is not about what you like. It is about what your audience likes. Make sure you keep that in mind. Too many people's feelings get hurt when it comes to web design because they let their personal feelings get in the way of the design process. You may like purple and yellow. But if you're designing a site for Packer fans, that might not go over so well.

# Typography

Making things readable.

Colors are important for how things look, but the typography we use is even more important. Typography is how we ensure people can read the content we are presenting.

# Serif and Sans-Serif

hello	hello
	

Serif and sans-serif fonts both have purposes. Serif fonts have little tails, called “serifs” and they often have thinner parts of the letters. They traditionally make it easier for people to distinguish letters. Sans-serif (without serifs) have an “even” stroke throughout the letters.

Sans-serif fonts tend to be easier to read on computer screens.



# Baselines

## Welcome

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We are masters of our own destiny

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## News

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## Events

Once upon a time there was a small town.

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You might not notice this, but well-designed content uses a grid system to make sure that content and images flow nicely. This is an example of text without a grid.

# Using a Grid

## Welcome

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We are masters of our  
own destiny

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## News

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## Events

Once upon a time there was a small town.

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But by applying a grid to the text the content is easier to read; even the smaller text flows better.

# Make It Readable!!!

- Avoid small fonts!
- 50-75 characters per line
- Strong contrast between background and foreground
- Use columns!

# Writing for The Web

- Avoid “click here”.
- Hyperlink key words or phrases

Why don't we say “click here”? Not everyone clicks. Some people tap. instead, highlight the key phrases that you want people to interact with.

# Universal Accessibility



Accessibility is about making our products, services, and information available to anyone who wants it.

# We often think of

- Blind people
- Low vision or colorblind people
- Deaf people
- Physically impaired people
- Cognitively impaired people

I want to point out here that these are not “users” or “customers”. These are people, and I think it’s really important that we keep that in the back of our minds.

When the topic of accessibility comes up, we usually think of disabilities. Specifically, these kind. Blind and low vision users are the ones who are obviously affected, and the hearing impaired have trouble with videos without captions. The physically impaired may have trouble working mice, and cognitive impairments can be anything from reading comprehension to dyslexia, which means you need to make wise choices about your fonts and spacing.

# But that's too narrow

- People on small screens
- People without Flash
- People without JavaScript
- People on slow connections
- People on limited connections

But here's another group of people to think about. Accessibility isn't just about disabled users.

# Plan from the start



If you plan accessibility from the very beginning, things are going to work out very well. It's hard to tack accessibility on at the end of the process. So make it easy and keep it in mind from the beginning.



# Empathy

In order to plan ahead, you need to think about people's needs. You already do that with your target audience anyway.

# Blindness



Blind users typically use either a Braille display or a screen reader to interpret the information displayed on their computer.

# Screen Readers

<http://webinsight.cs.washington.edu/wa/content.php>

## Welcome to WebAnywhere

Welcome to WebAnywhere



WebAnywhere has been initialized and is now ready to use.  
Press the 'control + forward slash' key at any time to hear a  
list of available shortcut keys.

**WebAnywhere** is a non-visual interface to the web that  
requires no new software to be downloaded or installed. It  
works right in the browser, which means you can access it  
from any computer, even locked-down public computer  
terminals. WebAnywhere enables you to interact with the  
web in a similar way to how you may have used other  
screen readers before.

For quick access to WebAnywhere type  
**[wa.cs.washington.edu](http://wa.cs.washington.edu)** into your browser.

They rely on  
annotated videos or  
alternative content

Captions are useful for the blind in cases where they don't have the ability to load the video.

# Supporting Blind People

- Check for, and fix, spelling errors
- Ensure your popup windows don't result in dead-ends for screen readers
- Provide keyboard navigation
- Provide text alternatives for images

Ensure you have no spelling errors.

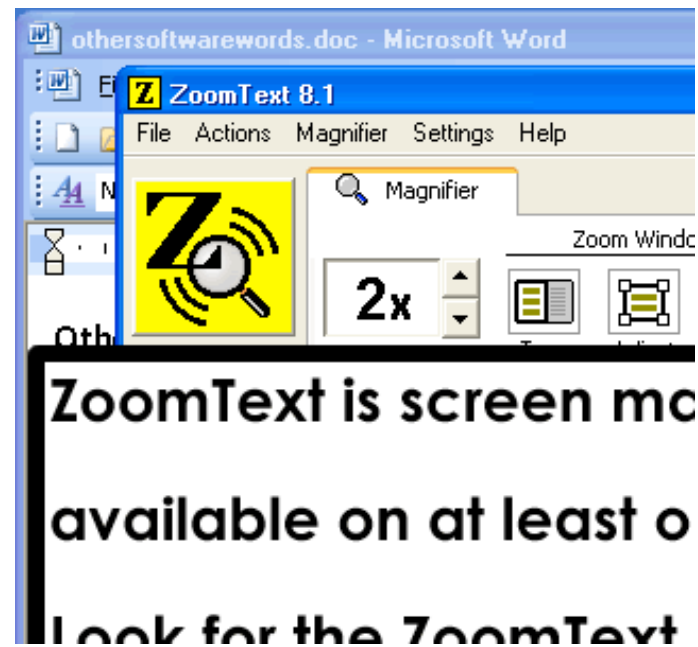
Ensure popups don't result in dead-ends for screen readers.

Make sure that keyboard navigation works. Have text alternatives for images, especially images like charts, graphs, etc.

# Low Vision

Low vision users present another challenge. These users also use screenreading software, but use other technologies as well.

# Screen magnification



OSX and Compiz offer amazing full screen zooming. Windows is very far behind so people use third-party products like ZoomText instead. Unfortunately this creates "tunnel vision" - a zoomed in user might miss something outside.

# Supporting Low Vision

- Be aware of issues with contrast
- Use 12pt or higher fonts that scale well
- Place important information close to main content as possible
- Ensure spelling is correct and elements have enough space to be clicked

Ensure you have enough contrast between foreground and background colors.

Don't use tiny text.

Use a 12pt font and test to see how well things look with the font increased.

Keep important information close to the main content.

If the user is using a magnifier they won't see everything on the page at once.

Make sure that spelling is correct and that elements have enough space around them to be clicked easily.



# Colorblindness



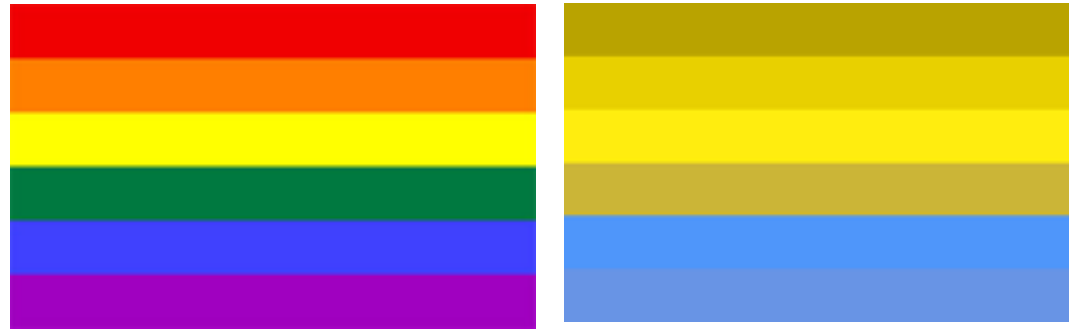
Colorblindness is another really important thing. Anywhere from 5 to 10% of men suffer from some degree of the inability to distinguish between certain colors.

# Protanopia



A difficulty in distinguishing differences between red, yellow, and green, as they can often appear all to be yellow or brown.

# Deuteranopia



Difficulty in distinguishing differences between red and green.

# Tritanopia



Tritanopia is an issue with yellows and blues. This is much more rare.

# Supporting Colorblindness

- Don't use color as the only method to draw attention
- Be aware of contrast issues
- Don't instruct people to identify things by color

When you draw attention to things on the interface, don't just use color. Be aware of the various color contrast issues and types of colorblindness. Don't tell people to "click the red button". Put a label on the button and call the button by name.

# Hearing Impairments

We all-too-often forget about the hearing-impaired users because we view the web as a visual medium.

# Videos need good transcripts



Especially if there's a lot of audio. If you're putting videos of a talk or presentation online, having a transcript is very helpful.

# Supporting the Hearing Impaired

- Provide useful accurate transcripts for audio content
- Ensure that audio tracks are normalized or have appropriate volume
- "Duck" background music or background sounds during voiceovers.

Provide useful accurate transcripts for audio content.

Ensure audio tracks are normalized; that they have consistent and appropriate volume throughout.

Mix the audio properly so that when someone's talking, you "duck out" the background music a bit.



# People with physical impairments

These people may not have enough motor skills to operate a keyboard or mouse and will use other input devices.



What if that was you? Have you taken good care of your hands, those tools you use to build the things you build? How would you write code if you couldn't use your hands?

# They navigate with head wands and tubes



Head wands let them touch a screen with a wand that extends from the forehead or jaw. Sip and blow tubes can control a mouse pointer with pressure. Both are very difficult to operate.

# They need to easily identify and click interface elements

We need to be mindful of these users and how they navigate when we place interface elements

Just like someone  
on a tablet!



# Supporting the Physically Impaired

- Ensure click targets are large enough to be easily accessed
- Ensure click targets are easily identified.

Make sure targets can be easily clicked. And make sure they're easily identified. This will also help users of touchscreen devices.

# Cognitive Impairments and Learning Disabilities

A lot of this comes down to reading comprehension.



With any kind of writing, we want to say more with less.



# Dyslexia



Dyslexic users often have trouble interpreting words, and you can help that by using fonts that are easier for them to read.

# Supporting Cognitive Impairments

- Avoid font confusion ( 0 vs O, l vs I )
- Target a 6th grade reading level
- Keep copy short - say more with less
- Ensure proper spelling and grammar

# Coding For Accessibility is Coding For Usability

By addressing the issues these groups have, we can make our sites better for all our users. If we use good colors and icon placement, and we keep our text simple and easy to follow, we'll gain some points there. But let's take it farther.

# Progressive Enhancement

We want to make it work first, then make it better.



Web apps without js are still cake. They may not be as awesome as cake without frosting, but they can still be quite tasty if done right.

We should  
progressively enhance

# Web pages should degrade gracefully

So, let's talk about web development. Let's look at a few ways we can build more accessible web things. We'll look at some very specific examples.

# Handling images

Let's talk about images. That's one of the hardest things to deal with correctly when it comes to the web. How do we make images accessible? Who can tell me?



# Alternate Text

- Don't describe the image, describe the content of the image
- Leave value empty for non-content images

Don't describe the image, describe the content of the image. Don't just say "logo" or "chart". Describe what's going on. And leave the value empty if that images is purely decorative.

# Use Semantic Markup

- No more XHTML. Use HTML
  - `<!DOCTYPE html>`
- Avoid DIVitis!
  - `<section>`, `<nav>`, `<header>`, `<footer>`,  
`<article>`, `<aside>`,  
`<details>`

First, start using HTML5 instead of XHTML for every web project.

# Separate concerns

- HTML is for content only.
- CSS is for presentation.
- JavaScript is for interactivity.
- CSS and JS in separate files.

Students need to understand, from the beginning, that HTML is a way to mark up content. And that CSS controls that content's presentation, while JavaScript is how we implement behavior. Making these clear separations, and keeping these things in separate files helps us build accessible content from the start.

# USE PROPER TAGS

- h1,h2,h3,h4,h5,h6
- Use <p>, not <br><br>
- Use <ol>, <ul>, and <dl> correctly
- Use <div> sparingly

Browsers provide a default stylesheet, which makes beginners think that HTML tags control how things look. They don't, and we need to reinforce that. The styles are a result of the browser \*interpreting\* the markup.

Students should use headings, and should know the purpose of each heading.

They should use paragraphs when there are paragraphs of text. There's rarely a reason to use the <br> tag. Use the right type of list markup. If elements are meant to be in a certain order, use the right list type. Watch out for overuse of DIVs.

These all affect accessibility. Using the right tags, and crafting compact HTML, makes pages load faster. It's less for the browser to process.

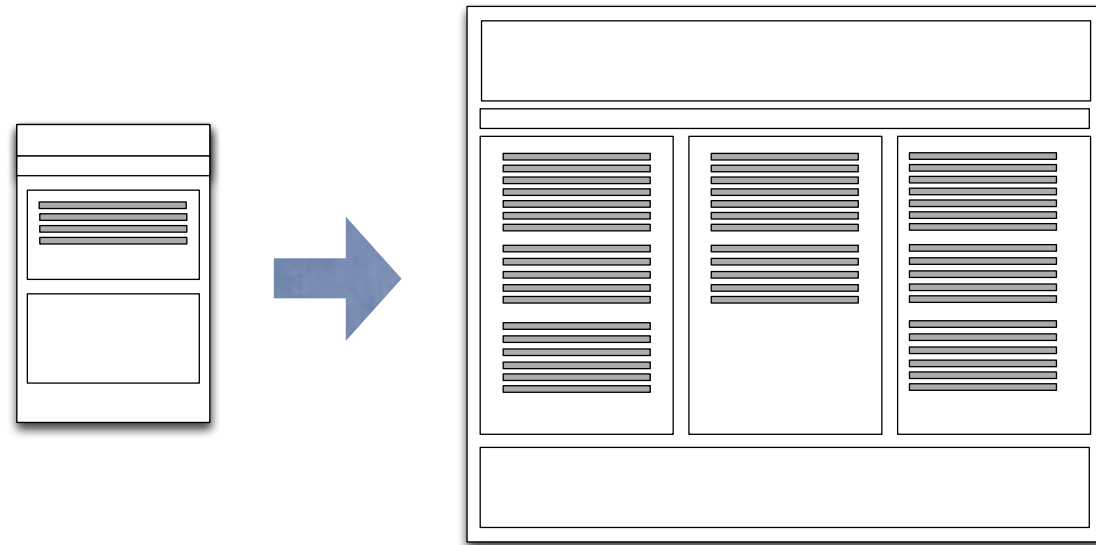
Understand  
your audience.

# Content First



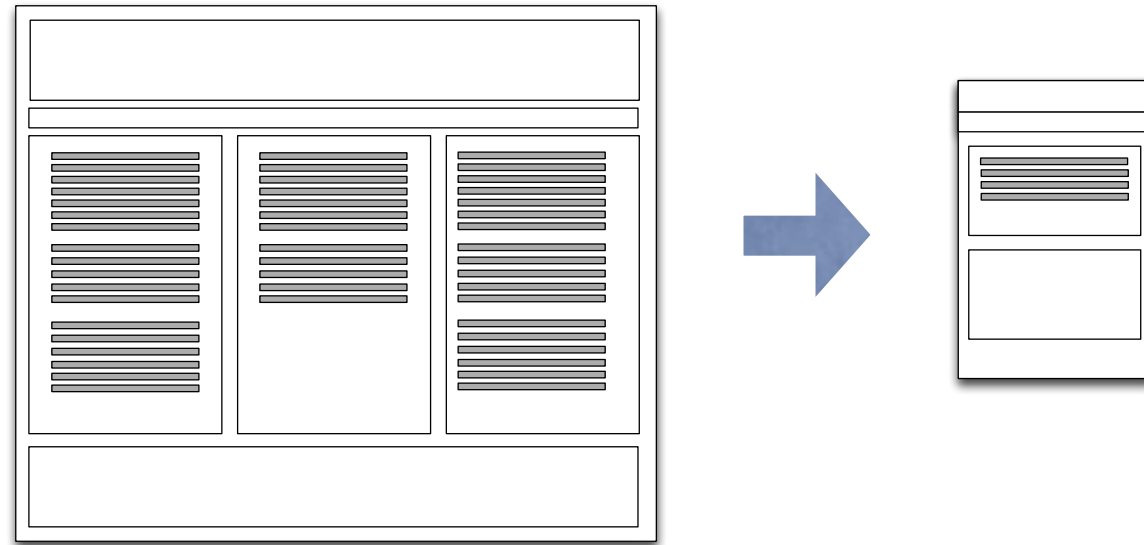
It all comes back to your content being the king. People are there for the content and you have to make sure that content is relevant.

# Responsive Design



We want to make a user interface that works well on mobile, and on large screens. In order to do that we have to think about the content and how that's going to fit.

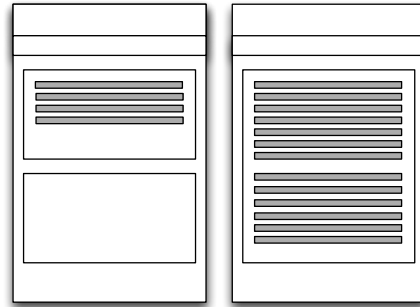
# This doesn't work!



It's very very hard to take a whole bunch of content on a big page with three columns and cram it onto a small screen. In fact, this is near impossible to do. We have to completely rethink what we're doing, and to do that we think about the content first.



# Mobile First?



With more people using phones, we need to think about mobile devices first. We have to design our content for phones and small screens first, and then “go out from there,”

# Identify Important Regions

- Header / Branding area
- Primary Navigation
- Content blocks
- Footer
- Secondary Navigation
- Don't think about a “sidebar”

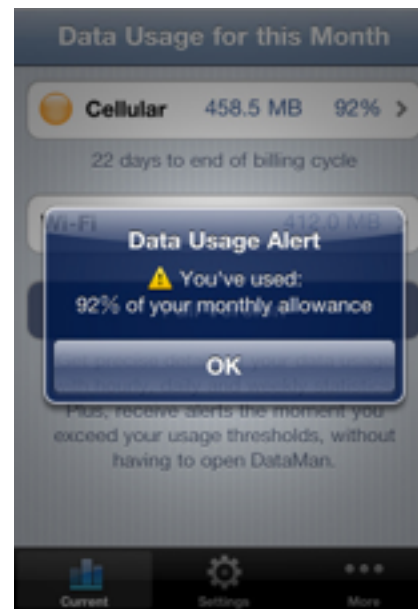
Identify the regions of your page first, as these are the easiest to find. Try not to think about what things will look like, but instead think about what they are. A “sidebar” of a page might just be another form of navigation or content. Identify the content regions.

# Dig Deeper

- Identify Content elements
- Identify Media elements
- Identify a hierarchy of the content!
- What does the audience need to see?

Once we know about the regions, we have to think about the content we place in those regions. Most importantly we have to be concerned with our site's content hierarchy. We need to prioritize elements. We may have blog articles, video content, comments, asides, etc. And then we think about the audience. What does the phone user need to see? What does the desktop user need to see?

Once we have that we're in great shape.



Our pages have gotten big. If we load up everything on the site, our users will have to download that information. On limited data plans and slow connections, that extra stuff can be costly. So we have to be very careful about what we make the people on these connections download.

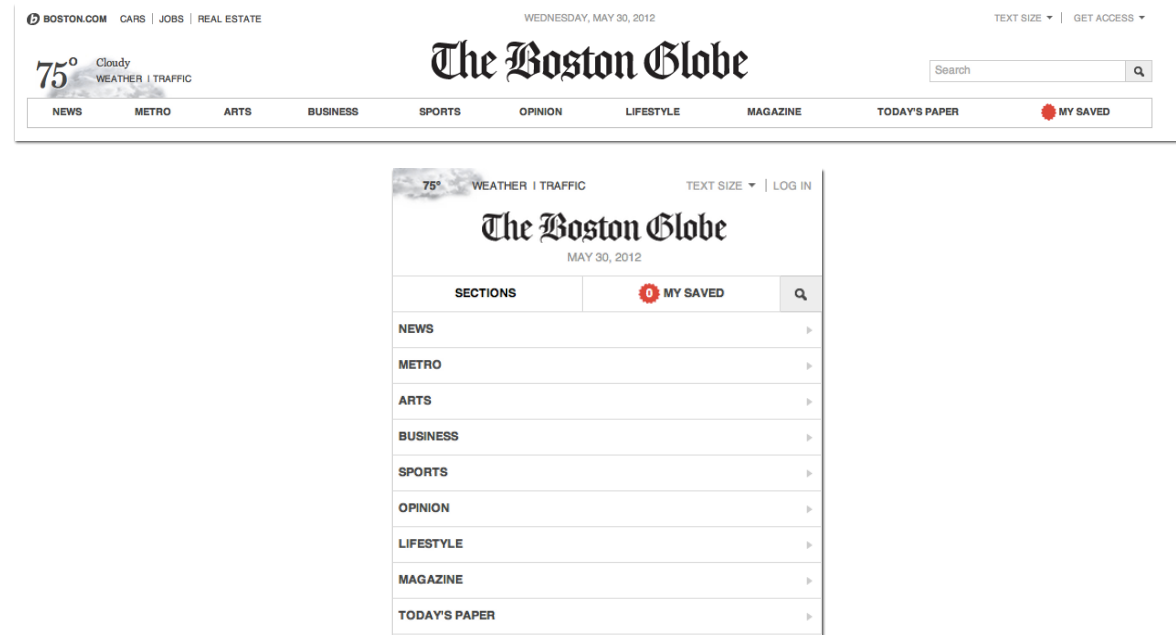
# Images



And it's not just text. We have to do this with images too. We can't make people on small screens download huge images if they don't add value. And there are many solutions for this, but it's really important to understand that if the image is in the HTML markup, it will be downloaded, no matter what. So we have to come up with clever tricks to make small images load on phones and make large images load on devices that can support them.

It is a good rule to save a small and large version of every picture and load the appropriate size picture the fits the display.

# Navigation



Navigation is another tricky subject. We are limited on small screens so we have to come up with different ways to present navigation. By using JavaScript and CSS, we can reconstruct the site's navigation. The Boston Globe has different navigation schemes at different screen sizes.

# “the fold”



Some folks will tell you that you need to put your most important information “above the fold.” This is a little outdated information. In the newspaper print days, you put the banner headline at the top of the page because the newspapers would be folded in half and you wanted people to be able to read the important info. When the web came to be, people put the most important info at the top of the page because they thought people wouldn’t scroll down to see that content. People do scroll, so this isn’t a hard rule anymore. You do, however, want important stuff to appear on the screen when it loads. But just know that they will scroll.

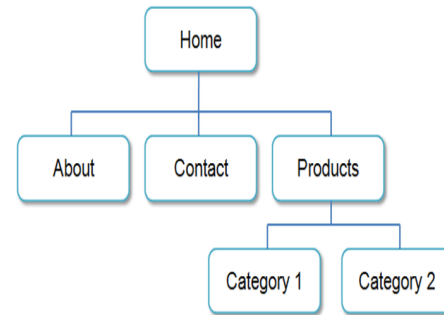
# Organization



That kind of brings us to organization of the site's content again. Organization of a site is an important aspect of design too. You need to be very careful how you choose to organize things though.

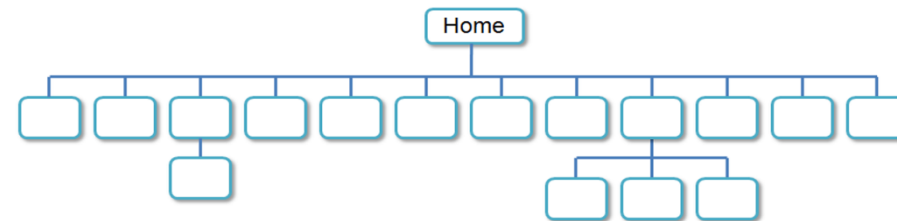


# Hierarchy?



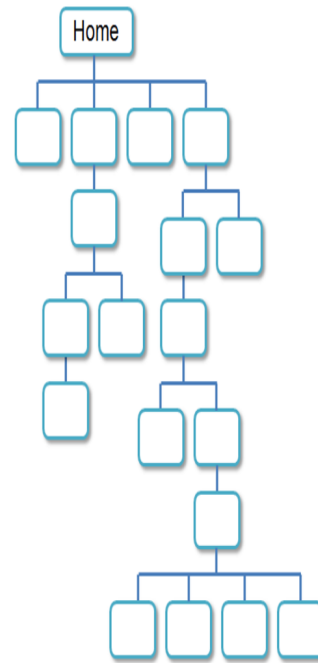
This is pretty typical for your business and corporate sites. You have a clear home page, navigation links to the main sections.

# Don't do this!



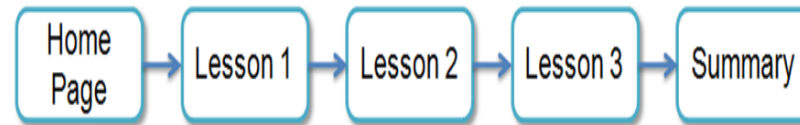
This is way too shallow. You need to try to condense the number of main sections down as much as possible when you use a hierarchy style. Try to keep it to like 3 to 6.

# But also, don't do this!



Ugh! What a mess! Now you've condensed things at the top level and now you have to make people drill down to get to where they want to go.

# Linear?



Linear organizations work well for slide shows, lessons, interactive things. Anything that's “do this, then do that.”

# Visual Design Principles

- Repetition
- Contrast
- Proximity
- Alignment

The concepts of repetition, contrast, proximity, and alignment are what make up a successful visual experience.

Repeat the same elements from page to page. Keep headers, footers, navigation consistent across the pages.

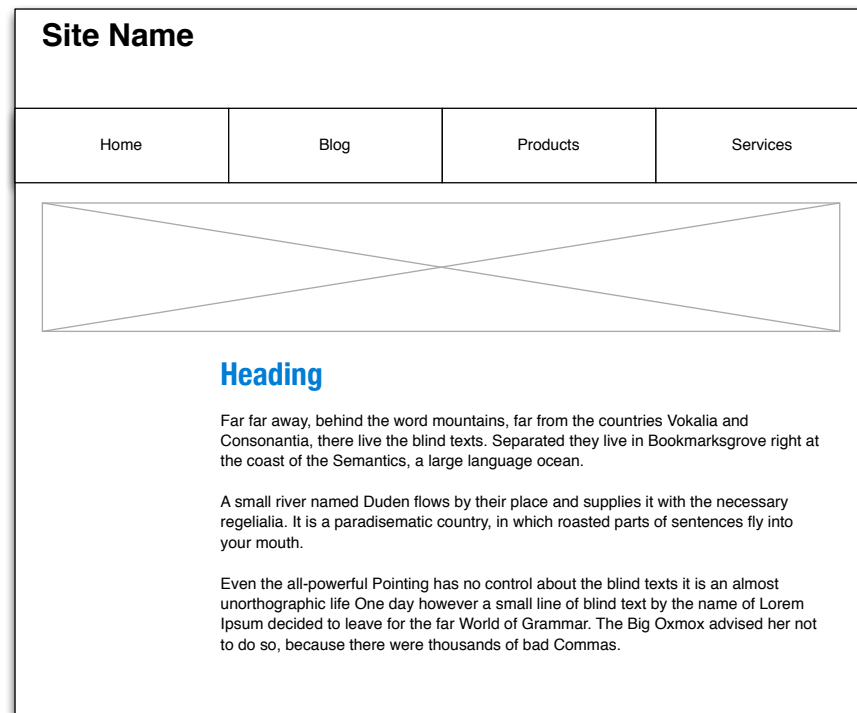
Use proper contrast to draw attention to the content, not obscure it.

Keep important things in close proximity to other important things.

Group content appropriately.

Finally, align elements to create visual unity. Again, think about that grid idea.

# Wireframing



Wireframing is a great way to quickly sketch up ideas for a site without having to code anything. There are universally understood symbols you can use, too, such as an X for an image. You can use dummy text in these wireframes if you want, or you can put in real text. But the idea is that these communicate how things will be laid out and organized. They are usually without color, which forces people to think about the layout without bickering over color choices. You'll think about the fonts you want to use at this point, and you'll think about the site structure and the navigation. You may even make wireframes of how the site will look on mobile devices as well. Once you have the layout and the color and the fonts, you're ready to move on to build the sites.

# Wrapping Up

- Colors matter
- So does text
- Organization is important too!
- Design is about universal access
- Universal access includes mobile
- Design for people.