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For the latest slides see:
https://klarence.net/assets/slides/responsive-design.pdf

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- Lecture: Accessibility for Everyone
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- Lecture: Designing for Accessibility
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What is a Website?

https://accviscom.com/klarence-ouyang/assets/pdf/what-is-a-website.pdf

https://drive.google.com/file/d/1rDh7KrtpC7zja7QIFgkg4g6XNLYIvhLb/view?usp=sharing

Setup Visual Studio Code

https://docs.google.com/document/d/18sibh0OX4uC9IJTpqZF_W0nxXuO6beivYwL34y0yQPU/edit?usp=sharing

https://code.visualstudio.com/download

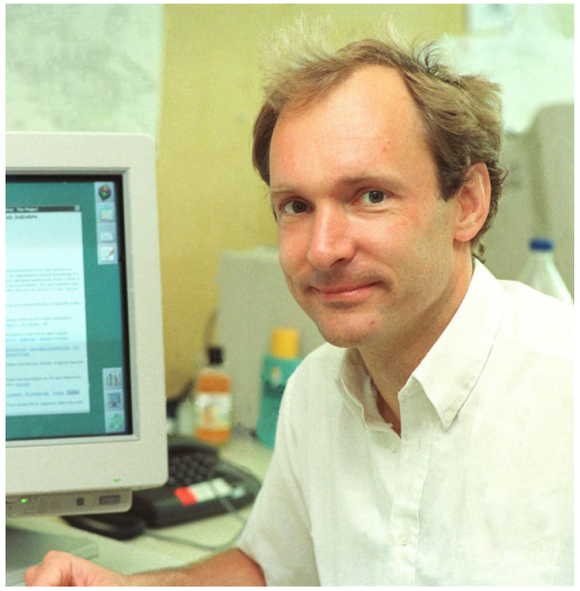
https://marketplace.visualstudio.com/items?itemName=ritwickdey.LiveServer

Intro to HTML

the markup language
for the Web

What is HTML

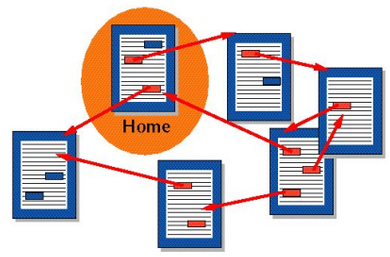
HTML stands for **Hypertext Markup Language**.
In 1990, computer scientist Tim Berners-Lee created HTML to display information from people in remote places.



Who - Tim Berners-Lee , creator of the World Wide Web
What - a Markup Language for Hypertext
Where - all over the world
When - 1990
Why - to display information from people in remote places

HyperText

- Hypertext is text displayed on a computer display or other electronic devices with references (hyperlinks) to other text that the reader can immediately access.
- Hypertext documents are interconnected by hyperlinks, which are typically activated by a mouse click, keypress set, or screen touch.
- Hypermedia - Apart from text, the term "hypertext" is also sometimes used to describe tables, images, and other presentational content formats with integrated hyperlinks.



https://en.wikipedia.org/wiki/Hypertext

HTML

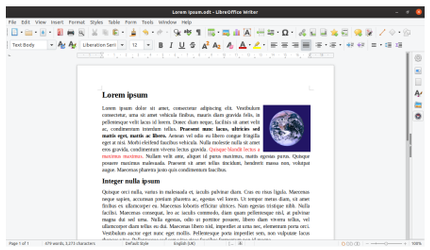
Hypertext Markup Language

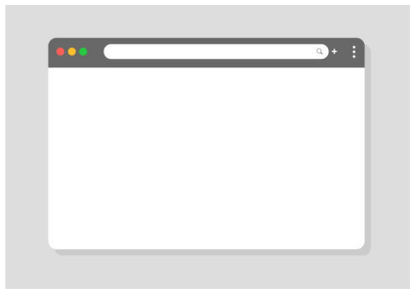
- HTML stands for Hyper Text Markup Language
- HTML is the standard markup language for creating Web pages
- HTML describes the structure of a Web page
- HTML consists of a series of elements
- HTML elements tell the browser how to display the content
- HTML elements label pieces of content such as "this is a heading", "this is a paragraph", "this is a link", etc.

HTML Syntax

HTML Basics

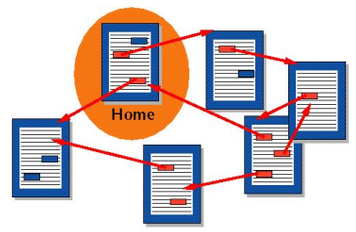
- **HTML Documents**
  - Version Declaration
  - HTML Elements
    - HTML Attributes





HTML Basics

- **HTML Documents**
  - Version Declaration
  - HTML Elements
    - HTML Attributes



Each of these blue rectangles are a document, an HTML document.
The orange circle is where we currently are, the home page. The small red rectangles are links that bring you to the different HTML documents.

HTML Basics

- HTML Documents
  - **Version Declaration**
  - HTML Elements
    - HTML Attributes

```
<!doctype html>
<html>
<body>

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>
```

The current version of HTML is version 5
HTML Specification - https://html.spec.whatwg.org/multipage/

doctype is not case-sensitive, <!DOCTYPE html>
Most HTML and CSS is case-insensitive. Exceptions are attribute values and CSS values for URL's and some font names.

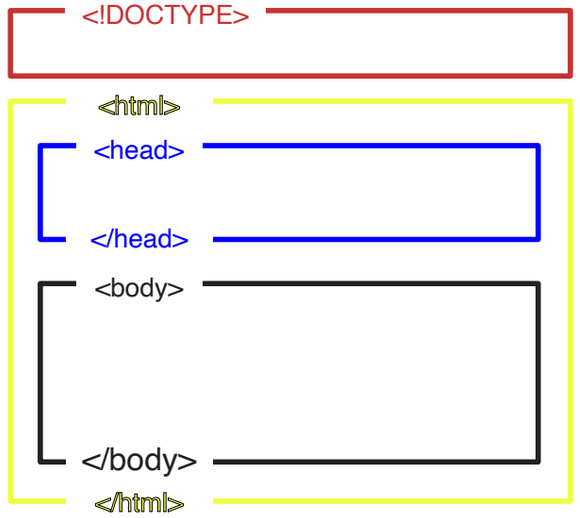
W3C recommends using lowercase.
XHTML requires lowercase.

HTML 4.01:
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">
XHTML 1.1:
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN" "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">

HTML Is About Structure and Content

All HTML pages have consistent structure:

1. The `<!DOCTYPE html>` declaration defines this document to be HTML5.
2. The `<html>` element is the root element of an HTML page.
3. The `<head>` element contains meta information about the document.
4. The `<title>` element specifies a title for the document.
5. The `<body>` element contains the visible page content.



- https://developer.mozilla.org/en-US/docs/Web/HTML

In this example, the head and the body element are children elements of the parent html tag.

HTML Basics

- HTML Documents
  - Version Declaration
  - **HTML Elements**
    - HTML Attributes

```
<!DOCTYPE html>
<html>
<body>

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>
```

The current version of HTML is version 5
HTML Specification - https://html.spec.whatwg.org/multipage/

HTML Basics

- HTML Documents
  - Version Declaration
  - **HTML Elements**
    - HTML Attributes

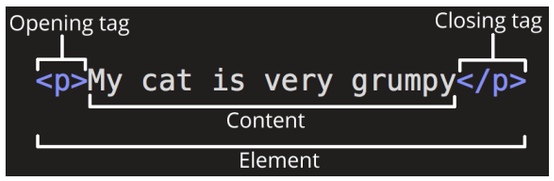
```
<!-- heading levels go up to 6 -->
<h1>My main title</h1>
<h2>My top level heading</h2>
<h3>My subheading</h3>
<h4>My sub-subheading</h4>

<p>My first paragraph.</p>
<p>My first paragraph.</p>

<ol>
   <li>1st Item</li>
   <li>2nd Item</li>
   <li>3rd Item</li>
</ol>
```

The current version of HTML is version 5
HTML Specification - https://html.spec.whatwg.org/multipage/

HTML Basics

- HTML Documents
  - Version Declaration
  - **HTML Elements**
    - HTML Attributes

```
<!DOCTYPE html>
<html>
<body>
```




```
</body>
</html>
```

HTML tags are used to define elements.
Most elements have a opening and closing tag.
A tag consists of an opening or left arrow bracket (<) and a closing or right angle bracket (>). Most elements have a closing tag (</>)which also has a forward slash (/) right after the opening arrow bracket (<).
However, there are some elements that only have one tag (a Void Element)
The <img> is a void element.

HTML Basics

- HTML Documents
  - Version Declaration
  - **HTML Elements**
    - HTML Attributes

```
<!-- Self-closing tags -->
<!-- Void (empty) Elements don't have content -->
<!-- so they don't have a closing tag -->
<!DOCTYPE html>
<html>
<body>

<img src="images/smiley.jpg"
     alt="a smiling face emoji" >

</body>
</html>
```

HTML tags are used to define elements.
Most elements have a opening and closing tag.
However, there are some elements that only have one tag (a Void Element)
The <img> is a void element.

Self-closing tags (<tag />) do not exist in HTML.

Void Elements

aka Empty Elements

- Do **not** have a closing tag
- Cannot have any child nodes (i.e., nested elements or text nodes)
  - content is created by using attributes
    - src https://en.wikipedia.org/wiki/File:Smiley.svg 

HTML tags are used to define elements.
Most elements have a opening and closing tag.
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The <img> is a void element.

Self-closing tags (<tag />) do not exist in HTML.

Nesting Elements

```
<!DOCTYPE html>
<html>
<body>

<p>These dolls <strong>nest</strong>
    inside each other.
    <img src="images/nested-russian-dolls.jpg"
        alt="Seven Russian Nesting Dolls
            side-by-side, largest to smallest " />
</p>

</body>
</html>
```

Parent

Child

These dolls **nest** inside each other.

HTML tags are used to define elements.
Most elements have a opening and closing tag.
However, there are some elements that only have one tag (a Void Element, aka Empty Element)
The <img> is a void element.

Self-closing tags (<tag />) do not exist in HTML.

<!- Anything wrapped between two tags is known as a parent-child relationship. This simply means that opening and closing tags wrap another html element. This becomes important later when building website structure -->

Nesting Elements

```
<!DOCTYPE html>
<html>
<body>
  <p>
    My cat is <strong>very</strong> grumpy.
    <a href="https://en.wikipedia.org/wiki/Grumpy_Cat">
      <img src="images/grumpy-cat.jpg"
           alt="a cat with a frown face" />
    </a>
  </p>
</body>
</html>
```

My cat is **very** grumpy.

HTML tags are used to define elements.
Most elements have a opening and closing tag.
However, there are some elements that only have one tag (a Void Element)
The <img> is a void element.

Self-closing tags (<tag />) do not exist in HTML.

HTML Basics

- HTML Documents
  - Version Declaration
  - HTML Elements
    - **HTML Attributes**

```
<!DOCTYPE html>
<html>
<body>
<p class="editor-note">My cat is very grumpy</p>
</body>
</html>
```

Attribute

We introduced src and alt attributes for the image tag.

Skeleton Code (Boilerplate HTML)

Skeleton Code

All HTML pages have consistent structure:

1. The `<!DOCTYPE html>` declaration defines this document to be HTML5.
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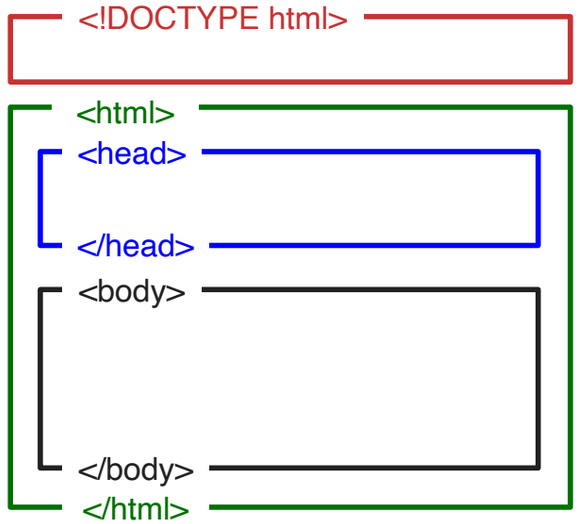
5. The `<body>` element contains the visible page content.



Skeleton Code
aka HTML Boilerplate

```
<!DOCTYPE html>
<html lang="en-US">
  <head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <title>HTML 5 Boilerplate</title>
    <link rel="stylesheet" href="style.css">
  </head>
  <body>
<img src"" >
    // Your Code Here
  </body>
</html>
```

https://codepen.io/Klarence/pen/LEPKOOM

Give link, and show how to use emmet (! + tab or enter)

<html lang="en-us">
<html lang="en-US">
Both of these are valid, even though HTML attribute values are one of the few places HTML is case sensitive.
NOTE: The quizzes code in the book must be lowercase.
https://www.w3.org/International/articles/language-tags/

https://www.freecodecamp.org/news/basic-html5-template-boilerplate-code-example/

Basic Text Elements

Basic Text Elements

- headings <h1> thru <h6>
- paragraphs <p>
- Strong and Emphasis &
- small <small>
- links <a> (anchor tag)
- lists <ol> and
  - List Items
- Breaking Elements
 & <hr>

https://codepen.io/Klarence/pen/yyBdPzX

tag and element are often used interchangeably, but an element usually consists of two tags. The element also consists of all of the content in between the tags, including other, nested elements.

All the HTML (version 5) elements/tags are case-insensitive. Case-insensitive means the tags/elements which are used in the code are understandable by the browser. Best practice is to always use lowercase.

Basic Text Elements

- headings <h1> thru <h6>
- paragraphs <p>
- Strong and Emphasis &
- small <small>
- links <a> (anchor tag)
- lists <ol> and
  - List Items
- Breaking Elements
 & <hr>

https://codepen.io/Klarence/pen/yyBdPzX

tag and element are often used interchangeably, but an element usually consists of two tags. The element also consists of all of the content in between the tags, including other, nested elements.

All the HTML (version 5) elements/tags are case-insensitive. Case-insensitive means the tags/elements which are used in the code are understandable by the browser. Best practice is to always use lowercase.

Remember HTML for content, CSS for presentation.

Header Element

<head> vs <header> vs heading <h1> — <h6>

```
<!doctype html>
<html lang="en">
<head>
  <!— meta info —>
</head>
<body>
<header>
  <!— intro content —>
</header>
<main>
  <h1>Page Title</h1>
</main>
</body>
</html>
```

Header Element

<header>, taglines

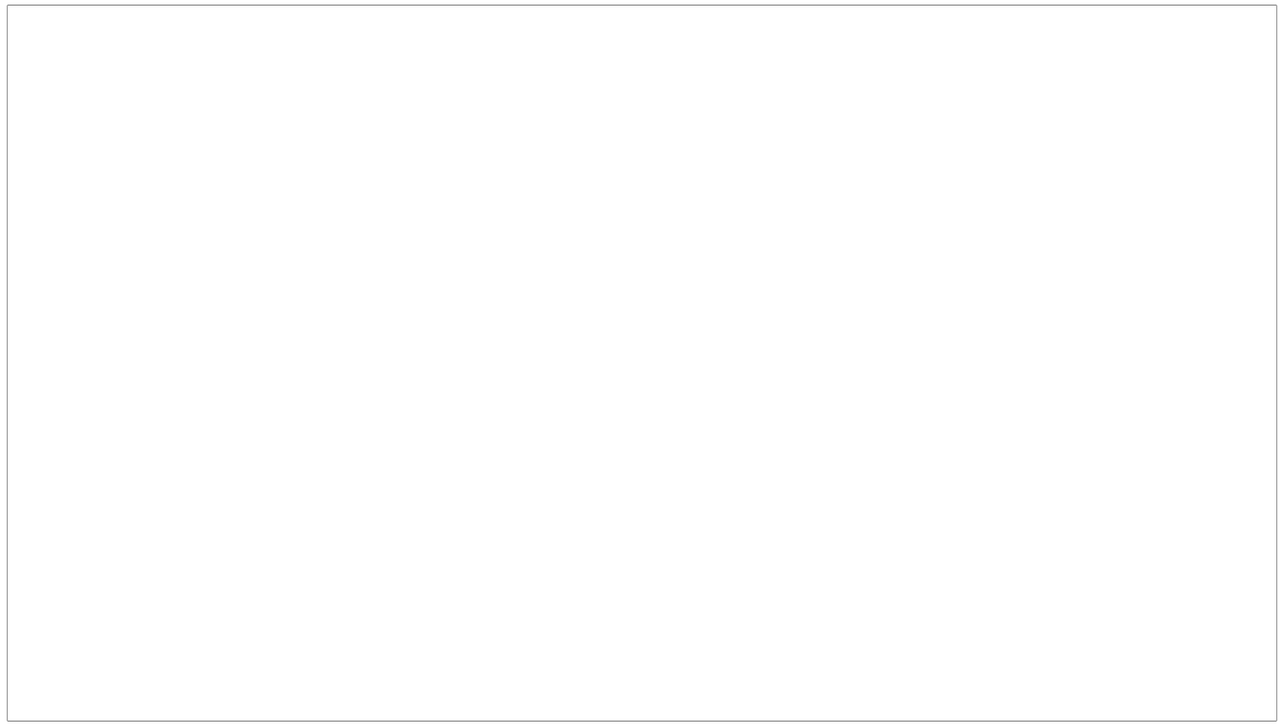
```
<header>
  <!– intro content, logo, nav, etc. –>
</header>

<header>
  <h1>Company, <span class="diff-style">Tagline</span></h1>
</header>

<header>
  <h1>Company</h1>
  <p>Tagline</p>
</header>
```

```
<hgroup>
  <h1>Company</h1>
  <p>Tagline</p>
</hgroup>
```

Don’t use more than one heading element in an hgroup element.
https://codelucky.com/html-hgroup-tag/ (This is WRONG)



File and Folder Organization

File paths

- **/** is the root
- **./** is the current directory (cwd)
- **../** is the parent of the current directory.
- **../../** is the grandparent

https://www.youtube.com/watch?v=ephId3mYu9o

if you omit the slash in the beginning ./ (relative to current directory) is assumed

https://superuser.com/questions/153165/what-does-represent-while-giving-path

`block` vs `inline`
Display of elements

block vs inline

block	inline
takes up the full width available	only takes up as much width as necessary
will break to a new line	will not break onto a new line
doesn’t allow other elements to sit behind it	allows other elements to sit behind it
height & width respected	height & width don't apply (vertical margin & padding don’t work)
all sides margin work as expected *margin between block elements collapse	top and bottom margin doesn't affect other inline elements

Margin collapse example - https://codepen.io/Klarence/pen/JoGRbWm

demo

https://codepen.io/Klarence/pen/OPLdXbz

HTML - Block and Inline - W3Schools.com-
https://www.youtube.com/watch?v=M4n-WSkehmI&list=PLP9IO4UYNF0VdAajP_5pYG-jG2JRrG72s

Choosing Image Formats

Image Formats

Older Formats

- JPEG
- PNG
- SVG
- GIF

Modern Formats

- WEBP
- AVIF
- APNG

Image Formats

Older Formats (Historical Support)

- **JPEG**
  photos, no transparency, lossy
- **PNG**
  supports transparency
- **SVG**
  Vector based, good for icons, diagrams, etc.
- **GIF**
  for simple images/animations

Modern Formats (Better Performance)

- **WebP**
  good for web graphics
  not good for offline use, 8-bit color
- **AVIF**
  good for digital photos
  best picture, best compression, least support
- **APNG**
  better support but not as performant as AVIF and WebP, more performance than GIF.

JPEG is the most popular. WebP has support for all major browsers.

You should use the picture element if you plan to use the modern formats.

I use WebP for pretty much everything.

AVIF has higher compression efficiency, with file sizes 50% smaller than JPEG and 20-30% smaller than WebP (source).

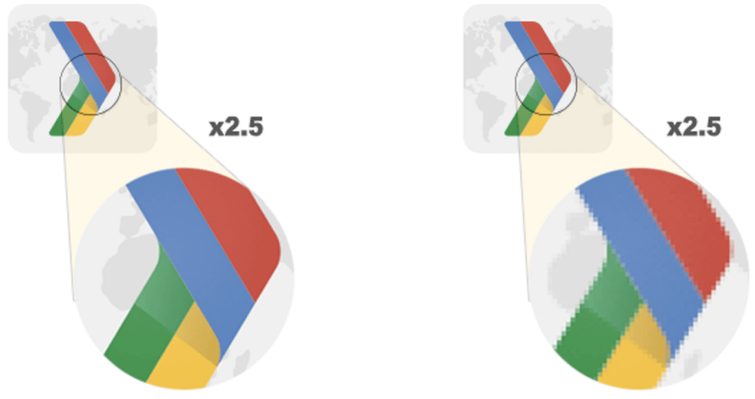
https://developer.mozilla.org/en-US/docs/Web/Media/Formats/Image_types

https://web.dev/articles/choose-the-right-image-format

Vector vs Raster

Vector graphics use lines, points, and polygons to represent an image.

Raster graphics represent an image by encoding the individual values of each pixel within a rectangular grid.



Vectors are good for logos, icons, diagrams, things that need to be scaled infinitely.

Raster Graphics are good for photos.

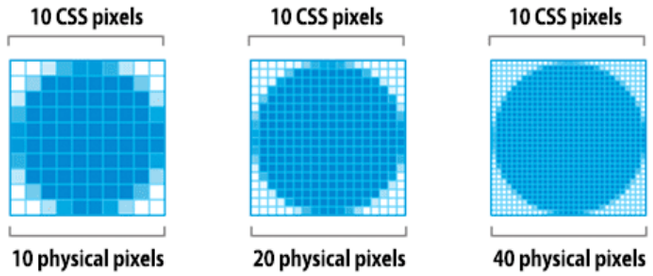
https://web.dev/articles/choose-the-right-image-format

Hi-Res Screens

Pixel Density

You don't have to worry about using different pixel values in CSS based on the devices resolution.

The difference between CSS pixels and device pixels.



https://web.dev/articles/choose-the-right-image-format#implications_of_high-resolution_screens
Pixel Density is the number of pixels per area. PPI (pixels per inch)
Higher resolution screens have a higher pixel density (More pixels in the same space).
Retina is apples name for high density pixel displays.
Best practice to use at least twice the resolution for photos to account for high resolution screens.

Adding Images

Adding Images

1. **<img>**
2. **<picture>**
3. Inline **<svg>**
4. **background-image**
   CSS property

There are four ways to add images to your webpage.

- <img>
    - remember to add an alt attribute
    - remember width & height for page load
- <picture>
    - newer tag with features for fallbacks
- Inline <svg>
    - good for customizing parts of the SVG
- background-image CSS property
    - generally avoid due to poor a11y
    - okay for decoration (not content)

Adding Images

1. **<img>**
   - remember to add an **alt** attribute
   - remember **width** & **height** for page load
2. **<picture>**
   - newer tag with features for fallbacks
3. Inline **<svg>**
   - good for customizing parts of the SVG
4. **background-image** CSS property
   - generally avoid due to poor a11y
   - okay for decoration (not content)

<img> The Image Element

- **<img>** is a self-closing element
  (aka Empty Element or Void Element)
  - the **src** attribute is the attribute that references the images location or path.
  - the **alt** attribute is descriptive text that *screen readers* read aloud or if the file doesn't load the value will display as text on the screen
  - **width** & **height** attributes are not necessary, but help page load
    - CSS is used for (responsive) sizing

scrset can be used to serve larger images to screens with a higher pixel density

```
<img src="path/image-400px.png"
        srcset="path/image-800px.png 2x"
        alt="image description">
```

<img> The Image Element

```
<img src="images/kittens.jpg"
     alt="Two tabby kittens"
     width="240" height="240">
```

Void Element is the technical term

https://htmlandcssguidebook.com/html/images/#optional-attributes

Mention title is a global attribute and is not recommended for a11y reasons. SR don't read them. You should have the same experience for both users.

<img> The Image Element

The **src** attribute's value refers to the image location or file path.

```
<!--Relative image path-->
<img src="folder/file.jpg">
```

```
<!--Absolute image path-->
<img src="http://domain.com/file.jpg">
```

Void Element is the technical term

Relative paths are files and folders in the same project
Absolute path can be on a different site, and will include a protocol, domain, folder path and filename.

https://htmlandcssguidebook.com/html/images/#optional-attributes
Mention title is a global attribute and is not recommended for a11y reasons. SR don't read them. You should have the same experience for both users.

<picture> The Picture Element

The **picture** element is a newer element that allows you to specify multiple sources. The source will be chosen depending on the supported image type, device size, orientation, etc.

```
<picture>
   <source srcset="folder/hi-res-file.avif"
           type="image/avif"
           media="(min-width: 1280px)">
   <source srcset="folder/hi-res-file.jpg"
           media="(min-width: 1280px)">
   <img src="folder/file.jpg" alt="Two tabby kittens">
</picture>
```

You should always have an image element that specifies an **alt** and a backup **src** attributes.

If the picture element or a specific source's type isn't supported by the browser then it is skipped. Just like if the media attribute doesn't match it is skipped.

https://developer.mozilla.org/en-US/docs/Web/HTML/Element/picture
The picture element still uses the img element.
<source> attributes
- srcset
- media
- type

https://htmlandcssguidebook.com/html/images/#optional-attributes
Mention title is a global attribute and is not recommended for a11y reasons. SR don't read them. You should have the same experience for both users.

Semantic Elements

HTML 5 Semantic Elements

- **<header>**
- **<footer>**
- **<main>**
- **<article>**
- **<section>**
- **<aside>**
- **<nav>**
- **<figure>** & **<figcaption>**

- **<details>**
- **<summary>**
- **<mark>**
- **<time>**

** & are non-semantic tags used for layout.*

https://www.freecodecamp.org/news/semantic-html5-elements/

Semantics are important for SEO, a11y, navigating with keyboard or screenreader.

HTML 5 Semantic Elements

- **<header>**
- **<footer>**
- **<main> -** only one per page
- **<article>**
- **<section> -** should always have a heading
- **<aside>**
- **<nav>**
- **<figure>** & **<figcaption>**

- **<details>**
- **<summary>**
- **<mark>**
- **<time>**

** & are non-semantic tags used for layout.*

div is used to group content together and both div & span are used to apply styles to the content.

https://www.freecodecamp.org/news/semantic-html5-elements/

Semantics are important for SEO, a11y, navigating with keyboard or screenreader.

Usually a <figure> is an image, illustration, diagram, code snippet, etc., that is referenced in the main flow of a document, but that can be moved to another part of the document or to an appendix without affecting the main flow.
A caption can be associated with the <figure> element by inserting a <figcaption> inside it (as the first or the last child). The first <figcaption> element found in the figure is presented as the figure's caption.
The <figcaption> provides the accessible name for the parent <figure>.
https://developer.mozilla.org/en-US/docs/Web/HTML/Element/figure

FTP Setup

FTP Instructions

Links
The Anchor Element <a>

Anchor Element <a>

```
<a href="https://google.com">Google</a>
```

The most important attribute for links (<a>) is the href attribute.

It indicates where the link take you or what to do.

```
<a href="https://google.com" target="_blank">Google</a>
```

The target attribute with a value of _blank open the link in a new tab/window.

Anchor Element <a>

- **Absolute links**
  - Includes domain (and protocol)
    - https://www.mysite.com
    - tel:+123456789
    - mailto:name@email.com
- **Relative links**
  - path to a file in your local workspace
- **Fragment / Jump links**
  - References an id attribute
    - Scrolls to section of page
    - Can autoplay media or highlight text

https://developer.mozilla.org/en-US/docs/Web/URI/Fragment

`id` and `class` attributes & selectors

`id` **and** `class`

IDs

- are unique
- Each element can only have one ID
- Each page can only have one ID
- lowerCamelCase is a common convention

Classes

- are not unique
- can be used on many elements
- One element can have multiple classes
- Are case sensitive
  - don’t use uppercase,
  - stick to dash and underline separators

`id` **and** `class` Selectors

IDs

#nameOfTheId

Classes

.one-class
.anotherclass
.yet_another_class

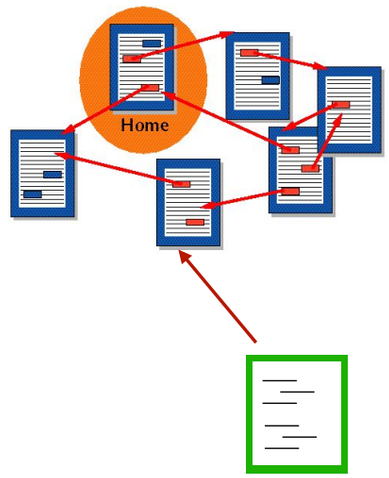
CSS Naming Convention
Block Element Modifier
https://getbem.com/naming/

CSS Intro

Cascading Style Sheets

Stylesheet

A stylesheet is a set of CSS rules used to control the layout and design of a webpage or document.



HTML is the Content
CSS is the Presentation, How it looks

https://developer.mozilla.org/en-US/docs/Glossary/Stylesheet

Cascade

What does the “cascading” in CSS mean?

- The “cascading” in CSS refers to the fact that styling rules “cascade” down from several sources. This means that CSS has an inherent hierarchy and styles of a higher precedence will overwrite rules of a lower precedence.

https://discuss.codecademy.com/t/what-does-the-cascading-in-css-mean/340936

Cascading Order

Rule of thumb: Closest to the code wins.

- **Inline styles**: Highest in priority (*unless overridden by* `!important`)
- **Internal CSS**: Styles within a `<style>` tag in <head> - only apply to that document.
- **External CSS**: Styles from external CSS files linked to the HTML document, which apply globally across multiple pages.
- **Browser/User styles**: Defaults or user-defined preferences.

Only use !important for debugging. Don’t deploy it live to production.

CSS Rules Hierarchy is based on Specificity and the Cascade order.
Cascade is secondary to specificity.

Inline styles are difficult to maintain, and override other methods. A best practice is to avoid using inline styles.
Inline CSS has some benefits over External CSS, but External is generally recommended way to use CSS.

https://www.geeksforgeeks.org/what-does-the-cascading-portion-of-css-means/

Cascading Order

Inline styles: Highest in priority (*unless overridden by* `!important`)

```
<p style="font-size: 24px;">
  This is my first paragraph
</p>
```

Only use !important for debugging. Don’t deploy it live to production.

CSS Rules Hierarchy is based on Specificity and the Cascade order.
Cascade is secondary to specificity.

https://www.geeksforgeeks.org/what-does-the-cascading-portion-of-css-means/

Cascading Order

Internal CSS

Internal CSS: Styles within a `<style>` tag - only apply to that document.

```
<!DOCTYPE html>
<html lang="en">
<head>

  <style>
     .first-p {
        color: red;
     }
  </style>

</head>
<body>
<p class="first-p">
  This is my first paragraph
</p>
```

Only use !important for debugging. Don’t deploy it live to production.

CSS Rules Hierarchy is based on Specificity and the Cascade order.
Cascade is secondary to specificity.

https://www.geeksforgeeks.org/what-does-the-cascading-portion-of-css-means/

Cascading Order

External CSS: Styles from external CSS files linked to the HTML document, which apply globally across multiple pages.

```
<head>

  <link rel="stylesheet" href="styles.css" />

</head>
```

Only use !important for debugging. Don’t deploy it live to production.

CSS Rules Hierarchy is based on Specificity and the Cascade order.
Cascade is secondary to specificity.

https://www.geeksforgeeks.org/what-does-the-cascading-portion-of-css-means/

Cascading Order

Browser rendering

Browsers read CSS from top to bottom.
When rules conflict, the last rule declared will win.

```
h1, h2, h3, h4, h5, h6 {
  color: grey;
  color: black; /* This rule beats the line before  */
}

h1 {
   color: darkgrey; /* This rule wins  */
}
```

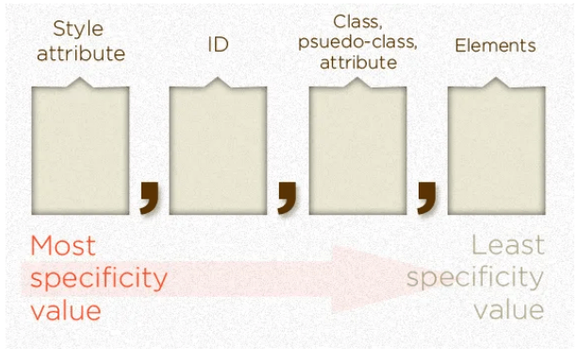
Only use !important for debugging. Don’t deploy it live to production.

CSS Rules Hierarchy is based on Specificity and the Cascade order.
Cascade is secondary to specificity.

https://www.geeksforgeeks.org/what-does-the-cascading-portion-of-css-means/

Specificity

- If the element has inline styling, that automatically1 wins (1,0,0,0 points)
- For each ID value, apply 0,1,0,0 points
- For each class value (or pseudo-class or attribute selector), apply 0,0,1,0 points
- For each element reference, apply 0,0,0,1 point



Specificity is based on the type and number of selectors used.

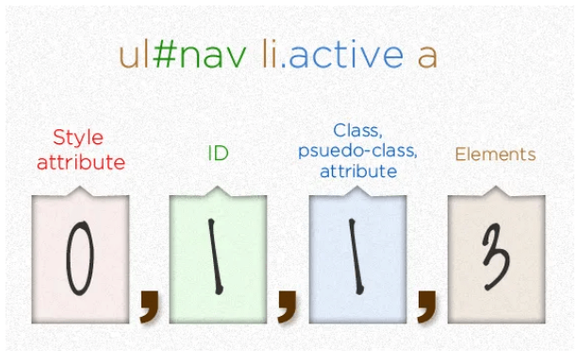
The number of each type of sector is concatenated (joined together).
The higher the value the the higher the specificity (priority).

https://css-tricks.com/specifics-on-css-specificity/
https://specificity.keegan.st/

CSS Specificity

```
<nav>
<ul id="nav">
  <li><a href="#">home</a></li>
  <li class="active">
    <a href="/about">about</a>
  </li>
</ul>
</nav>

ul#nav li.active a {
   font-weight: bold;
}
```



https://css-tricks.com/specifics-on-css-specificity/

!important

```
<span>
  <strong>!important</strong>: Highest priority, regardless of source.
</span>
...
strong {
  font-weight: bold !important;
}
```

!important: Highest priority, regardless of source.

- beats all specificity, cascade, and inheritance
- meant only for debugging

https://www.geeksforgeeks.org/what-does-the-cascading-portion-of-css-means/
Bad practice. Only use as a last resort.

!important

Inheritance

Some CSS property values set on parent elements are **inherited** by their child elements, these are usually related to typography.

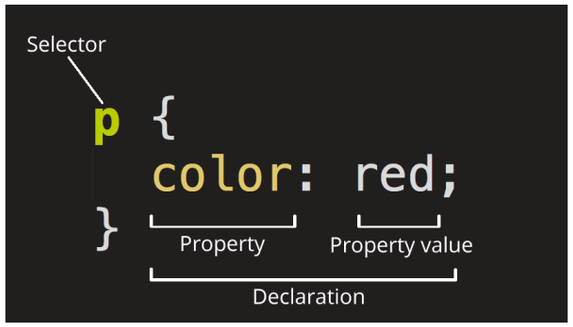
https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/Styling_basics/Handling_conflicts#inheritance

text-align, color, font-family

Styles that are for positioning or sizing do not inherit from their parent elements.
Width, height, position, etc.

CSS Syntax

- **CSS Ruleset**
  - Selector
  - **Declaration**
    - Property
    - Property Value



The entire block is called a CSS Ruleset or declaration block

Sometimes the entire ruleset is referred to as a rule, sometimes each declaration is referred to as a rule.

https://developer.mozilla.org/en-US/docs/Learn_web_development/Getting_started/Your_first_website/Styling_the_content

CSS Syntax

Shorthand and Longhand Properties

```
/* Shorthand properties are defined with multiple values. */
margin: 25px;

/* Longhand properties are defined with individual values. */
margin-top: 25px;
margin-right: 25px;
margin-bottom: 25px;
margin-left: 25px;
```

Shorthand properties that go on all sides go in clockwise order from the top. (TRBL)

CSS Syntax

Shorthand and Longhand Properties

```
/* Shorthand properties are defined with multiple values. */
margin: 10px 20px; /* top/bottom | right\left */
/* Longhand properties are defined with individual values. */
margin-top: 10px;
margin-right: 20px;
margin-bottom: 10px;
margin-left: 20px;
```

Shorthand properties that go on all sides go in clockwise order from the top. (TRBL)

CSS Syntax

Shorthand and Longhand Properties

```
/* Shorthand properties are defined with multiple values. */
margin: 10px 15px 20px;/* top | right\left | bottom */
/* Longhand properties are defined with individual values. */
margin-top: 10px;
margin-right: 15px;
margin-bottom: 20px;
margin-left: 15px;
```

CSS Syntax

Shorthand and Longhand Properties

```
/* Shorthand properties are defined with multiple values. */
margin: 10px 5px 20px 15px; /* top | right | bottom | left */
/* Longhand properties are defined with individual values. */
margin-top: 10px;
margin-right: 5px;
margin-bottom: 20px;
margin-left: 15px;
```

Shorthand properties that go on all sides go in clockwise order from the top. (TRBL)

CSS Syntax

Comments

```
/* This is a single-line comment. */
```

```
/*
This is a
multiline comment.
*/
```

/* starts the comment, and */ ends the comment. Everything in-between is a comment.

cmd + /
You can select a phrase or multiple lines and then use this shortcut.

CSS Selectors

CSS Selectors

- **Element/Type Selector**: selects all elements wit the same tag name
- **Class Selector:** selects one or more elements
- **ID selector:** selects only one element

Element/Type Selectors use the tag name (no <>)
Class selectors start with a period (.)
ID selectors start with a pound/hashtag (#)

https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/Styling_basics/Pseudo_classes_and_elements

CSS Selectors

- Element Selector (aka Tag or Type Selector)
- **Class Selector**
- Pseudo Selectors (Pseudo-class /Pseudo-element)
- ID selector
- Attribute selector
- Universal Selector

Pseudo-class (& Pseudo-element) selector
Selects elements in a specific state, like hover, visited, or the first child.
Pseudo-elements
Select a specific part of an element, like first-letter or first-line.
They behave in a similar way. However, they act as if you had added a whole new HTML element into the markup, rather than applying a class to existing elements.

Pseudo-classes start with a single colon :
Pseudo-elements start with a double colon ::
:first-of-type is an example of a pseudo-class.
::before is an example of a pseudo-element.

https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/Styling_basics/Pseudo_classes_and_elements

Element selector

HTML elements can be selected by their tag name

```
h1 {
  color: blue;
}
```

```
<h1>Page Title</h1>
```

Element selectors select html elements by their tag name.

Class selector

HTML elements can be selected by the class attribute

```
.make-it-pop {
  color: red;
}
```

```
<h3 class="make-it-pop">Heading</h3>
<h3>Another Heading</h3>
```

Element selectors select html elements by their tag name.

ID selector

HTML elements can be selected by the id attribute

```
#nameOfId {
  color: red;
}
<h2 id="nameOfId">Heading</h2>
<h2>Another Heading</h2>
```

ID selectors select only one element based on their id attribute value.

attribute selector

attributes can be selected as well

```
[hidden] {

  display: none;
  // do NOT override

}

// you don’t need to add this as browsers will
automatically have this style
```

https://developer.mozilla.org/en-US/docs/Web/CSS/Attribute_selectors

https://developer.mozilla.org/en-US/docs/Web/HTML/Global_attributes/hidden

attribute selector

attributes can be selected as well

```
[title] {

  color: red;
  font-size: 10rem;
  // to help find when title's are being used

}

// you should not use the title attribute
```

This is a style I would use for local development but not actually deploy live to production

https://developer.mozilla.org/en-US/docs/Web/CSS/Attribute_selectors

https://developer.mozilla.org/en-US/docs/Web/HTML/Global_attributes/title

CSS Combinators

- Descendant combinator (space)
- Direct Child combinator (>)
- Next-sibling combinator (+)
- Subsequent-sibling combinator (~)
  - Class Selectors
  - ID selectors

https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/Styling_basics/Combinators#child_combinator

CSS Combinators

- Descendant combinator (space)
- Direct Child combinator (>)
- Next-sibling combinator (+)
- Subsequent-sibling combinator (~)
  - Class Selectors
  - ID selectors
- Selector lists (,)

CSS Color

CSS Color

- Hexadecimal
- Named Colors
- RGB(a)
- And more
  - HSL, HWB, etc.

https://www.w3schools.com/cssref/css_colors.php

https://developer.mozilla.org/en-US/docs/Web/CSS/color_value

Hexadecimal Color

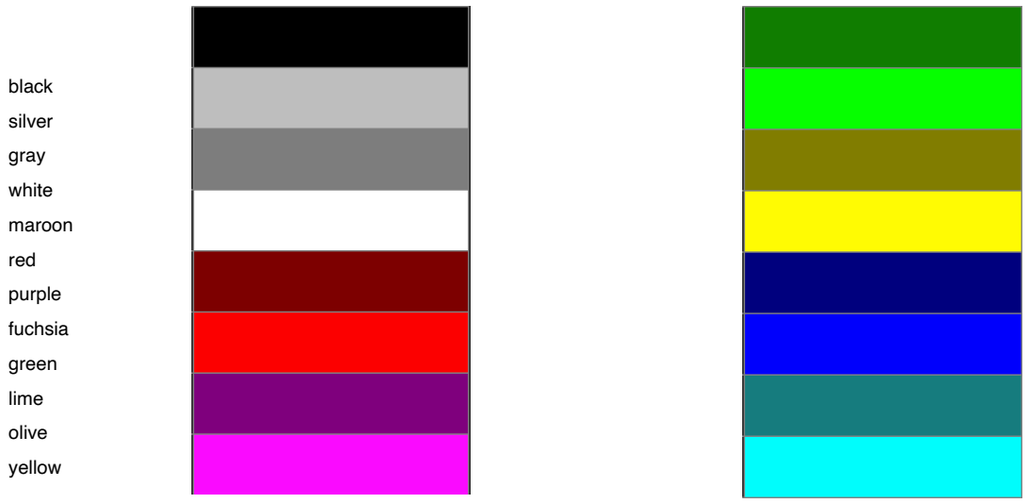
- Hexadecimal
  - #000000 to #FFFFFF
  - A base16 numbering systems
    - 16 symbols (0-9 and A-F)
    - #rrggbb (rr - red, gg - green, bb - blue)
    - #rrggbbaa - you can add two digits for alpha (transparency)

Each set of two digits represent R, G, B with a total of 256 values for each color.
00 for no color (black) and ff for full color (#ffffff is white) .

Hexidecimals with transparency can be used as well.
https://caniuse.com/?search=alpha%20hexadecimal

https://www.w3schools.com/colors/colors_hexadecimal.asp
https://www.wikihow.com/Understand-Hexadecimal

Named Colors



https://developer.mozilla.org/en-US/docs/Web/CSS/named-color#value

Less than 150 color values.

RGB(a) Colors

```
color: rgb(255 255 255);
```

- RGB
  - rgb(red green blue)
  - There are 256 values from 0 - 255.

```
color: rgba(255 255 255 / 50%);
```

- RGBA
  - rgba(red green blue / alpha)
    - The alpha parameter is a percentage value between 0 (fully transparent) and 100% (not transparent at all).

color: rgba(255 255 255 / 50%);

Old Syntax (uses commas) [still works]
color: rgba(255, 255, 255);
color: rgba(255, 255, 255, 0.5);
The alpha parameter is a number between 0.0 (fully transparent) and 1.0 (not transparent at all).

https://www.w3schools.com/cssref/css_colors.php

https://developer.mozilla.org/en-US/docs/Web/CSS/color_value

Creating a color palette

https://www.canva.com/colors/
https://coolors.co/

CSS Typography

CSS Typography

- Font-Family
- Font-Size
- Font-Weight
- Font-Style
- Color
- Line-Height
- Text-Transform
- Text-Decoration
- Letter-Spacing

https://codepen.io/Klarence/pen/RNwNqpZ

CSS size units

CSS Size Units

- Pixels
- Ems & Rems
- Percentages
- Viewport Units

CSS Pixels

- **Pixels** (px)
  - 1px = 1/96th of 1in

Ems & Rems

- **Ems** (em)
  - The size of the character "m"
  - A relative size based on its parent container
- **Rems** (rem)
  - Root Em, the size of the character "m" on the root element (html)
    - Default is 16px for most browsers

CSS Viewport Units

- **Viewport Units**
  - vh - Viewport Height
  - vw - Viewport Width
  - vmin - the smaller of vw or vh
  - vmax - the larger of vw or vh

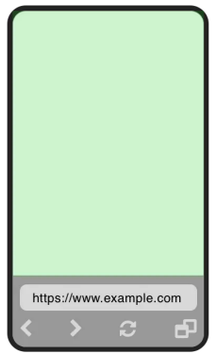
Relative to the size of the browser viewport.

New units Viewport Inline (vi) and Viewport Block (vb)
https://www.geeksforgeeks.org/new-css-viewport-units-vi-vb-vmax-vmin/

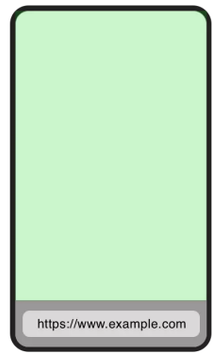
https://blog.webdevsimplified.com/2022-08/css-viewport-units/

CSS Viewport Units

- Viewport Unit Modifiers
  - s - Small
  - l - Large
  - d - Dynamic



Small viewport



Large viewport
(Browser controls retracted)

https://blog.webdevsimplified.com/2022-08/css-viewport-units/

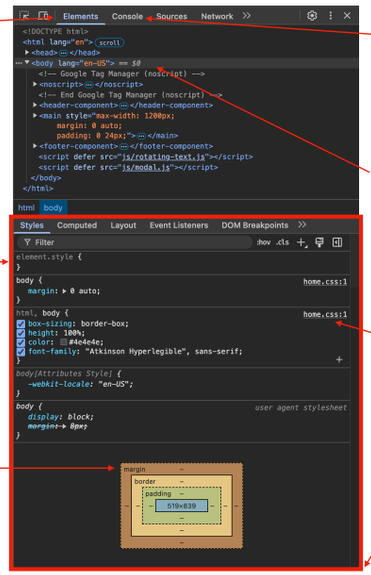
Browser Dev Tools

Inspect - Dev Tools

Elements Panel
Shows the DOM (HTML Structure) And the Style Pane by default.

element.style
You can apply temporary inline styles.
It will go away when the page is refreshed.
(click in between the brackets to edit)

Box Model
Lets you know the size of your elements content as well as any padding, border, and margin.



Console Panel
Mainly used for JavaScript, but it will notify you if there are issues linking to your images or CSS files

Highlighted Element
Let you know which element is selected and updates the below sub-panels (Styles).

Existing Selectors
You can also modify existing selectors

Styles Sub-panel
Mainly used for JavaScript, but it will notify you if there are issues linking to your images or CSS files

Go over the Computed and Layout Panes.

Chrome Inspect

- Keyboard Shortcut to open
  - Mac: cmd + shift + i
  - PC: ctrl + shift + i or F12
- Elements Panel
  - Prototyping
- Network Tab
  - Loading
- Lighthouse
- Performance

You can also right click o the website and select Inspect.

List Styling

https://codepen.io/Klarence/pen/mybZqjd

The Division & Span elements

`<div> | <span>`

The Division and Span Element

- and have no meaning
- They should only be used when no other elements make sense
- They are used to wrap content in order to apply styles to the nested elements.
  - is a **block** container *(by default)*
  - is a **inline** container *(by default)*

Demo span and div
https://codepen.io/Klarence/pen/KwKKXGr

Code Validation

https://validator.w3.org/#validate_by_input

https://jigsaw.w3.org/css-validator/#validate_by_input

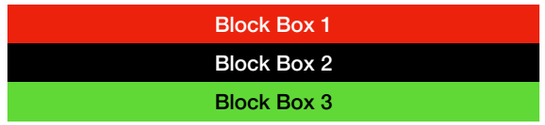
Website Checklist

https://docs.google.com/document/d/1X8zbE8bv-QmD_GZBkRXzh2cGK3QcKkcv6kMhr0H4EXE/edit?usp=sharing

The `display` Property

Display - Block

- **Block**
- Inline
- Inline-Block
- None



The element generates a block box, generating line breaks both before and after the element when in the normal flow.

Display - Inline

- Block
- **Inline**
- Inline-Block
- None

Inline Box 1 Inline Box Inline Box 3

The element generates one or more inline boxes that do not generate line breaks before or after themselves. In normal flow, the next element will be on the same line if there is space.

Display - Inline-block

- Block
- Inline
- **Inline-Block**
- None

The element generates a block box that will be flowed with surrounding content as if it were a single inline box.

Key
Inline Box 1
Inline-Block Box 2
Inline-Block Box 3

Display - None

- Block
- Inline
- Inline-Block
- **None**

Turns off the display of an element so that it has no effect on layout (the document is rendered as though the element did not exist).
All descendant elements also have their display turned off.

To have an element take up the space that it would normally take, but without actually rendering anything, use the visibility property instead.

Flexbox and CSS Grid will go over in depth later in the class.

Display - None

- Block
- Inline
- Inline-Block
- **None**

Turns off the display of an element so that it has no effect on layout (the document is rendered as though the element did not exist). All descendant elements also have their display turned off.

Block Box 1

Block Box 3

To have an element take up the space that it would normally take, but without actually rendering anything, use the visibility property instead.

Flexbox and CSS Grid will go over in depth later in the class.

Display - None

- Block
- Inline
- Inline-Block
- **None**

Turns off the display of an element so that it has no effect on layout (the document is rendered as though the element did not exist). All descendant elements also have their display turned off.
a11y: The element will be removed from the accessibility tree. This will cause the element and all its descendant elements to no longer be announced by screen reading technology.

To have an element take up the space that it would normally take, but without actually rendering anything, use the visibility property instead.

Flexbox and CSS Grid will go over in depth later in the class.

Display

- Block
- Inline
- Inline-Block
- None
- **Other Display Values**
  - **flex and grid**

Flexbox (aka flex)
is a layout method for arranging items in *rows* **OR** *columns*.
- 1-dimensional

CSS Grid (aka grid)
is a grid-based layout system, with *rows* **AND** *columns*.
- 2-dimensional

Display -
types for layouts

Flexbox (aka flex)

- is a layout method for arranging items in rows **OR** columns.
- 1-dimensional
- Focus: Alignment
- Good for Flexible Designs
  - content-first designs (components)
  - aligning, distributing, & ordering elements
  - small design implementations
  - elements can be shifted & moved around

CSS Grid (aka grid)

- is a grid-based layout system, with rows **AND** columns.
- 2-dimensional
- Focus: Grid Layout
- Good for complex designs with structure
  - Overlapping elements
  - Gaps between block elements
  - Precise positioning

Click on links in slide Flexbox and CSS Grid Sections.

You can use both Flexbox and Grid together (as well as the other display properties).
Before CSS Grid, I would often create nested flexbox containers in order to achieve a 2-dimensional layout.

The CSS Box Model

" Each HTML element you create in your HTML file is represented as a rectangular box.
The **content**, **padding**, **border**, and **margin** are built up around one another like the *layers of an onion*. "

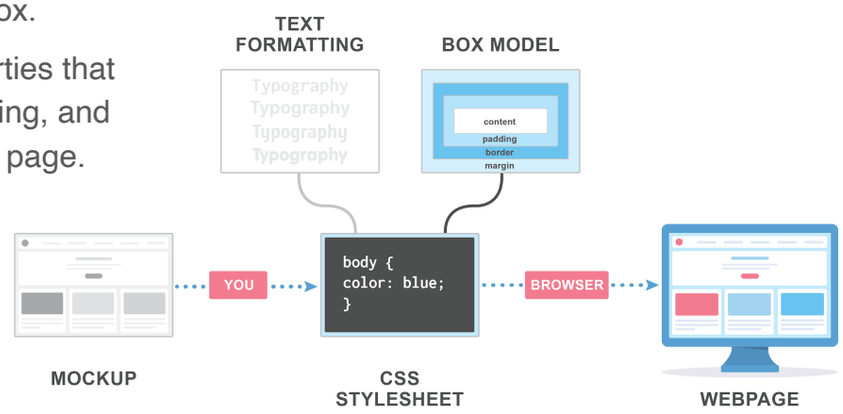
CSS Box Model

CSS calculates all the boxes on the page to display the content.

Just a bunch of boxes

CSS treats each element in your HTML document as a box.

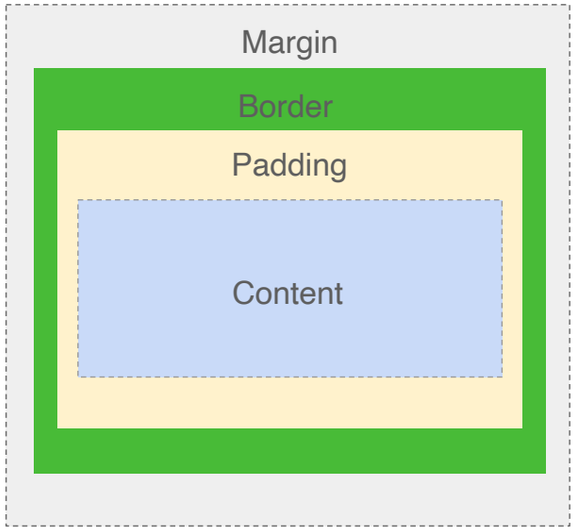
The box different properties that determine its size, spacing, and where it appears on the page.



Modified from AdobeStock_243484168
https://internetingishard.com/html-and-css/css-box-model/ (no longer exists)

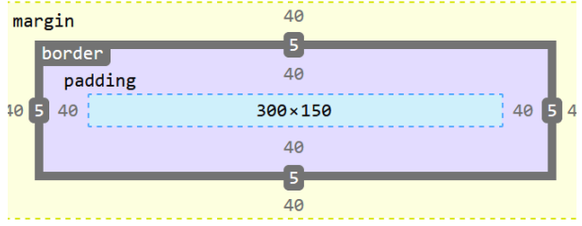
CSS Box Model

- **Content**: Content of the box where text and images appear.
- **Padding**: The padding clears a space for the content within it, but spaces the border and margin. It is completely transparent and can be defined using padding.
- **Border**: A border goes around the padding and the content. The border is affected by the background color of the box
- **Margin**: The empty area around the border. the margin is completely transparent and has no background color.



The Box Model

- Each element is made up of 4 boxes
  - content
  - padding
  - border
  - margin



https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/Styling_basics/Box_model#use_browser_devtools_to_view_the_box_model

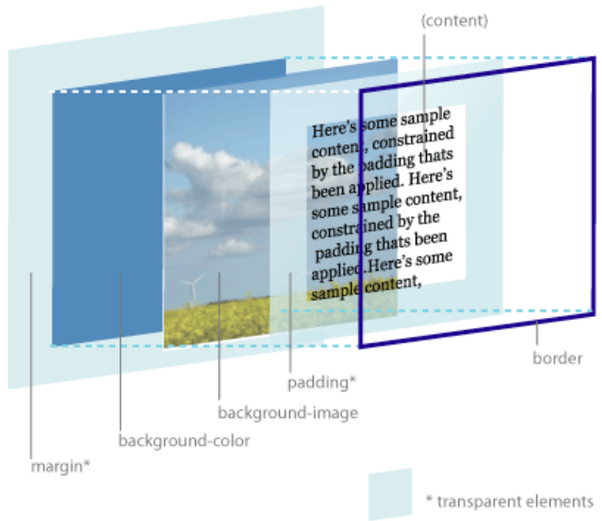
The CSS Box Model

Let's walk through the properties that affect the CSS box model:

- **Content inside your containers:** Text and images will both cause your box to expand to contain the content inside.
- **Height/Width**: Adding height and width to any of your elements will cause it to expand depending on what properties you set.
- **Margin**: Margin properties are used to create space outside elements. Margin will move your box away from other elements that surround it.
- **Padding**: Padding properties are used to expand space inside the box model.

CSS Box Model Hierarchy

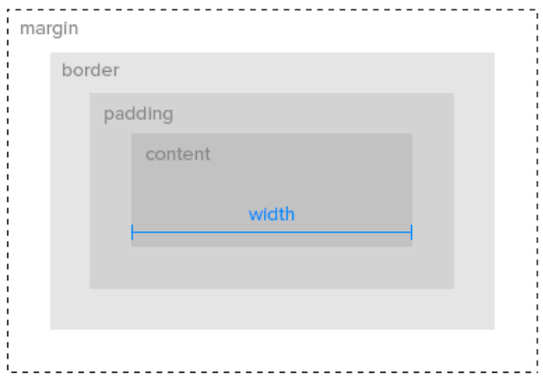
The box model is the building block of CSS. **Everything you see on the web is a rectangle.**



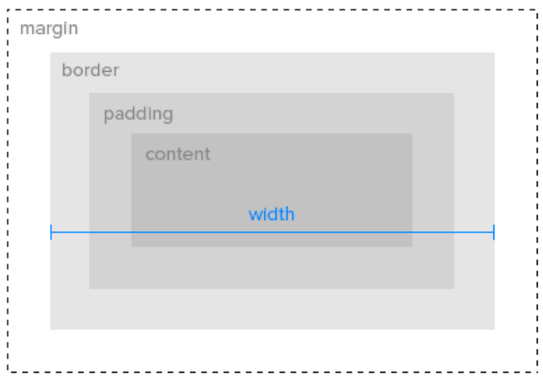
https://djnmarti.com/foothill/coin65/week_05/boxModel_diagramSummary.html
https://hackernoon.com/css-box-model-45ecf4ac219e

The box-sizing Property

(default)
`box-sizing: content-box;`



`box-sizing: border-box;`



Box-sizing - https://codepen.io/Klarence/pen/myVrOqy
By default when you use height or width you are setting the width of the content.
This can be confusing since the visual portion of a box (excludes margin) is bigger than the width/height you specify.
You need to add the padding and the border (both sides).

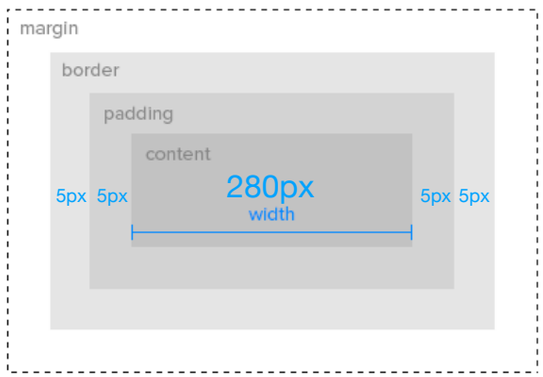
You can change the default behavior for the width and height to apply to the border by using box-sizing: border-box;

T, R, B, L - You can remember the order by associating it with clockwise or the sentence:
If you forgot the order you are in TRouBLe.

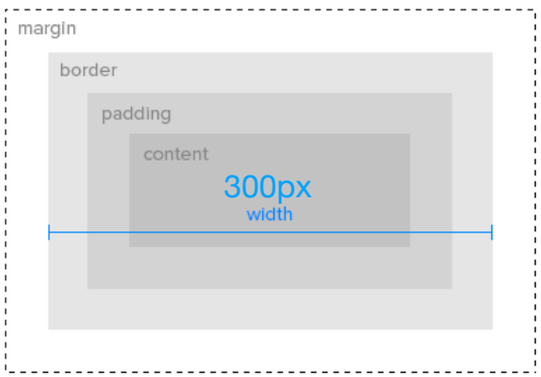
https://stackoverflow.com/questions/44453391/what-is-the-difference-between-border-box-and-content-box-in-css

The box-sizing Property

(default)
`box-sizing: content-box;`



`box-sizing: border-box;`



Box-sizing - https://codepen.io/Klarence/pen/myVrOqy
Margin Collapse and inline Whitespace - https://codepen.io/Klarence/pen/JoGRbWm
By default when you use height or width you are setting the width of the content.
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If you forgot the order you are in TRouBLe.

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Link States

Link States

Order Matters

a {}

a:visited {}

a:hover {}

a:focus {}

a:active {}

The order that you put your link states matter.
If you put them in the wrong order, bugs may happen.

a:active is the pressed state.

Link States

Order Matters

a {}

a:visited {}

a:hover {}

a:focus { }

a:active {}

a:focus-visible { }

a:focus-within { }

a:target { }

There are additional focus states that were added.
a:focus-visible { }
a:focus-within { }
a:target { }
These are outside the scope of the book.

Web Fonts

Web Fonts

- Cloud Hosted (Google, Adobe, etc.)
- Does Font Mapping for you

https://fonts.google.com/
https://css-tricks.com/snippets/css/using-font-face-in-css/

Font Mapping

In a font-family, you need to **map** each family member with its **weight** and **style**.

```
@font-face {
    font-family: "MyWebFont";
    src: url("fonts/myfont-regular.woff2") format("woff2"),
      url("fonts/myfont-regular.woff") format("woff");
    font-weight: 400;
    font-style: normal;
}
```

Font Mapping

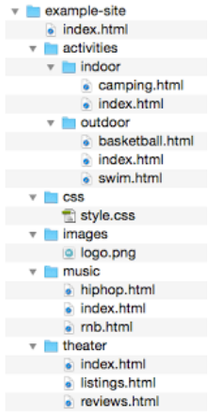
```
@font-face { font-family: 'MyWebFont';
        src: url('myfont-thin.woff2') format('woff2');
        font-weight: 100; }

@font-face { font-family: 'MyWebFont';
        src: url('myfont-light.woff2') format('woff2');
        font-weight: 300; }

@font-face { font-family: 'MyWebFont';
        src: url('myfont-regular.woff2') format('woff2');
        font-weight: 400; // normal }

@font-face { font-family: 'MyWebFont';
        src: url('myfont-bold.woff2') format('woff2');
        font-weight: 700; // bold }

@font-face { font-family: 'MyWebFont';
        src: url('myfont-black.woff2') format('woff2');
        font-weight: 900;}
```

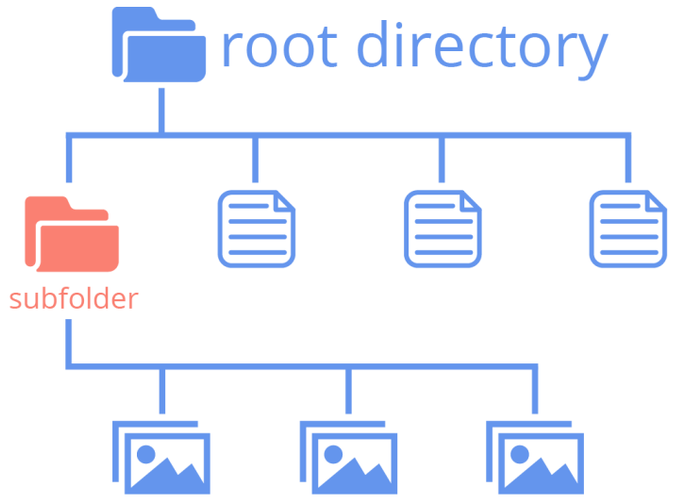
```
@font-face { font-family: 'MyWebFont';
        src: url('myfont-thin-italic.woff2') format('woff2');
        font-weight: 100; font-style: italic; }

@font-face { font-family: 'MyWebFont';
        src: url('myfont-light-italic.woff2') format('woff2');
        font-weight: 300; font-style: italic; }

@font-face { font-family: 'MyWebFont';
        src: url('myfont-italic.woff2') format('woff2');
        font-weight: 400; font-style: italic; }

@font-face { font-family: 'MyWebFont';
        src: url('myfont-bold-italic.woff2') format('woff2');
        font-weight: 700; font-style: italic; }

@font-face { font-family: 'MyWebFont';
        src: url('myfont-black-italic.woff2') format('woff2');
        font-weight: 900; font-style: italic;}
```

https://codepen.io/Klarence/pen/RNwNqpZ

File Structure & File Trees

File Structure & File Trees

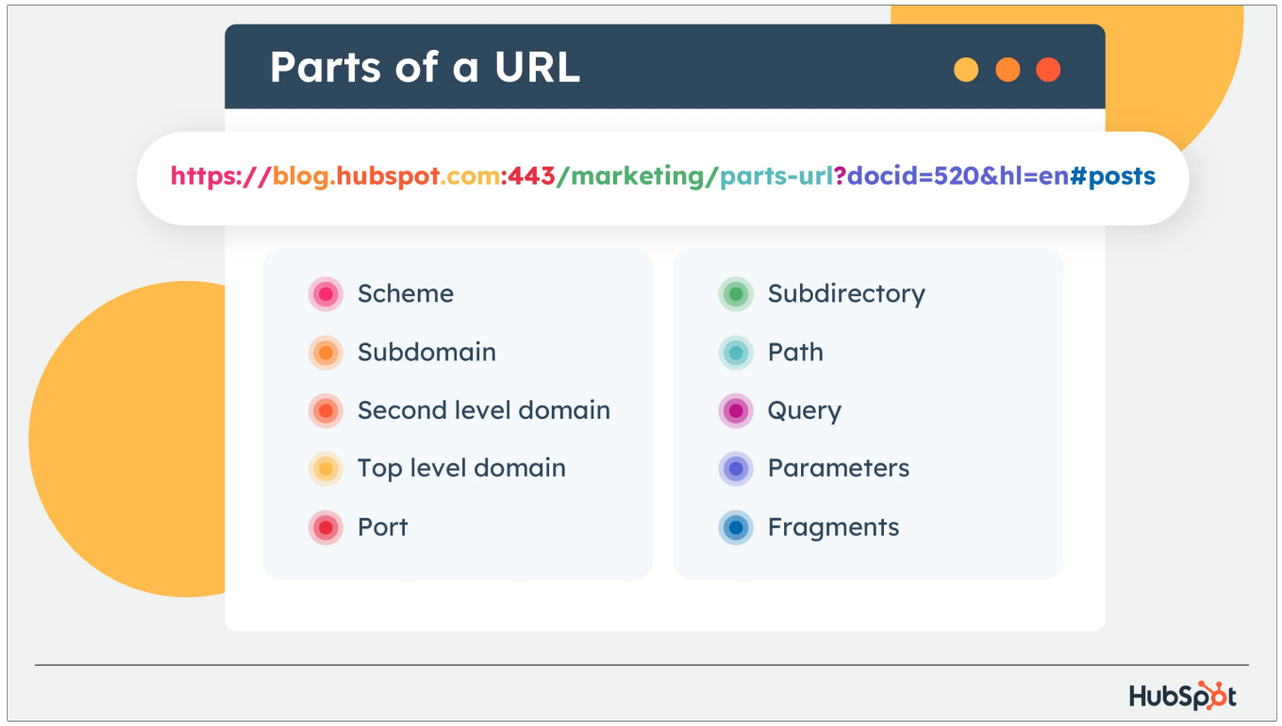




You don’t need to add the file name to a URL if it is **index.html**.

If a url route ends with a subdirectory instead of a file,
the browser will look for an index.html in that directory to display.

https://blog.hubspot.com/marketing/parts-url



https://blog.hubspot.com/marketing/parts-url

Navigation Styling

https://codepen.io/Klarence/pen/mydPONN

https://htmlandcssguidebook.com/advanced/responsive-nav/

Shared CSS

Shared CSS

You can reference a single CSS file, in multiple HTML files

Show base styles on how multiple html files are referenced.

Background Images

Background Images

- `background-image: url("");`
- Good for background patterns and textures
- Do NOT use for actual content
  - If you must, use ARIA attributes
    - `role="img"`
    - `aria-label="alt text"`

Link to Adding Images

https://www.magicpattern.design/tools/css-backgrounds

https://www.transparenttextures.com/

Fluid Width

Fluid Design

Allows content to scale and reflow automatically
regardless of device size (viewport).

- Uses percentage-based widths for elements.
  - Best practice on the web is to avoid horizontal scrolling
    - Only setting fluid widths. no heights, unless you want a scrollbar
- Provides a smooth transition across different screen sizes.
- Considered a core component of responsive design.

https://www.youtube.com/watch?v=-vDf7xDVDe0

While both responsive design and fluid design aim to adapt a website layout to different screen sizes, the key difference is that responsive design uses predefined breakpoints to adjust the layout at specific screen sizes using CSS media queries, while fluid design scales proportionally across all screen sizes without fixed breakpoints, relying primarily on relative units like percentages to adjust content size and placement. - Google AI

Fluid Width

- Percentage widths
- Using min-width & max-width
  - Not setting width

Well go over **flex integers** (ratio) and the similar **grid fractional unit** later in future classes.

Fixed, Responsive, Adaptive & Fluid

Fixed

- Scrolling / things may get cut off
- panning and zooming on mobile

Responsive

- Elements Stack, adjust layout on different screen sizes

Adaptive

- Breakpoints (Media Queries)
- for different Device Sizes (Mobile, Tablet, Laptop, etc.)

Fluid

- Scalable type and dimensions
- Smooth transition

https://www.youtube.com/watch?v=-vDf7xDVDe0

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A "fixed" design maintains a static layout regardless of screen size, while a "responsive" design dynamically adjusts to different screen sizes using fluid grids and media queries; a "fluid" layout primarily uses percentage-based widths to scale proportionally with the screen, and an "adaptive" design offers predefined layouts for specific screen sizes, providing more control over how content appears on different devices.
Key Differences:
Fixed Design:
Static layout with set pixel dimensions.
No adjustments based on screen size, may lead to large empty spaces on larger screens.
Simplest to implement but not user-friendly on various devices.
Fluid Design:
Uses percentage-based widths for elements, allowing them to scale proportionally with the screen.
Provides a smooth transition across different screen sizes.
Considered a core component of responsive design.
Responsive Design:
Combines fluid grids, media queries, and flexible image scaling to optimize for various devices.

Dynamically adjusts layout based on screen size using CSS rules.
Considered the most user-friendly approach for diverse devices.
Adaptive Design:
Predefined layouts for specific screen size breakpoints.
Offers more control over how content appears on each device compared to fully responsive design.
May require creating multiple versions of the layout for different screen sizes.

Fixed, Responsive, Adaptive & Fluid

Fixed

- Static layout with set pixel dimensions.
- No adjustments based on screen size, may lead to large empty spaces on larger screens.
- Simplest to implement but not user-friendly on various devices.

Responsive

- Combines fluid grids, media queries, and flexible image scaling to optimize for various devices.
- Dynamically adjusts layout based on screen size using CSS rules.
- Considered the most user-friendly approach for diverse devices.

Adaptive

- Predefined layouts for specific screen size breakpoints.
- Offers more control over how content appears on each device compared to fully responsive design.
- May require creating multiple versions of the layout for different screen sizes

Fluid

- Uses percentage-based widths for elements, allowing them to scale proportionally with the screen.
- Provides a smooth transition across different screen sizes.
- Considered a core component of responsive design.

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While both responsive design and fluid design aim to adapt a website layout to different screen sizes, the key difference is that responsive design uses predefined breakpoints to adjust the layout at specific screen sizes using CSS media queries, while fluid design scales proportionally across all screen sizes without fixed breakpoints, relying primarily on relative units like percentages to adjust content size and placement. - Google AI

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Position

https://codepen.io/Klarence/pen/VYwGqjp

Document Flow

Document Flow describes the default way block and inline elements are laid out and affect each other.

- By default, elements have `position: static;`
  - Positioning properties don't work (`top`, `right`, `bottom`, `left`)

Z-index also doesn't work on static position.

Position Basics

The `position` Values

- `static` (default)
- `relative`
- `absolute`
- `fixed`
- `sticky`

Properties for Positioning

- `top`, `right`, `bottom`, `left`
  - Doesn't work with `static`

Position

	Static (default)	**Relative**	**Absolute**	**Fixed**	**Sticky**
Doc Flow	Normal Flow	Normal Flow Leaves space	Out of Flow Removes Space	Out of Flow Removes Space	Normal Flow Leaves space
Position Offset (Top/Bottom & Left/Right)	-	Relative to itself	Relative to 1st parent container w/ `position:relative;`	Relative to the browser window	Same as Relative but becomes Sticky to remain on page

Position Offset does not work in static.

Forms

https://codepen.io/Klarence/pen/pvoOyWR?editors=1010

Forms

Forms are used to gather input data from users of websites. Like contact forms and checking out of an e-commerce site.

<form action="./submit-form.js" method="post">

// ... All the form inputs and data

</form>

All forms should have an action.
The action should trigger a method/open a file or reference the page that the user is on.
The default action is #, which means the same page the user is on.

The method attribute's default value is get.

Forms - Input

```
<input type="text" name="firstName"/>
```

Common type values
- text
- email
- url
- number
- password
- range
- file
- submit

The type attribute differentiates what type of input to display.

Forms - Input

<input type="text" name="firstName"/>

The name attribute is used to associate the data for an input for a form.

The name attribute is used by the form to send the data in the input to the backend server.

Forms - Input Labels

All form inputs should have a label.

```
<label>
  First Name
  <input type="text" name="firstName"/>
</label>
```

```
<label for="lastName">Last Name</label>
<input type="text" name="lastName" id="lastName"/>
```

Forms - Input Labels

All form inputs should have a label.

```
<label>
  First Name
  <input type="text" name="firstName"/>
</label>
```

```
<label for="lastName">Last Name</label>
<input type="text" name="lastName" id="lastName"/>
```

1. Implicit Association
2. Explicit Association with for and id attributes matching. (recommended, in case folks refactor the code)

Labels are good for Accessibility and Usability.
Some forms try to save space by using placeholders instead of labels. This is considered a bad practice as users often forget what was there after the placeholder disappears. This is often even more problematic for those with cognitive disabilities.

Clicking on a label for a checkbox or a radio button will interactive as if you clicked on the actual form element the large is associated with. This is helpful because off the size of those interactive elements.

Forms - Dropdown

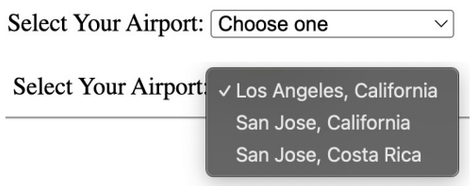
```
<label>Select Your Airport
  <select name="airport">
        <option value="LAX">Los Angeles, California</option>
        <option value="SJC">San Jose, California</option>
        <option value="SJO">San Jose, Costa Rica</option>
  </select>
</label>
```

The select element displays the dropdown.
The option elements nested inside
The form will submit the value instead of the text in the selected option.

The <select> element can now be customized with CSS, March 24, 2025
https://developer.chrome.com/blog/a-customizable-select

Forms - Dropdown

```
<label>Select Your Airport
  <select name="airport">
        <option disabled hidden selected>Choose one</option>
        <option value="LAX">Los Angeles, California</option>
        <option value="SJC">San Jose, California</option>
        <option value="SJO">San Jose, Costa Rica</option>
  </select>
</label>
```



Note: hidden attribute doesn't work in Safari

https://htmlandcssguidebook.com/html/forms/#showing-a-grayed-out-first-option

Forms - Textarea

```
<label>Tell us about yourself:
  <textarea name="selfDesc"></textarea>
</label>
```

The textarea element is useful for when a user will enter multiple lines of text.

Submitting Forms

```
<input type="submit" value="Submit" />
<button type="submit">Submit</button>
```

The first <button> tag (without a specified type) will implicitly submit the form.
Also keep in mind the ENTER key can submit a form.

Clearing Form Values

```
<input type="reset" value="Reset" />
<button type="reset">Reset</button>
```

Note: many users find this annoying.

I think a lot of people accidentally clear the form.

Think about the user experience and whether clearing the form is useful feature for your use case.

Common Attributes

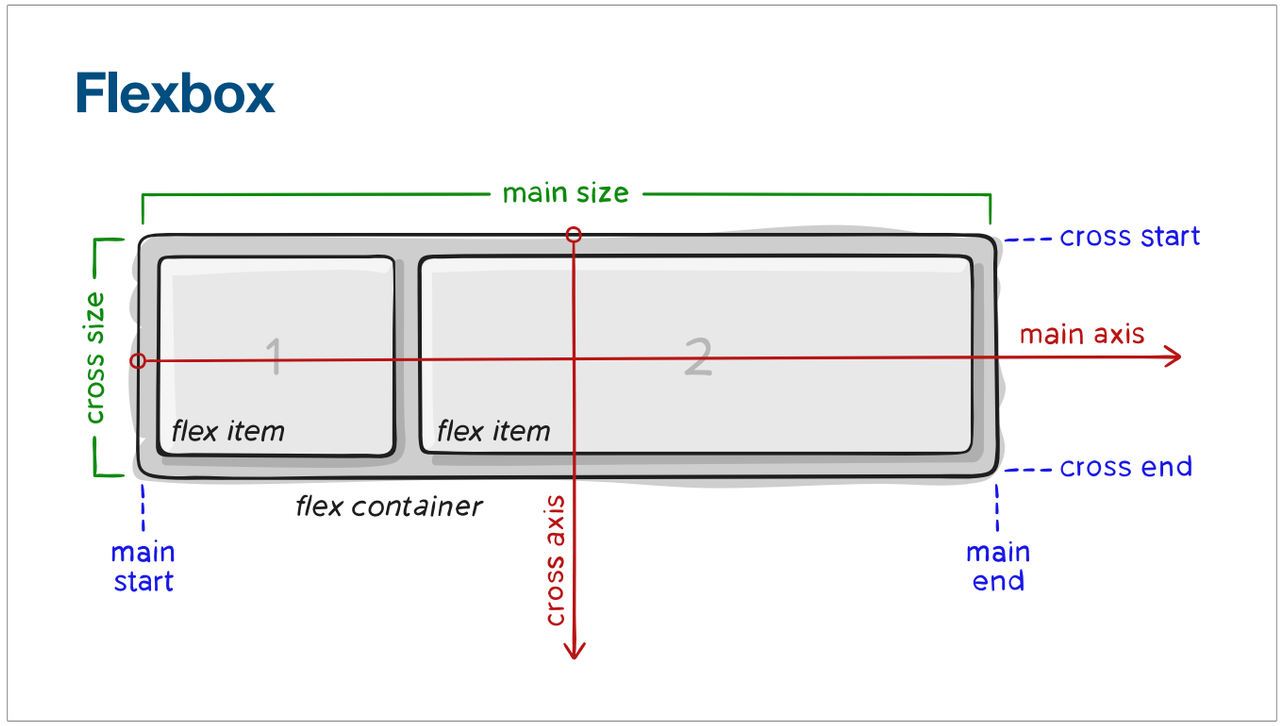
- <input type="text" required>
- <input type="text" disabled>
- <input type="text" placeholder="Example or Hint Text">

required and disabled are boolean attributes

placeholders - Do not replace labels. Use them to provide concise, helpful hints or examples without replacing labels

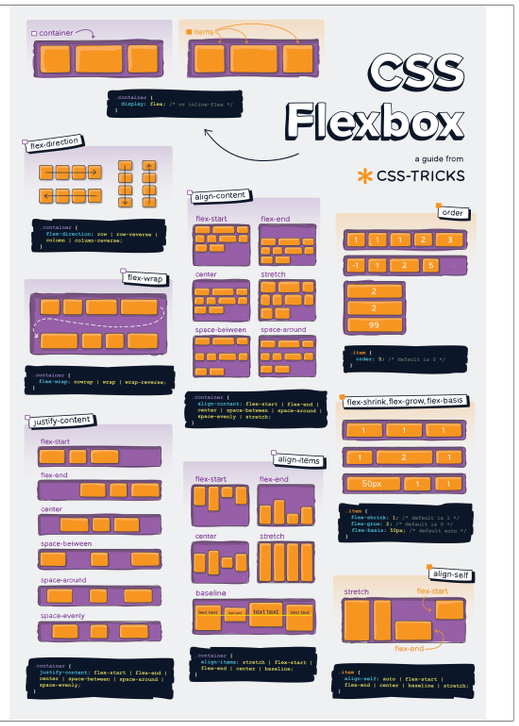
Flexbox

https://codepen.io/bwhitener/pen/MWeYLbV
https://css-tricks.com/snippets/css/a-guide-to-flexbox/
https://www.joshwcomeau.com/css/interactive-guide-to-flexbox/



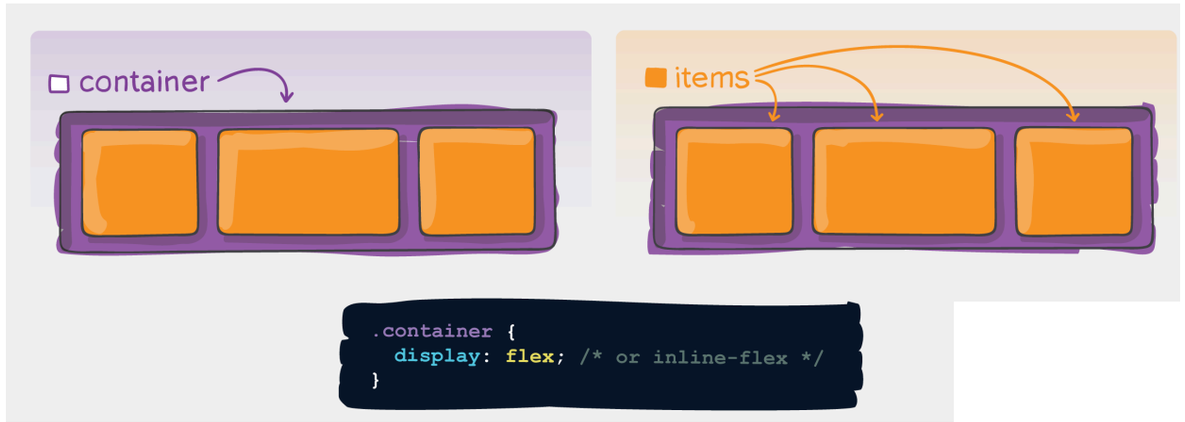
By default the main axis is horizontal and left-to-right.
By default the cross axis is vertical and top-to-bottom.

Flexbox



https://css-tricks.com/wp-content/uploads/2022/02/css-flexbox-poster.png
https://css-tricks.com/snippets/css/a-guide-to-flexbox/

Flexbox



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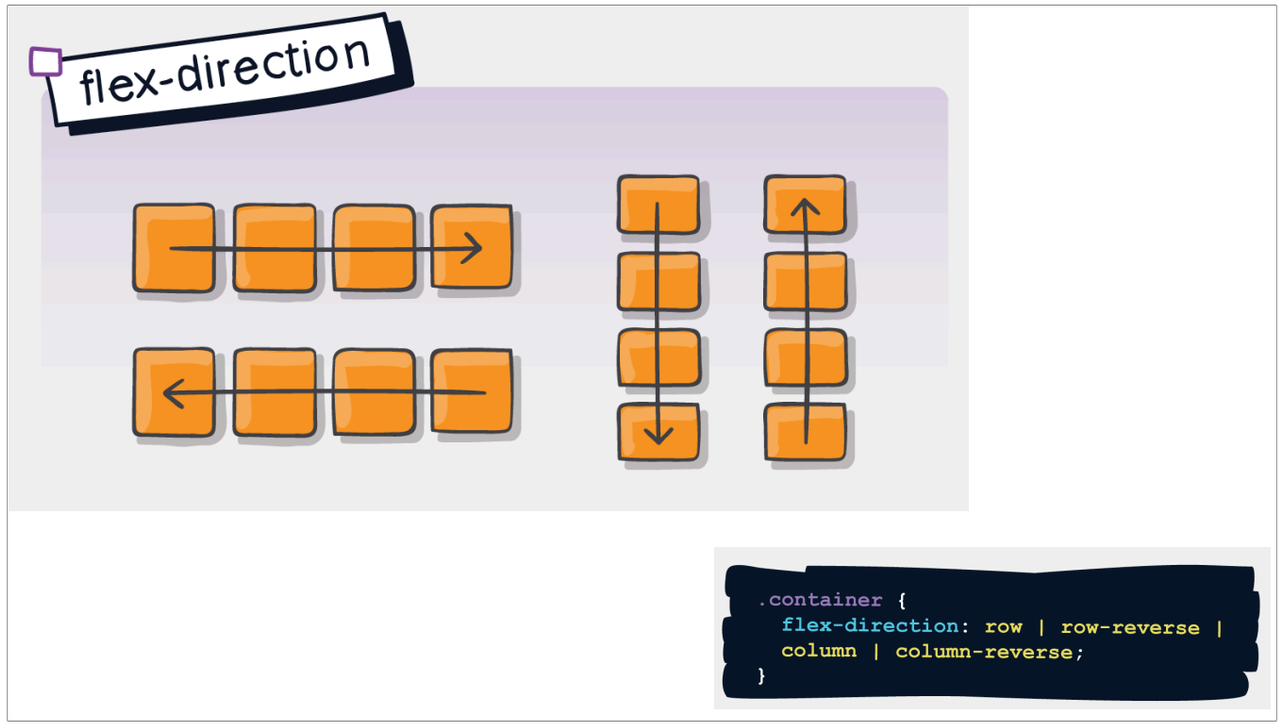

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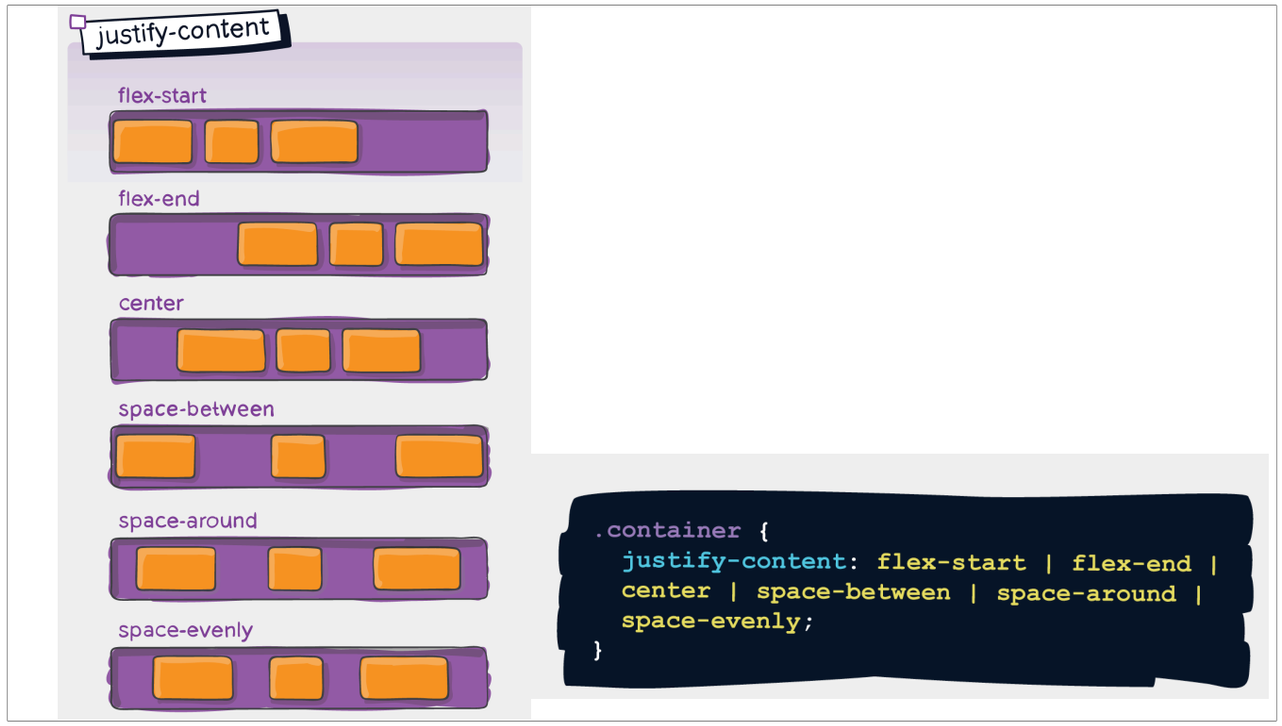

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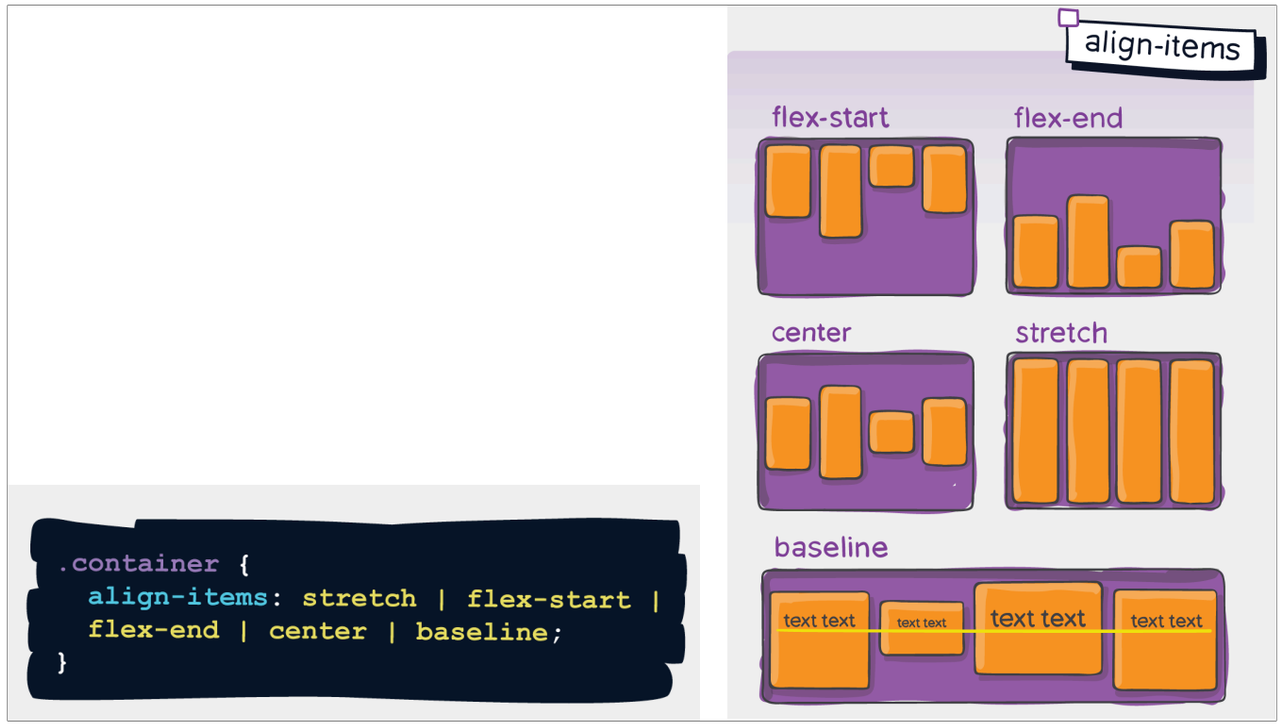
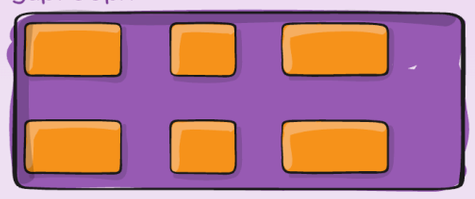


https://css-tricks.com/wp-content/uploads/2022/02/css-flexbox-poster.png
https://css-tricks.com/snippets/css/a-guide-to-flexbox/

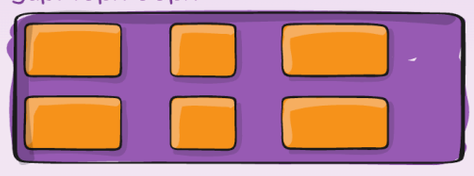
gap, row-gap, column-gap

gap: 10px

gap: 30px



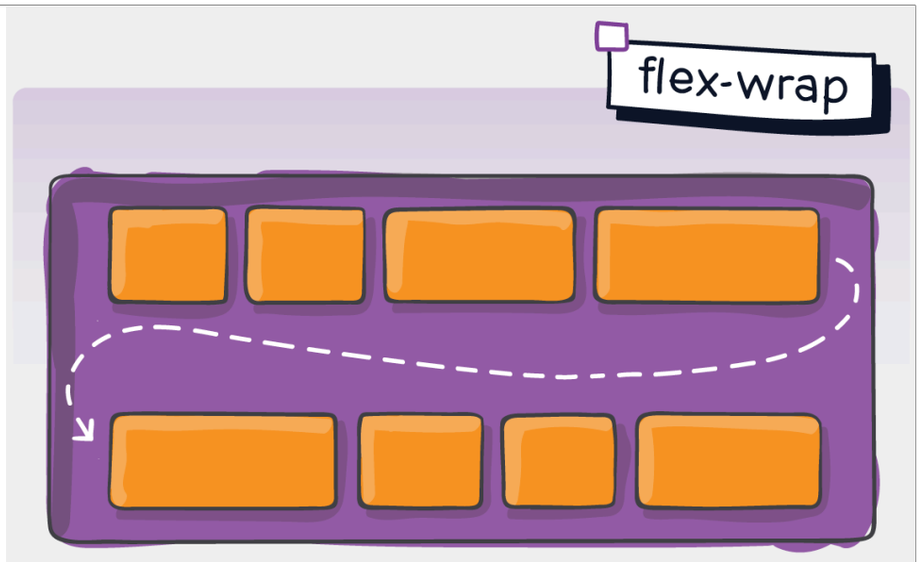
gap: 10px 30px



```css
.container {
  display: flex;
  ...
  gap: 10px;
  gap: 10px 20px; /* row-gap column gap */
  row-gap: 10px;
  column-gap: 20px;
}
```

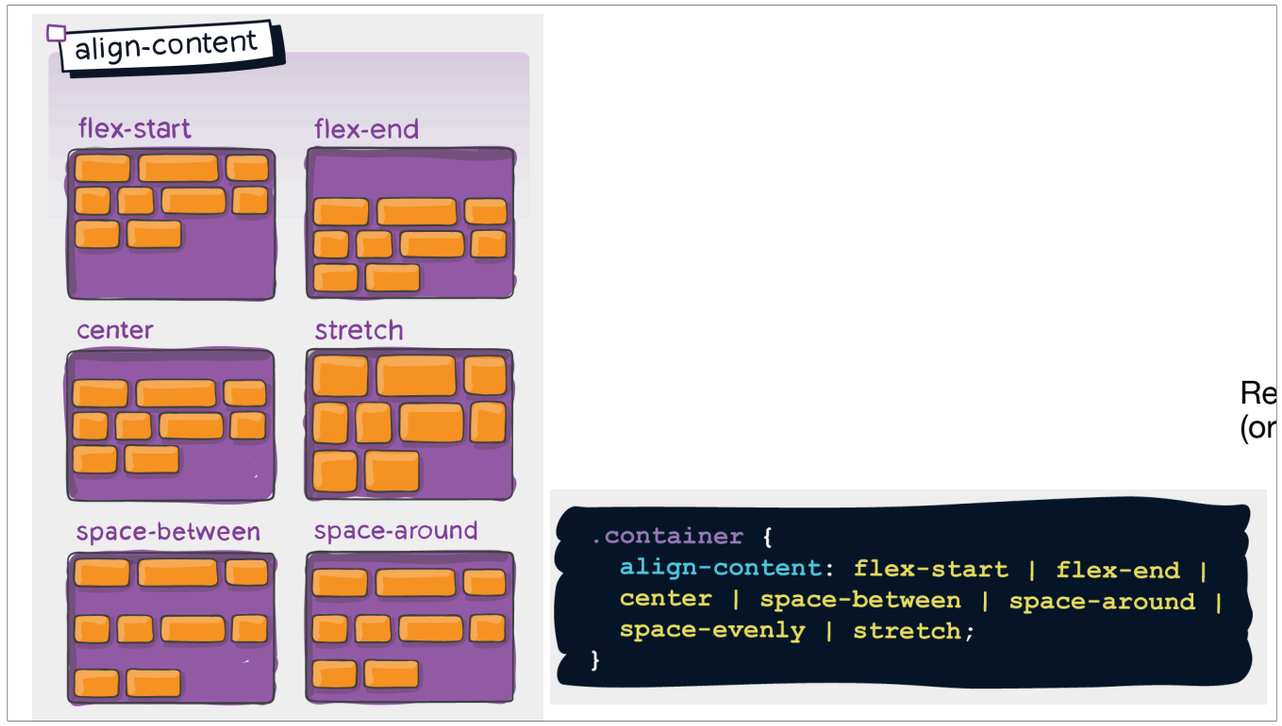
https://css-tricks.com/wp-content/uploads/2022/02/css-flexbox-poster.png
https://css-tricks.com/snippets/css/a-guide-to-flexbox/

Flexbox




```
.container {
  flex-wrap: nowrap | wrap | wrap-reverse;
}
```

https://css-tricks.com/wp-content/uploads/2022/02/css-flexbox-poster.png
https://css-tricks.com/snippets/css/a-guide-to-flexbox/



Re
(or

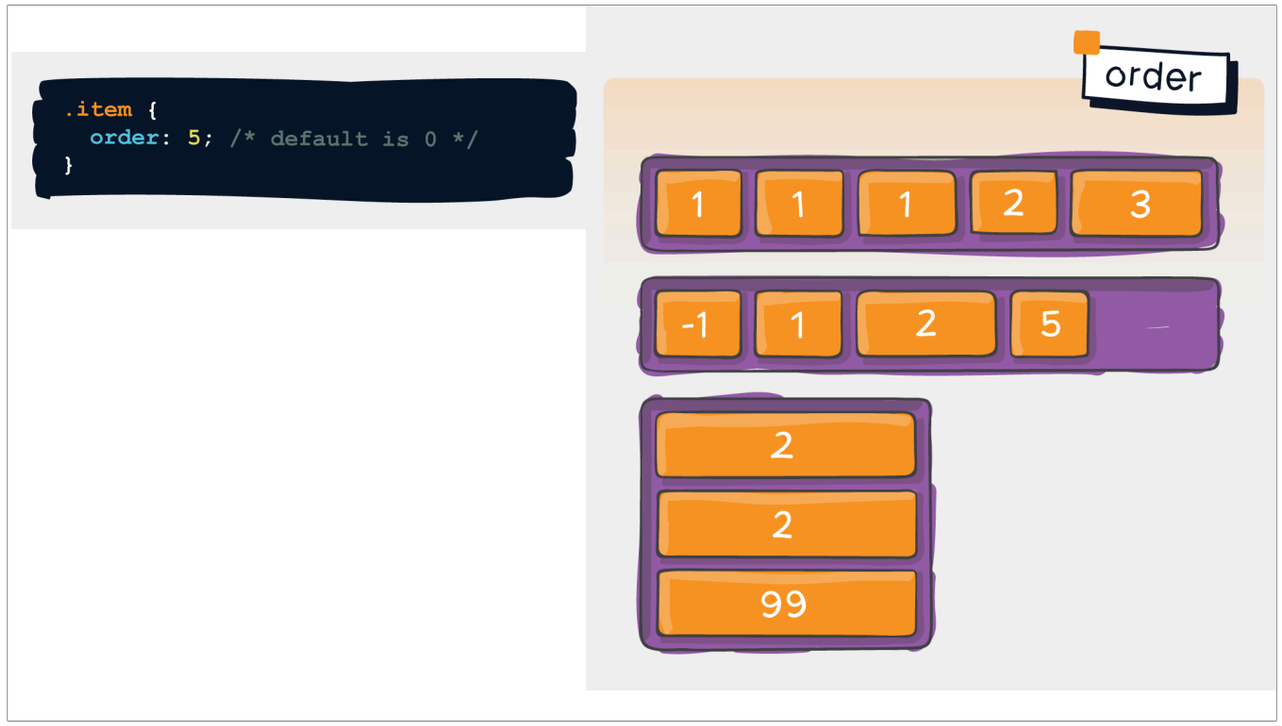
https://css-tricks.com/wp-content/uploads/2022/02/css-flexbox-poster.png
https://css-tricks.com/snippets/css/a-guide-to-flexbox/

align-content - must have flex-wrap: wrap/wrap-reverse;

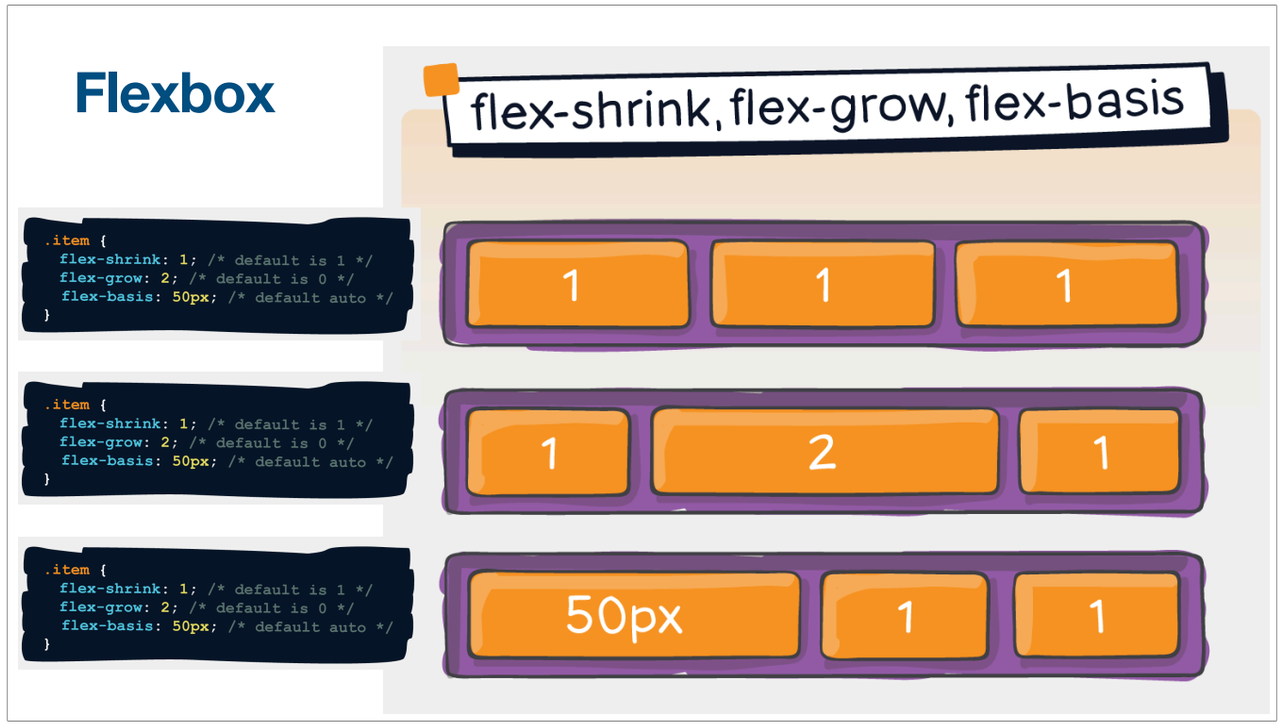
Flexbox

Flex-item Attributes

Some less common attributes are set on the flex-item.

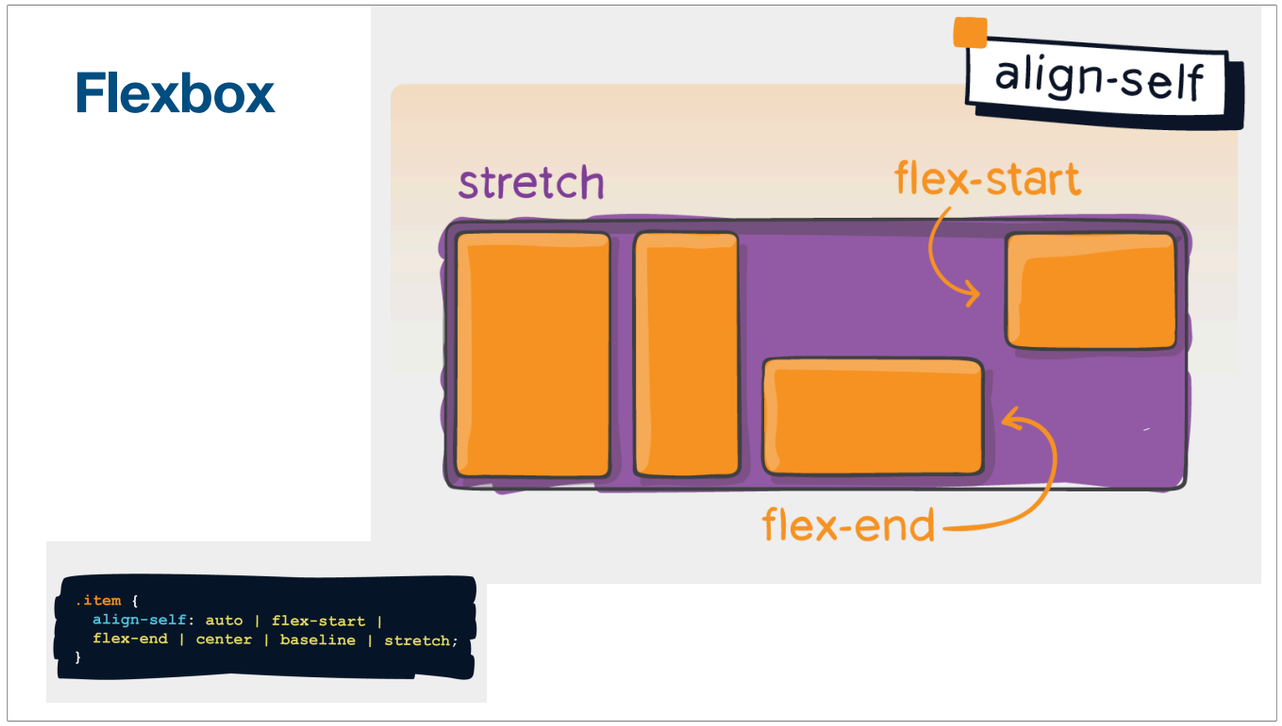


https://css-tricks.com/wp-content/uploads/2022/02/css-flexbox-poster.png
https://css-tricks.com/snippets/css/a-guide-to-flexbox/



https://css-tricks.com/wp-content/uploads/2022/02/css-flexbox-poster.png
https://css-tricks.com/snippets/css/a-guide-to-flexbox/

Flex-basis - pretty much the same as width/height (depending on flex-direction is row or column)



https://css-tricks.com/wp-content/uploads/2022/02/css-flexbox-poster.png
https://css-tricks.com/snippets/css/a-guide-to-flexbox/

Annotate a Website

CSS Grid

https://codepen.io/Klarence/pen/jEEEMvp
https://css-tricks.com/snippets/css/complete-guide-grid/#aa-important-css-grid-terminology
https://www.joshwcomeau.com/css/interactive-guide-to-grid/
https://cssgridgarden.com/

Table Layout

```
<table>
 <tr>
  <th colspan="4">
   Header
  </th>
 </tr>
 <tr>
  <td colspan="2">
   Main
  </td>
  <td></td>
  <td>Sidebar</td>
 </tr>
 <tr colspan="4">
  <td>Footer</td>
 </tr>
</table>
```

Grid Frameworks

```
<div class="container">
 <div class="row">
  <header class="col-12">
   Header
  </header>
 </div>
 <div class="row">
  <main class="col-6">
   Main
  </main>
  <aside class="col-3 push-3">
   Sidebar
  </aside>
 </div>
 <div class="row">
  <footer class="col-12">
   Footer
  </footer>
 </div>
</div>
```

CSS Grid

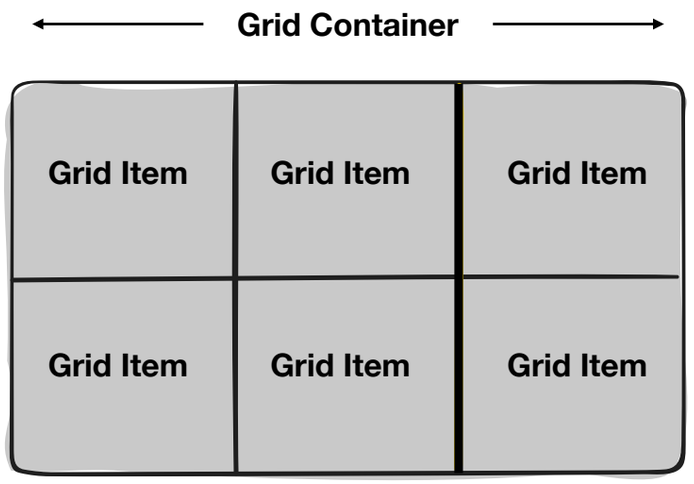
```
<div class="container">
 <header class="header">Header</header>
 <main class="main">Main</main>
 <aside class="sidebar">Sidebar</aside>
 <footer class="footer">Footer</footer>
</div>
```

When before layout techniques were created, folks used the table element to create layouts out of necessity.

Popular Frameworks like Bootstrap and Foundation used premade CSS classes to set elements (or their containers) to a grid.

CSS Grid

Terminology



CSS Grid
A 2 dimensional layout system that can handle both columns and rows.

Grid Container (Parent)
The container element to which most grid properties should be applied (including display: grid;). This should be the direct parent to the elements that will be arranged into grid cells.

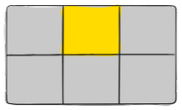
Grid Item (Children)
The direct child elements to the grid parent. These are the elements that will be arranged to fit in the grid cells.

CSS Grid

Terminology

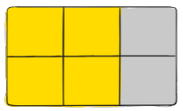
Grid Lines
The lines that defined the edges of grid columns or rows. These are numbered from left to right and top to bottom, respectively. They are important for positioning individual grid children into specific grid cells.

Grid Cells
The spaces defined by the intersections of grid columns and grid rows, similar to the cells in a spreadsheet. The grid children are arranged into these.



Grid Track
The space between two adjacent grid lines. You can think of them as the columns or rows of the grid. Here's the grid track between the second and third-row grid lines.

Grid Area
The total space surrounded by four grid lines. A grid area may be composed of any number of grid cells. Here's the grid area between *row* grid lines 1 and 3, and *column* grid lines 1 and 3

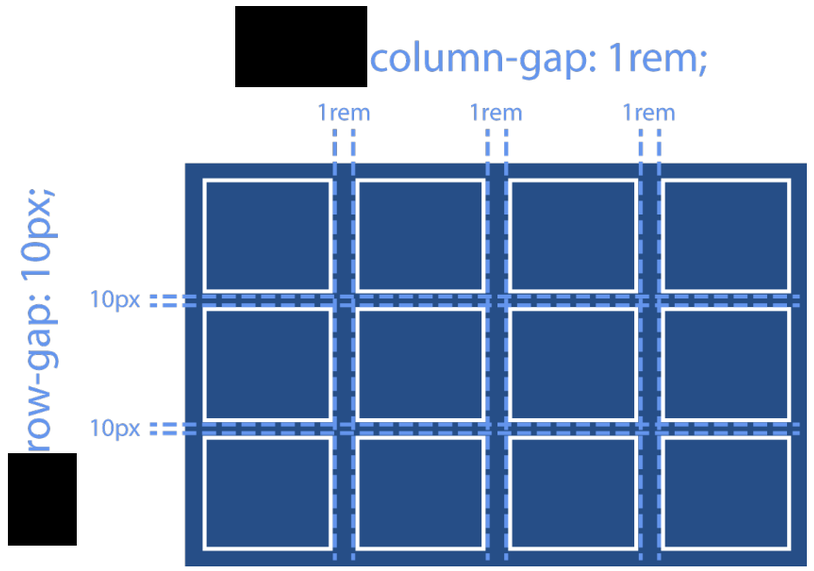


CSS Grid

Gap

Gap

Specifies the size of the grid lines. You can think of it like setting the width of the gutters between the columns & rows.



gap (formerly grid-gap)
gap: 1rem 10px;
Is a shorthand for row-gap and column-gap

If no row-gap is specified, it’s set to the same value as column-gap

NOTE: grid-row-gap and grid-column-gap should still work, but the syntax has been deprecated.

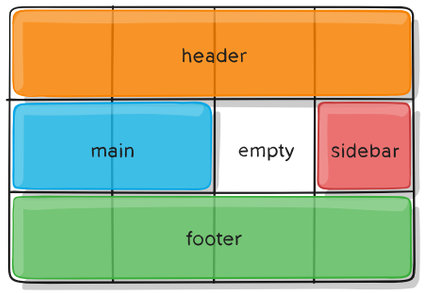
CSS Grid

Template

The **grid-template-columns** and **grid-template-rows** properties allow us to define any number of columns or rows, respectively, into which the **grid-child** elements will be placed.

Sometimes you will **grid-template-rows** set to **auto**, or you may not see it at all. This is because rows don't nee to be set explicitly and if you have have additional elements after your last column, a new row will be created implicitly.

```
.parent-container {
  width: 1000px;
  display: grid;
  grid-template-columns: 1fr 250px 15.625rem 25%;
  grid-template-rows: 1fr 250px 33%;
 }
```



You can set different unit values for each column in grid-template-columns (same for grid-template-rows).

Grid comes with fractional (fr) units, which uses up a fraction of the remaining grid space.

CSS Grid

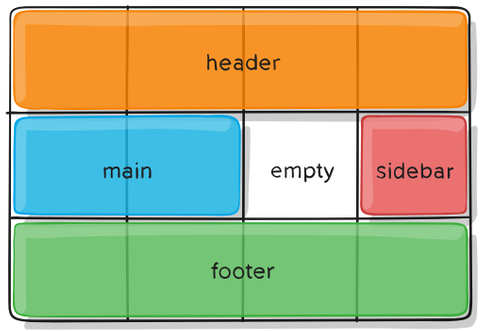
Placement

The **grid-column** and **grid-row** properties assigns each grid item to a place on the grid by specify the grid line numbers.

The long hand versions are **grid-row-start**, **grid-row-end**, **grid-column-start**, and **grid-column-end**.

```
.header {
  grid-column: 1 / 5;
  grid-row: 1 / 2;
 }

.main {
  grid-column-start: 1;
  grid-column-end: 3;
  grid-row-start: 2;
  grid-row-end: 3;
 }
```



You can set different unit values for each column in grid-template-columns (same for grid-template-rows)

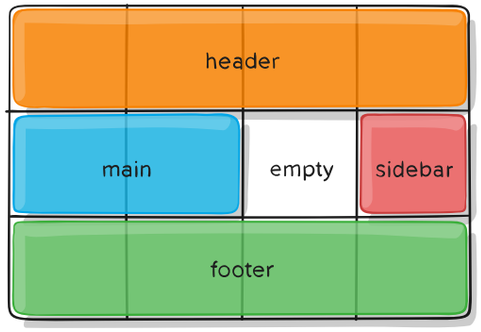
CSS Grid

Assigning Items

Another way of assigning children items to grid-cells is a named **grid-area,**
created with **grid-template-areas**

```
.parent-container {
  display: grid;
  grid-template-columns: 1fr 250px 15.625rem 25%;
  grid-template-rows: 1fr 250px 33%;
  grid-template-areas:
    "header header header header"
    "main main . sidebar"
    "footer footer footer footer"
 }
.header {
  grid-area: header;
 }

.main {
  grid-area: main;
 }
```



The dot (period, ".") is used to indicate an empty grid-cell.
If you are a visual person this will be a lot easier for you.

Grid Item **Alignment**

https://css-tricks.com/snippets/css/complete-guide-grid/#aa-important-css-grid-terminology
https://www.joshwcomeau.com/css/interactive-guide-to-grid/

CSS Grid

Alignment

By default, columns and rows stretch to fill the grid container.

However, if the grid container is larger than the width of all the columns you can align the columns using **justify-content**.
If it is larger than the height of all the rows than you can use **align-content**.

Likewise you can align a grid item inside of a grid-area using;
justify-items (for horizontal alignment - column)
align-items (for vertical alignment - row).

If you want to align an individual grid-item, you can use **justify-self** and **align-self**.

A grid-area can be a set of multiple columns/rows (or it could be a single column/row).

CSS Grid

Alignment

Justify	Columns
Align	Rows
Content	Grid Container (Parent)
Items	Grid Items (Children)

If a property contains a certain word, it is associated with a part of the grid.

CSS Grid

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A grid-area can be a set of multiple columns/rows (or it could be a single column/row).

Media Queries &
Mobile-first Design

Mobile First

Layouts for mobile are often much less complex than those for larger sizes.

Mobile First - start with CSS for the smallest possible size and add complexity with media queries for larger and larger viewports

https://htmlandcssguidebook.com/css/responsive/

Mobile First is considered a best practice.

Media Queries

Conditional CSS.

A media query is basically an if statement for CSS.

"If the criteria here are met, apply the CSS contained within."

```
@media media type and (condition: breakpoint) {
    // CSS rules
}
```

https://htmlandcssguidebook.com/css/responsive/

Mobile First is considered a best practice.

Media Queries

Media Types

- **screen**—for computer screens, tablets and, smart-phones
- print—for printers
- all—for all media types
- speech—for screen readers that “read” the page out loud

```
@media screen and (min-width: 1024px) {
    // CSS rules for desktop and larger
}
```

https://htmlandcssguidebook.com/css/responsive/

Mobile First is considered a best practice.

If you see "only screen", this was used to hide the styles from older browsers. https://stackoverflow.com/a/14168210/4267591

Media Queries

Common Breakpoints Sizes

- 320px – Small mobile (portrait)
- 480px – Mobile (landscape)
- 768px – Tablet (portrait)
- 1024px – Tablet (landscape) / sm desktop
- 1200px – Desktop
- 1600px+ – Large desktop

```
@media screen and (min-width: 481px) {
    // CSS rules for tablets and larger
}

@media screen and (min-width: 481px) and
(max-width: 768) {
    // CSS rules for tablets only
}
```

https://www.interaction-design.org/literature/topics/adaptive-design

Accessibility for Everyone

https://docs.google.com/presentation/d/1Lh-T7f9F6yoDxtRGqxvhaK_WuOfP9xIZr8m1qzMNu4A/edit?usp=sharing

Designing for Accessibility

https://docs.google.com/presentation/d/1Eytx-Msk5uxIS9tDdWeXZcki1_hWhUG9-V6XYP7-KT8/edit?usp=sharing

Screen reader practice

Lighthouse

End

Common Links

- Link to boilerplate / skeleton code

CSS Architecture

Most people think “being good at CSS means you can take a visual mock-up and replicate it perfectly in code” - Philip Walton

Predictable - CSS rules should behave as expected, and not impact other code.
Reusable - Decoupled so you can build new components with existing parts.
Maintainable - Adding new CSS should not affect old CSS.
Scalable -

Responsive Design Concepts & Patterns

For the latest slides see:
https://klarence.net/assets/slides/responsive-design.pdf

Agenda

- **Define** responsive design and its key concepts (grids)
- **Identify** common responsive design patterns
- **Explain** tactics to incorporate into the design process to account for responsive design

Responsive Design

For the latest slides see:
https://klarence.net/assets/slides/responsive-design.pdf

Defining Responsive Design

DURATION: 15 minutes for this section

TEACHING TIPS:

- Introduce the concepts and vocabulary of responsive design.

Responsive web design (RWD) or responsive design is an approach to web design that aims to make web pages render well on a variety of devices and window or screen sizes from minimum to maximum display size to ensure usability and satisfaction.

Responsive Design …
is an approach to web page creation that makes use of flexible layouts, flexible images, and cascading style sheet media queries.

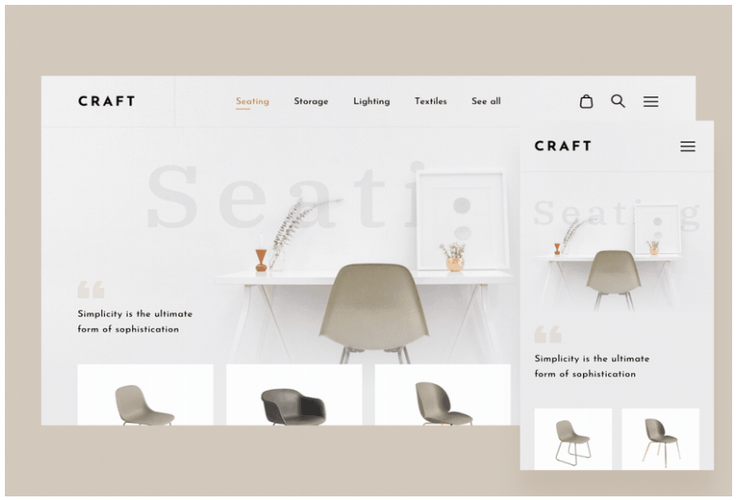
Who

Ethan Marcotte

- Ethan coined the term “responsive web design” to describe a new way of designing for the ever-changing Web.
- His book ***Responsive Web Design*** demonstrates how designers and organizations can leverage the Web’s flexibility to design across mobile, tablet, and desktop.

What

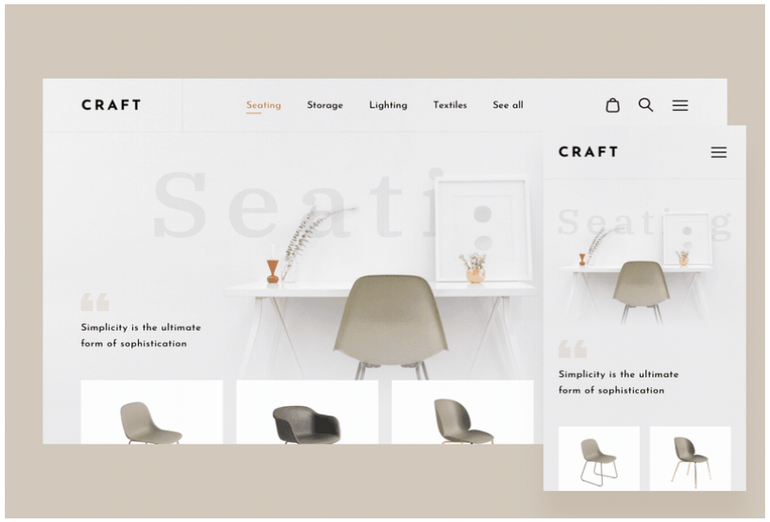
The goal of responsive design is to build web pages that have **flexible & fluid** content that **reflows** and **resizes** based on the **available space** on the screen.



https://dribbble.com/shots/5419518-Furniture-Store-Responsive-Design-Flow

Why

The goal of responsive design is to build web pages that detect the visitor's screen size and orientation and change the layout accordingly.



https://dribbble.com/shots/5419518-Furniture-Store-Responsive-Design-Flow

How

an approach to web page creation that makes use of fluid layouts, flexible images & text, and CSS media queries.

Intro

3 Pillars

- reflowing content
- relative sizing
- breakpoints

Purpose: Provide an introduction to the main topics of responsive design.

TALKING POINTS:

- Let’s start with this video. It covers a lot in two minutes but it’s great. We’ll review afterward.

TEACHING TIPS:

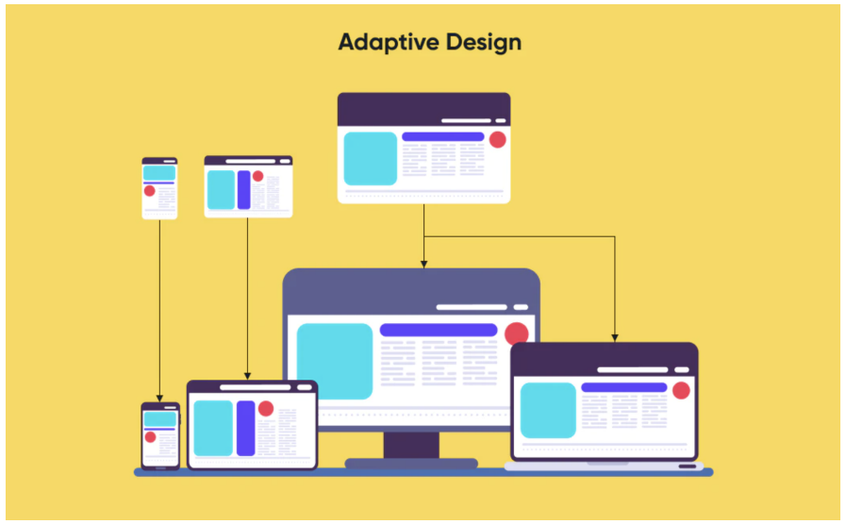
- The video covers the three ways that students may have seen a site on mobile.
- Three elements of responsive design: reflowing content, relative sizing, and breakpoints.

reflowing content (using fluid layouts that can wrap)
relative sizing (flexible images & text)
breakpoints (CSS media queries)

What's the difference?

Adaptive vs Responsive Design

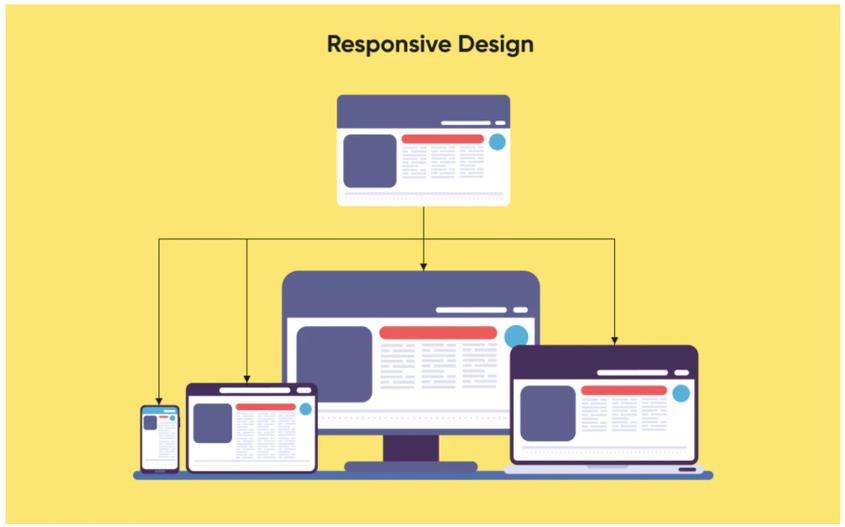
Adaptive Design vs Responsive Design



In **adaptive design,** the website design is purpose built for each device class. In adaptive design, the server determines which version of the website is served to each type of device. This is a more costly approach in the short and long-term, but it is optimized for user experience on each specific device.

netsolutions.com

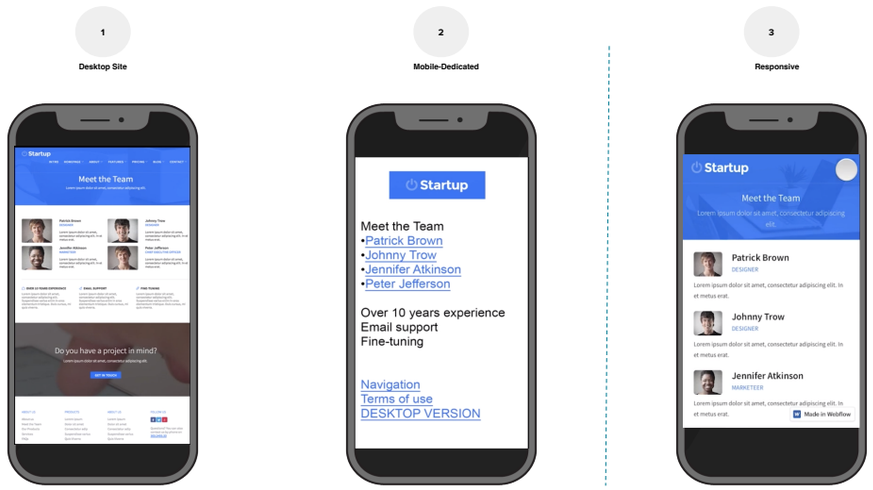
Adaptive Design vs Responsive Design



In **responsive design,** design elements are developed to scale across a variety of device sizes. A responsive web design is just one version of the website that adjusts automatically based on the user's screen size. As a single design, responsive web design is faster and cheaper, but a single mistake in image sizing or padding can impact user experience when adapting to smaller devices.

netsolutions.com

Adaptive Design vs Responsive Design



Purpose: Revisit the ways we may have interacted with a site on a mobile device.

TALKING POINTS:

- Ever visit a website on your phone or tablet and found it was just a scrunched-up version of the same layout you'd see on your laptop or desktop? (Image 1)
- What about a slightly more manageable experience, where the site is a "dumbed down" version of the desktop site, but isn't particularly pretty or usable? (Image 2)
- We've probably all been there. These two images show what happens when a company didn't design responsively.
- In Image 3, we see a responsive layout: The elements are laid out in a way that makes sense for our smaller screen size.
- **Source**: Webflow Video

So in this example, 1 & 2 are adaptive designs and 3 is responsive. 1 is designed for a desktop and 2 for a small mobile device.

However, this example can be misleading. Often Adaptive Design is more expensive since a Designer must Design for each chosen device size and sometimes different devices. Not just phone and computer, but e-readers, watches, etc.

Adaptive Design vs Responsive Design

Adaptive	Responsive
Multiple Fixed Layouts (for each device size)	Single Fluid, Flexible Design (that shrinks/stretchs)
More flexibility in different experiences for different devices Good for Complex Interfaces	Less Design Control, Elements can move around
More Design Work	Less Design work and usually easier to implement
More performant	Site speed can suffer
Challenging SEO	SEO Friendly
Amazon, Apple,	Slack, Dropbox,

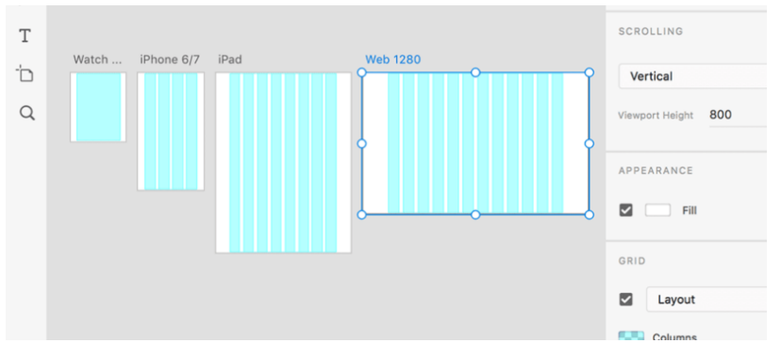
Also See Fluid Width (Slide 134)
I intentionally left amount of code off, since Adaptive Design probably requires a lot more code, but probably less for each platform/instance.
When I was working at Castlight Health, when I first started we had a separate codebase for desktop (only Web) and mobile (which included iOS, Android, and Web [mdot]). I worked on the Design System team that helped to merge the codebases into one.
We used both and Adaptive Design and Responsive Design solution, though we called it Responsive Web Design (RWD).

Search engines have a hard time with duplicate content on multiple sites.
Easier implementation for RWD depends on the flexibility of the Design, if the Design is strict it may have more complex code and difficult to achieve the desired result.

https://www.interaction-design.org/literature/article/adaptive-vs-responsive-design
https://www.interaction-design.org/literature/topics/responsive-design
https://www.interaction-design.org/literature/topics/adaptive-design
https://www.geeksforgeeks.org/css/difference-between-responsive-design-and-adaptive-design/

Mobile First

Mobile first design is designing for the **smallest** screen and working your way up.



https://dribbble.com/shots/5419518-Furniture-Store-Responsive-Design-Flow

Mobile first design is very popular. The mobile-first approach is exactly as it sounds: designing for the smallest screen and working your way up.

Mobile first usually incorporates responsive design, however it doesn't necessarily have to for all devices. A single device might be developed differently. For example, WatchOS, or iOS and Android native apps.

Maximizing Device Support

Graceful Degradation vs. Progressive Enhancement

Graceful degradation - Providing an alternative version of your functionality or making the user aware of shortcomings of a product as a safety measure to ensure that the product is usable.

Progressive enhancement - Starting with a baseline of usable functionality, then increasing the richness of the user experience step by step by testing for support for enhancements before applying them.

-W3C

Graceful degradation starts at a higher level of user experience for modern devices/browsers, while providing basic functionality for older devices/browsers. Progressive enhancement starts with a basic level of functionality for all users (devices/browsers) and then adds more advanced features for devices/browsers that support it.

So, graceful degradation is the practice of building your web functionality so that it provides a certain level of user experience in more modern browsers, but it will also degrade gracefully to a lower level of user in experience in older browsers. This lower level is not as nice to use for your site visitors, but it does still provide them with the basic functionality that they came to your site to use; things do not break for them.
Progressive enhancement is similar, but it does things the other way round. You start by establishing a basic level of user experience that all browsers will be able to provide when rendering your web site, but you also build in more advanced functionality that will automatically be available to browsers that can use it.
In other words, graceful degradation starts from the status quo of complexity and tries to fix for the lesser experience whereas progressive enhancement starts from a very basic, working example and allows for constant extension for future environments. Degrading gracefully means looking back whereas enhancing progressively means looking forward whilst keeping your feet on firm ground.
http://www.w3.org/wiki/Graceful_degradation_versus_progressive_enhancement

Grid Layout

What is a grid?

what are grids and why do we use them?

Grids are a series of
horizontal and **vertical lines**
used to **arrange layouts**
and build **compositions** across different devices.

smashingmagazine.com/2018/12/role-of-creativity-ux-design

The purpose of a grid is to convert your designs into an **intelligible**, **functional** and **programmatic system**.

- As a designer, grids are your best friend.
- They come in a variety of flavors but usually serve the same purpose; to **convert content into intelligible, functional and programmatic design systems.**
- Grids **add a level of polish to your design deliverables** and **help your developers** bring your designs to life.

smashingmagazine.com/2018/12/role-of-creativity-ux-design

“The **grid system is an aid**, not a guarantee. It permits a number of possible uses and each designer can look for a solution appropriate to his personal style.

“But one must learn **how to use the grid**; it is an **art that requires practice**.”

- Josef Müller-Brockmann

- **Josef Müller-Brockmann** (9 May 1914 – 30 August 1996) was a Swiss graphic designer, author, and educator. He was a pioneer of the International Typographic Style. Müller-Brockmann is recognized for his simple designs and his clean use of typography, shapes and colors which inspire many graphic designers in the 21st century.
- Josef believed that while grids are and should be a design standard, the practice of using them was an ever-evolving process.

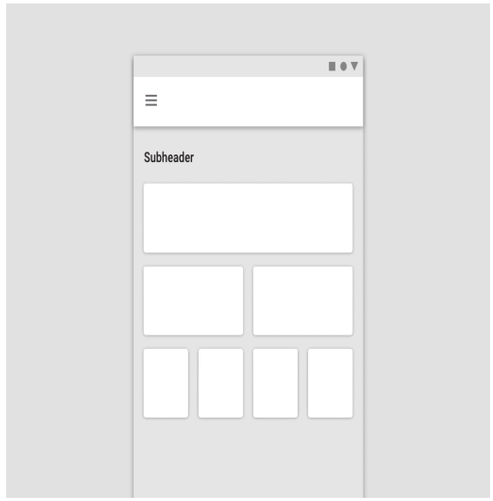
smashingmagazine.com/2018/12/role-of-creativity-ux-design

Taxonomy of a Grid

Let’s talk about the components that make up a grid

Taxonomy of a Grid

- Format
- Columns
- Gutters
- Margins
- Field Elements



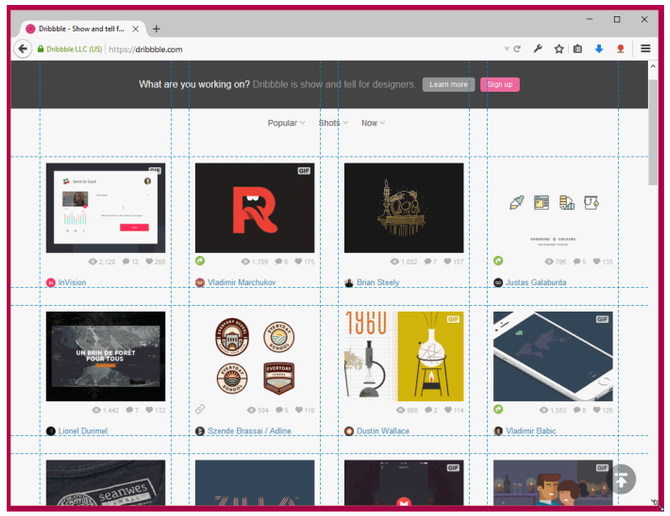
- A grid is composed of 5 essential elements
- Each must be considered when setting up a grid for your design
- But what does each mean?

https://material.io/design/layout/responsive-layout-grid.html

Format

Format is the given area for the overall design, such as:

- Screen size
- Viewport size
- Device size



- Format
- If we were designing in print, this would refer to the paper size. In digital design, format refers to size of the browser window or display screen.
    - Screen size
    - Viewport size
    - Device size

https://hacks.mozilla.org/2015/09/the-future-of-layout-with-css-grid-layouts/

Columns

While the structure of your grid is relative to its device, on a typical digital product the column structure is as follows:

•12 for laptop/desktop

•8 for tablet

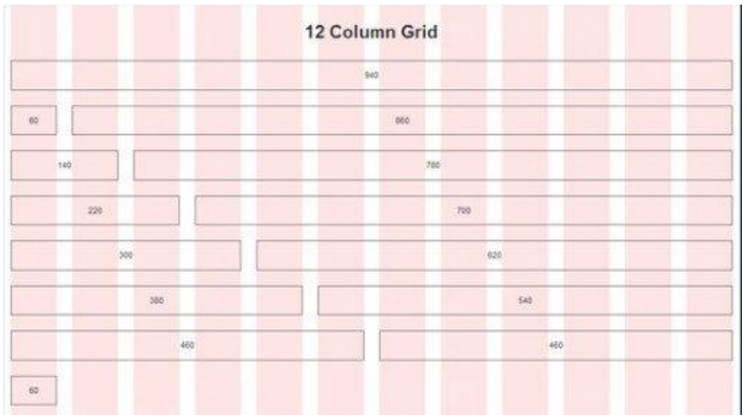
•4 for mobile

- Structure
- Each column should be approximately 60–80px in width with the height determined by the volume of content.
- What structure to use?
    - 12 for desktop
    - 8 for tablet
    - 4 for mobile

https://www.propublica.org/nerds/meet-column-setter

The 12 column grid

The 12 column grid system, often referred to as a Bootstrap grid, was **designed for responsive layouts**. This grid system allows for multiple design layouts that adapt by specific breakpoints.

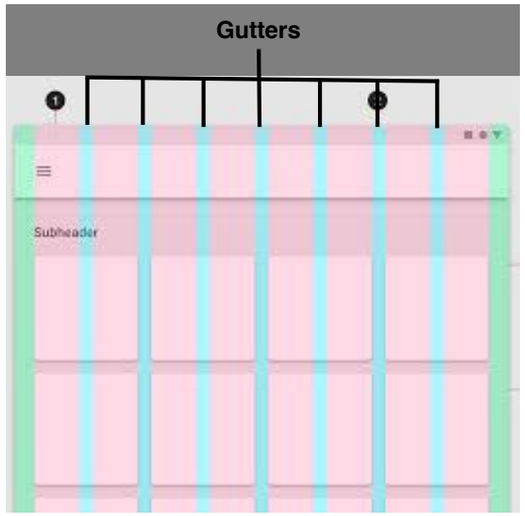


- The 12 column grid!!!
- Breaks down into columns of 3, 4, and 6 making it easier to design for different screen sizes.
- Designing elements is easier since it is designed in pts and elements are multiples of 8.
- ALTERNATES but less popular: 16-, 18- or 24-column
-

Gutters

Gutters are the space in between columns.

- Define sections
- Align content
- Width (20px)



- https://material.io/design/layout/responsive-layout-grid.html

Width usually in pixels

Margins

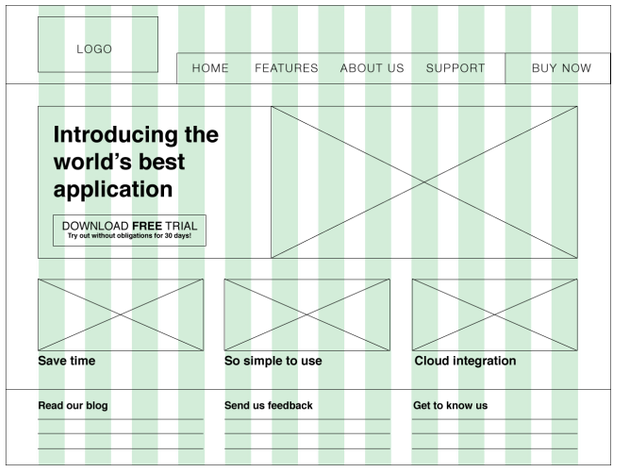
The space between content and the left and right edges of the screen

- Margins are defined by the product or device. Dependent on what the project is, you'll need to observe the software device kit (SDK) to define the value of each margin.
- https://material.io/design/layout/responsive-layout-grid.html
-

Field Elements

Independent groupings of:

- Text
- Images
- Icons
- Calls to action



- Field Elements - remember atomic design?
- Blocks of design elements (text, images, icons, or a grouping of elements.)

- https://webdesign.tutsplus.com/articles/a-beginners-guide-to-wireframing--webdesign-7399

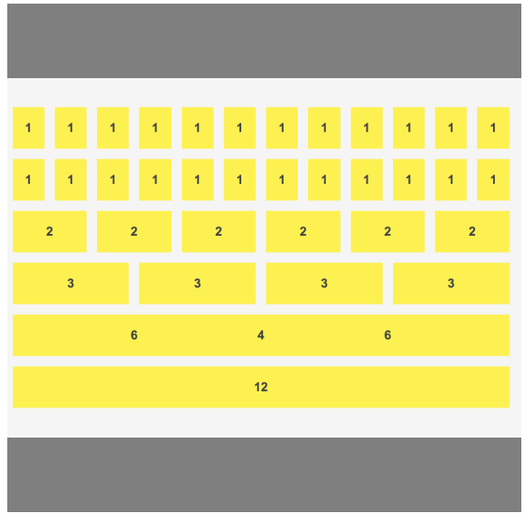
Types of Grids

- It’s **pretty hard to produce ideas that can be considered** both original and functional.
- We **usually need structure** in order to foster creativity, so let’s revisit a few thought processes or methods that we can leverage when ideating.
- The terms “divergent thinking” and “convergent thinking” were first coined in 1956 by psychologist, J.P. Guilford.
- You might already be familiar with these terms as they’re often referenced throughout psychology and academic fields. We’ll be discussing them within the context of design thinking.

Types of Grids

Fixed Grids

Fixed grids are layouts with a fixed width, height, and design elements. Thus, when the screen size or resolution changes the elements inside will be consistent.



Source: Profoundgrid

Fixed grids are layouts with a fixed width, height, and design elements - like a newspaper. Snaps to new size at breakpoint, only margins change. When the screen size or resolution changes **the elements inside will be consistent**.

Pros

- Considered a designer's best friend because the design remains consistent
- Best suited for absolute screen sizes but works across devices.

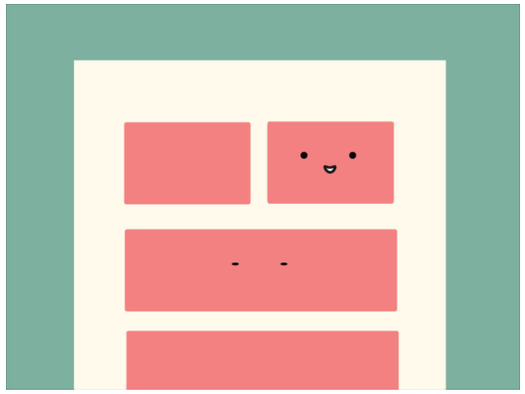
Cons

- Due to its fixed nature, designs may have a fair amount of whitespace relative to larger screen size.

Types of Grids

Fluid Grids

Fluid grids are built in percentages, so depending on the user's browser or the device screen size the layout and overall composition will adapt the size of the screen.



Source: Dribbble

Fluid grids are built in percentages so depending on the user's browser or the device screen size the layout and overall composition will adapt the size of the screen. While this is great for the user's to interact with since it will manipulate to the user's setup, the overall visual design will be inconsistent.

Pros

- Designed in percentages. Ultra precise.
- User friendly

Cons

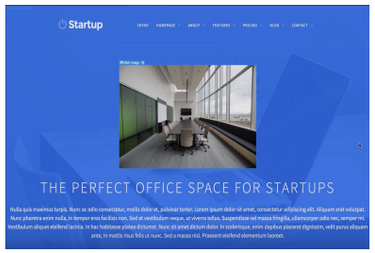
Inconsistent layouts

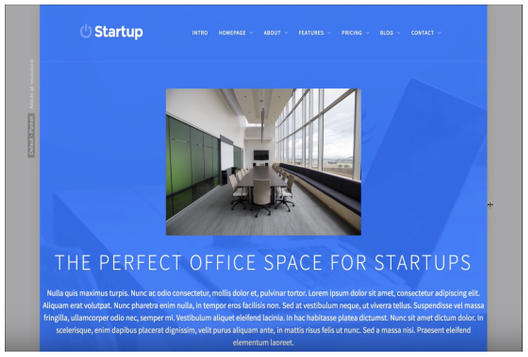
Beyond the Grid: Responsive Design Concepts & Vocabulary

- DURATION: 10 minutes for this section
- TEACHING TIPS:
- Introduce the concepts and vocabulary of responsive design.
- The slides following the video revisit the concepts taught in the video.
-

Reflowing Content

The text adapts to the size of the **viewport**.





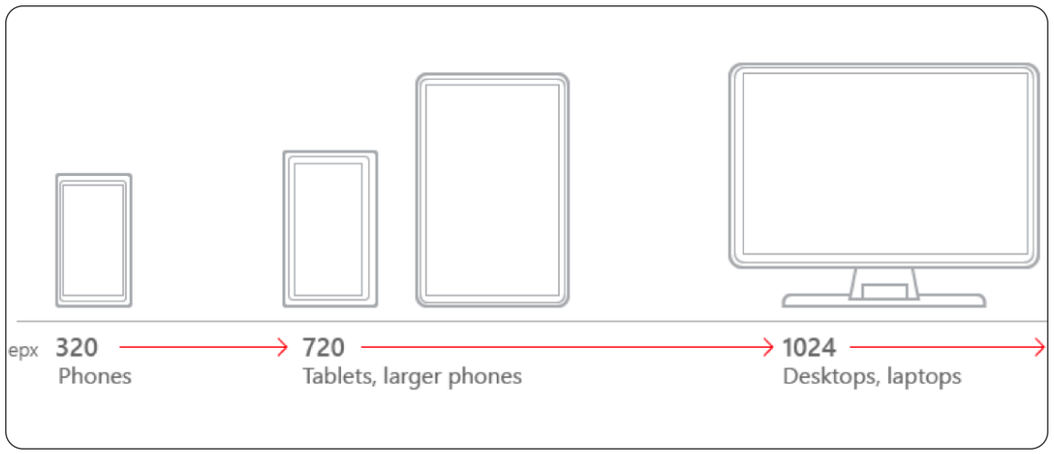
Purpose: Review what we mean by “reflowing content.”

TALKING POINTS:

- The heading and paragraph adjusted according to the size of the **viewport.**

TEACHING TIPS:

- **Define “viewport.”**
- the **viewport** is the visible area of a website or an application from the user's perspective. So the **viewport** size might be smaller than the screen size, since for instance you can change the size of a window.



Breakpoints

Breakpoints are the points at which your site's *layout* will change based on the width of the viewport.

Purpose: Revisit "breakpoints."

TALKING POINTS:

- **Breakpoints** are basically checkpoints that developers can set that enforce the layout changes based on the viewport.
- New elements aren't being made; rather, the existing desktop layout reflows into a modified layout based on viewport size. We're just adjusting the styles and layout of the same elements!
- This image shows common breakpoints.
    - So at 320px, our layout looks a certain way; when the viewport hits 720px, it may look a tad different; and at 1024px, the layout assumes its desktop layout.
- You will likely not design for ALL of these but instead will choose based on the goals and what you know about the user.
- Think of a **breakpoint** as the specific point where the screen will change. You may hear "**media query**" as well. This is a code that calls how the content should behave differently when it reaches said breakpoint.

TEACHING TIPS:

- If you'd like to illustrate this again, dropbox.com is one such example.

Fun Fact!

How does the design render for the right viewport?

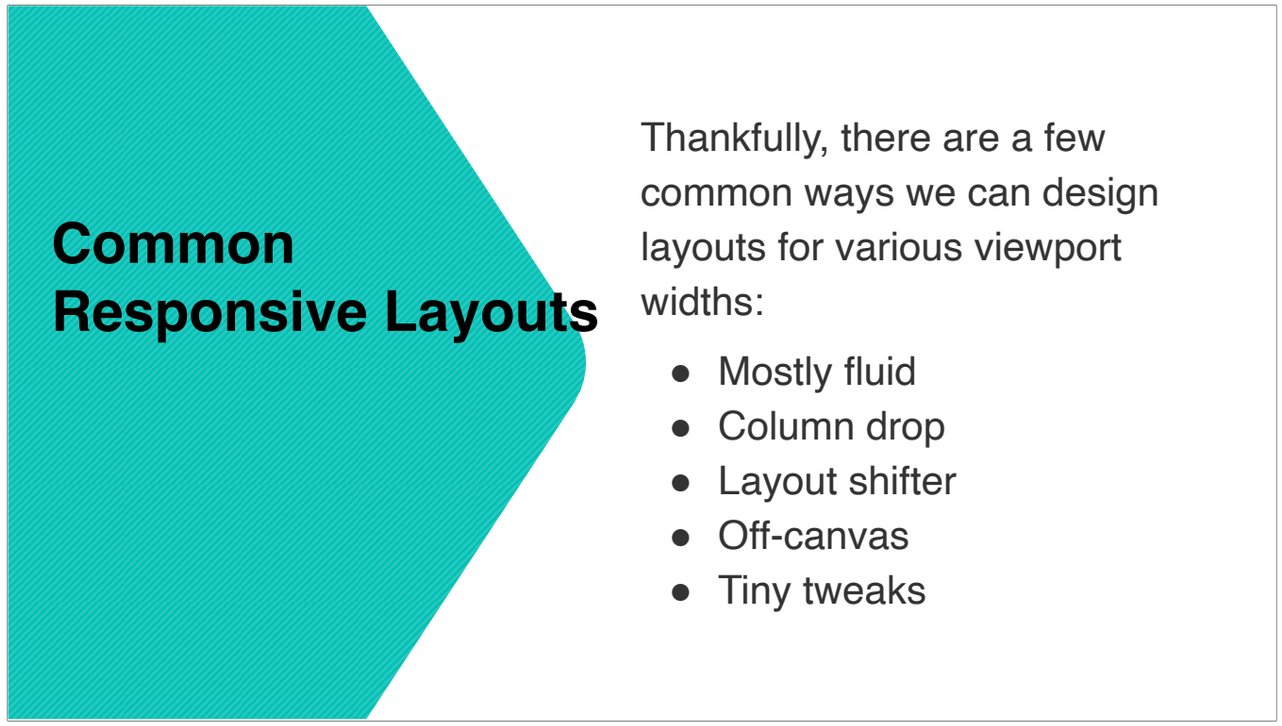
Developers include this in the <head> section of the code:

```
<meta name="viewport"
  content="width=device-width,
  initial-scale=1.0">
```


Purpose: Provide a fun fact about the viewport.

TALKING POINTS:

- This tidbit of code gives the browser instructions on how to control scaling for page content.
- This is not something you need to memorize, it's just cool!



Purpose: Introduce the common tactics for designing responsive layouts.

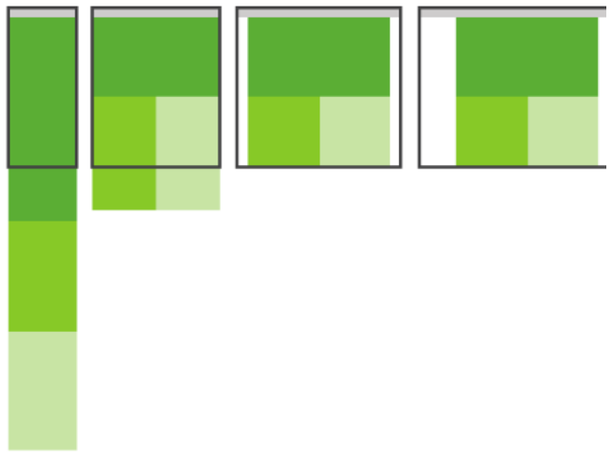
TALKING POINTS:

- We do not have to reinvent the wheel here. We can employ common techniques to design the layouts of our site at various breakpoints!
- Let's dive into each.

Mostly Fluid

On large or medium screens, adjusts the margins on wider screens

On smaller screens, the main content reflows while columns are stacked vertically



BOOTSTRAP

Purpose: Introduce the “mostly fluid” responsive layout.

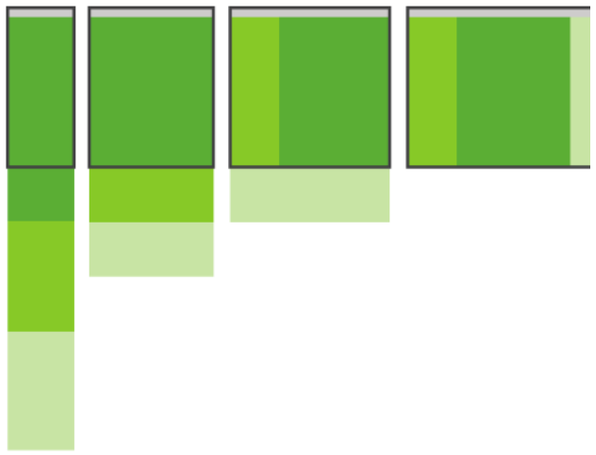
TALKING POINTS:

- The mostly fluid pattern consists primarily of a fluid grid. On large or medium screens, it usually remains the same size, simply adjusting the margins on wider screens.
- On smaller screens, the fluid grid causes the main content to reflow, while columns are stacked vertically.
- One major advantage of this pattern is that it usually only requires **one** breakpoint between small screens and large screens.

Column Drop

On large or medium screens, there are multi-column layouts

As the screen size changes, the layout **drops a column**, eventually leading to all columns stacking vertically



BBC NEWS

Purpose: Introduce the “column drop” responsive layout.

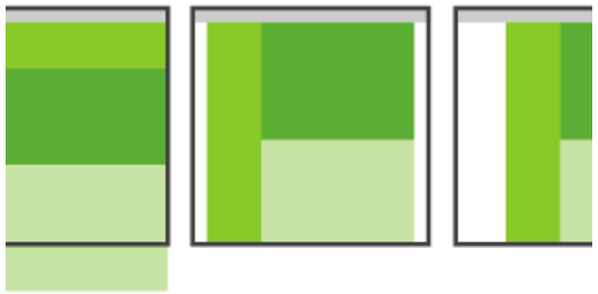
TALKING POINTS:

- For full-width multi-column layouts, column drop simply stacks the columns vertically as the window width becomes too narrow for the content.
- Eventually, this results in all of the columns being stacked vertically.
- Choosing breakpoints for this layout pattern is dependent on the content and changes for each design.

Layout Shifter

Most responsive layout

Content moves around (vs. just dropping columns)



AMAZON

Purpose: Introduce the “layout shifter” responsive layout.

TALKING POINTS:

- The layout shifter pattern is the most responsive pattern, with multiple breakpoints across several screen widths.
- Key to this layout is the way content moves about, instead of reflowing and dropping below other columns.
- Due to the significant differences between each major breakpoint, it is more complex to maintain and likely involves changes within elements, not just overall content layout.

Tiny Tweaks

Instead of making large changes to layout, this layout adjusts font size, image size, and slight adjustments to content

MEDIUM

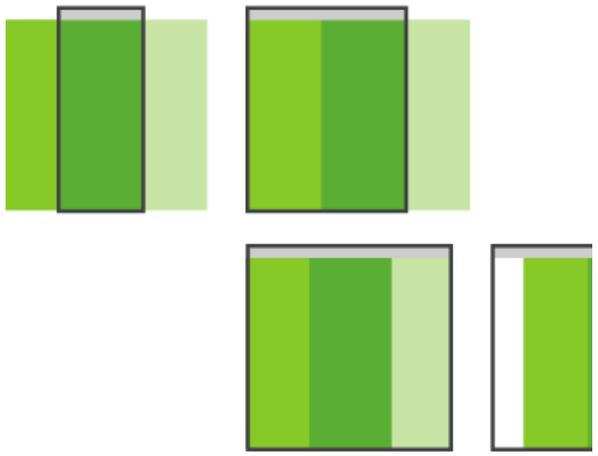
Purpose: Introduce the “tiny tweaks” responsive layout.

- Tiny tweaks simply makes small changes to the layout, such as adjusting font size, resizing images, or moving content around in very minor ways.
- It works well on single column layouts such as one-page linear websites and text-heavy articles.

Off-Canvas

Instead of stacking content, this layout moves less-frequently used content **off-screen**

For example: navigations, app menu, etc.



PINTEREST

Purpose: Introduce the “off-canvas” responsive layout.

TALKING POINTS:

- Rather than stacking content vertically, the off-canvas pattern places less-frequently used content — perhaps navigation or app menus — off screen, only showing it when the screen size is large enough; on smaller screens, content is only a click away.

Identify Responsive Approaches

5 minutes

- Let’s test the responsive layouts of some different websites

- Can you identify which layout is being used? How can you tell?
  - Mostly fluid
  - Column drop
  - Layout shifter
  - Tiny tweaks
  - Off-canvas

Purpose: Give students an opportunity to distinguish between the various layouts.

  - Mostly fluid: Wikipedia
  - Column drop: NYT
  - Layout shifter: Etsy
  - Tiny tweaks: Basecamp
  - Off-canvas: AirBnB
  - None: Craigslist

The Process of Designing Responsively

- DURATION: 15 minutes for this section
- TEACHING TIPS:
- This section is framed as “the process” of designing responsively.
- It can also be thought of as “tactics” to include in your design process to incorporate responsive design.
-

How to Design Responsively

1. Understand the context.
2. Prioritize elements based on that context.
3. Choose breakpoints.
4. Design wireframes for those breakpoints.
5. Conduct design reviews for usability.

Purpose: Introduce the five-step process.

TALKING POINTS:

- These are the five steps to designing responsively.
- We'll go more into each of these in a moment.
- Your involvement as a UX designer will vary across each step.

Step 1: Understand the Context

- What are the user's primary goals for each context?
- How much time does the user typically have to complete those goals in each context?
- What else are they trying to do, and what is happening around them in that moment?

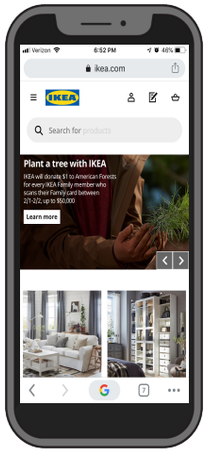
Mobile users may want quicker access to tasks specific to their exact location

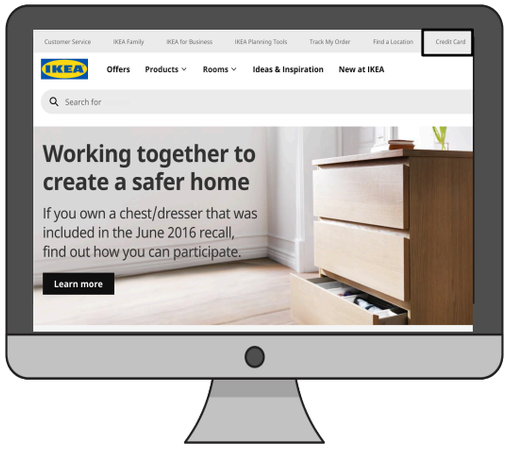
Laptop users may have more time for complex tasks

Purpose: Dive deeper into “understanding the context.”

Step 2: Prioritize Elements

Prioritize certain elements based on what you learn about your users' primary goals in each context



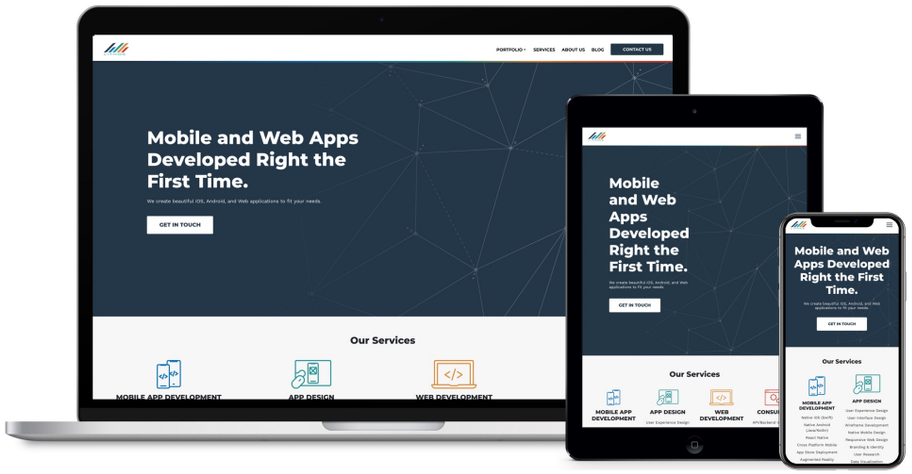


Purpose: Dive deeper into "prioritize elements."

TALKING POINTS:

- **In this example,** "Credit Card" lives in the website header on desktop and would be higher up in the information architecture.
- On mobile, it has been buried deeper in the IA because it was not prominent in the mobile layout.
- This goes beyond IA as well! **Elements and features** may be three levels deep on the desktop site, because that feature is a priority in that context.

DEFINITELY Prioritize Calls to Action



Purpose: Illustrate prioritizing elements.

TALKING POINTS:

- This image shows that the primary CTA (call to action), "Get in Touch," is equally prominent across all layouts.

Step 3: Select Appropriate Breakpoints

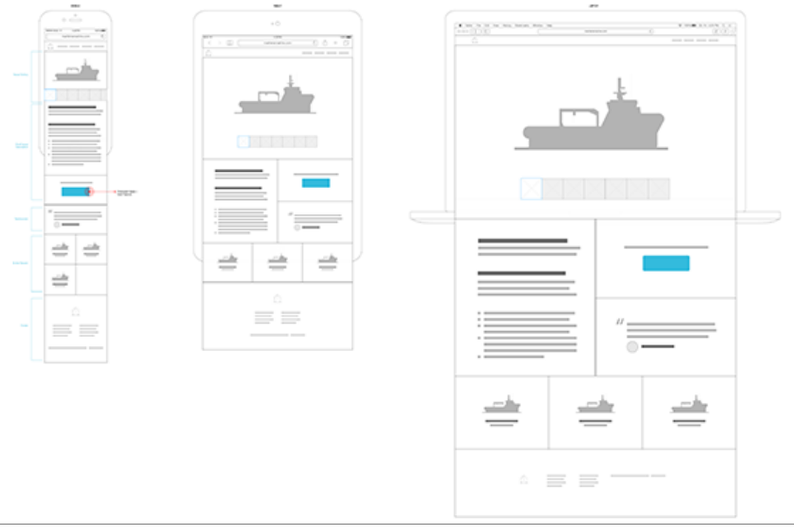
- What screen sizes are most commonly used by your users?
- Focus your efforts on those screen sizes

Purpose: Dive deeper into “select appropriate breakpoints.”

TALKING POINTS:

- How do we know what screen sizes our users actually use? User research and analytics!
- Create a list of screen sizes that are most commonly used by your users.
- This will help define the scope of your project and focus your efforts on the screen sizes that are used most often.

Step 4: Design Wireframes For Your Breakpoints

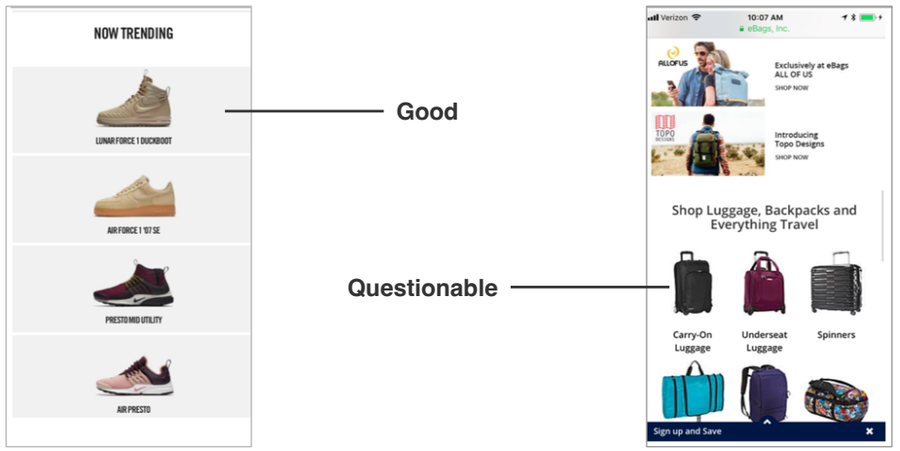


Purpose: Dive deeper into “wireframe for breakpoints.”

TALKING POINTS:

- Here is an example of wireframes with breakpoints.
- Designing for responsive can increase workload and take up to six times as long because:
    - You have to create more wireframes to support the chosen breakpoints.
    - You may have to create prototypes for each of those breakpoints.
- It really depends on the audience you are designing for. What devices are they using? What do you need to design for? Are there any data/analytics we can refer to?

Remember List and Grid Conventions



Purpose: Mention it is best practice for a column to include one or two items.

TALKING POINTS:

- We know several of the common responsive layouts display stacked single columns on mobile screen sizes.
- When you're wireframing these columns, we recommend keeping one column confined to one or two items.

Step 5: Design Reviews and Usability Testing

- Review all versions with stakeholders and team
- Test all versions
- Remember to try to view people using it in their real context

Purpose: Dive deeper into “usability testing.”

TALKING POINTS:

- Responsive design and layout is yet another thing we can learn when conducting usability tests.
- Were you accurate about the goals for each context?
- Did your wireframe address layout in a way that makes sense for users? (And so on…)

Break
until 7:05pm

Temp Slide to be used for class