The Four Phases of Web Development

Stages 3 and 4:
Develop & Deploy

Domenic J. Licata, Instructional Support Technician
University at Buffalo Department of Art
djlicata@buffalo.edu

4 phases of
web development

4 phases of web development

1. Discovery

4 phases of web development

1. Discovery
2. Design

4 phases of web development

1. Discovery
2. Design
3. Develop

4 phases of web development

1. Discovery
2. Design
3. Develop
4. Deploy

Phase 4: develop

1. Write clean, valid code: HTML, CSS, WP Theme
2. Optimize images and video
   - Smallest acceptable file size
   - Use pure CSS in place of images where possible
3. Testing
   - Chrome Dev Tools: Network; Audits
   - Cross browser/device testing
   - Validate: W3C Validator http://validator.w3.org/

Convert Sketches to HTML and CSS

- Sketch out your wireframes - Simplify!
- Compute grid dimensions in pixels.
- Convert static pixel grid to fluid percentages.
- Build out wireframe in HTML and CSS, starting with the largest, most general areas, like #wrapper and #main, down to the smallest details, like buttons.
- Discover breakpoints and add media queries.

Plan For Responsiveness

- Inspect the Robot or Not website (from Ethan Marcotte's book, Responsive Web Design.)
    - This is a complex site, with lots going on. You will not be building sites this complex, but you may find helpful tips by looking through the code.

Building From Wireframes to Code

Building From Wireframes to Code

- Carefully compute and markup the measurements of each component of your sketches/wireframes.

Building From Wireframes to Code

- Carefully compute and markup the measurements of each component of your sketches/wireframes.

- Which components can be grouped together within HTML5 semantic elements or generic DIVs?

Building From Wireframes to Code

- Carefully compute and markup the measurements of each component of your sketches/wireframes.

- Which components can be grouped together within HTML5 semantic elements or generic DIVs?

- Consider how each element will flow, float and clear in the overall HTML:

    - By default, browsers place a line break after each element. Overridden with floats (moves a left or right) and clears (forces a line break left and right)

Building From Wireframes to Code

- Carefully compute and markup the measurements of each component of your sketches/wireframes.
- Which components can be grouped together within HTML5 semantic elements or generic DIVs?
- Consider how each element will flow, float and clear in the overall HTML:
  - By default, browsers place a line break after each element. Overridden with floats (moves a left or right) and clears (forces a line break left and right)
- Create your elements in your HTML according to your flow analysis, and give them width, height (if necessary) and position in CSS.

HTML

HTML Tags

- **HTML** is plain text consisting of tags which define the content of a page. Tags define the elements which make up the structure of the page and the content.

- **Structural tags**, like <h1> through <h6> headings and <p> paragraphs define the hierarchical flow of elements on a page. Hierarchy refers to a logical progression of the importance of items on a page – <h1> is the most important headline; <h2> second most important; and so on.

- **Semantic tags** define extra info, like where to place emphasis in a sentence.

Structure, not Style

- **tags must not be used to define the look of content (style.) Instead, tags define the semantic structure of a page, outlining the relative importance of each chunk of information being presented**

Block Level vs Inline

- **Block Level Elements**
  - Stack on top of each other
  - Will start on a new line and cause a new line to be created at the close.
    - `<h1>` through `<h6>` Head 1 through Head 6
    - <p> paragraph
    - unordered list (bullets)

Block Level vs Inline

- **Inline Elements**
  - Will appear next to each other as long as there is room within the parent container.
  - Do not cause a line break.
    - emphasis, or implied importance (looks like italic)
    - <i>italic - looks like emphasis, but semantically implies alternate voice or mood.
    - implies extra importance (looks like bold)
    - range of selected text, commonly used to apply a define a class to which a style can be applied
    - <a>anchor (links)

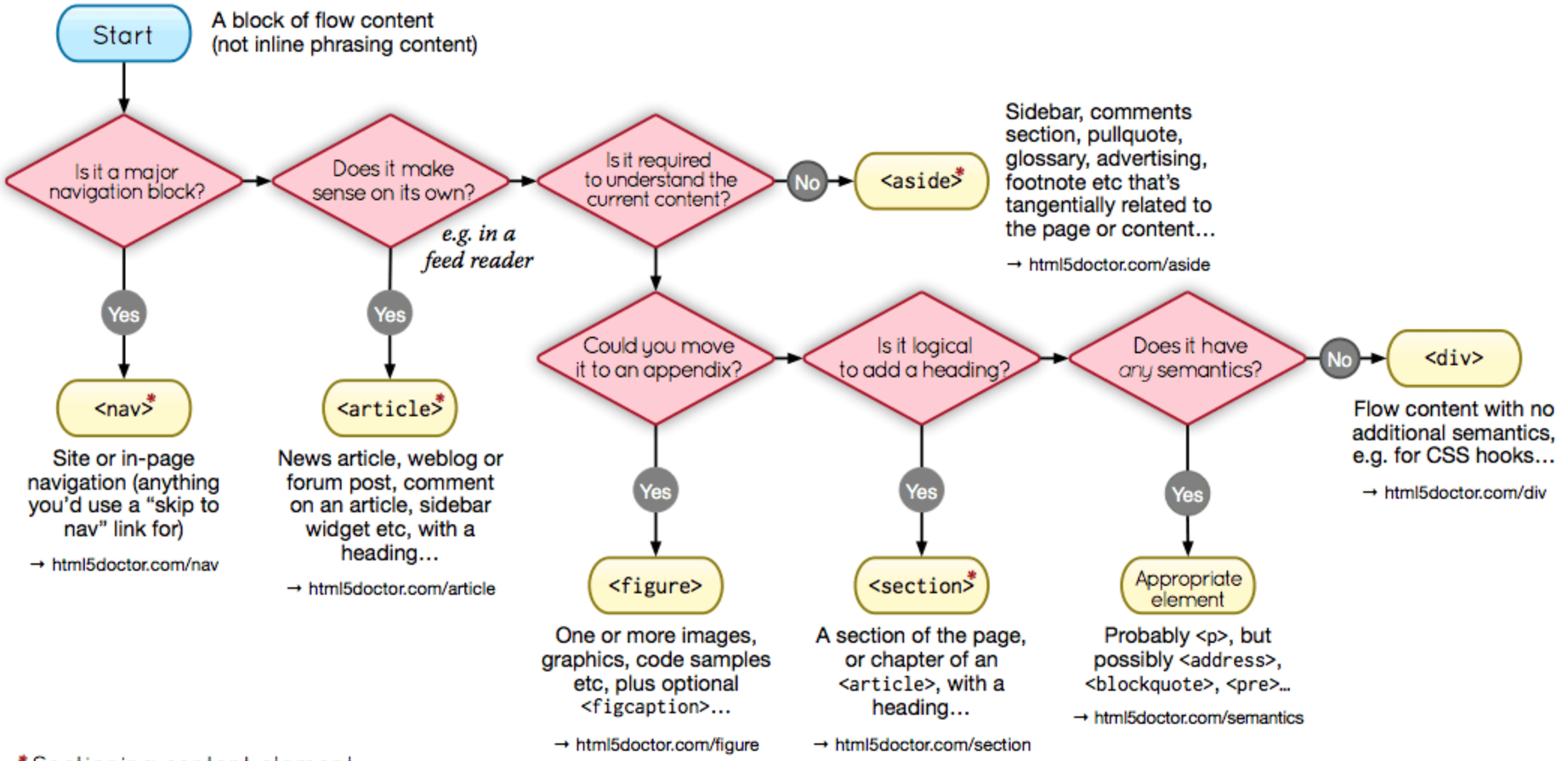
HTML5 Semantic Elements

- header
- main
- section
- article
- nav
- aside
- footer

HTML5 Element Flowchart

Sectioning content elements and friends

By @riddle & @boblet
www.html5doctor.com



* Sectioning content element

These four elements (and their headings) are used by HTML5's outlining algorithm to make the document's outline
→ html5doctor.com/outline

2011-07-22 v1.5
For more information:
www.html5doctor.com/semantics

hyperlinks

Hyperlinks (<a> anchor tags) are the heart of HTML. Clicking a link sends a request to a web server to send a different page (or a specific location of a page) to the browser.

A link (URL) is the address (or the path) to the location of the new page.

A link can call for a page located on the same website or on a different site altogether.

hyperlinks

An **absolute path** points to a specific page on a specific server using a full URL

<http://art.buffalo.edu/exercises/ex01/instructions.html>

A **document-relative path** points to a file relative to the file you are currently browsing

<../exercises/ex01/instructions.html> (one level up out of the current directory and into the folder named “exercises”)

A **root-relative path** describes the location of a file relative to the top level of a site

</exercises/ex01/instructions.html> (at the top level of the website in the exercises folder.)

URLs & <a> tags

Uniform Resource Locators

Domain Name Servers

Fully Resolved URL

http://www.art.buffalo.edu/undergraduate/programs.html

Absolute Path

VS

Document Relative Path

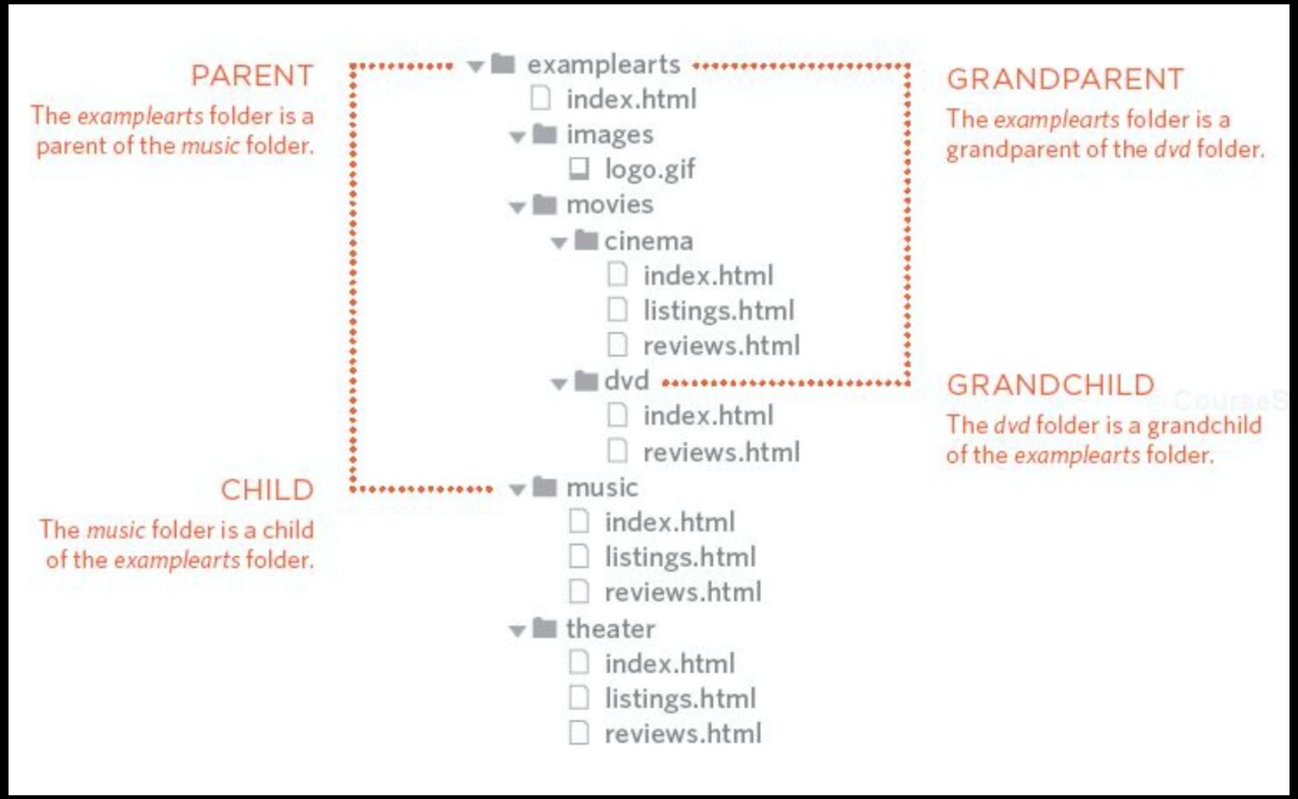
Undergrad Programs

Root Relative Path

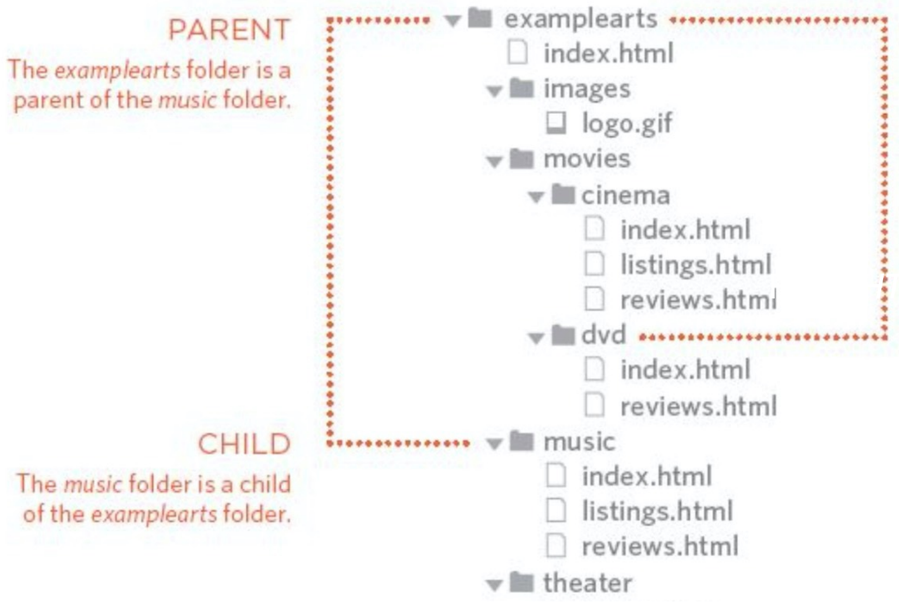
Undergrad Programs

directories & paths

From *HTML & CSS: design and build websites*



build websites



RELATIVE LINK TYPE	EXAMPLE (from diagram on previous page)
SAME FOLDER To link to a file in the same folder, just use the file name. (Nothing else is needed.)	To link to music reviews from the music homepage: `<a href="reviews.html">Reviews</a>`
CHILD FOLDER For a child folder, use the name of the child folder, followed by a forward slash, then the file name.	To link to music listings from the homepage: `<a href="music/listings.html">Listings</a>`

GRANDCHILD FOLDER
Use the name of the child folder, followed by a forward slash, then the name of the grandchild folder, followed by another forward slash, then the file name.
	To link to DVD reviews from the homepage:
	`<a href="movies/dvd/reviews.html">`
	`Reviews</a>`

PARENT FOLDER Use `../` to indicate the folder above the current one, then follow it with the file name.	To link to the homepage from the music reviews: `<a href="../index.html">Home</a>`
GRANDPARENT FOLDER Repeat the `../` to indicate that you want to go up two folders (rather than one), then follow it with the file name.	To link to the homepage from the DVD reviews: `<a href="../../index.html">Home</a>`

email links

Email Joe

opening links
in a new window*

```
<a href="http://eff.org" target="_blank">EFF</a>
            (opens in a new window)
```

EFF (opens in a new window)

* frowned upon

Linking to parts of the same page or to parts of a different page

Modified from *HTML & CSS: design and build websites*

```
    <h1 id="top">Film-Making Terms</h1>
    <ul>
        <li><a href="#arc_shot">Arc Shot</a></li>
        <li><a href="#interlude">Interlude</a></li>
        <li><a href="#prologue">Prologue</a></li>
    </ul>
    <h2 id="arc_shot">Arc Shot</h2>
    <p>A shot in which the subject is photographed byan encircling or moving
    camera</p>
    <h2 id="interlude">Interlude</h2>
    <p>A brief, intervening film scene or sequence, not specifically tied to
    the plot,that appears within a film</p>
    <h2 id="prologue">Prologue</h2>
    <p>A speech, preface, introduction, or brief scene precedingthe the main
    action or plot of a film; contrast to epilogue</p>
    <p><a href="#top">Top</a></p>
```

Linking to parts of the same page or to parts of a different page

Modified from *HTML & CSS: design and build websites*

```
    <h1 id="top">Film-Making Terms</h1>
    <ul>
        <li><a href="#arc_shot">Arc Shot</a>
        <li><a href="#interlude">Interlude</
        <li><a href="#prologue">Prologue</a>
    </ul>
    <h2 id="arc_shot">Arc Shot</h2>
    <p>A shot in which the subject is photogr
    camera</p>
    <h2 id="interlude">Interlude</h2>
    <p>A brief, intervening film scene or se
    the plot,that appears within a film</p>
    <h2 id="prologue">Prologue</h2>
    <p>A speech, preface, introduction, or br
    action or plot of a film; contrast to epi
    <p><a href="#top">Top</a></p>
```

Film-Making Terms

- Arc Shot
- Interlude
- Prologue

Arc Shot

A shot in which the subject is photographed byan encircling or moving camera

Interlude

A brief, intervening film scene or sequence, not specifically tied to the plot,that appears within a film

Prologue

A speech, preface, introduction, or brief scene precedingthe the main action or plot of a film; contrast to epilogue

Top

404 ERROR (Page Not Found)

A broken path:
If the location of the linked page changes, or if it’s name is changed, the link must be updated to reflect the new path, otherwise a 404 (Page Not Found) error will result.

CSS

Cascading Style Sheets

- Cascading Style Sheets (CSS) is a set of formatting rules that determine the look and position of HTML elements on a page.
- CSS rules are applied to HTML elements based on selectors and declarations.

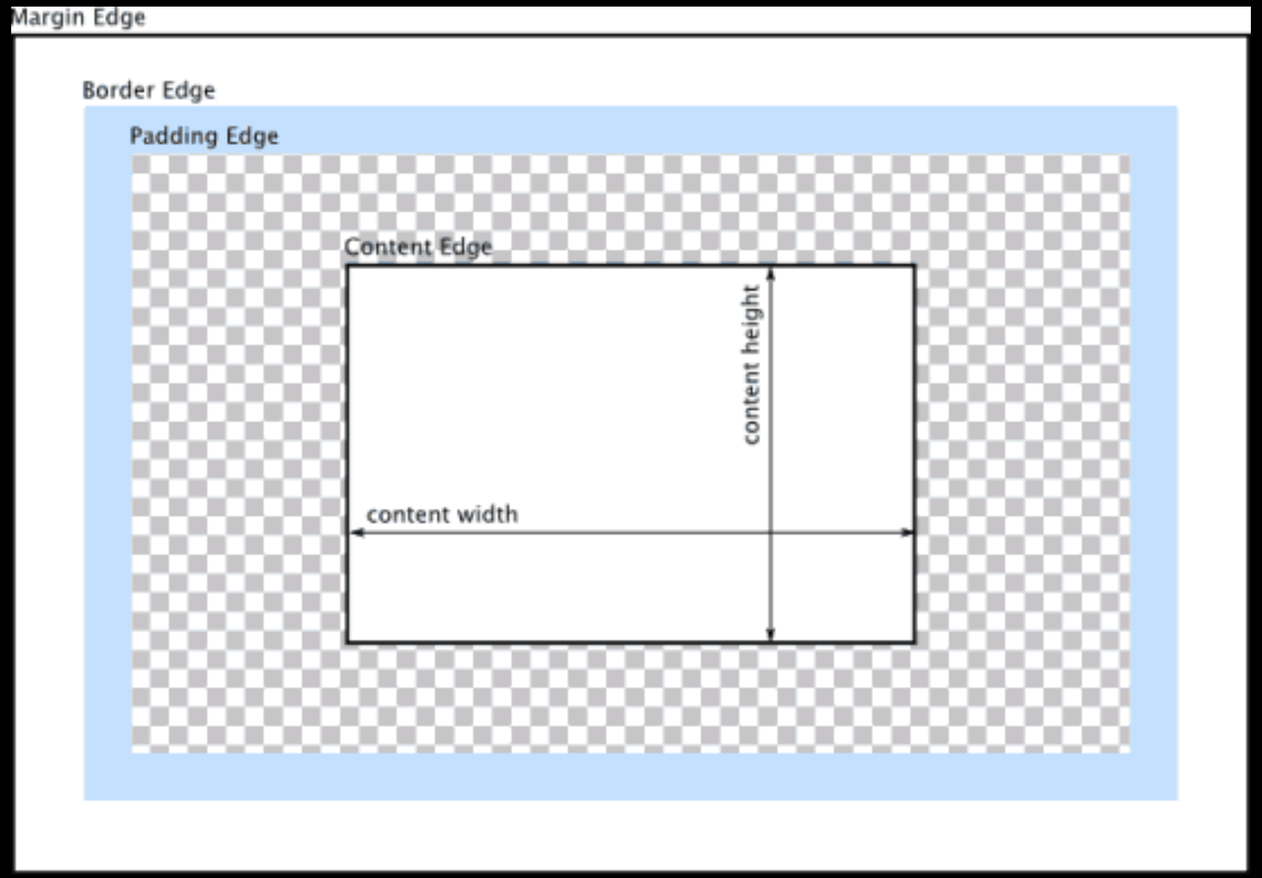
Selectors

- Selectors determine which HTML element a style should be applied to, such as:
  - tags:<p>
  - classes: can be applied to any element, such as . In the CSS, class names begin with a dot, such asÂ .boldRed.
  - IDs: specify a style for a single, unique element, such as . In the CSS, class names begin with a #, such as #MainContent.
  - pseudo-classes: add custom looks and behaviors to certain selectors, such as a property when the mouse is hovered over a link, or the style of a visited link.

Declarations

- Declarations consist of a property and a value. The property is the style attribute (like color or margin) that you wish to change. Each property has a value (like "red" or "20px").

The CSS Box Model



The CSS Box Model

The CSS Box Model

- **Margin** - Clears an area around the border. The margin does not have a background color, it is completely transparent

The CSS Box Model

- **Margin** - Clears an area around the border. The margin does not have a background color, it is completely transparent

- **Border** - A border that goes around the padding and content. The border is inherited from the color property of the box, or it can have its own color.

The CSS Box Model

- **Margin** - Clears an area around the border. The margin does not have a background color, it is completely transparent

- **Border** - A border that goes around the padding and content. The border is inherited from the color property of the box, or it can have its own color.

- **Padding** - Clears an area around the content. The padding is affected by the background-color or background-image of the box

The CSS Box Model

- **Margin** - Clears an area around the border. The margin does not have a background color, it is completely transparent
- **Border** - A border that goes around the padding and content. The border is inherited from the color property of the box, or it can have its own color.
- **Padding** - Clears an area around the content. The padding is affected by the background-color or background-image of the box
- **Content** - The content of the box, where text and embedded images appear.

The CSS Box Model

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

The CSS Box Model

box-sizing: content-box;

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

The CSS Box Model

box-sizing: content-box;

This is the default behavior (no CSS rule needed).

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

The CSS Box Model

box-sizing: content-box;

This is the default behavior (no CSS rule needed).

Width and height is applied only to the element's content box. Any border or padding is added to the width and height when rendering the object on screen.

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

The CSS Box Model

box-sizing: content-box;

The CSS Box Model

box-sizing: content-box;

What is the total width of this element?

width: 250px;
padding: 10px;
border: 5px solid gray;
margin: 20px 10px 20px 10px;

The CSS Box Model

box-sizing: content-box;

What is the total width of this element?

width: 250px;
padding: 10px;
border: 5px solid gray;
margin: 20px 10px 20px 10px;

250+(10+10)+(5+5)+(10+10) = 300px

The CSS Box Model

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

The CSS Box Model

box-sizing: border-box;

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

The CSS Box Model

box-sizing: border-box;

border-box tells the browser to account for any border and padding in width and height. If you set an element's width to 100 pixels, that 100 pixels will include any border or padding you added, and the content box will shrink to absorb that extra width. This typically makes it much easier to size elements.

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

The CSS Box Model

box-sizing: border-box;

The CSS Box Model

box-sizing: border-box;

What is the total width of this element?

width: 250px;
padding: 10px;
border: 5px solid gray;
margin: 20px 10px 20px 10px;

The CSS Box Model

box-sizing: border-box;

What is the total width of this element?

width: 250px;
padding: 10px;
border: 5px solid gray;
margin: 20px 10px 20px 10px;

250+(10+10)+(5+5)+(10+10) = 250px

The CSS Box Model

box-sizing: border-box;

The CSS Box Model

box-sizing: border-box;

Use this in your universal selector for easier element sizing:

```
* {
  box-sizing: border-box;
  }
```

Floats and Clears

- Floats cause block elements to behave as inline elements, that is, they will move right or left rather than stacking in their own lines
- Clears force a line break. In other words, they will cause an inline-behaving object to appear on a new line.
- Objects must have defined widths to float next to each other, or else they will overlap.

Responsive Design

- RWD acknowledges that websites are increasingly accessed from a multitude of devices with different screen sizes and in different contexts - sitting at a desk or on a train, swiping from page to page or having the words read aloud.

- When executed properly, a single responsive site provides optimized users experience and content across all devices.

building flexible sites

1. sketch
2. compute grid and dimensions
3. convert static grid to fluid, pixel measurements to percentages
    - target ÷ context = result
4. build out wireframe
5. discover breakpoints and add media queries

target ÷ context = result

Take the target size from the comp, and divide it by the size of its containing element—in other words, its context. The result is the desired size expressed in relative percentages.

Flexible Grids

- Every row and column can be expressed as a proportion of their containing elements.

Flexible Font Sizes

- Text Default Size: Most browsers interpret 100% as 16px. If the target size of your <p> text, for example, is 11px, divide 11px by the font-size of its containing element: 11 ÷ 16 = 0.6875em.

flexible type

```
body {
  background-color: #DCDBD9;
  color: #2C2C2C;
  font: normal 100% Georgia, serif;
}
```

not flexible type

```
body {
    font-size: 24px;
    font-style: italic;
    font-weight: normal;
}
```

target ÷ context = result

take the target font size from the comp, and divide it by the font-size of its containing element—in other words, its context. The result is our desired font-size expressed in relative, flexible ems.

base font-size: 100% usually equates to 16px

24 ÷ 16 = 1.5em

flexible type

```
body {
    background-color: #DCDBD9;
    color: #2C2C2C;
    font: normal 100% Georgia, serif;
}
```

flexible type

```
body {
    font-size: 1.5em;
    font-weight: normal;
}
```

target ÷ context = result

The context of an element is expressed by the parent it is contained within. ie the context of an <a> element within an <h1> element is the <h1> element.

If the desired target for an <a> within a 24px (1.5em) <h1> is 11px, the formula would be:

11 ÷ 24 = .458333333333

```
h1 a {
    font: bold 0.45833em Arial, sans-serif /* 11px / 24px */
    color: #747474;
    letter-spacing: 0.15em;
    text-transform: uppercase;
    text-decoration: none;
}
```

Media Queries

```
<head>
    <meta charset="UTF-8">
    <title>UNTITLED</title>
    <link href="style.css" rel="stylesheet">
    <meta name="viewport" content="width=device-width,
    minimum-scale=1.0, maximum-scale=1.0" />
</head>
```

- Media queries inspect the physical attributes on the device being used.
- HTML meta tag - viewport (must be present)

Media Queries

In CSS

```
@media screen and (min-width: 1024px) {

    body {
        font-size: 100%;    }
    }

}
```

Media Queries - Break Points

@media screen and (**min-width: 1024px**)

- At each breakpoint, media queries cause new CSS to be loaded, changing the size and position of elements.
- Test for appropriate break points by enlarging your window until the design no longer works well. Note the window size, create a break point, and alter the CSS as needed.

Misc. Final Steps

- Embed images as background-image (in CSS) and in <img> elements (in CSS)
- Import web fonts, as needed
- Add CSS decorations as needed: box shadows, borders, rounder corners, color gradients
- Populate content areas with text and images

Image Optimization

- Determine the largest size needed for any given image
- Use the Image Size command to resample an image down to the largest necessary dimension
- Use the Save for Web command to select the most appropriate format (jpg, png, gif) and the most compression finding the balance of image size and quality.

Reference

- HTML5 Reference from MDN
- CSS Properties from MDN

HTML & CSS tools

- caniuse.com
  - browser compatibility
  - some properties require vendor-specific prefixes
  - many designers no longer supporting IE 8 and older
- html5please.com

CSS tools

- css3gen.com
  - box shadow
  - text shadow
- border-radius.com

CSS tools

- google.com/fonts
  - include link in HTML
  - Include font-family code in CSS

CSS tools

- Xcode - iOS Simulator
- Google Chrome Dev Tools
- Opera Mobile Emulator

Phase 4: deploy

1. Content Migration
2. User Testing
3. Training
4. Launch