

MODULE 3

The DOM



Can you ?

- Describe the difference between the DOM and HTML
- Select elements from the DOM using getElementById, querySelector, querySelectorAll
- Describe the DOM and how it is structured (tree)
- Set innerText on HTML elements
- Describe why innerHTML can be dangerous
- Create new DOM elements using createElement() and insertAdjacentElement()
- Traverse the DOM
- Investigate the living DOM in the browser

Back to HTML

```
<!DOCTYPE html>

<html lang="en" xmlns="http://www.w3.org/1999/xhtml">
<head>
  <meta charset="utf-8" />
  <title></title>
  <link rel="stylesheet" href="style.css" type="text/css" />
  <script src="jquery-3.1.0.js"></script>
</head>
<body>
  <section class="content">

    <div id="box1" class="red box">
      <p class="text">Text inside a red box</p>
    </div>

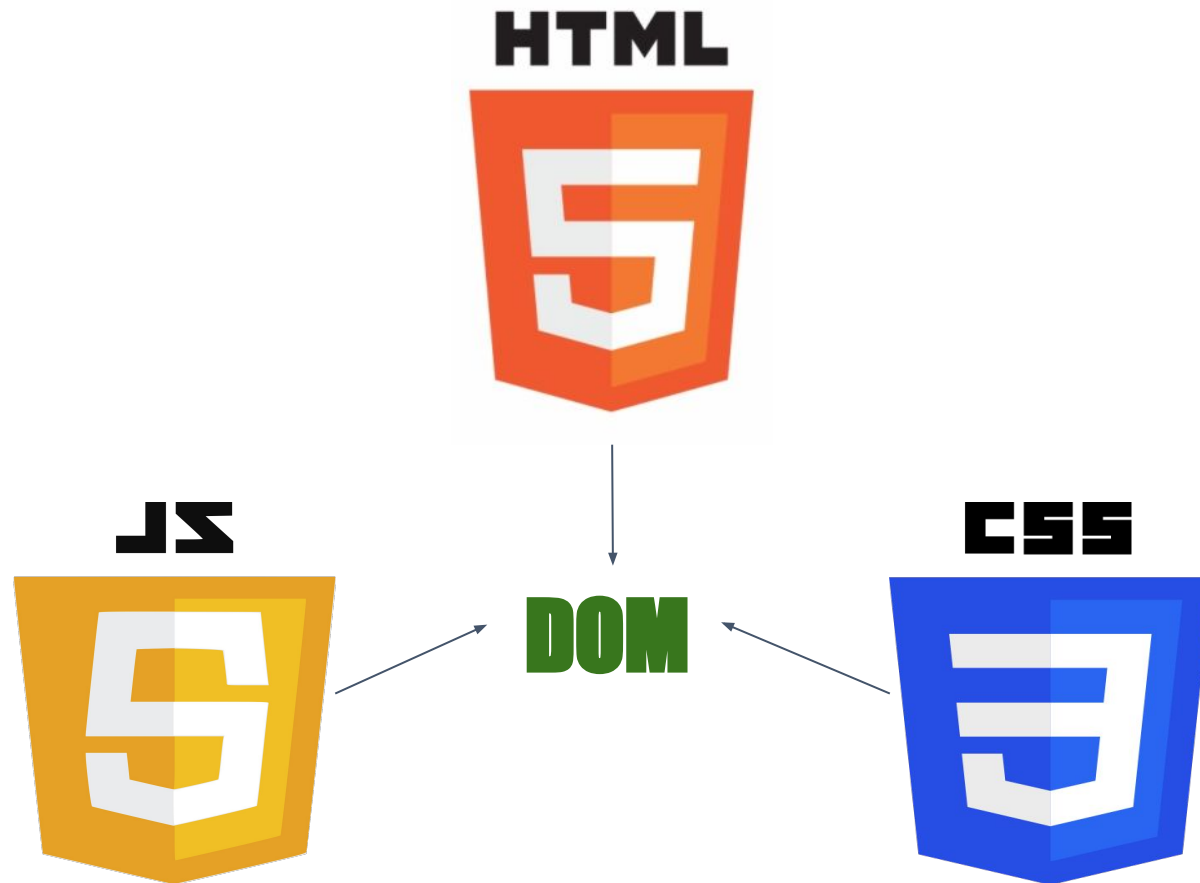
    <div id="box2" class="blue box">
      <p class="text">Text inside a blue box</p>
    </div>

  </section>

  <script src="script.js"></script>
</body>
</html>
```

HTML is Static

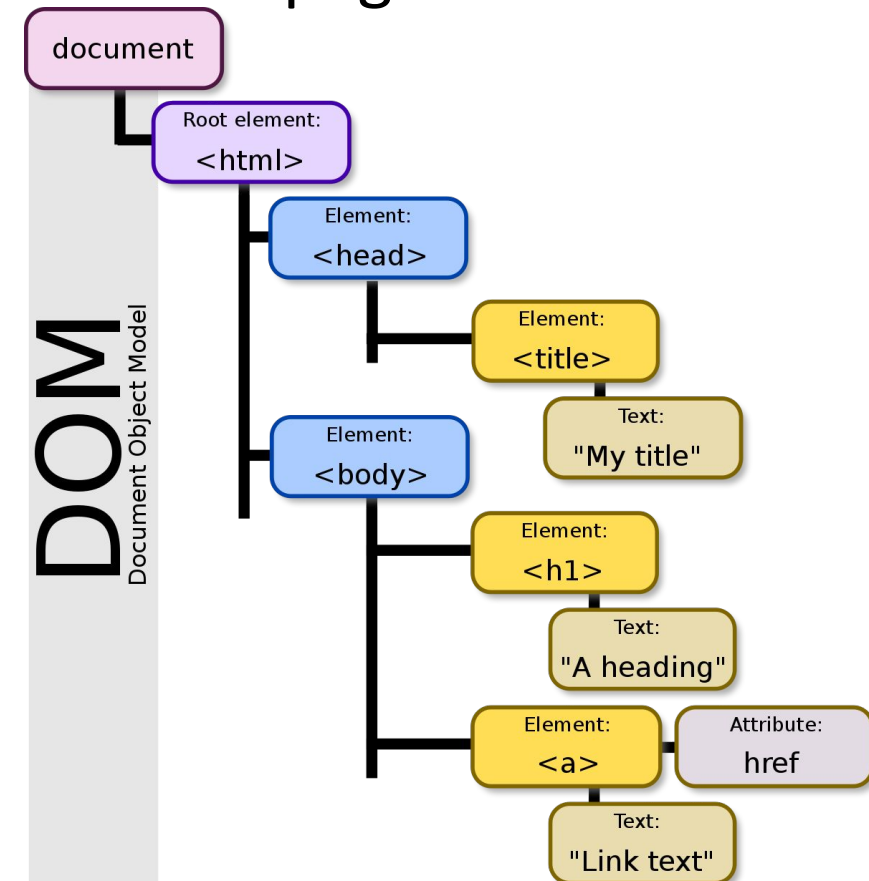
- HTML is read once and turned into the DOM
- CSS and Javascript run against the DOM, not the HTML



Document Object Model (the DOM)

The Document Object Model (DOM) is an **internal, in-memory representation** of a web page's structure, typically stored in RAM as a **nested tree of objects** that represent the elements of the page.

- It is not the page source
- It allows developers to:
 - look for an element with JavaScript
 - find an element's parents, siblings, children
 - add/remove css classes via JavaScript
 - add/remove elements from the page
 - manipulate pretty much anything on the page



Vanilla JavaScript

What makes it “vanilla”?

It is JavaScript that does not rely on any outside utility libraries to do things that can be done with functions and object defined in the ECMAScript specification.

Vanilla JS is what we'll use to interact with the DOM.

DOM Selection Functions

<https://book.techelevator.com/content/dom-api-javascript.html#dom-selection-functions>

- `getElementById()`
 - This function will get a single `HTMLElement` from the DOM and return a reference to it.
 - <https://developer.mozilla.org/en-US/docs/Web/API/Document/getElementById>
- `querySelector()`
 - Takes a standard CSS selector and returns the first element it finds that matches that selector
 - <https://developer.mozilla.org/en-US/docs/Web/API/Document/querySelector>
- `querySelectorAll()`
 - This will return a `NodeList` of all the elements, which you can use as an array
 - <https://developer.mozilla.org/en-US/docs/Web/API/Document/querySelectorAll>

Selector Review... Here's Just a Few

https://www.w3schools.com/cssref/css_selectors.asp

Selector	Example	Example description
<u>.class</u>	.intro	Selects all elements with class="intro"
.class1.class2	.name1.name2	Selects all elements with both <i>name1</i> and <i>name2</i> set within its class attribute
.class1 .class2	.name1 .name2	Selects all elements with <i>name2</i> that is a descendant of an element with <i>name1</i>
<u>#id</u>	#firstname	Selects the element with id="firstname"
*	*	Selects all elements
<u>element</u>	p	Selects all <p> elements
<u>element.class</u>	p.intro	Selects all <p> elements with class="intro"
<u>element,element</u>	div, p	Selects all <div> elements and all <p> elements
<u>element element</u>	div p	Selects all <p> elements inside <div> elements
<u>element>element</u>	div > p	Selects all <p> elements where the parent is a <div> element
<u>element+element</u>	div + p	Selects all <p> elements that are placed immediately after <div> elements
<u>element1~element2</u>	p ~ ul	Selects every element that are preceded by a <p> element



Changing Elements

- `innerText`
 - Updates any text information on the page
 - All text (including html tags) is replaced!
 - Insert text treated as literals: no interpreting of HTML
- `innerHTML`
 - Updates any text information on the page
 - All text (including html tags) is replaced!
 - Interprets HTML for display
 - Do not use with user input! (Why? --see demo)

Manipulating Classes

- `classList` accesses the classes applied to an element

```
// Get the first line item
```

```
let firstListItem = document.querySelector('#todos li');
```

```
// Add the class `done`
```

```
firstListItem.classList.add('done');
```

```
// Remove the class `priority`
```

```
firstListItem.classList.remove('priority');
```

Traversing the DOM

- `.children` will select the immediate child elements
- Convert to an array to manipulate
 - `map`, `filter`, `reduce`, etc.
- `.childNodes` will get all nodes inside an element
- `children` vs `childNodes`
 - `children` are elements, only contain HTML not text
 - `childNodes` contain HTML and text/values

Traversing the DOM

- `.parentNode`
 - Gets the immediate parent node of the element
- `nextElementSibling`
- `previousElementSibling`
- `removeChild`
 - Removes the child element from the DOM

LET'S CODE!



A Quick Aside

Not to be a bore, but there's just a little more,
a final technique for us to critique . . .



JQuery

- Part of the JS Foundation (<https://js.foundation>)
- Can be installed via CDN (Content Delivery Network)

JQuery Syntax

- Start with bling!!
 - `$()`
 - Accepts any argument that is a CSS selector and returns a jQuery DOM element(s) that represents that selector
 - Javascript:
 - `const element = document.querySelector("#main-content");`
 - JQuery
 - `const element = $("#main-content");`

To Learn more about JQuery, start here: [w3schools JQuery Tutorial](#)

Manipulating the DOM with JQuery

- The element can have any HTML or CSS property set on it
 - .text()
 - .html()
 - .val()
 - .addClass('name')
 - .removeClass('name')
 - .hasClass('name')

Manipulating the DOM with JQuery

- Creating a DOM element can be done with `$("<div>")`
- Elements can be added/removed from the DOM
 - `.append()` adds the element as the last child in the jQuery collection (inside)
 - `.prepend()` adds as the first child in the jQuery collection. (inside)
 - `.before()` adds before each element in the set of matched elements. (outside)
 - `.after()` adds after each element in the set of matched elements (outside)
 - `.remove()` removes matched elements from the DOM
 - `.empty()` removes all child nodes from the DOM
 - `.detach()` removes from the DOM to be attached later

**WHAT QUESTIONS DO
YOU HAVE?**



Reading for tonight:



Event Handling

