WEEK 4 - INTRO TO JAVASCRIPT

GENERAL ASSEMBLY

FEWD

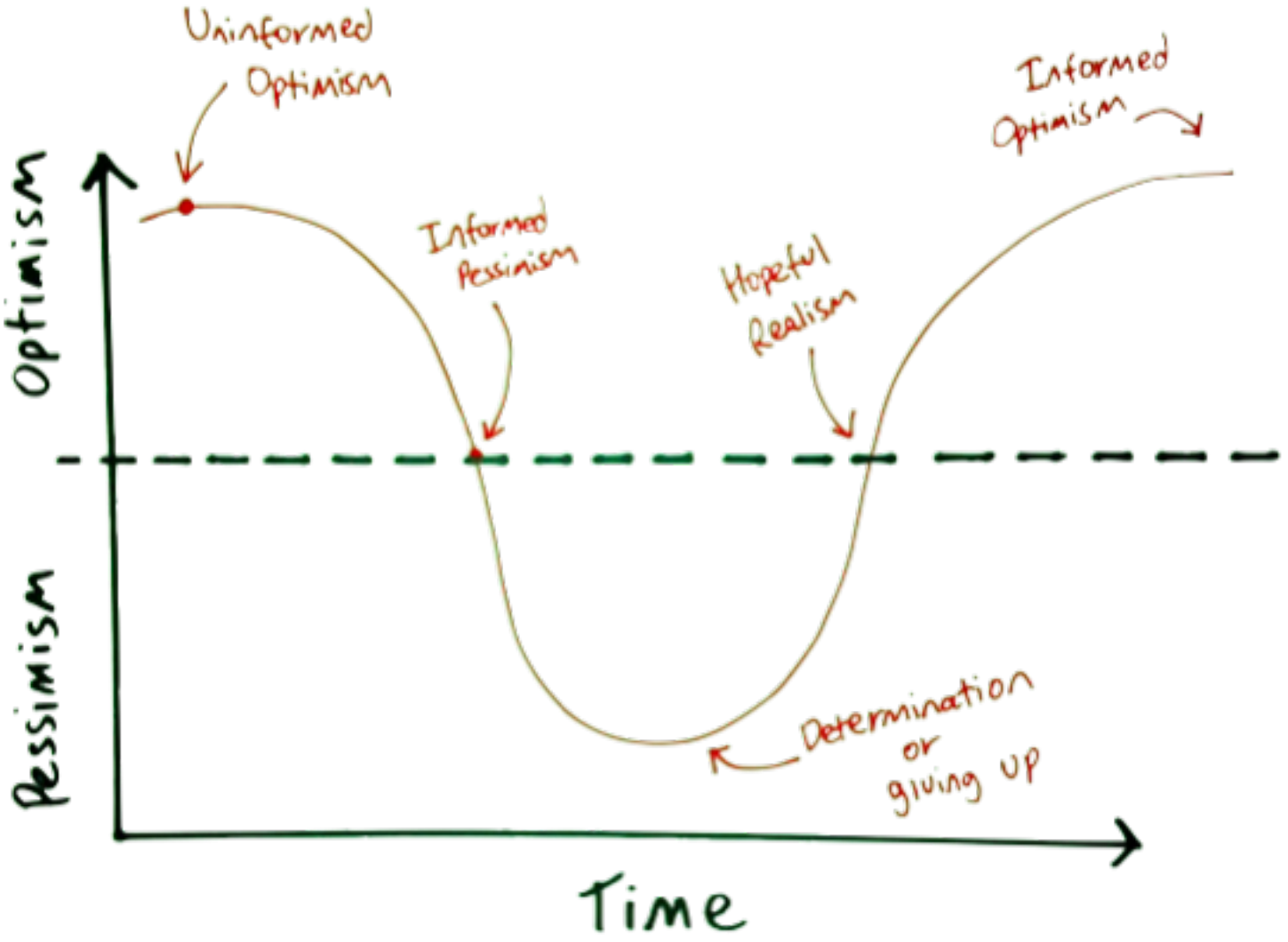
Joe Bliss
Running on Java …

AGENDA

Review Busy Hands
Sprites
What can JS do?
Thinking Programmatically
Pseudo Code
JS Basics - Data Types, Variables, Functions
Temperature Converter
Final Project Milestone

BUSY HANDS

And how did we do??


Uninformed Optimism
Informed Optimism
Informed Pessimism
Hopeful Realism
Determination or giving up
Optimism
Pessimism
Time

SPRITES - WHY WE USE THEM

Faster load time

- Reduce the number of server requests and save bandwidth.

Easier for designers to manage

- All images stored in one place.

No “Blips”

- http://jobs.smashingmagazine.com

EXERCISE - SPRITES

Find a video game Sprite image online. Create a Codepen including the Sprite one time. Then, create multiple characters or states on your page based on that Sprite.

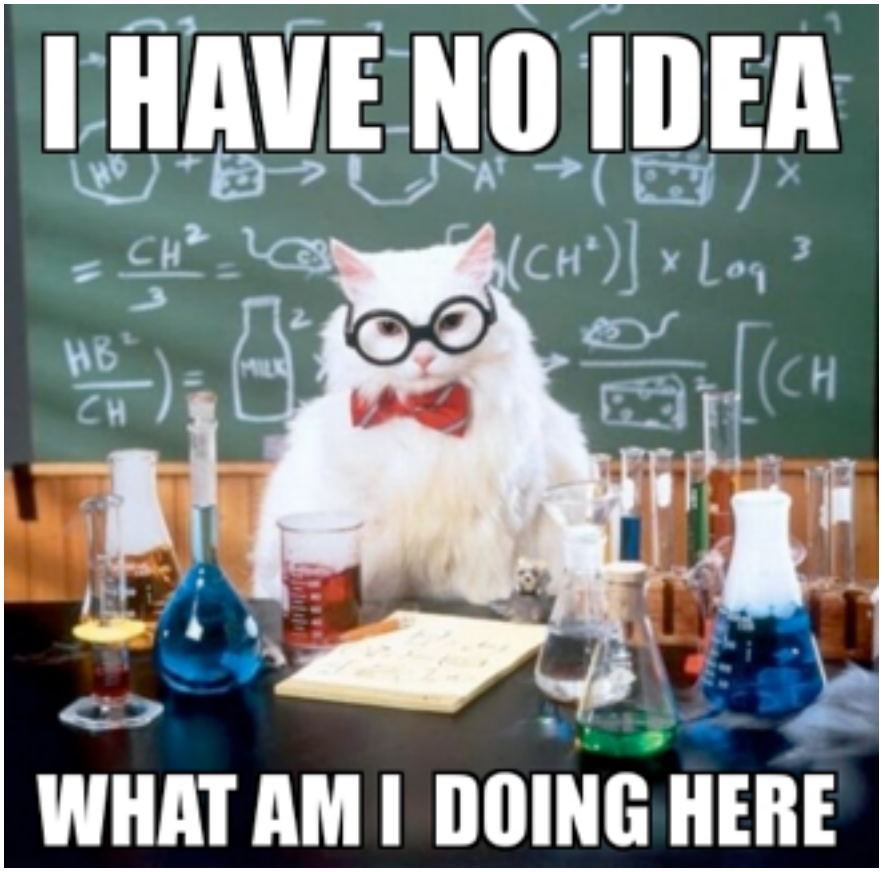
Add hover states, as well, to add some interactivity.

INTRO TO JAVASCRIPT

JAVA ≠ JAVASCRIPT

WHAT CAN WE DO WITH JS?

Why are we
learning Javascript?



EXERCISE – WHAT CAN JS DO?

Go out on the internet and find some cool effects on your favorite sites. We want to try to explore the different things we can add to our sites by utilizing Javascript.

WHAT DID WE DISCOVER?

Adding / Removing Elements
Changing CSS “on-the-fly”
Animating content
Detecting user interactions
Form validation
Loading dynamic content
Etc.

USES OF JAVASCRIPT

Most uses of JS fall into one of four categories:

Changing HTML Content
Changing HTML Attributes
Changing CSS Styles
Validating Form Fields

JS IS DIFFERENT FROM HTML AND CSS

HTML and CSS are used to define the initial state of our website.

JS is used to define how this state changes.

HTML and CSS are static.

JS is dynamic.

HOLY SCRIPT!

Check out how the page changes when we add our JS files.

YOU HAVEN'T LEARNED TO PROGRAM YET

Surprise!

WHAT IS A PROGRAM?

A program is a set of instructions that a person writes to tell a computer how to carry-out a task.

WHAT IS PROGRAMMING?

Programming is the task of writing those instructions in a language that the computer can understand.

BECOMING A PROGRAMMER

… isn't about learning a particular programming language; it's about learning how to "think" like a computer.

We have to know how the computer "thinks" to change how we think.

THINK LIKE A COMPUTER

CLOSE YOUR LAPTOPS

Seriously.

WHAT DID WE LEARN?

You have to be speaking the same language.

You have to know what's pre-defined in the language.

Steps execute sequentially.

Steps must be small, granular.

The computer will do ONLY and EXACTLY what you tell it to do.

PSEUDOCODE

Pseudocode is the process of thinking through a program without actually writing the syntax of a programming language.

PSEUDOCODE-ALONG - THERMOSTAT

Write pseudo code for how a home thermostat works.

SYNTAX

Syntax: Spelling and grammar rules of a programming language.

Like with any language, there are formal rules around how to write it. This is the syntax.

(SOME) JAVASCRIPT SYNTAX

JavaScript statements end in semicolons: “;”

JavaScript is case-sensitive. Variables, function names, etc. must be consistent. joeBliss(); is not the same as joebliss();

Javascript uses various keywords (i.e. function, if, else, for, while) or symbols (i.e. ( ), { }, [ ]) to demarcate control flow.

WORKING LOCALLY WITH JAVASCRIPT

A text file with the ".js" extension. Like CSS, we include it one of two ways:

External (most common)

```
<script type="text/javascript" src="js/project.js"></script>
```

Internal

```
<script type="text/javascript">
    //Do stuff here
</script>
```

Group multiple scripts into a folder, such as "js" or "scripts".

CODEALONG - OUR FIRST JAVASCRIPT

We will write our first Javascript together.

alert("Message");
- Creates a pop-up in the browser that will display: Message

document.write("Message")
- Writes Message out to the page

TYPES OF DATA - NUMBERS

Integers

1, 2, 3, 4, 5

Floats (numbers with decimal points)

3.14159, 2.718281828459045

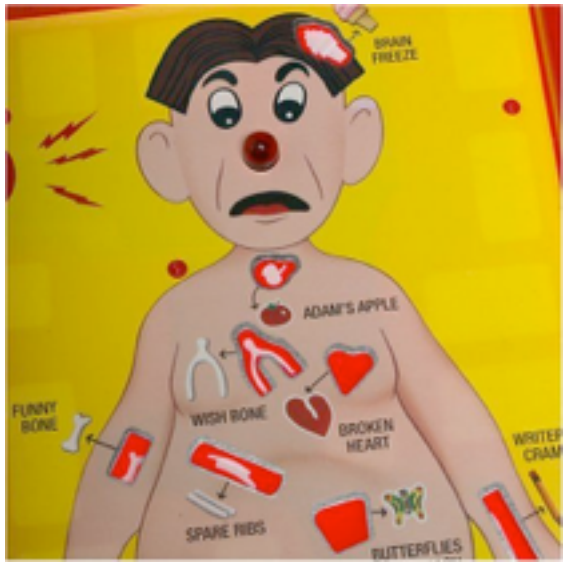
Can be Signed or Unsigned (- or +)

6, -8.2

We can perform arithmetic on number data types

NUMERICAL OPERATIONS

Operator	Description	Example
+	Addition	1+1
-	Subtraction	3-2
*	Multiplication	5 * 3
/	Division	10 /2



TYPES OF DATA – STRINGS

Strings

- A sequence of characters enclosed in quotes, i.e. “I am a String”, “Hello!”, “Joe Bliss”
- Stores textual information
- Can be “double” or ‘single’ quoted

MORE ON STRINGS

Double vs single quoted strings:

- 'They "purchased" it'
- "It's a beautiful day"

Escaping

- "They \"purchased\" it"
- 'It\'s a beautiful day'

EXERCISE - OUR FIRST JAVASCRIPT

Add to our script the following alerts / Document Write messages:

- The product of 5 and 23 (using *)
- The difference of 4 and 2 (using -)
- The quotient of 42 and 6 (using /)
- The sum of 7 and 8 (using +)
- Your first and last name (“Zaphod Beeblebrox”)
- A warning message of your choosing (“These are not the droids you are looking for!”)

RETAINING INFORMATION

What does the following do?

```
alert(2+3);
```

What about this?

```
2+3;
```

VARIABLES

We can tell our program to remember values for us to use later on. The entity we use to store the value is called a variable.

We use the keyword “var” to reserve a variable in JS.

VAR OUT, MAN

Declaration - Creating a variable, reserves a space in memory and gives it a name.

- var age;

Assignment - gives that variable a value.

- age = 2;

Intialization (Declaration and Assignment):

- var age = 2;

WHAT'S IN A NAME?

Variable Naming Conventions:

- Start with a lowercase letter. If they contain multiple words, subsequent words will start with an uppercase letter.
- var number = 5;
- var numberOfClasses = 10;

RESERVED WORDS – I.E. DON'T USE!

abstract
boolean
break
byte
case
catch
char
class
const
continue
debugger
default
delete
do
double
else
enum
export
extends
false
final
finally
float
for
function
goto
if
implements
import
in
instanceof
int
interface
long
native
new
null
package
private
protected
public
return
short
static
super
switch
synchronized
this
throw
throws
transient
true
try
typeof
var
void
volatile
while
with

IN A GALAXY VAR, VAR AWAY ...

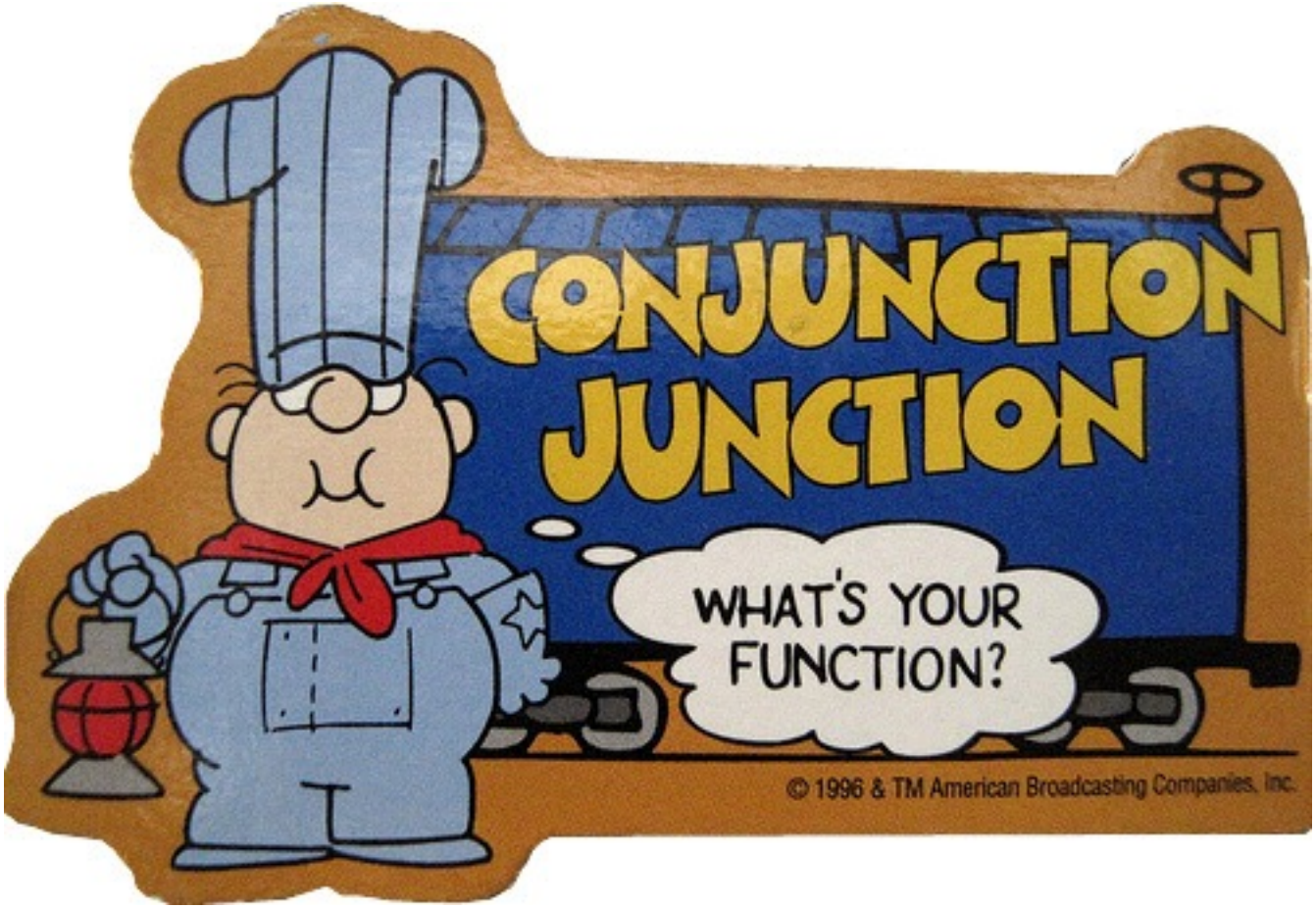
Re-assignment:

- var name = “Joe”;
- name = “Chandler”;

alert(name);

- Will display “Chandler”

FUNCTIONS


CONJUNCTION JUNCTION
WHAT'S YOUR FUNCTION?
© 1996 & TM American Broadcasting Companies, Inc.

FUNCTIONS

Functions are simply a collection of lines of code that you group together so that you can:

- Execute them at a given time
- Reuse them
- Respond to user input

We will spend much more time on functions next week.

DOM - THE DOCUMENT OBJECT MODEL

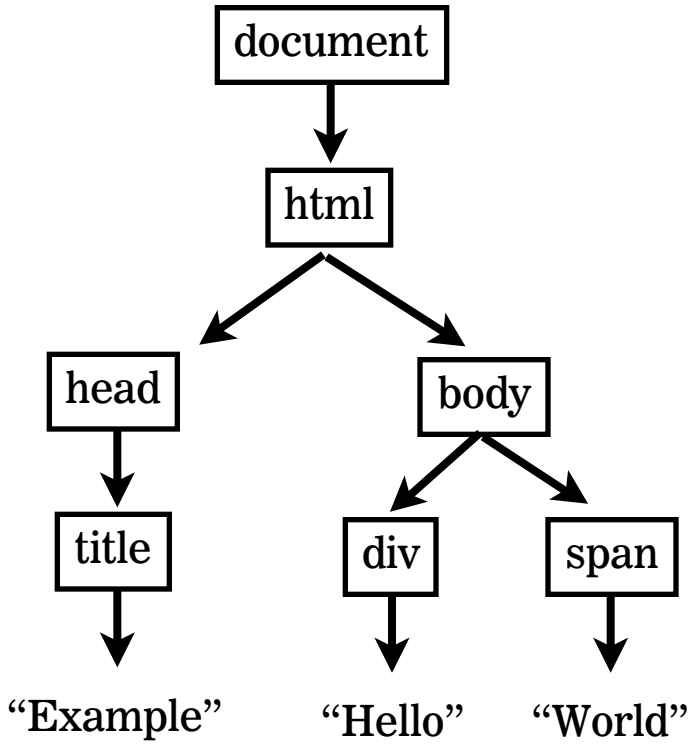
The browser is showing you the DOM, not the HTML/CSS. Think of the DOM as the "current" view of a website. When the page first loads, the DOM matches the defaults stored in the HTML / CSS.

Javascript changes the DOM, not the HTML/CSS. Which is why, on re-load, the page goes back to default.

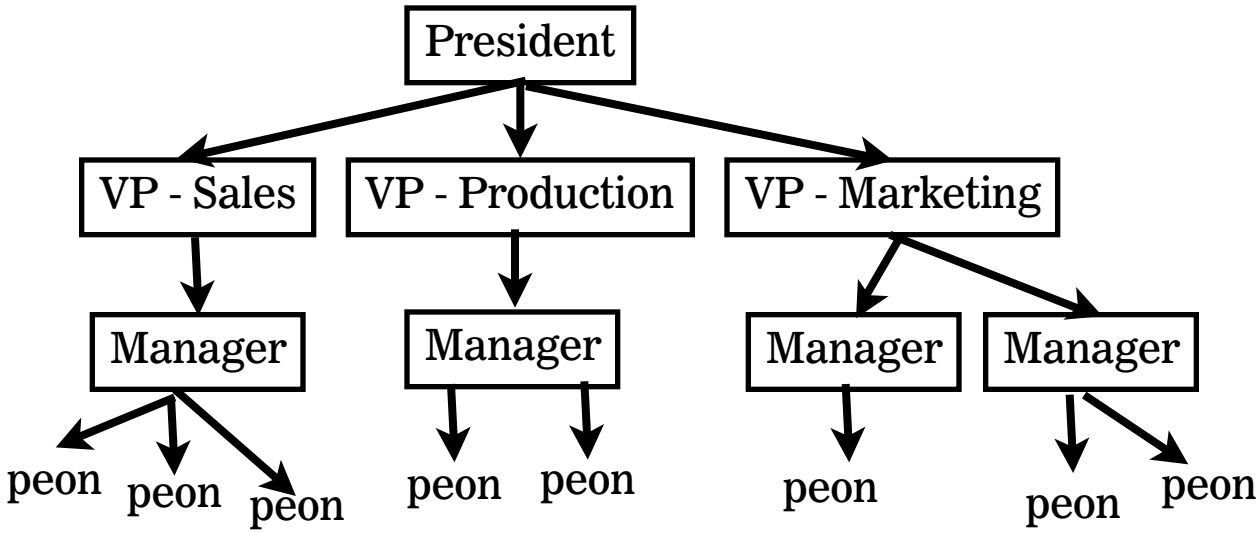
Changes to the DOM are reflected almost immediately.

DOM ... NO, NOT THAT ONE ...

THIS DOM - DOCUMENT OBJECT MODEL



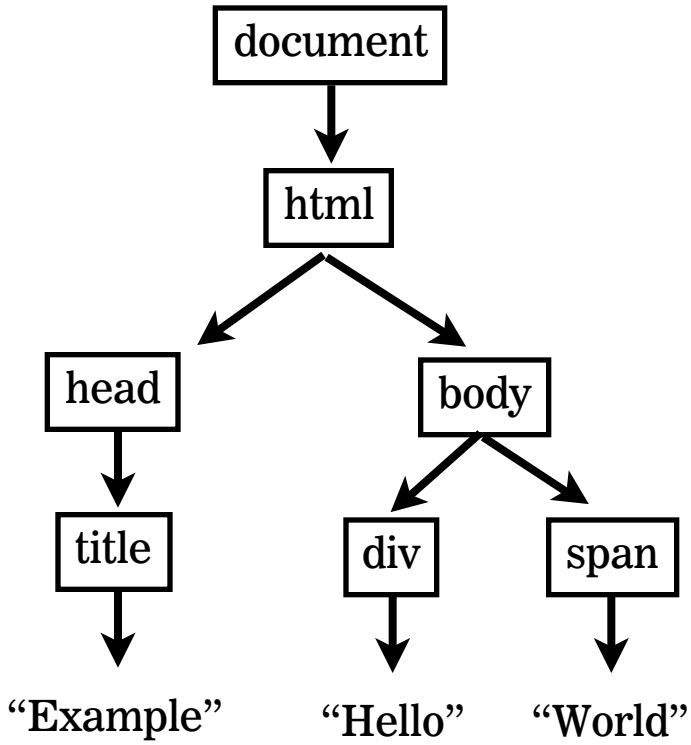
THINK OF IT LIKE AN ORG CHART



TREE STRUCTURE OF THE DOM

The document has a tree structure. There are root, parent, child, sibling, and text nodes.

```
<html>
  <head>
    <title>Example</title>
  </head>
  <body>
    <div>Hello</div>
    <span>World</span>
  </body>
</html>
```



WHAT'S IN A NODE?

Every node in the DOM is what is referred-to as a Javascript Object has a bunch of stuff associated with it:

- Properties and Methods

http://www.w3schools.com/jsref/dom_obj_all.asp

- Events

http://www.w3schools.com/jsref/dom_obj_event.asp

Manipulating these values is how we effect change on our pages.

GETELEMENTBYID - YOUR BEST FRIEND

document.getElementById("someID");

- queries the HTML document and returns a reference to the object in the HTML with id="someID".

This object has several properties associated with it that we will explore - innerHTML, value, style, onclick.

CODEALONG - COLOR SWITCHER

http://codepen.io/josephjbliss/pen/Hblqk

First, let's talk through the pseudocode.

Second, we'll look at the syntax.

EXERCISE - TRAFFIC LIGHT

Take the following Codepen and see if you can understand what it is doing to manipulate it to match the example I will show you.

http://codepen.io/josephjbliss/pen/vkDmB

CODEALONG - VARIABLE REASSIGNMENT

Score counter:

http://codepen.io/josephjbliss/pen/vqarh

Increment (or decrement) the total by the indicated values.

EXERCISE - RGB COLOR CHOICE

User enters a value into the red, green, and blue fields.

User clicks "Change the color!" (bind an onclick event to this and create a separate function)

Create variables for red, green, and blue, and set those to the value of those inputs from the page using document.getElementById(“whatever-the-id-is").value.

Create a color String that looks like "rgb(0,0,0)" using String concatenation techniques. I.e. the String "Joe Bliss" can be made from the strings "Joe "+"Bliss". You will concatenate the red, green, and blue variables for which you assigned values to just moments before and set that equal to the color string you just created. This will look something like: "rgb(" + red + "," + green + "," + blue + ")"

This new variable will have the color you want to use. Set this to be the background color with document.body.style.backgroundColor. Set this to be the text displayed by setting the innerHTML property of the paragraph with id="colorfultext".

CODEALONG - LIFETIME SUPPLY

Store your current age into a variable.

Store a maximum age into a variable.

Store a favorite drink (from a drop-down) into a variable.

Store an amount per day into a variable.

Calculate how many you would eat total for the rest of your life.

Output the result to the screen.

EXERCISE - TEMPERATURE CONVERTER

This assignment is open-ended. The HTML/CSS is up to you. There is no starter code.

Build an application using HTML/CSS and JS that converts a temperature from Fahrenheit to Celsius AND from Celsius to Fahrenheit, based on user input.

HOMEWORK

Finish the Temperature Converter
Final Project Proposal

FINAL PROJECT PROPOSAL

Make sure Chandler or I have chatted with you about your project before you go today. An “executive summary” and initial sketch is due by next week:

Can be sketched out by hand

Can be done using a wireframing tool:

- https://gomockingbird.com/mockingbird/
- http://balsamiq.com/
- More: http://mashable.com/2010/07/15/wireframing-tools/