MODULE ONE - JAVASCRIPT FOUNDATIONS

INTRO TO CLIENT-SIDE JAVASCRIPT

TODAY'S SCHEDULE

1. Welcome / Course Introduction
2. Syllabus/ Course Outline Review
3. What is JavaScript?
4. What Can We Do with JavaScript?
5. Adding JavaScript
6. JavaScript Basics
7. Show What You Know (KAHOOOOOT!)
8. Practice Time
9. Review/ Weekly Tasks

PART ONE – WELCOME!

A LITTLE ABOUT ME

- graduate of the Web Design & Animation (WBAN) program at Georgian (2012 - 2014)
- previously worked at Gel Creative, Tyger Shark, 3Sixty Marketing & Element 6
- teaching at Georgian for 4 years (COMP1006, COMP1054, COMP2081, COMP2107, COMP1073, COMP1002).
- cat lady

A LITTLE ABOUT YOU . . .

- Your Name
- Your Program
- Where You Are Working From This Semester (optional)
- Something You Hope To Learn In This Class
- A Strange/Fun/Interesting/Fun Fact About You (optional)

A LITTLE ABOUT YOU. . .

HTTPS://FLIPGRID.COM/299DBAF8 - SECTION ONE (THURS)

HTTPS://FLIPGRID.COM/CB85740C - SECTION TWO (TUES)

A LITTLE ABOUT COMP 1073 . . .

- Course Outline
- Course Syllabus
- Communication Policy
- Academic Integrity
- Blackboard Tour

RANDOM CAT MEME

PART ONE – GETTING TO KNOW JAVASCRIPT

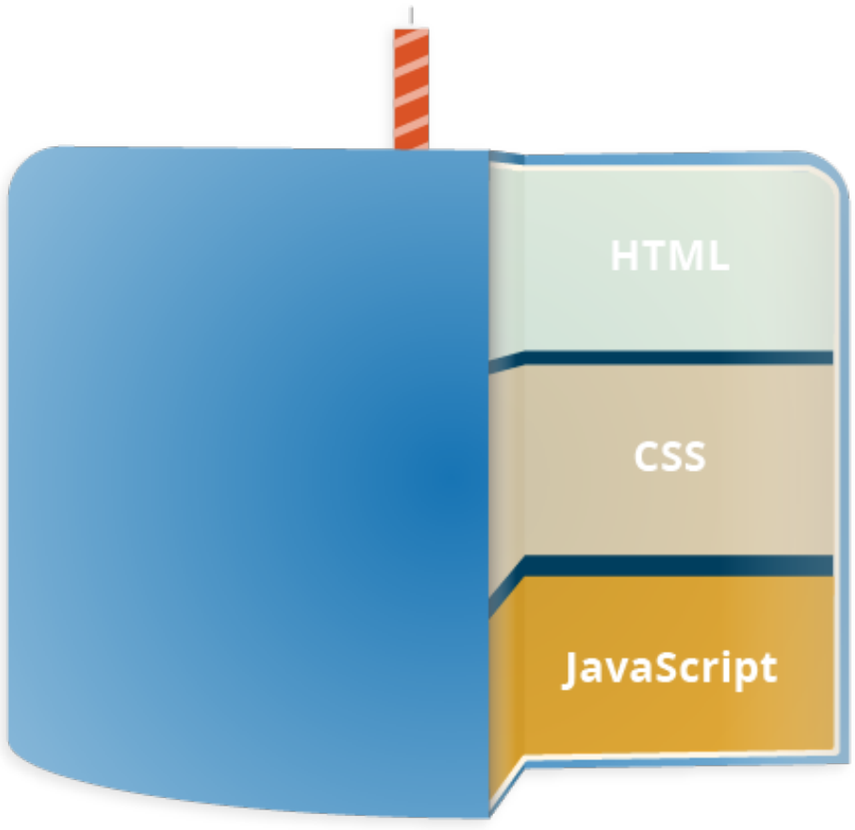
LET'S START WITH WHAT YOU ALREADY KNOW ABOUT JS?

PollEv.com/jessicagilfi616

SO WHAT'S JAVASCRIPT ALL ABOUT?

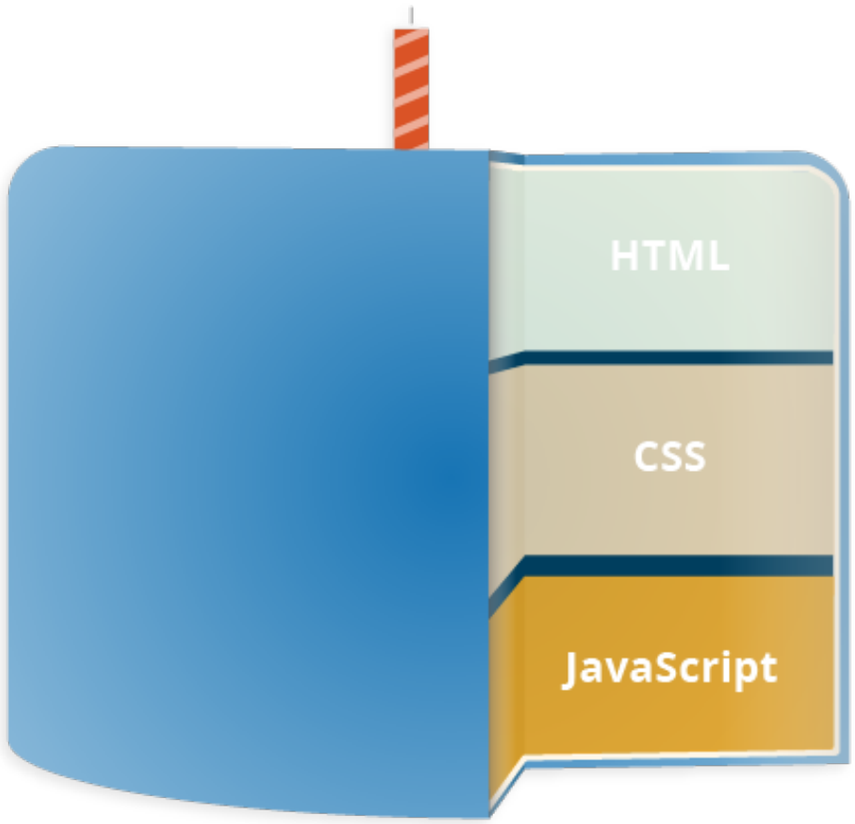
- a scripting language that runs in the browser and interacts with HTML markup and CSS rules to change what you see and what you can do
- JavaScript allows us to add INTERACTIVITY to our static webpages

WE CAN THINK OF WEBSITES/ APPLICATIONS LIKE A PIECE OF CAKE



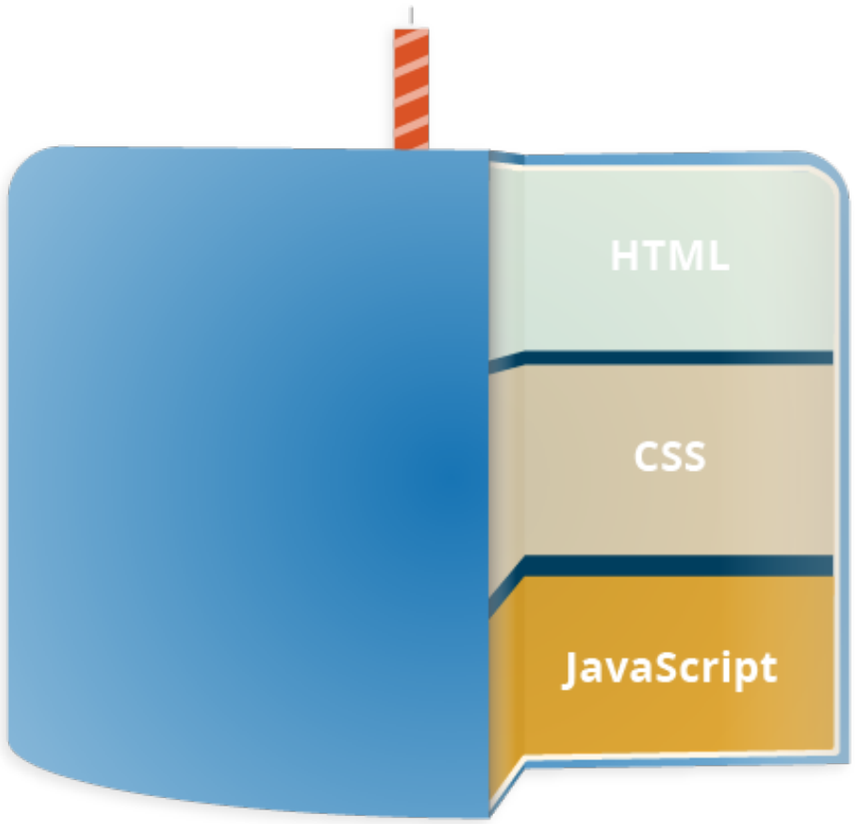
- **HTML** is the first layer. We use HTML to define content and provide structure for our webpage/ application.

Image: https://developer.mozilla.org/en-US/docs/Learn/JavaScript/First_steps/What_is_JavaScript



- **CSS** is the second layer. We use CSS to visually style and layout our websites and applications.

Image: https://developer.mozilla.org/en-US/docs/Learn/JavaScript/First_steps/What_is_JavaScript



- **JS** is the third layer. We use JS to add interactivity to our websites/ applications.

Image: https://developer.mozilla.org/en-US/docs/Learn/JavaScript/First_steps/What_is_JavaScript

EXAMPLE ONE: EXPLORING THE LAYERS OF A WEBSITE/APPLICATION

SO WHAT'S JAVASCRIPT ALL ABOUT?

- high level, dynamic
- loosely typed
- object-based
- single-threaded
- prototype-based
- interpreted, or just-in-time compiled
- standardized using the ECMAScript language specification
- NOT Java!

ECMASCRIPT!?

I THOUGHT WE WERE LEARNING JAVASCRIPT!?

"ECMAScript (or ES)[1] is a scripting-language specification standardized by Ecma International. It was created to standardize JavaScript to help foster multiple independent implementations"

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

WHAT ABOUT JQUERY, REACT, NODE, ANGULAR?

PART TWO– WHAT CAN WE DO WITH JAVASCRIPT ?

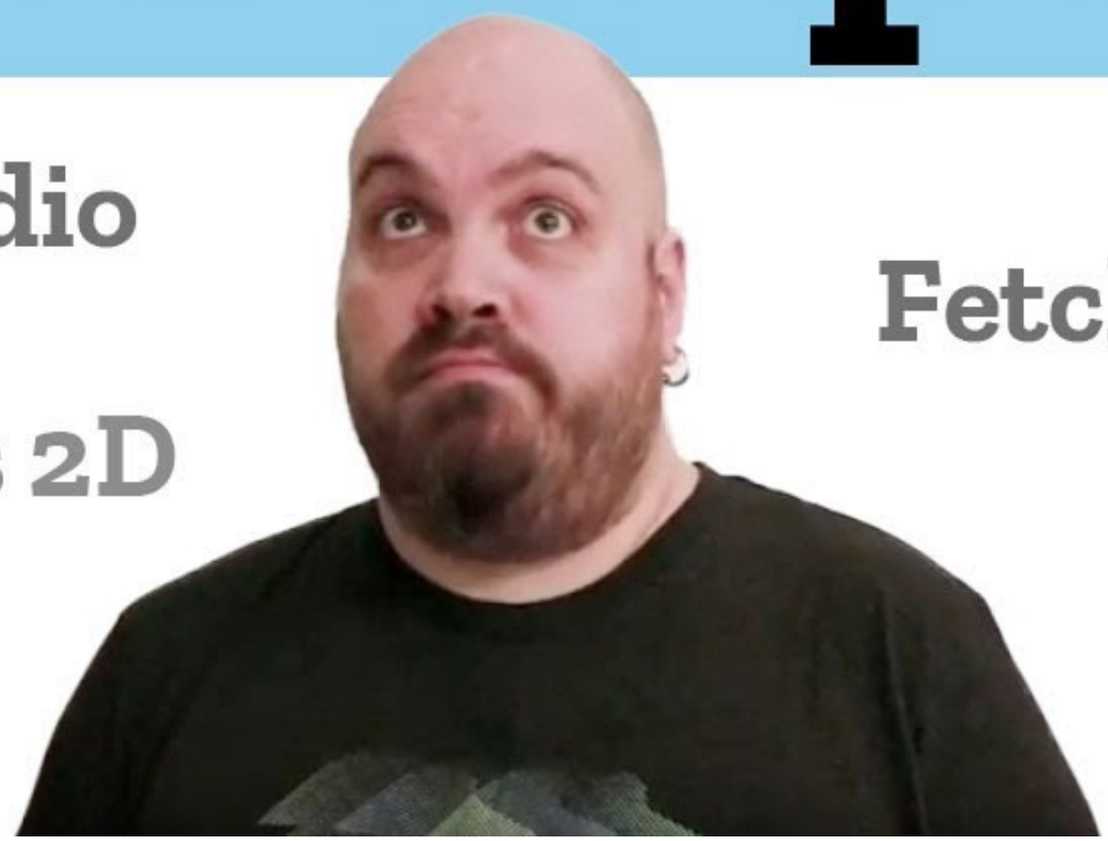
WHAT CAN WE DO WITH JAVASCRIPT?

What is JavaScript?

Web Audio

Canvas 2D

WebGL



Fetch

WHAT CAN I DO WITH JAVASCRIPT?

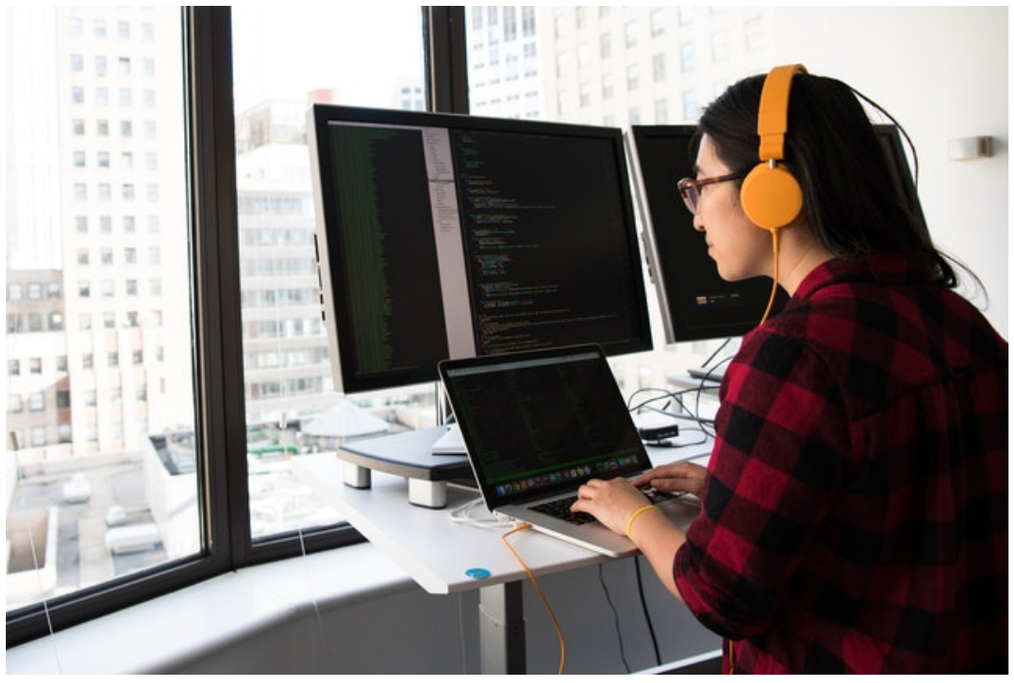
- Add new HTML to the page, change the existing content, modify styles.
- React to user actions, run on mouse clicks, pointer movements, key presses.
- Send requests over the network to remote servers, download and upload files (so-called AJAX and COMET technologies).
- Get and set cookies, ask questions to the visitor, show messages.
- Remember the data on the client-side (“local storage”).

WHAT CAN I DO WITH JAVASCRIPT?

- Allow us to make our static websites more dynamic!
- Store useful values inside variables
- Operations on pieces of text
- Work with APIs
- Running code in response to certain events occurring on a web page
- Server-side stuff (although we won't be focusing on that this semester)

PART THREE –

HOW DOES IT WORK?



- programs are called scripts
- can execute on the browser (as well as the server) or any device that has a special device called the JavaScript engine
- the engine reads or parses the script, converts or compiles the script to the machine language and then the machine code runs

HOW CAN WE ADD JS?

- Internal or Embedded JavaScript 👍
- External JavaScript 👍
- Inline JavaScript 🤮

RUNNING ORDER

- when the browser encounters a block of JavaScript, it generally runs it in the order it appears (from top to bottom)

SCRIPT LOADING STRATEGIES

- getting scripts to load at the right time can be tricky!
- HTML loads in order it appears, meaning your JS may load before the elements on the page are ready

SCRIPT LOADING STRATEGIES

- async attribute - will download the script without blocking rendering the page and will run it as soon as the script finishes downloading
- defer attribute - scripts will run in the order they appear in the page and run them as soon as the script and content are downloaded

EXAMPLE TWO: ADDING JAVASCRIPT

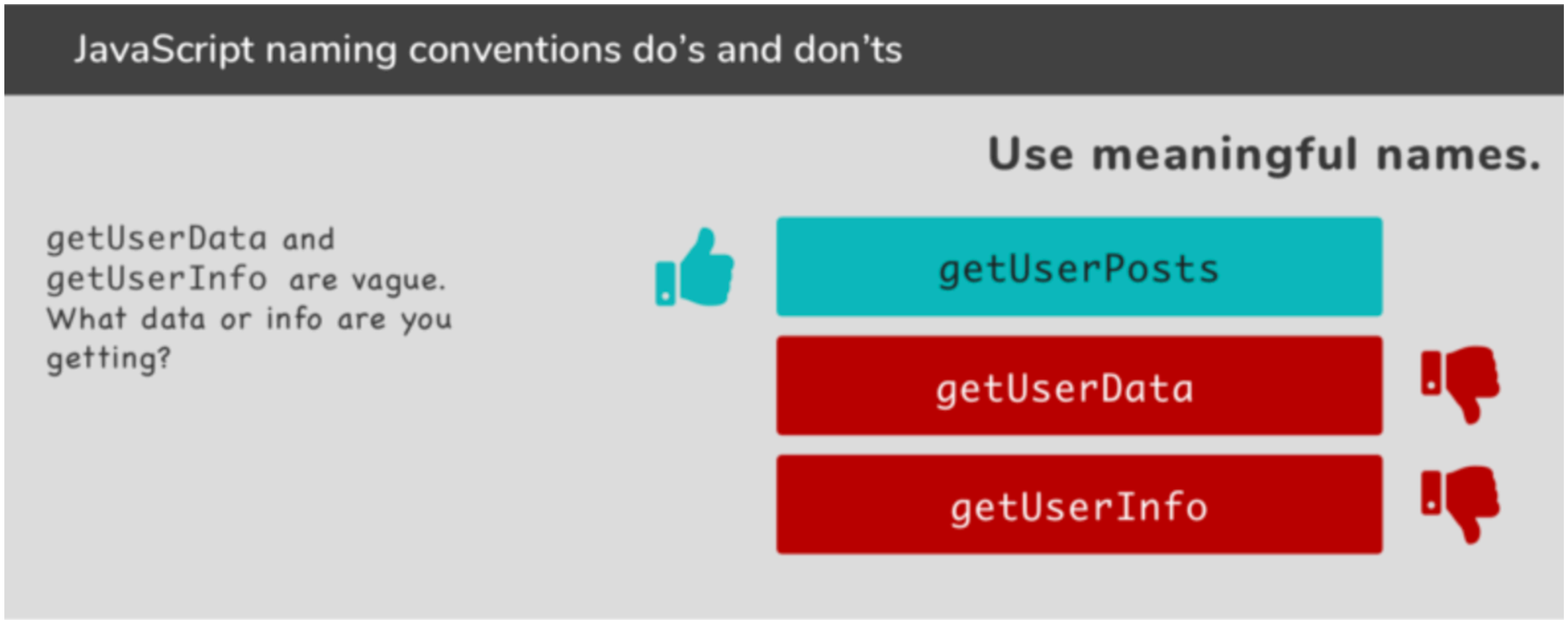
PART THREE –

JAVASCRIPT BASICS

VARIABLES & STATEMENTS

We can think of variables as buckets or containers used to store things in our programs

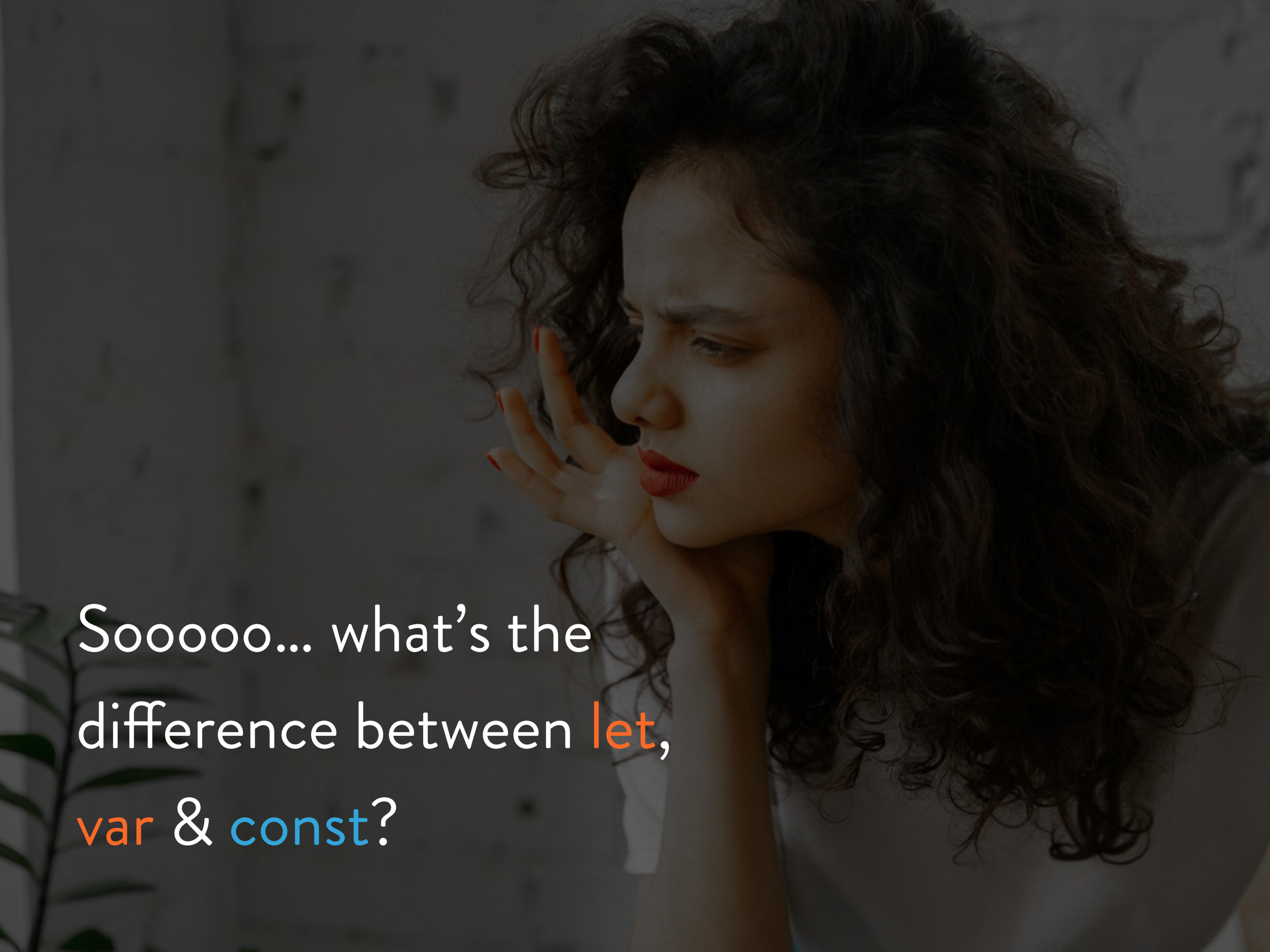
NAMING VARIABLES



https://www.freecodecamp.org/news/javascript-naming-conventions-dos-and-don-ts-99c0e2fdd78a/

THREE WAYS TO DECLARE VARIABLES

1. Var
2. Let
3. Const*


Sooooo... what's the
difference between let,
var & const?

VARIABLE SCOPE

- Where a variable is defined affects where we can access that variable
- global scope vs. local scope

STATEMENTS & SEMICOLONS

```
let catsAreGreat = true; // statement terminates with a semicolon

function catFunction() {
  if(catsAreGreat === true) {
    console.log('You got it!');// statement terminates with a
    semicolon
  }// no semicolon
  else{
    console.log('Wrong');// statement terminates with a semicolon
  } // no semicolon
} // no semicolon
```

statement = doing something & needs a semi-colon at the end

TYPES OF DATA

TYPES OF DATA

- numbers
- strings
- objects
- arrays
- booleans
- null
- undefined

JavaScript is

Loosely Typed!

NUMBERS & ARITHMETIC OPERATORS

ARITHMETIC OPERATORS

Operator	Name	Purpose	Example
+	Addition	Adds two numbers together.	`6 + 9`
-	Subtraction	Subtracts the right number from the left.	`20 - 15`
*	Multiplication	Multiplies two numbers together.	`3 * 7`
/	Division	Divides the left number by the right.	`10 / 5`
%	Remainder (sometimes called modulo)	Returns the remainder left over after you've divided the left number into a number of integer portions equal to the right number.	`8 % 3` (returns 2, as three goes into 8 twice, leaving 2 left over).
**	Exponent	Raises a `base` number to the `exponent` power, that is, the `base` number multiplied by itself, `exponent` times. It was first Introduced in EcmaScript 2016.	`5 ** 2` (returns `25`, which is the same as `5 * 5`).

INCREMENT AND DECREMENT OPERATORS

INCREMENT & DECREMENT

- ++ — increment by one
- - - — decrement by one

ASSIGNMENT OPERATORS

ASSIGNMENT OPERATORS

Operator	Name	Purpose	Example	Shortcut for
`+=`	Addition assignment	Adds the value on the right to the variable value on the left, then returns the new variable value	`x += 4;`	`x = x + 4;`
`-=`	Subtraction assignment	Subtracts the value on the right from the variable value on the left, and returns the new variable value	`x -= 3;`	`x = x - 3;`
`*=`	Multiplication assignment	Multiplies the variable value on the left by the value on the right, and returns the new variable value	`x *= 3;`	`x = x * 3;`
`/=`	Division assignment	Divides the variable value on the left by the value on the right, and returns the new variable value	`x /= 5;`	`x = x / 5;`

COMPARISON OPERATORS

COMPARISON OPERATORS

Operator	Name	Purpose	Example
`===`	Strict equality	Tests whether the left and right values are identical to one another	`5 === 2 + 4`
`!==`	Strict-non-equality	Tests whether the left and right values are **not** identical to one another	`5 !== 2 + 3`
`<`	Less than	Tests whether the left value is smaller than the right one.	`10 < 6`
`>`	Greater than	Tests whether the left value is greater than the right one.	`10 > 20`
`<=`	Less than or equal to	Tests whether the left value is smaller than or equal to the right one.	`3 <= 2`
`>=`	Greater than or equal to	Tests whether the left value is greater than or equal to the right one.	`5 >= 4`

LOGICAL OPERATORS

LOGICAL OPERATORS

- && – AND; all conditions must be met to evaluate to true .
- || – OR; one or more of your conditions must be met to evaluate to true

STRINGS

STRINGS

- used for text
- use double or single quotes, be consistent
- escaping characters in a string
- concatenating strings
- template literals (or template strings)

EXAMPLE THREE:

JAVASCRIPT BASICS

SHOW WHAT YOU KNOW . . .

https://kahoot.it/

THIS WEEK'S TASKS . . .

NEXT WEEK :

MORE JAVASCRIPT BASICS & TOOLS, TROUBLESHOOTING & DEBUGGING