GENERAL ASSEMBLY

JAVASCRIPT DEVELOPMENT

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HELLO!

1. Pull changes from the `svodnik/JS-SF-8-resources` repo to your computer:
   - Open the terminal
   - `cd` to the `JSD/JS-SF-8-resources` directory
   - Type **`git pull`** and press **return**
2. In your code editor, open the following folder: `JSD/JS-SF-8-resources/03-loops-conditionals/starter-code`

CONDITIONALS & FUNCTIONS

LEARNING OBJECTIVES

At the end of this class, you will be able to

- Build iterative loops using `for` and `forEach` statements.
- Use Boolean logic to combine and manipulate conditional tests.
- Use `if/else` conditionals to control program flow.
- Differentiate among true, false, truthy, and falsy.
- Describe how parameters and arguments relate to functions
- Create and call a function that accepts parameters to solve a problem
- Define and call functions defined in terms of other functions
- Return a value from a function using the `return` keyword
- Define and call functions with argument-dependent return values

AGENDA

- `for` loops
- Comparison operators, logical operators, & conditional statements
- Functions

WEEKLY OVERVIEW

WEEK 2	Data Types & Loops / Conditionals & Functions
WEEK 3	Scope & Objects / (holiday)
WEEK 4	Slackbot Lab / JSON & Object Oriented Programming

EXIT TICKET QUESTIONS

1. I'm not sure how to apply what I'm learning on solving problems
2. Having trouble remembering all the methods
3. We can add elements to an array to the beginning and the end and rearrange the elements in reverse, but can you add an element to a particular spot in the array?
4. How Array is used in the real world
5. Does having strings and numbers in the same array make using the array more complicated?

How to you decide what to have for dinner?

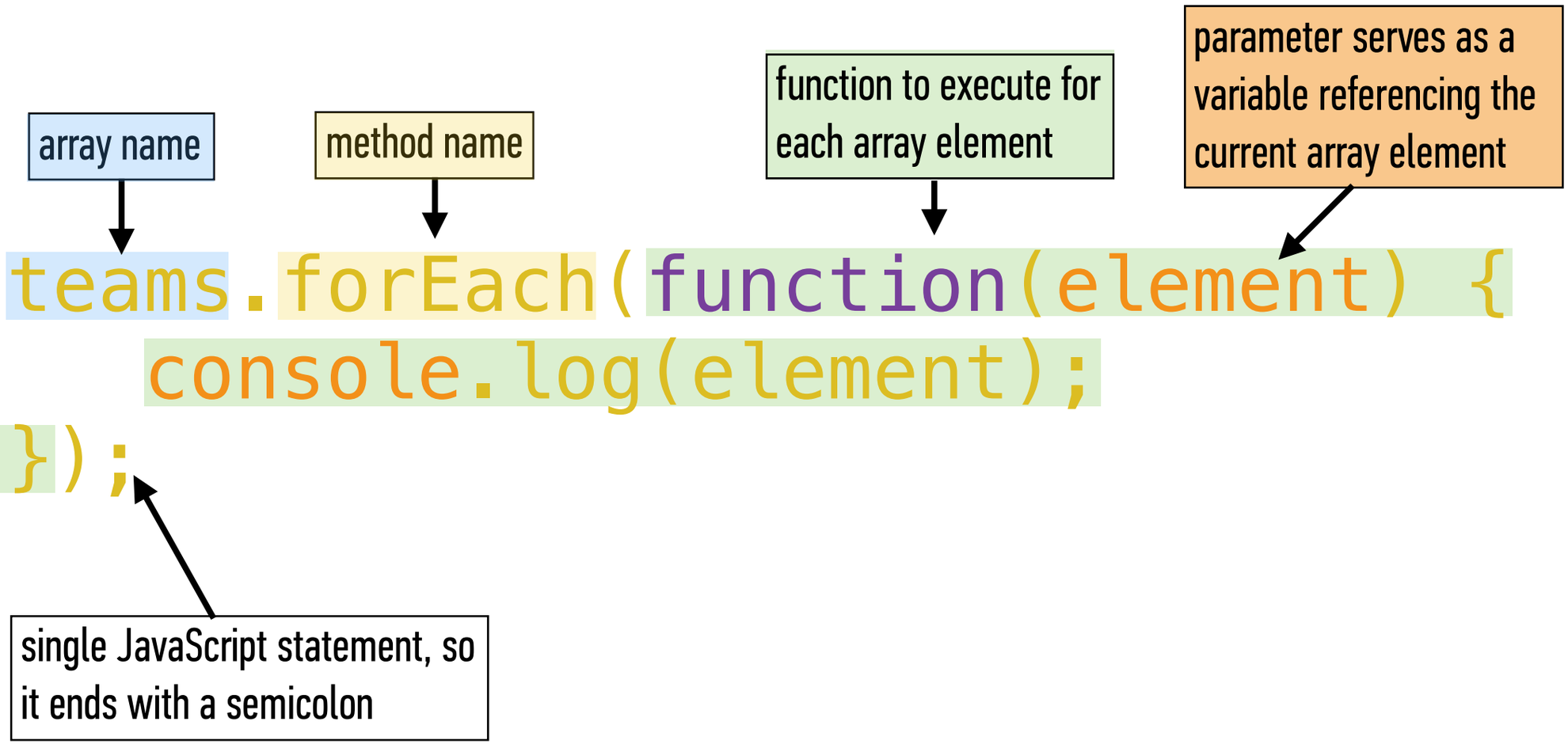
- What factors do you consider?
- How do you decide between them?

LOOPS

ITERATING

Going through the same process with a bunch of items, one at a time

forEach()


array name
method name
function to execute for each array element
parameter serves as a variable referencing the current array element
teams.forEach(function(element) {
console.log(element);
});
single JavaScript statement, so it ends with a semicolon

forEach() EXAMPLE

```
let teams = ['Bruins', 'Bears', 'Ravens', 'Ducks'];

teams.forEach(function(element) {
    console.log(element);
});
```

LAB — ARRAYS

TYPE OF EXERCISE

- Individual / Pair

LOCATION

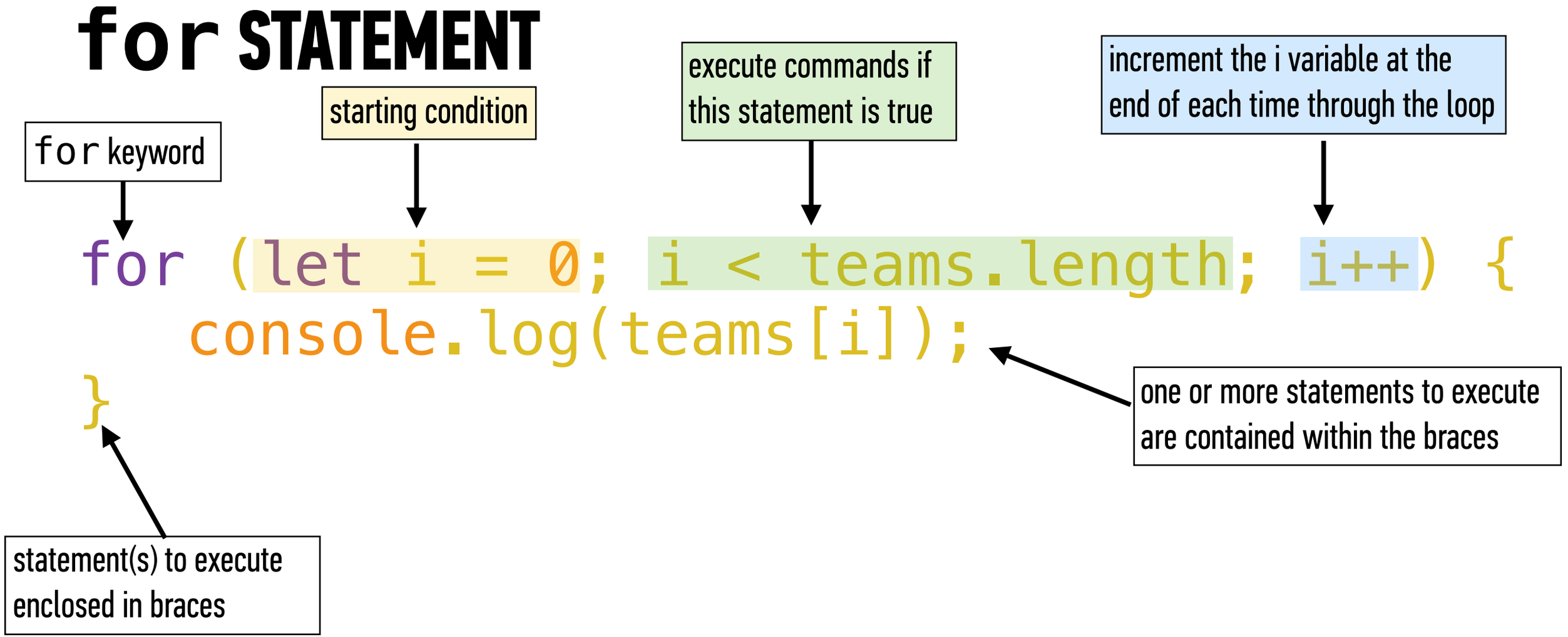
- `starter-code > 0-arrays-loops-exercise`

TIMING

10 min

1. In the `app.js` file, complete Questions 5-6.
2. BONUS: Complete Question 7.

for STATEMENT



`for` STATEMENT

```
let fruits = ['apples', 'oranges', 'bananas'];

for (let i = 0; i < fruits.length; i++) {
    console.log(fruits[i]);
});
```

result in console:

```
< "apples"
< "oranges"
< "bananas"
```

LAB — FOR LOOPS

TYPE OF EXERCISE

- Individual / Pair

LOCATION

- `starter-code > 2-loops-exercise`

TIMING

10 min

1. Write code that creates a `for` loop that calculates 2 to a given power, and console.logs each step of the calculation. (Full instructions in the `app.js` file.)
2. BONUS 1: Rewrite your code to allow a user to enter the exponent value, rather than hard-coding it into your program. (Hint: Read up on the window.prompt method.)
3. BONUS 2: Rewrite your code to use a while loop rather than a `for` loop.
4. BONUS 3: Rewrite your code to use a do/while loop rather than a `for` loop or `while` loop.

CONDITIONALS

CONDITIONAL STATEMENTS

- Decide which blocks of code to execute and which to skip, based on the results of tests that we run
- Known as **control flow statements**, because they let the program make decisions about which statement should be executed next, rather than just going in order

`if` STATEMENT

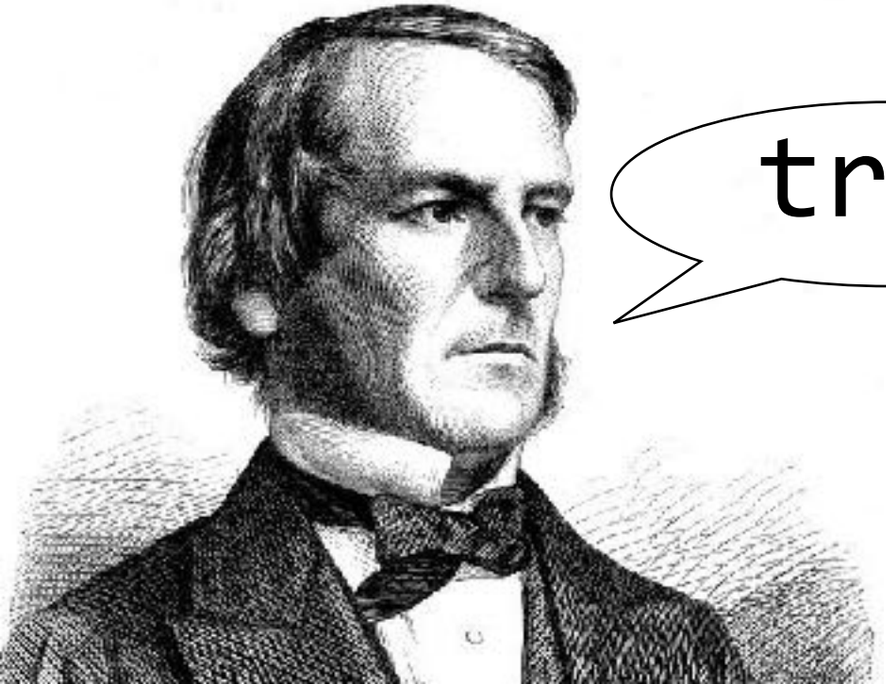
```
if (expression) {
    code
}
```

```
if (expression) { code }
```

- JavaScript doesn't care about white space, so these are equivalent.
- **However**, putting block contents on a separate line is best practice for code readability.

BOOLEAN VALUES

- A separate data type
- Only valid values are `true` or `false`
- Named after George Boole, a mathematician



COMPARISON OPERATORS

>	greater than
>=	greater than or equal to
<	less than
<=	less than or equal to
===	strict equal (use this one)
==	coercive equal (AVOID)
!==	strict not equal (use this one)
!=	coercive not equal (AVOID)

TYPE COERCION

- JavaScript “feature” that attempts to make it possible to run a comparison operation on two objects of different data types
- Results are sometimes unpredictable
- == and != use coercion if necessary to arrive at an answer — avoid them
- === and !== do not use coercion — best practice is to use these rather than the coercive operators

`if` STATEMENT

```
let weather = "sunny";

if (weather === "sunny") {
   console.log("Grab your sunglasses");
}
```

`if/else` STATEMENT

```
var weather = "sunny";

if (weather === "sunny") {
   console.log("Bring your sunglasses");
} else {
   console.log("Grab a jacket");
}
```

`else if` STATEMENT

```
var weather = "sunny";

if (weather === "sunny") {
   console.log("Bring your sunglasses");
} else if (weather === "rainy") {
   console.log("Take an umbrella");
} else {
   console.log("Grab a jacket");
}
```

TERNARY OPERATOR

- A compact `if/else` statement on a single line
- “ternary” means that it takes 3 operands

TERNARY OPERATOR

```
(expression) ? trueCode : falseCode;
```

TERNARY OPERATOR

- Can produce one of two values, which can be assigned to a variable in the same statement

```
let name = (expression) ? trueCode : falseCode;
```

BLOCK STATEMENTS

- Statements to be executed after a control flow operation are grouped into a block statement
- A block statement is placed inside braces

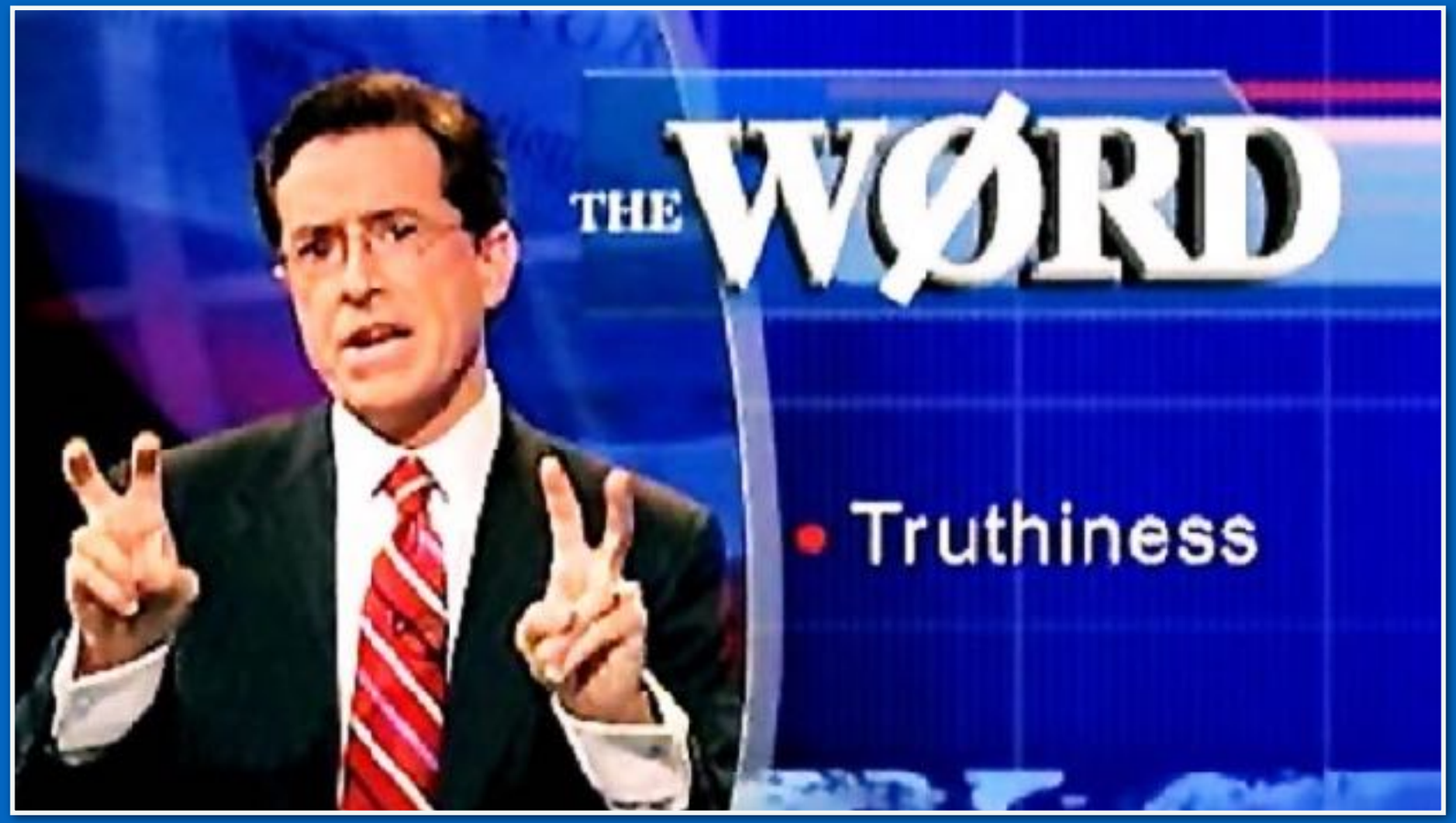
```
{
   console.log("Grab your sunglasses.");
   console.log("Enjoy the beach!");
}
```

LOGICAL OPERATORS

- Operators that let you chain conditional expressions

&&	AND	Returns `true` when both left and right values are `true`
||	OR	Returns `true` when at least one of the left or right values is `true`
!	NOT	Takes a single value and returns the opposite Boolean value

TRUTHY AND FALSY VALUES



FALSY VALUES

- All of these values become `false` when converted to a Boolean:
  - `false`
  - `0`
  - `""`
  - `NaN`
  - `null`
  - `undefined`
- These are known as **falsy values** because they are equivalent to `false`

TRUTHY VALUES

- All values other than `false`, `0`, `""`, `NaN`, `null`, and `undefined` become `true` when converted to a Boolean
- All values besides these six are known as **truthy values** because they are equivalent to `true`
- `'0'` and `'false'` are both truthy! (Why?)

BEST PRACTICES

- Convert to an actual Boolean value
  - Adding `!` before a value returns the *inverse* of the value as a Boolean
  - Adding `!!` before a value gives you the *original* value as a Boolean
- Check a value rather than a comparison

just use
`if (name)`

instead of
`if (name === false)`

LAB — CONDITIONALS

EXERCISE

TYPE OF EXERCISE

- Pair

LOCATION

- `starter-code > 4-ages-lab`

TIMING

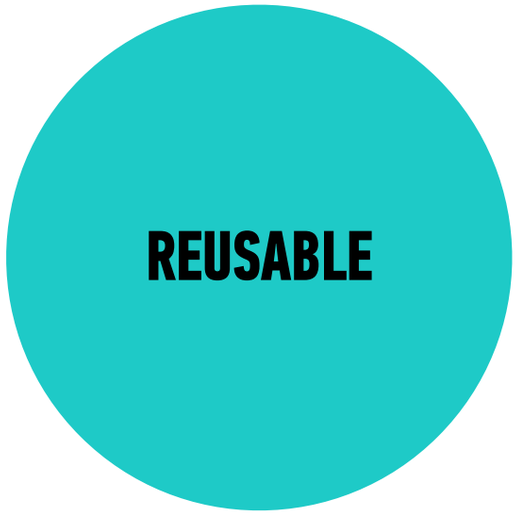
15 min

1. Write a program that outputs results based on users' age. Use the list of conditions in the `app.js` file.
2. BONUS 1: Rewrite your code to allow a user to enter an age value, rather than hard-coding it into your program. (Hint: Read up on the window.prompt method.)
3. BONUS 3: Rewrite your code to use a switch statement rather than if and else statements.

FUNCTIONS

FUNCTIONS

Allow us to group a series of statements together to perform a specific task



We can use the same function multiple times

Not always executed when a page loads. Provide us with a way to 'store' the steps needed to achieve a task.

DRY = DON'T REPEAT YOURSELF

FUNCTION DECLARATION SYNTAX

```
function name(parameters) {
  // do something
}
```

FUNCTION DECLARATION EXAMPLE

```
function speak() {
  console.log(“Hello!”);
}
```

FUNCTION EXPRESSION SYNTAX

```
let name = function(parameters) {
  // do something
};
```

FUNCTION EXPRESSION EXAMPLE

```
let speak = function() {
  console.log(“Hello!”);
};
```

ARROW FUNCTION SYNTAX

```
let name = (parameters) => {
  // do something
};
```

ARROW FUNCTION EXAMPLE

```
let speak = () => {
  console.log(“Hello!”);
};
```

CALLING A FUNCTION

```
function pickADescriptiveName() {
    // do something
}
```

To run the function, we need to *call* it. We can do so like this:

```
pickADescriptiveName();
```

Function name + parentheses

EXERCISE — WRITING FUNCTIONS

KEY OBJECTIVE

- Practice defining and executing functions

TYPE OF EXERCISE

- Individual/paired

LOCATION

- `starter-code > 0-functions-exercise` (part 1)

EXECUTION

4 min

1. Follow the instructions under Part 1

FUNCTION EXPRESSION VS FUNCTION DECLARATION

- Function expressions define functions that can be used anywhere in the scope where they're defined.
- You can call a function that is defined using a function declaration before the part of the code where you actually define it.
- Function expressions must be defined before they are called.

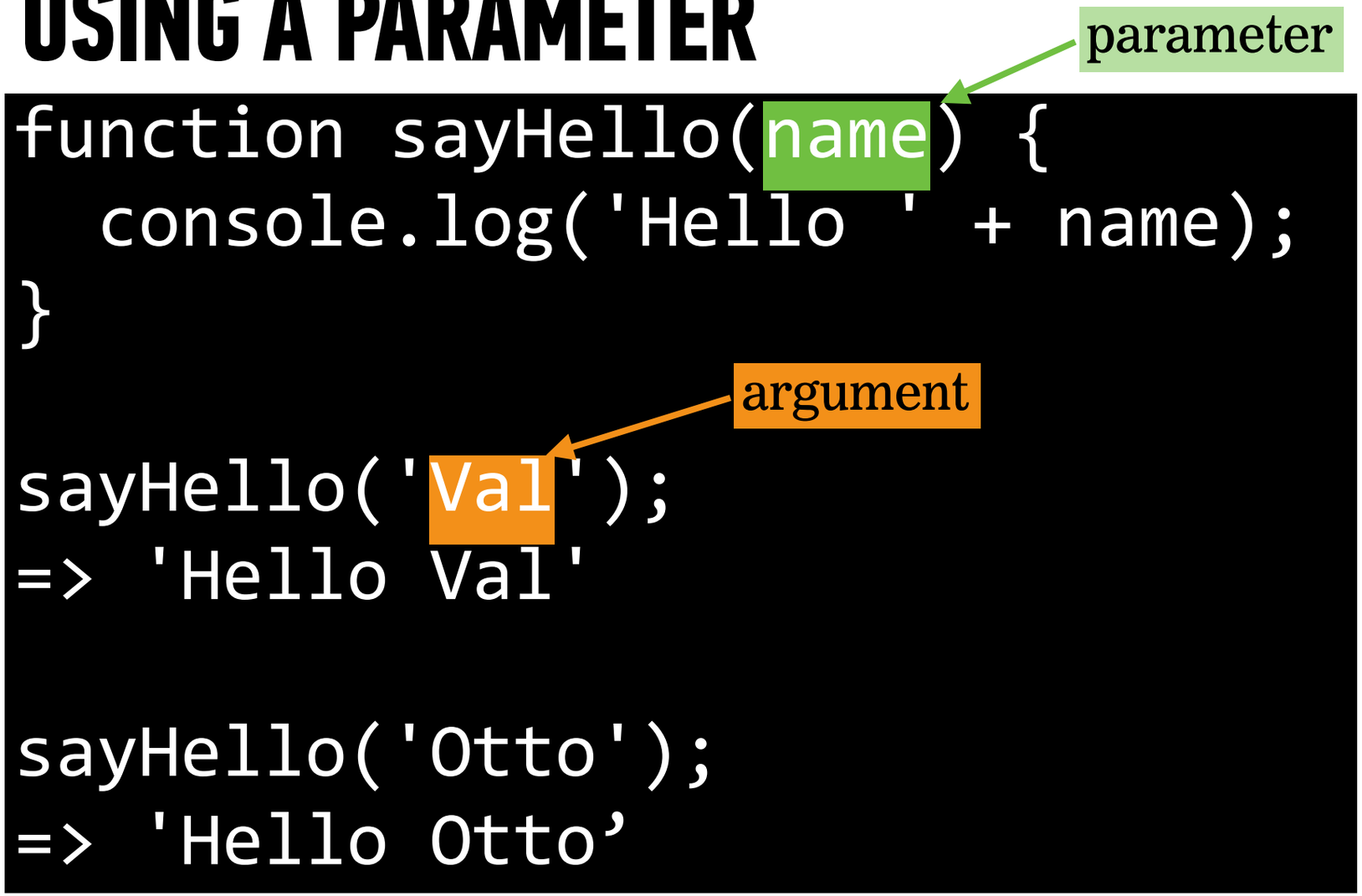
PARAMETERS

DOES THIS CODE SCALE?

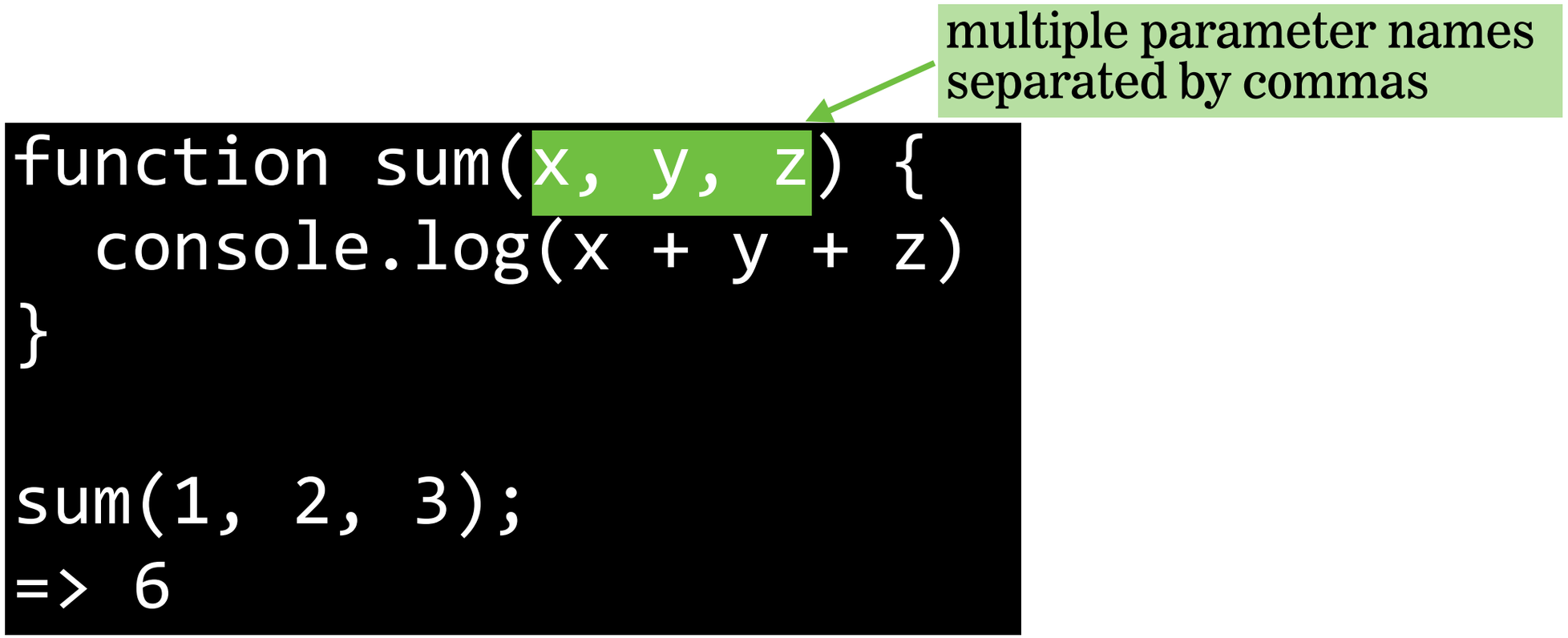
```
function helloVal () {
  console.log('hello, Val');
}

function helloOtto () {
  console.log('hello, Otto')
}
```

USING A PARAMETER



USING MULTIPLE PARAMETERS



USING DEFAULT PARAMETERS

default value to set for parameter if no argument is passed when the function is called

```
function multiply(x, y = 2) {
  console.log(x * y)
}

multiply(5, 6);
=> 30 // result of 5 * 6 (both arguments)
multiply(4);
=> 8 // 4 (argument) * 2 (default value)
```

EXERCISE — READING FUNCTIONS

KEY OBJECTIVE

- Given a function and a set of arguments, predict the output of a function

TYPE OF EXERCISE

- Groups of 2 - 3

LOCATION

- `starter-code > 5-functions-exercise` (part 2)

EXECUTION

3 min

1. Look at Part 2 A and B. Predict what will happen when each function is called.

EXERCISE — READING FUNCTIONS

KEY OBJECTIVE

- Create and call a function that accepts parameters to solve a problem

TYPE OF EXERCISE

- Groups of 2 - 3

LOCATION

- `starter-code > 5-functions-exercise` (part 3)

EXECUTION

8 min

1. See if you can write one function that takes some parameters and combines the functionality of the *makeAPizza* and *makeAVeggiePizza* functions.
2. BONUS: Create your own function with parameters. This function could do anything!

EXERCISE — FUNCTIONS

KEY OBJECTIVE

- Describe how parameters and arguments relate to functions

TYPE OF EXERCISE

- Turn and Talk

EXECUTION

1 min

1. Summarize why we would use functions in our programs. What purpose do they serve?
2. What is a parameter? What is an argument? How are parameters and arguments useful?

THE `return` STATEMENT

`return` STATEMENT

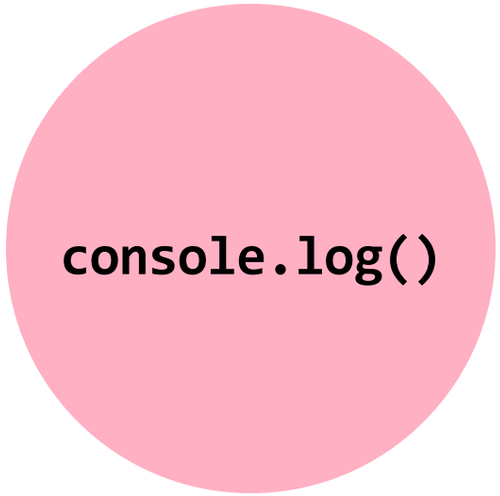
- Ends function's execution
- Returns a value — the result of running the function

`return` STOPS A FUNCTION'S EXECUTION

```
function speak(words) {
  return words;

  // The following statements will not run:
  let x = 1;
  let y = 2;
  console.log(x + y);
}
```

`console.log()` vs `return`

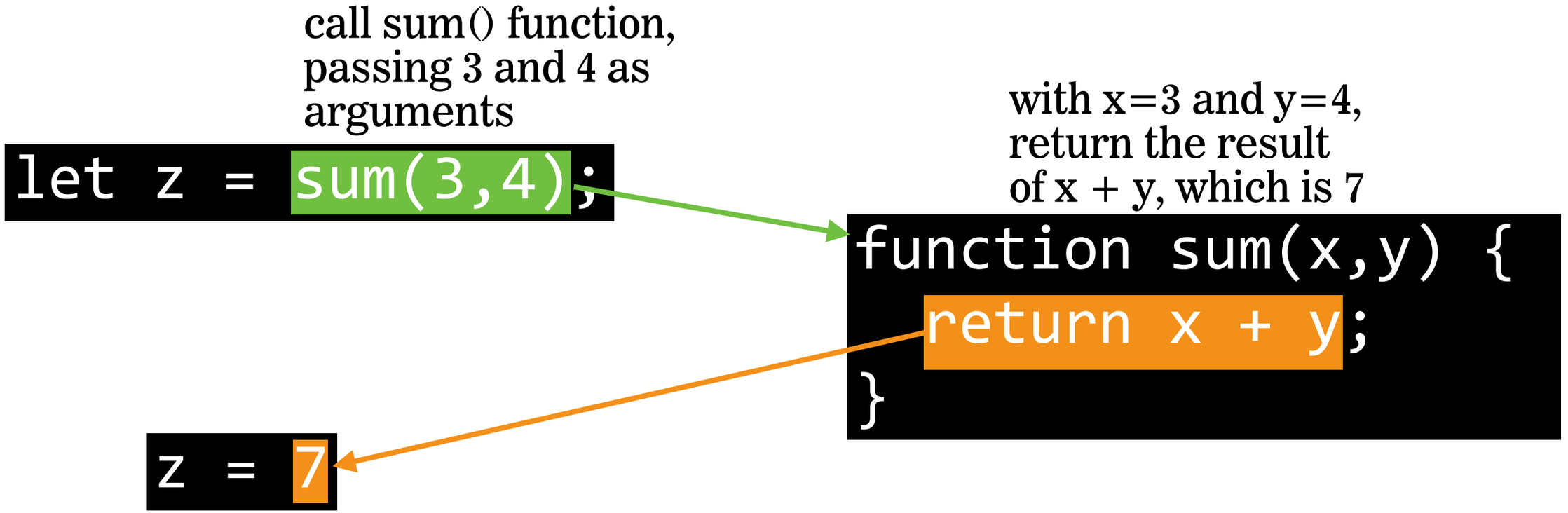


vs

- Write a value at any point in a program to the browser console
- Helpful for developer in debugging
- Not seen by user or used by app

- Sends a value back wherever the current statement was triggered
- Can use a function to get a value and then use that value elsewhere in your app
- Does not appear in the console unless you're executing commands there

return in action



Exit Tickets!

(Class #3)

LEARNING OBJECTIVES - REVIEW

- Build iterative loops using `for` and `forEach` statements.
- Use Boolean logic to combine and manipulate conditional tests.
- Use `if/else` conditionals to control program flow.
- Differentiate among true, false, truthy, and falsy.
- Describe how parameters and arguments relate to functions
- Create and call a function that accepts parameters to solve a problem
- Define and call functions defined in terms of other functions
- Return a value from a function using the `return` keyword
- Define and call functions with argument-dependent return values

NEXT CLASS PREVIEW

Scope & Objects

- Determine the scope of local and global variables
- Create a program that hoists variables
- Identify likely objects, properties, and methods in real-world scenarios
- Create JavaScript objects using object literal notation

Q&A