Jumping for JavaScript

Web Development Boot Camp
Lesson 3.2

Admin Items

- Pre Class Drills
- Homework 2: ways to get help
  - If you are not sure how to get started, you are not alone (ask for help, it's OK)
  - Watch the video of Tuesday's office hours for some hints
  - Stay for office hours today
  - Use the "Ask BCS" App
- Homework 3: Due Tuesday September 22
  - Big jump in difficulty
  - All Javascript

Today's Class

Objectives

In today's class, we'll cover:

Array Assignments

The Concept of for Loops

The Art of Pseudocoding
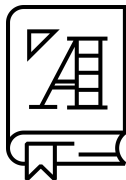
Building Rock-Paper-Scissors

Basics Recap

What is JavaScript?
(And what is it used for?)

JavaScript Definitions

JavaScript is the third of the three fundamental programming languages of the modern web (along with HTML and CSS).

JavaScript allows developers to create dynamic web applications capable of taking in user inputs, changing what's displayed to users, animating elements, and much more.

What is a Variable?
(And how do we declare one?)

Variable Basics

Variables are the nouns of programming.

They are "things" (numbers, strings, Booleans, etc.).

A variable is composed of a variable name and a value.

```javascript
var fullName = "Snow White";
var dwarfCount = 7;
var isSleeping = true;
```

What is meant by `console.log`?
(And how does it differ from an alert, prompt, or confirm?)
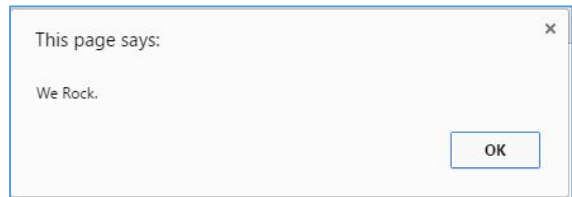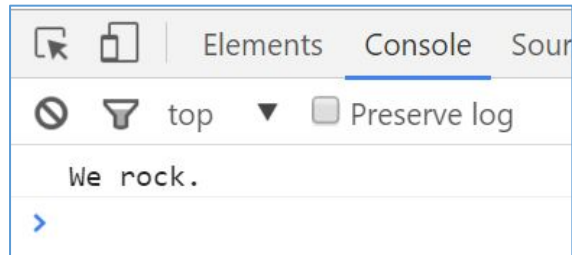
Console.log vs. JavaScript popup boxes

console.log displays discreetly to the debugger.

alert displays a pop-up message to the user.

```
console.log("We rock.");
```

| Elements | Console | Sour |
| top ▼ | ☐ Preserve log |

We rock.

>

```
alert("We Rock.");
```

This page says: ×
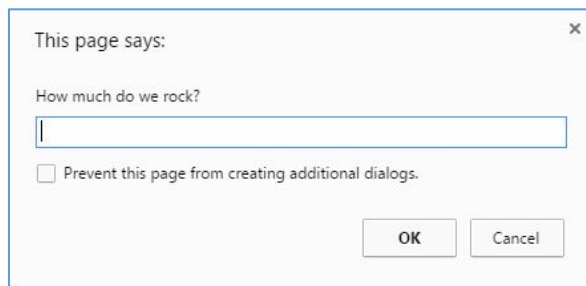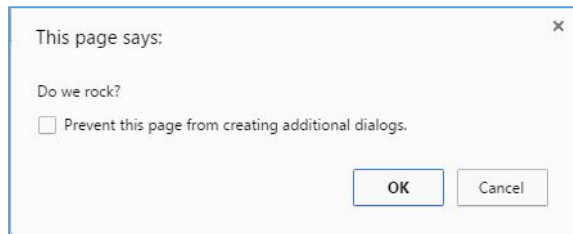
We Rock.

OK

Console.log vs. JavaScript popup boxes

`confirm` displays a true/false popup.

`prompt` displays a popup with a text-box input.

```
confirm("Do we rock?");
```

This page says:

Do we rock?

☐ Prevent this page from creating additional dialogs.

OK   Cancel

```
prompt("How much do we rock?");
```

This page says:

How much do we rock?

☐ Prevent this page from creating additional dialogs.

OK   Cancel

How do we **check** conditions?

If/Else statements are critical

Each statement is composed of an if, else-if, or else (keyword), a condition, and the resulting code in { } curly brackets.

```javascript
// If the user likes sushi (confirmSushi === true), we run the following block of code.
if (confirmSushi) {
  alert("You like " + sushiType + "!");
}
// If the user likes ginger tea (confirmGingerTea === true), we run the following block of code.
else if (confirmGingerTea) {
  alert("You like ginger tea!!");
}
// If neither of the previous condition were true, we run the following block of code.
else {
  alert("You don't like sushi or ginger tea.");
```

What is an **array**?

Basic Arrays

Arrays a type of variable that are collections.

These collections can be made up of strings, numbers, Booleans, other arrays, objects, anything.

Each element of the array is marked by an `index`. Indexes always start with `0`.

```
var nickCharacters = ["Tommy", "Doug", "Oblina"];

var diceNumbers = [1, 2, 3, 4, 5, 6,];

var mixedArray = ["Zoo", 12, "Carrot", 3];
```

Activity:
Basic JavaScript Dissection

Activity: Basic JavaScript Dissection

Examine the file in the activity `14-JSDissect`

See if you can better understand how it works—at this point in today's class.

Prepare to share once the time is up.

Suggested Time: 3 minutes

Activity:
Array Logging

Activity: Array Logging

Follow the instructions in **15-CoolPeopleArray** to `console.log` each of the names in the `coolPeople` variable.

Hint: You should be repeating similar code 6 times.

Be prepared to share once time is up.

Suggested Time: 5 minutes

Activity: Array Setting

Activity: Array Setting

Follow the instructions in **16-ArraySetting** to convert each item in the array to lowercase.

Make sure to only add in lines of code where instructed.

Hint: You will need to use the method `.toLowerCase()`. Research if you don't know how to use it.

Be prepared to share when time is up.

Suggested Time: 5 minutes

Back to The Zoo Pen

Array Name: zooAnimals

Zebra	Rhino	Giraffe	Owl
Index 0	**Index 1**	**Index 2**	**Index 3**

Coded in JavaScript using an Array

```javascript
// Our array of zoo animals.
var zooAnimals = ["Zebra", "Rhino", "Giraffe", "Owl"];
```

Back to The Zoo Pen

Array Name: zooAnimals

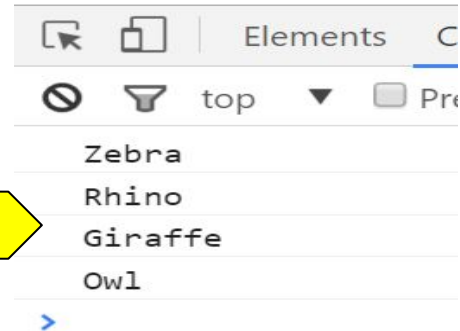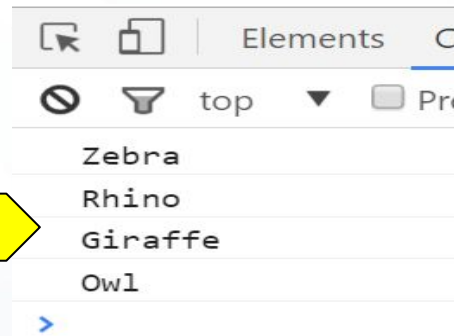| Zebra	Rhino	Giraffe	Owl
Index 0	**Index 1**	**Index 2**	**Index 3**

```
// Array of zoo animals.
var zooAnimals = ["Zebra", "Rhino", "Giraffe", "Owl"];

console.log(zooAnimals[0]);
console.log(zooAnimals[1]);
console.log(zooAnimals[2]);
console.log(zooAnimals[3]);
```
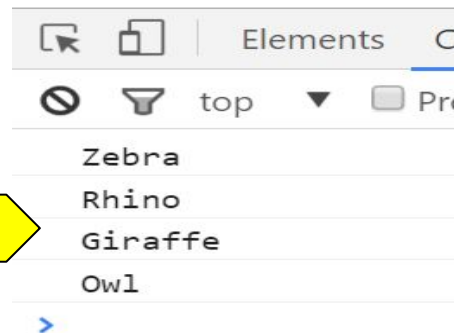
What's wrong here?

```javascript
// Array of zoo animals.
var zooAnimals = ["Zebra", "Rhino", "Giraffe", "Owl"];

console.log(zooAnimals[0];
console.log(zooAnimals[1];
console.log(zooAnimals[2];
console.log(zooAnimals[3];
```

Elements C

top ▼ Pre

Zebra
Rhino
Giraffe
Owl
>

Don't Repeat Yourself (DRY)

Repeated Code! Let's be more efficient.

```javascript
// Array of zoo animals.
var zooAnimals = ["Zebra", "Rhino", "Giraffe", "Owl"];

console.log(zooAnimals[0];
console.log(zooAnimals[1];
console.log(zooAnimals[2];
console.log(zooAnimals[3];
```

Elements C

top ▼ Pr

Zebra
Rhino
Giraffe
Owl

>

Activity:
For Loop Dissection

Activity: For Loop Dissection

With a partner, spend a few moments trying to dissect the code in `17-MyFirstLoop`

Try to explain to one another what is happening in each line of code.

Feel free to do research if you are stumped. As a **hint**, look into the phrase "for loop".

Be prepared to share when time is up.

Suggested Time: 5 minutes

Enter the For Loop

For loops are **critical** in programming.
We use for loops to run **repeated blocks of code** over a set period.

Each for loop is composed of a:

Variable declaration or counter (iterator)

Loop condition

Iteration (addition)

```javascript
// Start with an Array.
var vegetables = ["Carrots", "Peas", "Lettuce", "Tomatoes"];

// Loops through each index of the Array.
for (var i = 0; i < vegetables.length; i++) {
  console.log("I love " + vegetables[i]);
}
```

Enter the For Loop

```javascript
// Start with an Array.
var vegetables = ["Carrots", "Peas", "Lettuce", "Tomatoes"];

// Loops through each index of the Array.
for (var i = 0; i < vegetables.length; i++) {
  console.log("I love " + vegetables[i]);
}

// Logs:
// I love Carrots
// I love Peas
// I love Lettuce
// I love Tomatoes
```

Iterator   Condition   Increment

Enter the For Loop

Code between the { } gets repeated each time the iterator is smaller than the condition (in this case, as long as i < 4).

```javascript
// Start with an Array.
var vegetables = ["Carrots", "Peas", "Lettuce", "Tomatoes"];

// Loops through each index of the Array.
for (var i = 0; i < vegetables.length; i++) {
  console.log("I love " + vegetables[i]);
}

// Logs:
// I love Carrots
// I love Peas
// I love Lettuce
// I love Tomatoes
```

Enter the For-Loop

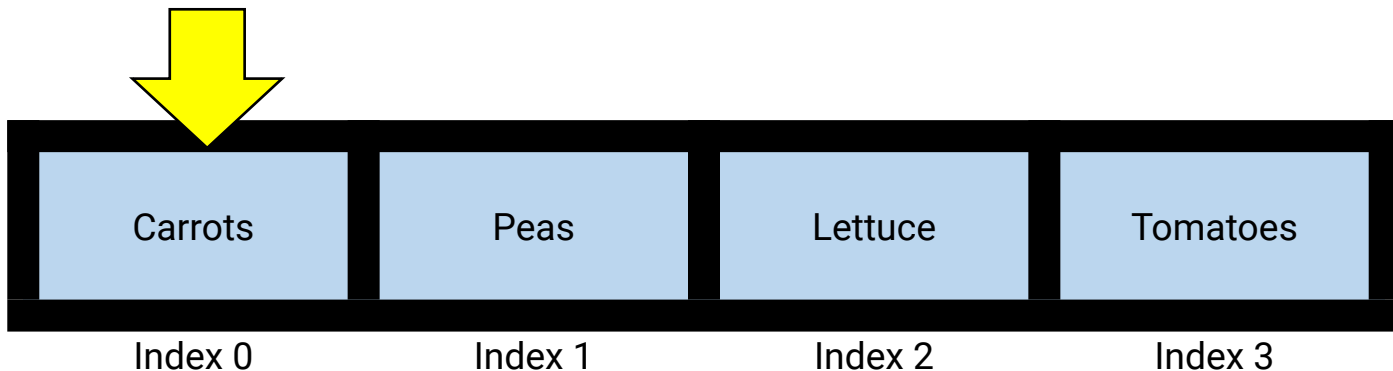Running the code "loops" through and prints each element in the array.

```javascript
// Start with an Array.
var vegetables = ["Carrots", "Peas", "Lettuce", "Tomatoes"];

// Loops through each index of the Array.
for (var i = 0; i < vegetables.length; i++) {
  console.log("I love " + vegetables[i]);
}

// Logs:
// I love Carrots
// I love Peas
// I love Lettuce
// I love Tomatoes
```

Run That Loop

```javascript
// Start with an Array.
var vegetables = ["Carrots", "Peas", "Lettuce", "Tomatoes"];

// Loops through each index of the Array.
for (var i = 0; i < vegetables.length; i++) {
  console.log("I love " + vegetables[i]);
}
```
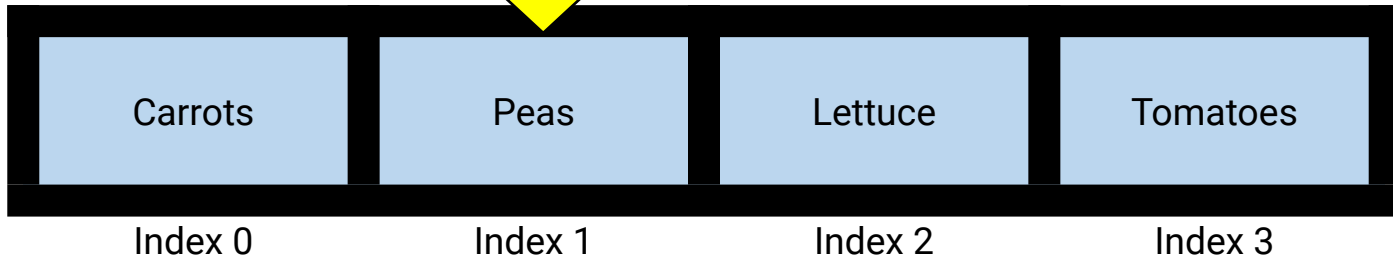
When i = 0 … console.log("I love Carrots")

Carrots	Peas	Lettuce	Tomatoes
Index 0	Index 1	Index 2	Index 3

Run That Loop

```javascript
// Start with an Array.
var vegetables = ["Carrots", "Peas", "Lettuce", "Tomatoes"];

// Loops through each index of the Array.
for (var i = 0; i < vegetables.length; i++) {
  console.log("I love " + vegetables[i]);
}
```
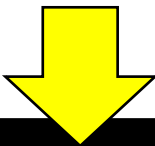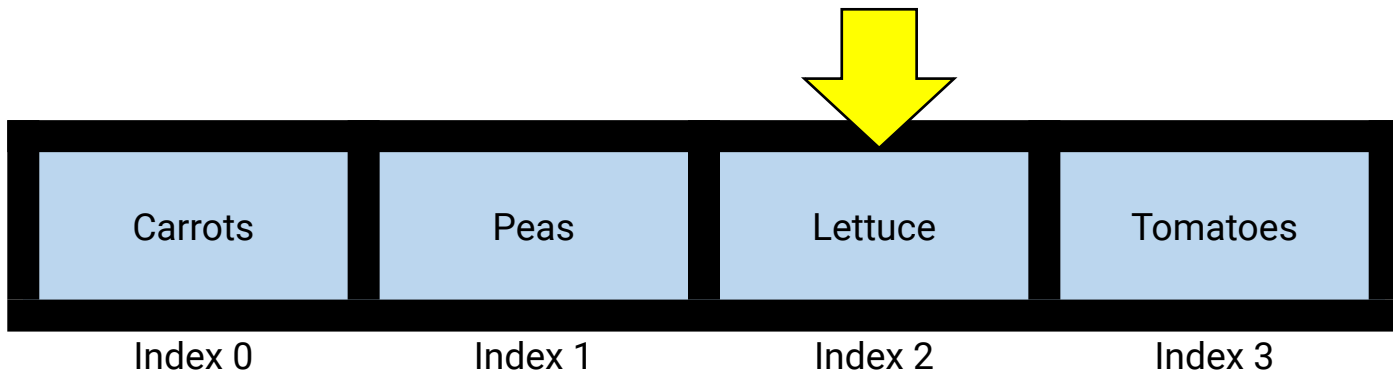
When i = 1 … console.log("I love Peas")

Carrots	Peas	Lettuce	Tomatoes
Index 0	Index 1	Index 2	Index 3

Run That Loop

```javascript
// Start with an Array.
var vegetables = ["Carrots", "Peas", "Lettuce", "Tomatoes"];

// Loops through each index of the Array.
for (var i = 0; i < vegetables.length; i++) {
  console.log("I love " + vegetables[i]);
}
```

When i = 2 … `console.log`("I love Lettuce")

Carrots	Peas	Lettuce	Tomatoes
Index 0	Index 1	Index 2	Index 3

Run That Loop

```javascript
// Start with an Array.
var vegetables = ["Carrots", "Peas", "Lettuce", "Tomatoes"];

// Loops through each index of the Array.
for (var i = 0; i < vegetables.length; i++) {
  console.log("I love " + vegetables[i]);
}
```

When i = 3 … `console.log`("I love Tomatoes")

Carrots	Peas	Lettuce	Tomatoes
Index 0	Index 1	Index 2	Index 3
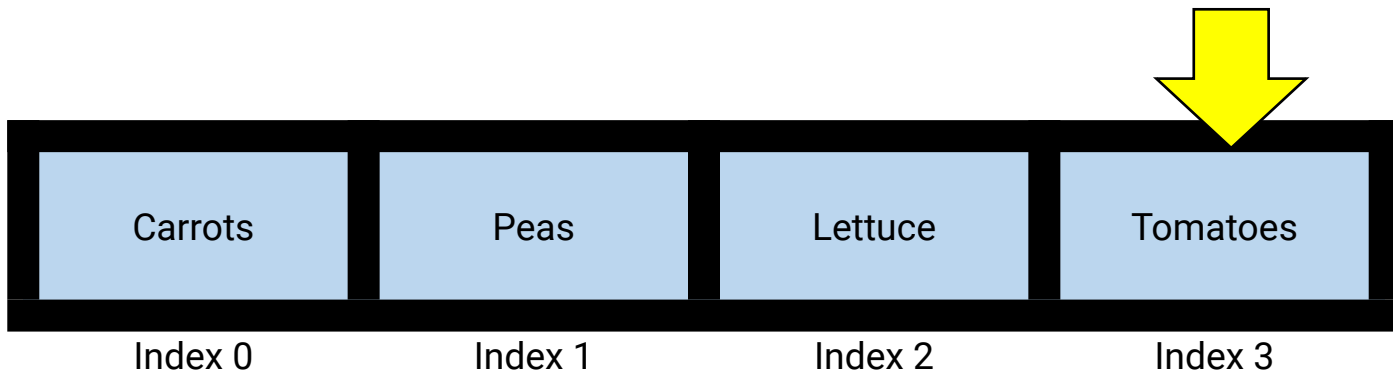
Activity: For Loop Zoo

Activity: For Loop Zoo

01   Spend a few moments rewriting the code in `18-ZooLoop` using a for loop.

02   If you need help, use the code from the previous example as a guide.

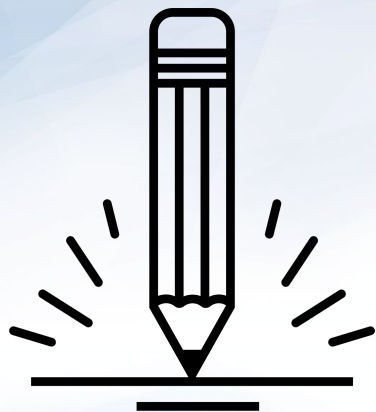**03**   Then try to explain to the person next to you how your code works.

```javascript
// Array of zoo animals.
var zooAnimals = ["Zebra", "Rhino", "Giraffe", "Owl"];

console.log(zooAnimals[0];
console.log(zooAnimals[1];
console.log(zooAnimals[2];
console.log(zooAnimals[3];
```

Suggested Time: 15 minutes

Take a Break!

Activity: Another Loop

Activity: Another Loop

Starting from scratch, create a for loop that prints the following lines:
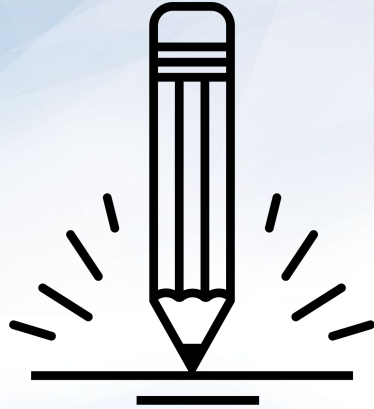
```
I am 0

I am 1

I am 2

I am 3

I am 4
```

This time, don't use an array!

Suggested Time: 15 minutes

Group Activity (2 people)**:**
Loop with Conditions

Suggested Time:
10 minutes

Group Activity: Loop with Conditions

Starting from scratch, write code that loops through the following array:

```
// This is our starting myFarm array.
var myFarm = ["chickens", "pigs", "cows", "horses", "ostriches"];
```

Use `console.log` to display the name of each animal on the farm.

Using the `.charAt()` method (research it), check if the first letter in the animal's name begins with a "c" or "o". If it does, create an alert saying: "Starts with c or an o!"

Suggested Time: 10 minutes

Activity: Random Numbers

Activity: Random Numbers

Research how to use `Math.random()` to generate a whole number between 1 and 10.

Open **21-RandomNumbers/Unsolved** and modify the code so that is logs random *whole numbers* from 1 to 10 inclusive.

Suggested Time: 7 minutes

Rock-Paper-Scissors with the Person Next to You!

Play five rounds.

Group Activity (2 people)**:**
Pseudocode
Rock-Paper-Scissors (RPS)

Group Activity: Pseudocode RPS

With a partner, spend a few moments outlining all the steps and conditions that go into a single game of rock paper scissors.

Try to break it down into steps that you could "code out."

Think of basic elements like loops, if-then statements, arrays, alerts, etc.
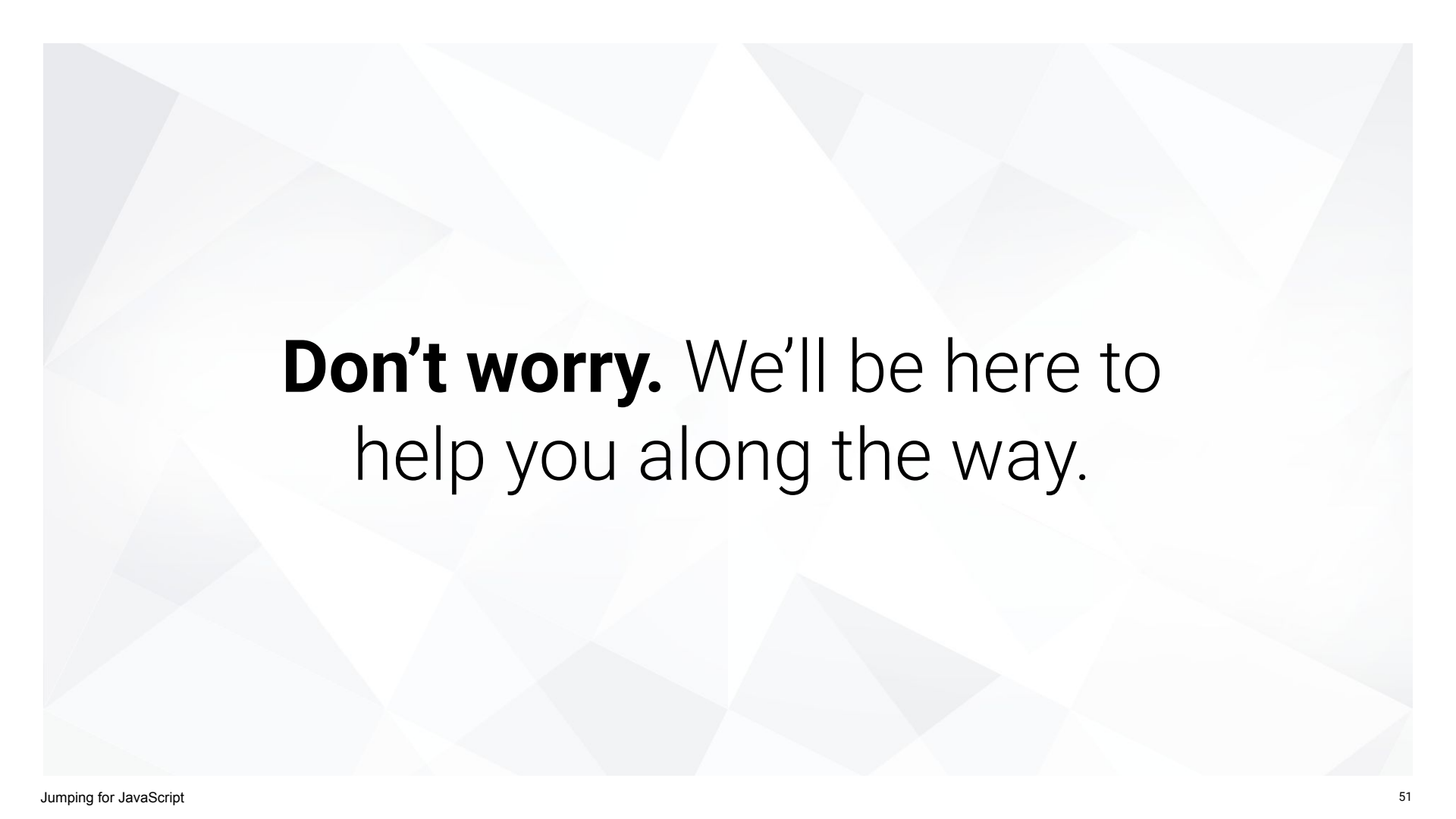
Be prepared to share your outlined approach.

Suggested Time: 8 minutes

You just **pseudocoded!**

And now, for the rest of the class …
YOU will be coding it out!

Don't worry. We'll be here to help you along the way.

Group Challenge (4 people)**:**
Coding Out RPS

Suggested Time:
60 minutes
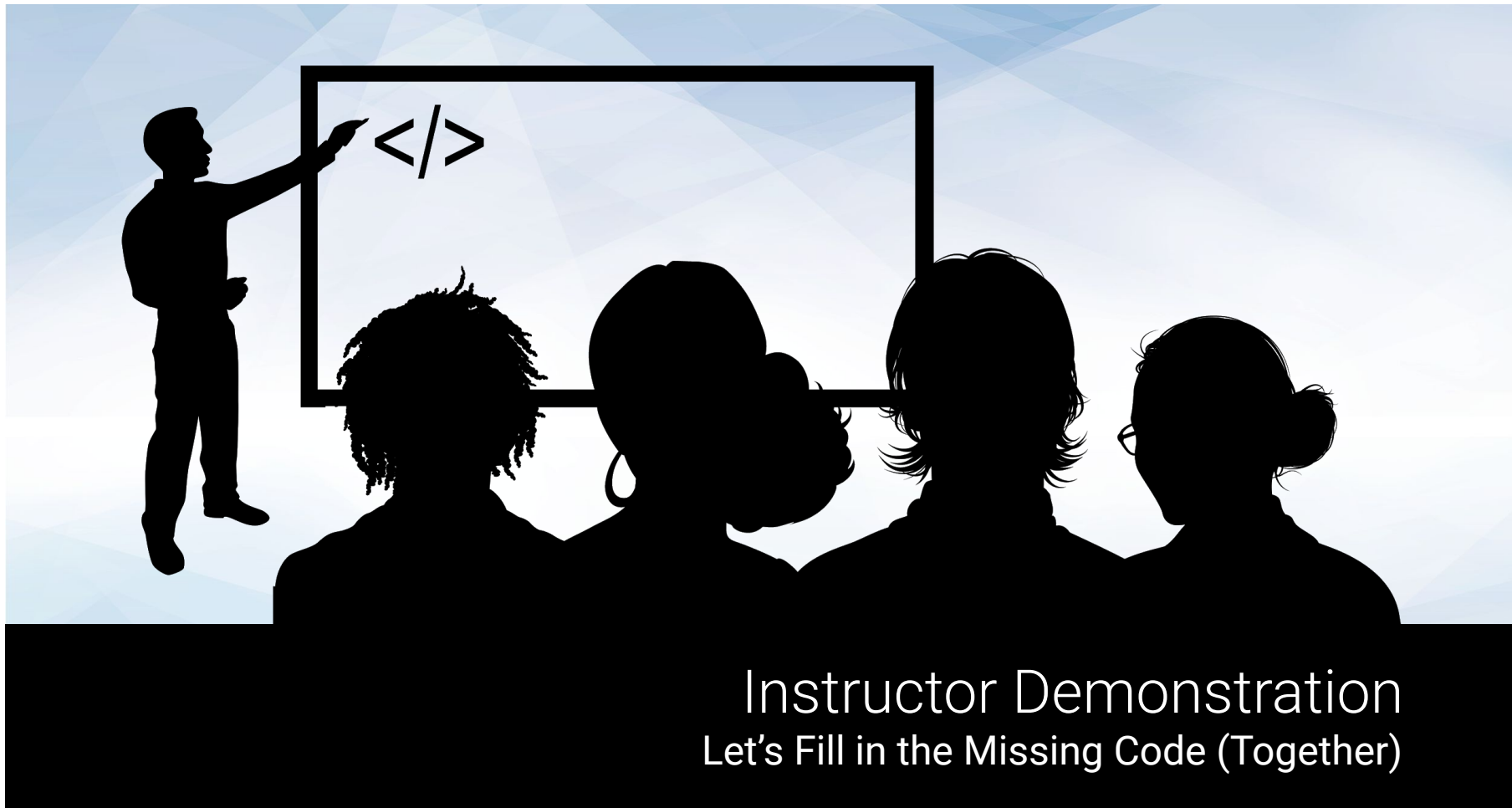
Group Challenge: Coding out RPS

In groups of four, begin the process of coding out the rock-paper-scissors game.

Do as much as you can on your own, but don't be afraid to ask for help if you feel your team is struggling.

Suggested Time: 60 minutes

Instructor Demonstration
Let's Fill in the Missing Code (Together)

Questions?