ADVANCED JS TOPICS

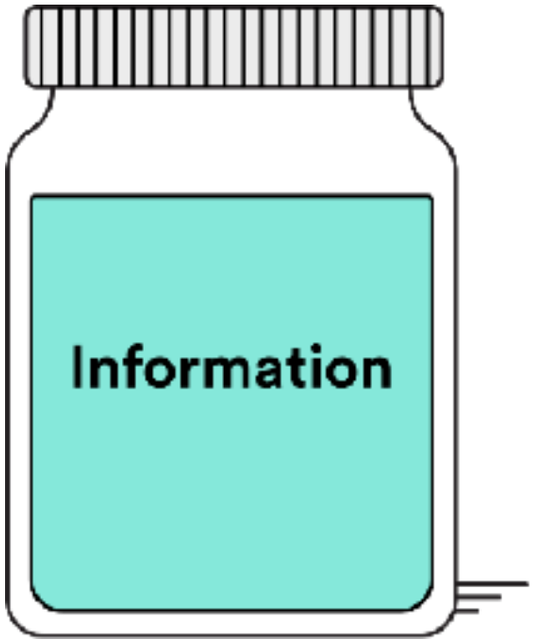
LEARNING OBJECTIVES

- Define arrays
- Practice using indexes to access array elements
- Create objects and access and update values in objects.

REVIEW

WHAT ARE VARIABLES?

- We can tell our program to remember (store) values for us to use later on.
- The "container" we use to store the value is called a variable



DECLARING A VARIABLE

```
var age = 29;
```

JAVASCRIPT — UPDATING THE VALUE OF A VARIABLE

Declaring a variable:

```
var champion = "John";
```

Update the value of the variable:

```
champion = "Madeline";
```

ASSIGNMENT OPERATORS

	Initial Value	Operator	Example	Result
Assign value to variable	var num = 8	=	num = 6	6
Add value to variable	var num = 8	+=	num += 6	14
Subtract value from variable	var num = 8	-=	num -= 6	2

COMPARISON OPERATORS

Comparison Operators	
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to

COMPARISON OPERATORS

Equality Operators	
`===`	Strict equal to
`==`	Equal to
`!==`	Strict not equal to
`!=`	Not equal to

ASSIGNMENT VS. COMPARISON — DON'T GET THEM CONFUSED!

Assignment	Comparison
=	==

var number = 7;	if (number === 8) {
	  // Do something
	}

JAVASCRIPT — IF STATEMENT

COMPARISON OR EQUALITY OPERATOR

```
if (age > 65) {
    console.log("Senior Discount Applied");
}
```

Comparison Operators	
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to

Equality Operators	
===	Strict equal to
==	Equal to
!==	Strict not equal to
!=	Not equal to

IF STATEMENTS

```
if (age > 65) {
    console.log("Senior Discount Applied");

} else if (age < 18) {
    console.log("Student Discount Applied");

} else {
      console.log("Sorry, you don't qualify for a discount");
}
```

WHAT CAN BE STORED IN VARIABLES?

DATA TYPES:

1. Numeric	2. String	3. Boolean
Handles numbers	Consists of letters and/or other characters	Handles true or false values
Ex: 200.54 Ex: 893	Ex: 'GA@ga.co' Ex: "How are you user?"	Ex: true Ex: false
Used for tasks that involve counting or calculating	Used when working with any kind of text Written with single or double quotes	Used when there are two options for a value (i.e. yes/no, on/off, true/false)

ARRAYS

"Numbers, Booleans, and strings are the bricks that data structures are built from. But you can’t make much of a house out of a single brick. Objects allow us to group values—including other objects—together and thus build more complex structures."

— Marijn Haverbeke "Eloquent JavaScript"

ARRAYS

ACTIVITY — ARRAYS PART 1

KEY OBJECTIVE

- Follow the steps under part 1 in arrays_practice

TYPE OF EXERCISE

- Individual

LOCATION

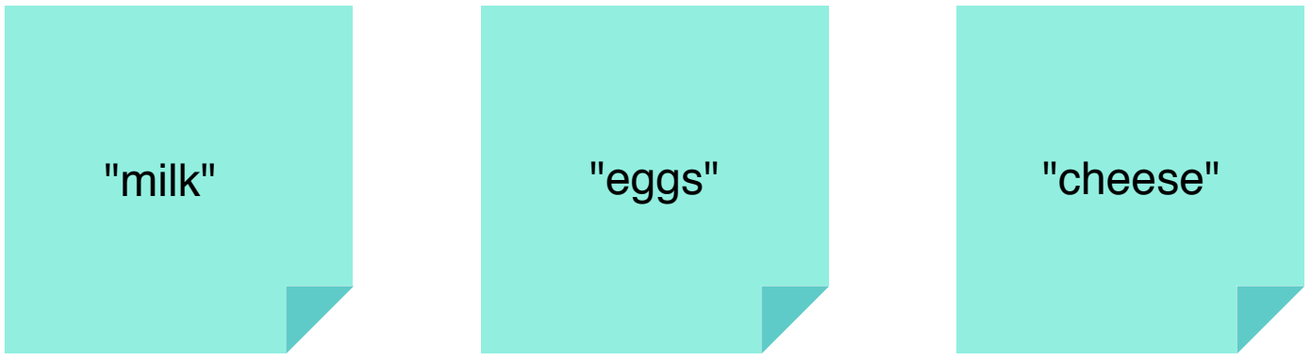
- starter code> arrays_practice

TIMING

1 min

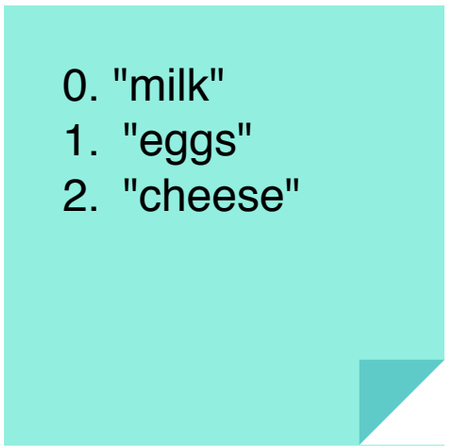
- Follow instructions in main.js under part1.
- Check the console as you go to make sure you're on track!

ARRAYS



ARRAYS — STORING LISTS OF VALUES

- An array can be used to store a list of values in a single variable
- They are an ordered collection of values



DECLARING ARRAYS

```
var descriptiveNameHere = [item1, item2, item3];
```

DECLARING ARRAYS

```
var beverages = ["coffee", "tea", "hot chocolate", "milk"];
```

```
var leapYears = [2016, 2020, 2024, 2028];
```

ARRAYS - ACCESSING ITEMS BY INDEX

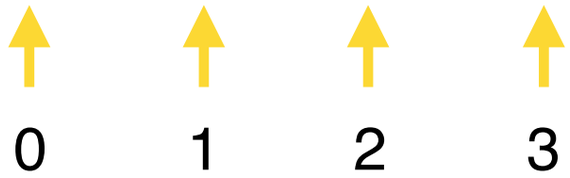
- Each item in an array has an index, by which you can access that item.
- The first item has an index of 0, the second item 1, the third item 2, etc.

```
var students = ['Mike', 'Austin', 'Karl', 'Suzie'];
```


0 1 2 3

ARRAYS — ACCESSING ITEMS IN AN ARRAY

```
var students = ['Mike', 'Austin', 'Karl', 'Suzie'];
```



ACCESSING ITEMS (RETRIEVING VALUES):

`students[1]` → `'Austin'`

`students[2]` → `'Karl'`

`students[0]` → `'Mike'`

`students[3]` → `'Suzie'`

ARRAYS — ACCESSING ITEMS IN AN ARRAY

```
var students = ['Mike', 'Austin', 'Karl', 'Suzie'];
```

We can save what we find in a variable like so:

```
var firstStudent = students[0];
```

→ 'Mike'

ARRAYS - ADDING A VALUE/REPLACING A VALUE

```
var students = ['Mike', 'Austin', 'Karl', 'Suzie'];
```


0 1 2 3

INSERTING A NEW VALUE

To add a new value to the array, specify the index where the new value should be added.

```
students[4] = 'Matt';
```

```
['Mike', 'Austin', 'Karl', 'Suzie', 'Matt']
```

UPDATING VALUES

If there's already an item at that position, it will be replaced with the new value.

```
students[3] = 'Sophie';
```

```
['Mike', 'Austin', 'Karl', 'Sophie', 'Matt']
```

ARRAYS - LENGTH

- We can use the .length property to find out how many items are in an array

```
var scores = [90, 85, 100];
```

```
scores.length
```

→ 3

- The length property is also useful for accessing the last item in an array

```
var lastScore = scores[ scores.length - 1 ];
```

→ 100

This is like saying: `var lastScore = scores[2];`

ACTIVITY — ARRAYS PART 1

KEY OBJECTIVE

- Define arrays and practice using indexes to access array elements

TYPE OF EXERCISE

- Individual

LOCATION

- starter code> arrays_practice

TIMING

5 min

- Follow the instructions under Part 2
- Be sure to check your console as you work!

ARRAYS LAB

ACTIVITY — QUOTE CAROUSEL

KEY OBJECTIVE

- Apply JS and jQuery knowledge to program a quote carousel.

TIMING

20 min

1. Open the page in your browser.
2. Follow the instructions in main.js
3. Keep your console open, use the debugger, log values to the console to check things
4. Bonus: Create an array of colors (these should be strings in hex format, e.g. '#17A9F8'). Each time the quote changes, use the .css() method to change the background color as well. Hex codes: '#17A9F8','#59B776', '#E8519C'
5. **Super bonus:** Switch between more than 3 background colors.

OBJECTS

THE NEED FOR OBJECTS

- In our programs, we'll sometimes want the ability to model real life objects.
- We could store information about an object in an array like so:

```
var artist = ["Michael", "Jackson", 1958, 13];
```

- What does the number 13 refer to? How old Michael Jackson was when he sang his very first hit song? The number of best selling albums he made?

THE NEED FOR OBJECTS

- Objects allow us to associate keys with values:

```
var artist = {
  firstName: "Michael",
  lastName: "Jackson",
  birthYear: 1958,
  numberOneHits: 13
};
```

OBJECT SYNTAX

Properties (camel case)

```
var user = {
  firstName: "Bill",
  lastName: "Smith",
  email: "billsmith@email.com",
  age: 29
};
```

Values

ACCESSING VALUES IN AN OBJECT

Properties

```
var user = {
  firstName: "Bill",
  lastName: "Smith",
  email: "billsmith@email.com",
  age: 29
};
```

Values

- To access values in an object: use the object name followed by a dot followed by the property we want to access:

```
var email = user.email   → "billsmith@email.com"

var age = user.age       → 29
```

UPDATING VALUES IN AN OBJECT

- To update values in an object: use the object name followed by a dot followed by the property we want to update. Then assign a new value:

```
user.email = "billy@email.com"

user.age = 30
```

BEFORE UPDATING:

```
var user = {
  firstName: "Bill",
  lastName: "Smith",
  email: "billsmith@email.com",
  age: 29
};
```

AFTER UPDATING:

```
var user = {
  firstName: "Bill",
  lastName: "Smith",
  email: "billy@email.com",
  age: 30
};
```

ACTIVITY — OBJECTS PART 1

KEY OBJECTIVE

- Define objects and practice using dot notation to update and access properties in an object

LOCATION

- starter code> objects

TIMING

5 min

- Follow instructions in main.js for part 1.

ARRAYS CONTAINING OBJECTS

```
var fruits = [
  {
    color: "red",
    type: "apple",
    price: 79
  },
  {
    color: "green",
    type: "avacado",
    price: 1.50
  }
];
```

ARRAYS CONTAINING OBJECTS

```
var fruits = [
  {
    color: "red",
    type: "apple",
    price: 79
  },
  {
    color: "green",
    type: "avacado",
    price: 1.50
  }
];
```

Accessing a value:

```
fruits[0].color
fruits[1].price
```

Updating a value:

```
fruits[0].color = "green";
fruits[1].price = 1.00;
```

ACTIVITY — OBJECTS PART 2

KEY OBJECTIVE

- Define arrays and practice using indexes to access array elements

TYPE OF EXERCISE

- Individual/Paired

LOCATION

- starter code> objects

TIMING

5 min

- Follow instructions in main.js for part 2.

ACTIVITY — OBJECTS PART 2

KEY OBJECTIVE

- Define objects and practice using dot notation to update and access properties in an object

LOCATION

- starter code> objects

TIMING

5 min

- Follow instructions in main.js for part 2.

LAB

ACTIVITY — IMAGE CAROUSEL

KEY OBJECTIVE

- Apply JS and jQuery knowledge to program an image carousel.

TIMING

1. Follow the instructions in main.js
2. Bonus: Complete the bonus version.

LEARNING OBJECTIVES

- Define arrays
- Practice using indexes to access array elements
- Create objects and access and update values in objects.

HOMEWORK

EXIT TICKETS