

# **The ULTIMATE JavaScript Fundamentals Study Guide**

## **Class Lessons**

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## **Lesson 1 - Getting Started with JavaScript**

**Variable** - A tool for pointing towards information. The associated value can vary or change. Variables can be declared using the keyword var (Lesson 1) and the keywords [let](#rjwwnfi9wdjk) and [const](#vsvrdu9wg2hj) (Lesson 9).

**Values** - Information stored in a variable. Specifically, a value is a sequence of bits that is interpreted according to some [data type](#eoe9s1in3h3p) (e.g., number, string, boolean).

**Assignment operator** - An operator that assigns a value to a variable. The assignment operator uses the equal sign (=). See the [Javascript Operators Cheatsheet](https://learn.skillcrush.com/module-3/javascript-operators-cheatsheet/) (Lesson 3) for a list of assignment operators.

**Statement** - A single instruction to the program. Often, semicolons appear at the end of a statement to show it's complete.

| var cerealTypes = 16; |
| --- |

| console.log("We love JS!"); |
| --- |

**String** - A series of characters, like numbers, letters, and symbols. Strings will have quotes around them to group the characters and keep them in a sequence.

| var vacationSpot = "beach"; |
| --- |

| var phoneNumber = "555-555-1234"; |
| --- |

**CamelCase** - The standard naming convention for variables in JavaScript. The first words are all lowercase letters, while each proceeding word begins with an uppercase letter.   
Examples: bankDeposit, userInputDate, and ageLimit18

**Console** - An environment in your browser where you can execute, or run, JavaScript. The console lets you see the output of your code and troubleshoot errors. In CodeSandbox, your console is located under the "Console" tab. In Google Chrome, go to More Tools > Developer Tools > Console tab.

**console.log()** - A method to log out a message to the console.

| console.log("Party time! Excellent!");  *// Party time! Excellent!* |
| --- |

| **var** cats = 4; console.log("I have" + cats + "cats."); *// I have 4 cats.* |
| --- |

**+ operator** - An operator that uses the plus sign (+) to combine strings and variables.

| var name = "Giorno Giovanna"; console.log("His name is" + name + "."); *// His name is Giorno Giovanna.* |
| --- |

**Concatenating** - The process of joining strings together using the + operator.

| **var** ringMetal = "gold"; console.log("She gave her a" + ringMetal + "ring."); *// She gave her a gold ring.* |
| --- |

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## **Lesson 2 - Data Types & Arithmetic Operators**

**Template literals** - Output strings using placeholders and backticks (`). Compared to outputting strings with single or double quotes and the plus operator, template literals make it easier to output multi-line strings and combine variables with strings. In addition, you can calculate expressions inside the string.

| **var** jewelry = "watch"; **var** event = "dinner";  console.log(`They wore a ${jewelry} to ${event}.`); *// They wore a watch to dinner.* |
| --- |

| **var** pizzaType = "veggie"; **var** slicesEaten = 4; console.log(`The ${pizzaType} pizza has ${8 - slicesEaten} slices left.`); *// The veggie pizza has 4 slices left.* |
| --- |

**Expressions** - Code that results in a value. For example, expressions can result in numeric, string, and logical values (Lesson 3).

| console.log(8 - 5); *// 3* |
| --- |

| console.log("I love" + " coding."); *// I love coding.* |
| --- |

| console.log(5<8); *// true* |
| --- |

**Integer** - A whole number, like 5100 or -258. Integers can be positive or negative.

**Floating point number** - A number with a decimal, like 2134.3625 or -562.12. Floating point numbers can be positive or negative.

**Addition operator** - An operator to add two numbers together. The addition operator uses the plus sign (+).

| **var** applesBananas = 5 + 8; console.log(applesBananas);  *// 13* |
| --- |

| **var** floor1 = 10; **var** floor2 = 15; console.log(`There are ${floor1 + floor2} tables in the restaurant.`); *// There are 25 tables in the restaurant.* |
| --- |

**Arithmetic operators** - Symbols for math operations, like the addition (+), subtraction (-), multiplication (\*), and division (/) operators. See the [JavaScript Operators Cheatsheet](https://learn.skillcrush.com/module-3/javascript-operators-cheatsheet/) (Lesson 3) for a complete list of arithmetic operators.

**Data type** - The type of value a variable points to. Examples include numbers, strings, booleans (Lesson 3), [undefined](#siq3h6au0f3b), [null](#qre7ffc38y5d), arrays (Lesson 8), and objects (Lesson 10).

**Primitive data types** - Values with only a single value, like numbers, strings, booleans (Lesson 3), undefined, and null.

**Undefined** - A variable with no value assigned to it.

| **var** happiness;  console.log(happiness); *// undefined* |
| --- |

**Null** - A data type that represents an intentionally empty, or non-existent, value.

| **var** ideas = null;  console.log(ideas); *// null* |
| --- |

**Type conversion** - Changing one value to a different value to complete an operator. Type conversion is beneficial for changing strings into numbers so you can calculate them.

**Number()** - Convert a string into a number. Number() is useful when gathering input from a user and then changing it to a number so that you can calculate a value.

| **var** tvShows = Number("23"); **var** movies = 12; console.log(tvShows + movies);  *// 35* |
| --- |

**p****rompt()** - Displays a field to gather information from the user. Users will see a pop-up dialog box on their screen asking for input.

| var favoriteGenre = prompt("What's your favorite music genre?"); console.log(favoriteGenre); |
| --- |

| **var** oldFunds = 1500; **var** **newFunds** = Number(prompt("How much funds were raised?")); console.log( `The fundraiser total is now $${oldFunds + **newFunds**}!.` ); |
| --- |

**toFixed()** - Convert a number data type into a string and then round to a specified number of decimal places. Add a number inside toFixed() to specify the number of decimal places to round to.

| **var** taxAmount = 7.23335651; console.log(taxAmount.toFixed(2)); *// 7.23* |
| --- |

| ***var*** *tempFahrenheit = 98.6785; console.log(`Her temperature is ${tempFahrenheit.toFixed(1)}.`); // Her temperature is 98.7.* |
| --- |

| **var** people = 27; **var** payout = 800.29; console.log(`You won $${(payout / people).toFixed(2)}.`); *// You won $29.64.* |
| --- |

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## **Lesson 3 - Comparisons & Conditionals**

**Conditional statement** - Code that will only run if a condition is true.

**Boolean** - Represent just two values: true or false.

**Boolean data type** - A primitive data type with true or false values.

| **var** lightsOn = true; **var** fanOn = false; console.log(lightsOn);  *//true* |
| --- |

**Comparison operators** - Operators that use symbols to compare two or more values, like >, <, and ===. See the [JavaScript Operators Cheatsheet](https://learn.skillcrush.com/module-3/javascript-operators-cheatsheet/) (Lesson 3) for a complete list of comparison operators.

**i****f keyword** - Keyword to use in a statement to test a condition. If the condition evaluates to true, then the program runs the code inside the if block. You won't include a semicolon after the condition.

| **var** hotWeather = true;   **if** (hotWeather === true) {  console.log("Wear shorts and a tank top today!");  } *// Wear shorts and a tank top today!* |
| --- |

**e****lse keyword** - Keyword to use in a statement to perform another action if the previous condition evaluates to false.

| **var** hotWeather = false;   **if** (hotWeather === true) {  console.log("Wear shorts and a tank top today!");  } **else** { console.log("Grab a sweater, it might be chilly."); } *// Grab a sweater, it might be chilly.* |
| --- |

**e****lse if keyword** - Keyword to use in a statement to test a new condition, and then perform an action if the previous condition evaluates to false. As soon as a condition evaluates to true, the code block that the condition is associated with runs and the conditional block is exited, regardless if there are subsequent conditions that would also evaluate to true.

| **var** hotWeather = false; **var** snowyWeather = true; **var** windyWeather = true;   **if** (hotWeather === true) {  console.log("Wear shorts and a tank top today!"); } **else** **if** (snowyWeather === true) { console.log("Put on a heavy jacket and boots!"); } **else** **if** (windyWeather === true) { console.log("Time to slip on your windbreaker."); } **else** { console.log("Grab a sweater, it might be chilly."); } *// Put on a heavy jacket and boots!* |
| --- |

**alert()** - Displays a pop-up message for users to see. The prompt includes an OK button for users to click and close the pop-up.

| alert("Hello, welcome to my site!")*;* |
| --- |

**Date()** - A method to retrieve the current date.

| var weekday = **new** Date().toLocaleString("en-US", { weekday: "long" }); |
| --- |

**getHours()** - A method to retrieve the current time. The time will reflect the 24-hour clock, AKA military time.

| **var** time = **new** Date().getHours(); |
| --- |

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## **Lesson 4 - JS, HTML, & CSS**

**defer attribute** - Instructs the browser to load the script after the page has loaded. The attribute creates a faster loading experience for the user because all the HTML renders first, even if the JavaScript hasn't run yet. It also makes sure the HTML elements are loaded so the JavaScript can modify them. You'll add the <script> tag and defer attributes in the head section of the HTML page.

| **<!DOCTYPE html>** <html> <head> <script src="js/script.js" defer></script> </head> |
| --- |

**DOM** - Short for Document Object Model, the DOM represents the structure and content of a web page. The document is the web page. The objects include HTML elements, text, and attributes.

**DOM tree** - A graphical representation of the DOM which shows relationships between objects. The DOM tree is useful for determining how to access different objects on the document.

**Methods** - JavaScript actions performed on objects. Examples of methods include console.log(), prompt(), alert(), , and querySelector(). Methods are also a type of [object](#1j7wpg27pg6x) property (Lesson 10).

**querySelector()** - A method to access the first element that matches a specified selector. To select multiple items, you'll need to use an [array](#17tufw3ylvtf) (Lesson 8) with [querySelectorAll()](#wrlujuw81o9d) (Lesson 9).

| ***var*** *available = document.querySelector("h3");* ***var*** *mainTitle = document.querySelector(".main-title");* ***var*** *firstItem = document.querySelector("ul li");* ***var*** *intro = document.querySelector(".intro p");  console.log(available, mainTitle, firstItem, intro); // <h3>We're here for you every day of the week.</h3> // <h1 class="main-title">Ryan's Roses</h1> // <li>Today's Specials</li> // <p>Available today</p>* |
| --- |

| var firstImg = document.querySelector("img")*;* firstImg.src = "img/lulu.jpeg"*;* firstImg.alt = "Lulu bouquet"*;*   console.log(firstImg)*;* *// <img src="img/lulu.jpeg" alt="Lulu bouquet"></img>* |
| --- |

**style property** - A property that allows you to change the style of an element. If the property name is two words, like background-color, change it to one word using camelCase (backgroundColor).

| *var intro = document.querySelector(".intro p");  intro.style.color = "purple"; intro.style.fontSize = "3em"; intro.style.fontStyle = "italic";  console.log(intro); // <p style="color: purple; font-size: 3em; font-style: italic;">Available today</p>* |
| --- |

**innerText property** - A property that accesses the text within an element. This property is useful when you want to change or retrieve the text inside an element.

| **var** firstCaption = document.querySelector("figcaption"); firstCaption.innerText = "The Lulu.";   console.log(firstCaption); *// <figcaption>The Lulu.</figcaption>* |
| --- |

**innerHTML property** - A property that changes the HTML of an element on the page. This property is useful for updating or adding elements to a page.

| firstCaption.innerHTML = "The <strong>Lulu</strong>";   console.log(firstCaption); *//<figcaption>The<strong>Lulu</strong></figcaption>* |
| --- |

| var intro = document.querySelector(".intro p");  intro.innerHTML = 'Available <span class="increase\_\_size">today</strong>';  console.log(intro); *// <p>Available<span class="increase\_\_size">today</span></p>* |
| --- |

**Debugging** - Identifying and removing errors in your code.

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## **Lesson 5 - Events & Event Listeners**

**DOM events** - Actions that happen in the document (web page). Events can be triggered by the browser or by the user. In this class, you'll use [mouse](#7db3cnneyni9), [change](#lrdebpoeozru), [keydown](#yr37lovirgys), and [input](#xasu5jjenbzm) events. See Mozilla's [Event Reference](https://developer.mozilla.org/en-US/docs/Web/Events) page for a complete list of events.

**Mouse events** - An event that happens when a pointing device, like a mouse, joysticks, keyboard, or adaptive switch interacts with the document. Common mouse events are "click", "mouseover", and "select".

**Event listener** - A method that "listens" for events to happen and then takes action. Use the method addEventListener() to listen for events in the DOM.

| **var** title = document.querySelector("h1");   title.addEventListener("mouseover"); |
| --- |

**Event handler** - A [function](#73cfr91y6fnk) that runs code when an event occurs.

| var title = document.querySelector("h1");   title.addEventListener("mouseover", function () {  title.innerText = "Let's PARTY!";  title.style.color = "maroon"; }); |
| --- |

**Function** - A block of code that can be called or invoked to run as many times as needed without repeating code. Functions are vital to writing streamlined JavaScript. [Lesson 6](#_nup4gvpkrn92) contains a full dive into functions.

**Function body** - The part of the function that contains the statements that specify what the function does. Curly braces surround the function body.

**classList property** - A property to add, remove, or toggle CSS classes on an element. This property let's you apply (or remove) multiple styles at once. You can use the classList property with the [add()](#u6hoc2fmrt8h) and [remove()](#kv028ojn37oh) methods: classList.add() and classList.remove().

**classlist.****add()** - A method to add a new class.

| **var** darkModeButton = document.querySelector(".dark-mode"); **var** body = document.querySelector("body");   darkModeButton.addEventListener("click", **function** () { body.classList.add("dark-palette"); }); |
| --- |

**classlist.****remove()** - A method to remove a new class.

| **var** lightModeButton = document.querySelector(".light-mode");   lightModeButton.addEventListener("click", **function** () { body.classList.remove("dark-palette"); }); |
| --- |

**Modal window** - A web page element that overlays a box in front of a web page. A modal is also called a lightbox.

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## **Lesson 6 - Functions**

**Function expression** - A syntax for writing functions that begins with a variable name and then uses the **function** keyword to define the function.

| **var** welcome = **function** () { console.log(); }; |
| --- |

**Reserved keywords** - A word that can't be used as a variable name in JavaScript. See a complete [list of reserved keywords](https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Lexical_grammar#keywords).

**Parameters** - Placeholders for values you want to pass to the function. If there's more than one parameter, separate the parameters with a comma.

| **var** welcome = **function** (name) {  console.log(`Welcome, ${name}. Have a great day!`); } |
| --- |

**Calling** - An action which will cause a function to run. If the function expects arguments, you must provide them in the function call.

| **var** welcome = **function** (name) {  console.log(`Welcome, ${name}. Have a great day!`); }   welcome("Sadie");  *// Sadie* |
| --- |

**Arguments** - Values passed to the function when it's called. If there's more than one argument, separate the arguments with a comma.

| **var** addTogether = **function** (num1, num2) {  console.log(num1 + num2); };   addTogether(13, 72); *// 85* addTogether(36, -2.88); *// 33.12* |
| --- |

**return keyword** - A keyword to return the value of a function and end its execution. Use the return keyword to make the result of a function available to other parts of your code. Unlike console.log() which only outputs a message to the console, the return keyword allows a value to be used by other parts of the code, including console.log().

| ***var*** *addTogether =* ***function*** *(num1, num2) {* ***return*** *num1 + num2; };   alert(addTogether(36, -2.88)); console.log(addTogether(13, 72)); // 85*  ***var*** *lunchForTwo = addTogether(24.56, 18.99); console.log(lunchForTwo); // 43.55* |
| --- |

## **Lesson 7 - Keydown & Change Events**

**Callback function** - A function that's passed to another function as an argument. For example, an event handler is a callback function.

| button.addEventListener("click", **function** () {  cat.classList.add("show"); }); |
| --- |

**Keydown event** - An event that occurs when a key is pressed on a keyboard, like a letter, number, or Enter key. Inside the callback function for a keydown event, you'll pass a parameter that will hold the event object. Most coders use e as the parameter to represent "event."

| **var** body = document.querySelector("body");   document.addEventListener("keydown", **function** (e) {  *// console.log(e);*  **if** (e.key === "l") {  body.classList.add("light");  } }); |
| --- |

**Nested if statement** - An if statement testing the condition of another if, else if, or else statement.

In this example, the second if statement (**if** (**body**.classList.contains("light"))) is the nested if statement.

| var **body** = document.querySelector("body");   document.addEventListener("keydown", **function** (e) {  *// console.log(e);*  **if** (e.key === "l") {  **body**.classList.add("light");  } **else** **if** (e.key === "d") {  **if** (**body**.classList.contains("light")) {  **body**.classList.remove("light");  }  } }); |
| --- |

**Change event** - An event that occurs when the user changes a drop-down list (i.e., the <select> element) or input areas like the <input> or <textarea> elements. Inside the callback function for a change event, you'll pass a parameter that will represent the change event. Most coders use e as the parameter to represent "event."

| var fave = document.querySelector("#favorite"); var heading = document.querySelector("h1"); var selection = "regular";   fave.addEventListener("change", function (e) {  selection = e.target.value;  **if** (selection === "stealth") {  heading.innerText = "Stealth Quincy 😎";  } **else** **if** (selection === "party") {  heading.innerText = "Party Quincy 🥳";  } **else** {  heading.innerText = "Quincy";  } }); |
| --- |

**toUpperCase()** - A method for converting a string value into all uppercase letters.

| **var** louder = "Speak up, please!"  console.log(louder.toUpperCase()); *// SPEAK UP, PLEASE!* |
| --- |

**Math.floo****r()** - A method for rounding a number down to the next whole number.

| **var** seatingCapacity = 1256.3;  console.log(Math.floor(seatingCapacity)); *//1256* |
| --- |

**Math.****random()** - A method for producing a random number between 0 and 1. Multiply it by another number to output a larger random number. Pair it with Math.floor() to round the number to the nearest whole number.

| console.log(Math.random()); *// 0.15884857919099582* |
| --- |

| console.log(Math.random() \* 36); *// 18.873096475917126* |
| --- |

| console.log(Math.floor(Math.random() \* 12)); *// 10* |
| --- |

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## **Lesson 8 - Arrays & Loops**

**Arrays** - A data type that contains one or more values. You'll add square brackets around the array values (elements). See the [Javascript Arrays Cheatsheet](https://learn.skillcrush.com/module-7/javascript-arrays-cheatsheet/) (Lesson 8) for a list of array methods.

| var timeOfDay = [6, "noon", 8, "morning", "evening", 12]; |
| --- |

You can also create an empty array to add items.

| var medicine = []; |
| --- |

**Elements** - The values stored in an array. Elements can be strings, numbers, and floating point numbers data types.

| var ages = ["thirty", 16, 48, "fifty-five", 1.5]; |
| --- |

**Index** - The position of an element in an array. In JavaScript, the first element starts at index 0. The second element would start at index 1, and so on.

| **Elements** | ["thirty", | 16, | 48, | "fifty-five", | 1.5]; |
| --- | --- | --- | --- | --- | --- |
|  | **↑** | **↑** | **↑** | **↑** | **↑** |
| **Index** | **0** | **1** | **2** | **3** | **4** |

**Loop** - A statement that allows you to repeat code multiple times.

**Iterating** - Each time a loop runs through a block of code. Each pass of the loop is called an iteration.

**for loop** - A type of loop that iterates through a block of code a designated number of times. Examples of for loops include the [for...of](#44z1i2n0tear) loop (Lesson 8) and the [for...in](#ik889mo8f2lq) loop (Lesson 11).

**for...of loop** - A type of for loop that iterates over the values of an array. A for...of loop only has access to the values of an array, not the index. You can use the for...of loop with the [for...in](#povbisvbxh4c) loop (Lesson 11) to loop through multiple object properties.

| **var** timeOfDay = [6, "noon", 8, "morning", "evening", 12];  **for** (**var** time **of** timeOfDay) {  console.log(`It is ${time}.`); } *// It is 6.* *// It is noon.* *// It is 8.* *// It is morning.* *// It is evening.* *// It is 12.* |
| --- |

**Loop** **body** - The loop section where you'll write the statements you want to execute on each loop iteration.

**forEach()** - A method to iterate through elements in an array and then execute a function for each array item. Unlike for...of loops, forEach() lets you access the array elements' value and index.

| var timeOfDay = [6, "noon", 8, "morning", "evening", 12];  timeOfDay.forEach(function (time, index) {  console.log(`The ${time} element is at position ${index}.`); }); *// The 6 element is at position 0. // The noon element is at position 1. // The 8 element is at position 2. // The morning element is at position 3. // The evening element is at position 4. // The 12 element is at position 5.* |
| --- |

**Modulus operator** - An operator to return the remainder of two numbers divided. The modulus operator uses the percent sign (%). The modulus operator is also called the "modulo" operator.

| **var** candy = 14; **var** kids = 4;  console.log(`There are ${candy % kids} pieces of candy remaining.`); *// There are 2 pieces of candy remaining.* |
| --- |

| var num = 45;  **if** (num % 2 === 0) {  console.log("This is an even number."); } **else** {  console.log("This is an odd number."); };  *// This is an odd number.* |
| --- |

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## **Lesson 9 - Scope**

**Scope** - The context where variables are visible to certain parts of your program. Scope can be divided into [global scope](#4uyzde2n4xzl), [function scope](#8gawlr881ygh), and [block scope](#dgljkc3s8p5g).

**Context** - The place the code is evaluated and executed, like inside a function or loop.

**Global scope** - The context for the whole program. Globally scoped variables are available to any part of the program.

**Function scope** - The context inside a function. Variables defined within a function are scoped only to that function or nested functions.

**Block scope** - The context inside a block of code. Unlike declaring variables with var, declaring your variables with let and const keeps variables in block scope.

**let keyword** - A keyword to declare variables and prevent them from being accessed outside the block they were declared in. Use let inside code blocks (e.g., loops, if/else if statements) and when you want to reassign the value of a variable.

| **if** (numOfDrinks === 5) {  **let** soda = "lemon-lime";  console.log(soda); } *// lemon-lime*   console.log(soda); *// ReferenceError: soda is not defined* |
| --- |

**const keyword** - A keyword to declare variables to constrain a variable to block scope and prevent the value from being reassigned. Using const will prevent data types like strings, booleans, and numbers from being reassigned to a different value. For data types like [arrays](#17tufw3ylvtf) and [objects](#1j7wpg27pg6x), const will prevent reassigning the variable but still allow you to modify the elements inside the array/object.

| **const** numOfDrinks = 5;   **const** drinks = **function** () {  **const** tea = 6 + numOfDrinks;  console.log(tea); };   drinks(); *// 11* |
| --- |

If you try to reassign a variable declared with const, you'll receive an error in the console like “TypeError: Assignment to constant variable” or "<variable name> is read-only" when attempting to reassign a variable.

| const numOfDrinks = 5; numOfDrinks = 7;   console.log(numOfDrinks); *// SyntaxError: /script.js: "numOfDrinks" is read-only* |
| --- |

**const vs. let vs. var** - For most uses, you'll want to use const to declare your variables, except when you need to reassign variables (let) or you're working with legacy code (var).

|  | **const** | **let** | **var** |
| --- | --- | --- | --- |
| **Function scoped** | Yes | Yes | Yes |
| **Block scoped** | Yes | Yes | No |
| **Reassignable** | No | Yes | Yes |
| **Redeclareable** | No | No | Yes |
| **Summary** | Use const as the default way to declare variables. You'll use const 95% of the time. | Declare variables with let when you need to reassign the value of your variables, like in a loop or if/else if statement. | Use var when working with legacy code that already uses var. Declaring with var is also helpful when learning to write code and scope issues aren't a factor. |

**value property** - A property to capture the content entered into a text box.

**createElement()** - A method to create a new HTML element.

**append()** - A method to add elements at the end of another DOM element, like a list.

**querySelectorAll()** - A method to select all the elements that match a specific selector. The querySelectorAll() returns a list of elements in an array-like structure..

| addShowButton.addEventListener("click", **function** () {  **const** show = showInput.value;  **if** (show !== "") {  **let** listItem = document.createElement("li");  listItem.innerText = show;  showList.append(listItem); **let** shows= document.querySelectorAll(".show-list li")*;*  showCount.innerText = shows.length; } })*;* |
| --- |

**length property** - A property to identify the number of elements in an array.

| **var** daysOfWeek = ["Monday", "Tuesday", "Wednesday", "Thursday", "Friday"]; console.log(daysOfWeek.length); *// 5* |
| --- |

**Refactored code** - Code that was restructured without changing or adding to its functionality, usually with the goal to make it more readable, better performing, or both.

**disabled property** - A property to indicate if an element can be interacted with or not. The disabled property uses the boolean values of true and false. For example, if the disabled property is set to true for a button, the user can no longer click the button.

| assignButton.addEventListener("click", **function** () {  assignItems();  assignButton.disabled = true; }); |
| --- |

**Math.min()** - A method that finds the smallest value passed to it. Use the spread (...) operator to send individual array elements to Math.min() instead of the whole array.

| console.log(Math.min(2, -12, 71)); *// -12* |
| --- |

| const employees = [12, 68, 333, 56, 1250]; const smallestNum = Math.min(...employees);  console.log(smallestNum); *// 12* |
| --- |

**Math.max()** - A method that finds the largest value in an array. Use the spread (...) operator to send individual array elements to Math.max() instead of the whole array.

| console.log(Math.max(2, -12, 71)); *// 71* |
| --- |

| const employees = [12, 68, 333, 56, 1250]; const largestNum = Math.max(...employees);  console.log(largestNum); *// 1250* |
| --- |

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## **Lesson 10 - Objects & Methods**

**Objects** - A data type used to group multiple properties and their corresponding values into a single, unordered entity. Like an object in real life, a JavaScript object represents a thing with characteristics (properties), like a person, animal, instrument, or house. An object is a collection of [key-value pairs](#vrn8jrnbjym).

**Properties** - Different values of an object. A property represents the different characteristics of your object. Properties can be any data type, like a number, string, array, boolean, or function.

**Dot notation** - A syntax to assign or access the property of an object using a period between the object name and property.

| **const** **cat** = {};   **cat**.name = "Fred"; **cat**.nickname = "Flooficus"; **cat**.age = 5; **cat**.isSleeping = true; **cat**.favoriteToys = ["spring", "ping pong balls", "bird stuffy"] **cat**.pet = function () {  **return** "purrrrrrrr"; } |
| --- |

**Method (object property)** - A function that's a property in an object. Use the **return** keyword to return the value of the method and make the result available to other parts of your code.

Methods can be added to an object following its creation:

| **const** cat = {};   cat.pet = **function** () {  **return** "purrrrrrrr"; } |
| --- |

Methods can also be created inside an object literal:

| **const** cat = {  pet: **function** () {  **return** "purrrrrrrr";  } }; |
| --- |

**Keys** - An object's unique elements which are used to access its values. Keys are also known as "identifiers" or "names." An object's keys must be unique and cannot be duplicated in the same object.

**Key-value pair** - An object's property consisting of a key and its associated value.

| [**Dot Notation**](#p7rp96g38zbr) | | | |  | [**Bracket Notation**](#181irs6f2key) | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | |  |  |  | | |
|  | **key-value pair** | | |  |  | **key-value pair** | | |
| house.color | | = | "blue" |  | house["color"] | | = | "blue" |
| **↑** | **↑** |  | **↑** |  | **↑** | **↑** |  | **↑** |
| **object** | **key** |  | **value** |  | **object** | **key** |  | **value** |

| [**Object Literal**](#a4jcje28rb8e) | | | | |  | [**Factory Function**](#s0s1q3d821i7) **(w/parameter)** | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |  |  |  |  |  |  |
| const house = { | |  | **←** | **object** |  | const createHouse = function (color) { | | | | | |
| color: "blue" | |  | **←** | **key-value pair** |  |  | const house = { | |  | **←** | **object** |
| }; |  |  |  |  |  |  | color: color | |  | **←** | **key-value pair** |
|  |  |  |  |  |  |  | }; |  |  |  |  |
|  |  |  |  |  |  |  | return house; | |  |  |  |
|  |  |  |  |  |  | }; |  |  |  |  |  |

**Bracket notation** - A syntax to access or assign the property of an object using square brackets around the between property. Add quotation marks around the property name inside the square brackets.

| **const** cat = {  name: "Fred",  nickname: "Flooficus",  age: 5,  isSleeping: true,  favoriteToys: ["spring", "ping pong balls", "bird stuffy"],  pet: **function** () {  **return** "purrrrrrrr";  } };   cat["color"] = "orange";   console.log(cat["isSleeping"]); *// true* |
| --- |

**Object literal** - A collection of key-value pairs inside the object’s curly braces, separated by a comma. The key and value are separated by a colon (:). You can add or change existing properties of an object literal by using either dot or bracket notation and the **=** assignment operator.

| const cat = {  name: "Fred",  nickname: "Flooficus",  age: 5,  isSleeping: true,  favoriteToys: ["spring", "ping pong balls", "bird stuffy"],  pet: **function** () {  **return** **"purrrrrrrr"**;  } };   cat.isSleeping = false; cat["color"] = "orange";   console.log(cat); // {name: "Fred", nickname: "Flooficus", age: 5, isSleeping: false, favoriteToys: **Array**(3)...} |
| --- |

**this keyword** - In a method, the **this** keyword allows you to reference another property from the same object.

An example of the **this** keyword used with a method that's outside the object declaration:

| **const** house = {  windows: 20 };  house.windowWash = **function** () {  **if** (**this**.windows > 15) {  **return** `That's a lot of windows to wash!`;  } };  console.log(house.windowWash()); *//That's a lot of windows to wash!* |
| --- |

Here's an example of **this** keyword used with a method that's declared in an object literal:

| **const** house = {  windows: 20,  windowWash: **function** () {  **if** (**this**.windows > 15);  **return** `That's a lot of windows to wash!`;  } };  console.log(house.windowWash()); *//That's a lot of windows to wash!* |
| --- |

**Compound assignment operators** - An assignment operator that combines the assignment operator (=) with an arithmetic operator (+, -, \*, /, and %). Compound assignment operators provide a shorter, cleaner syntax for performing calculations. See the [JavaScript Operators Cheatsheet](https://learn.skillcrush.com/module-3/javascript-operators-cheatsheet/) (Lesson 3) for a full list of assignment operators.

| **let** paperclips = 10; paperclips += 2; console.log(paperclips); *// 12* |
| --- |

| **let** candy = 15; candy %= 6; console.log(`There's ${candy} candies leftover.`); *// There's 3 candies leftover.* |
| --- |

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## **Lesson 11 - Factory Functions**

**Factory functions** - Patterns to create multiple objects. Factory functions let you quickly build several objects that share the same characteristics, AKA properties. You must return your object at the bottom of your factory function. You'll use factory functions when you want to create and manage multiple objects that have the same characteristics (e.g., color) that are expressed differently (e.g., blue, green, yellow).

| **const** createContact = **function** () {  **const** contact = {  name: "Noelle Silva",  phoneNum: "555-555-1234",  isNew: true,  message: **function** () {  **this**.isNew = true;  console.log("You've added a new contact!");  }  };  **return** contact; };  console.log(createContact()); *// {name: "Noelle Silva", phoneNum: "555-555-1234", isNew: true, message: ƒ message()}* |
| --- |

You can provide [parameters](#yyd18sthyn90) to your factory function in order to make your object more flexible and easy to reuse:

| const createContact = **function** (name, phone) {  const contact = {  name: name,  phoneNum: phone,  **isNew**: true,  message: **function** () {  this.**isNew** = true;  console.log("You've added a new contact!");  }  };  **return** contact; };  const contact1 = createContact("Noelle Silva", "555-555-1234"); const contact2 = createContact("Yami Sukehiro", "555-321-5555");  console.log(contact1, contact2); *// {name: "Noelle Silva", phoneNum: "555-555-1234", isNew: true, message: ƒ message()} // {name: "Yami Sukehiro", phoneNum: "555-321-5555", isNew: true, message:* *ƒ message()}* |
| --- |

**for...in loop** - A type of **for** loop that will allow you to loop over an object's key-value pairs. When looping over objects, you may want to access just the keys, just the values, or both the keys and the values.

| const createContact = **function** (name, phone) {  const contact = {  name: name,  phoneNum: phone,  **isNew**: true,  message: **function** () {  this.**isNew** = true;  console.log("You've added a new contact!");  }  };  **return** contact; };  const contact1 = createContact("Noelle Silva", "555-555-1234");  **for** (**let** key in contact1) {  console.log(key, contact1[key]); } *// name Noelle Silva* *// phoneNum 555-555-1234* *// isNew true* *// message f message() {}* |
| --- |

To loop through multiple objects, add the objects to an array and then loop through the array using the [for...of](#44z1i2n0tear) loop (Lesson 8). After the **for...of** loop, nest the **for...in** loop to access the object's key, value, or keys and values.

| ***const*** *contact1 = createContact("Noelle Silva", "555-555-1234");* ***const*** *contact2 = createContact("Yami Sukehiro", "555-321-5555");*  ***const*** *contactsArray = [contact1, contact2];* ***for*** *(****let*** *contact* ***of*** *contactsArray) {* ***for*** *(****let*** *key* ***in*** *contact) {  console.log(key, contact[key]);  } } // name Noelle Silva // phoneNum 555-555-1234 // isNew true // message f message() {} // name Yami Sukehiro // phoneNum 555-321-5555 // isNew true // message f message() {}* |
| --- |

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## **Lesson 12 - Intro to APIs**

**API** - An Application Programming Interface (API) is a way to allow information from an internal or external source to interact with your program.

**API URL** - The address to get access to the API. The API developers determine the API URL and associated [endpoints](#t7esd6qoiqf) and [parameters](#yyd18sthyn90), which can be found in the API's documentation. To access specific data from the API, you'll need the API URL combined with endpoints and possibly parameters.

Example API URLs:

* https://api.quotable.io/
* https://api.tvmaze.com/

**JSON files** - A type of text file used for exchanging data. Most programming languages can interpret JSON files. JSON stands for JavaScript Object Notation. JSON files end with a .json file extension. Install an extension on your browser, [JSON Formatter](https://chrome.google.com/webstore/detail/json-formatter/bcjindcccaagfpapjjmafapmmgkkhgoa?hl=en), to reformat JSON data and make it easier to read.

**REST APIs** - A type of API for making use of HTTP requests. You'll use the REST API's documentation to discover the [API URL](#kix.w0lp722nl00s), [endpoints](#t7esd6qoiqf), and [parameters](#ox1yv51nojlk).

**Endpoints** - The "end" of the API URL that determines the type of information available.

* Example API endpoint for all quotes:   
  [https://api.quotable.io/**quotes**](https://api.quotable.io/quotes)
* Example API endpoint for a subset of quotes:   
  [https://api.quotable.io/**random**](https://api.quotable.io/random)

**API parameters** - Placeholders for data in the API URL. You'll add a question mark (?) between the endpoint and the parameters. If the parameter has a space between words, replace the space between the words with the "%20" character. To chain more than one parameter together, add the ampersand (&) sign between the parameters.

Example API URL with a single parameter:

[https://api.quotable.io/quotes?](https://api.quotable.io/quotes?author=maya-angelou)**[author=maya-angelou](https://api.quotable.io/quotes?author=maya-angelou)**

Example API URL with multiple parameters (separated by a "&" sign):

[https://api.quotable.io/quotes?](https://api.quotable.io/quotes?author=maya-angelou&limit=1)**[author=maya-angelou&limit=1](https://api.quotable.io/quotes?author=maya-angelou&limit=1)**

**fetch()** - A method to allow you to get resources over a network, like data from an API.

**async keyword** - A keyword to enable asynchronous communication between your program and the API.

**await keyword** - A keyword that tells the program to wait on that line in the function until the API data are received.

**json()** - A method to parse (interpret) the JSON data from the API call and transform it into a JavaScript object.

| **const** getData = **async** **function** () {  **const** res = **await** fetch(  "https://quote-garden.herokuapp.com/api/v3/quotes?author=beyonce"  );  **const** data = **await** res.json();  console.log(data); }; getData(); |
| --- |

| **const** getShows = **async** **function** () {  **const** showRequest = **await** fetch("https://api.tvmaze.com/schedule/web");  **const** data = **await** showRequest.json();  console.log(data); }; getShows() *// {61) [Object, Object, Object, Object, Object, Object, Object, Object, Object, Object, ...]* |
| --- |

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## **Lesson 13 - Project: Guess the Word Game**

**Decomposition** - A computer science term that means breaking down a larger problem into smaller problems. Decomposition makes tackling a large project easier by breaking it into smaller problems that need to be solved.

**Regular expression** - A sequence of characters that lets you find text that matches a specific pattern. You'll use a regular expression when searching or replacing text. Regular expressions are also called "regex" or "regexp" for short. To learn more about regular expressions, check out this [JavaScript Regex](https://www.programiz.com/javascript/regex) article.

**match()** - A method used with a regular expression to search the strings and match them to the regular expression.

| ***const*** *str = 'CanyoufindthesecretchocolatesnackIhaveinthislongstring';* ***const*** *snackMatch = str.match(/chocolate/);*  ***if*** *(snackMatch) {  console.log("Found the chocolate!") };  // Found the chocolate!* |
| --- |

**Delimiter** - A character to separate words in a string.

**\n** - A delimiter to create a line break (AKA newline).

| console.log("First,\nsecond,\nand third!"); *// First* *// second,* *// and third!* |
| --- |

**trim()** - A method to remove extra whitespace before and after a string.

| **var** happiness = " Happiness is bug-free code. ";  console.log(happiness); *// Happiness is bug-free code.*  console.log(happiness.trim()); *// Happiness is bug-free code.* |
| --- |

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## **Lesson 14 - Projects: GitHub Repo Gallery**

**matches()** - A method to check if the target element (i.e., where the user clicks on the page) matches a specific selector.

| **const** h2 = document.querySelectorAll('h2'); **for** (**let** heading **of** h2){  **if** (heading.matches(".highlight")){  heading.style.backgroundColor = "yellow";  } } |
| --- |

**Input event** - An event triggered when the value of the <input> element changes, like when a user inputs text in the search box. Inside the callback function for an input event, you'll pass a parameter that will hold the data for the text input. Most coders use e as the parameter to represent "event."

| **const** namefield = document.querySelector("input.name");  namefield.addEventListener("input", **function**(e) {  console.log(e.target.value) } |
| --- |

**toLowerCase()** - A method for converting a string value into all lowercase letters.

| **var** quiet = "PLEASE Lower Your Voice"  console.log(quiet.toLowerCase()); *// please lower your voice* |
| --- |

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