

JavaScript Objects

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Real Life Objects

In real life, **objects** are things like: houses, cars, people, animals, or any other subjects.

Here is a car object example:

Car Object	Properties	Methods
	car.name = Fiat	car.start()
4-9	car.model = 500	car.drive()
	car.weight = 850kg	car.brake()
	car.color = white	car.stop()

Object Properties

A real life car has **properties** like weight and color:

car.name = Fiat, car.model = 500, car.weight = 850kg, car.color = white.

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A real life car has **methods** like start and stop:

```
car.start(), car.drive(), car.brake(), car.stop().
```

Car objects have the same **methods**, but the methods are performed **at different times**.

JavaScript Variables

JavaScript variables are containers for data values.

This code assigns a **simple value** (Fiat) to a **variable** named car:

Example

```
let car = "Fiat";
```

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JavaScript Objects

Objects are variables too. But objects can contain many values.

This code assigns **many values** (Fiat, 500, white) to an **object** named car:

Example

```
const car = {type:"Fiat", model:"500", color:"white"};
```

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It is a common practice to declare objects with the const keyword.

Learn more about using const with objects in the chapter: <u>JS Const</u>.

JavaScript Object Definition

How to Define a JavaScript Object

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· Using an Object Literal

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- Using the new Keyword
- Using an Object Constructor

JavaScript Object Literal

An object literal is a list of **name:value** pairs inside curly braces **{}**.

```
{firstName:"John", lastName:"Doe", age:50, eyeColor:"blue"}
```

Note:

name:value pairs are also called key:value pairs.object literals are also called object initializers.

Creating a JavaScript Object

Spaces and line breaks are not important. An object initializer can span multiple lines:

```
// Create an Object
const person = {
  firstName: "John",
  lastName: "Doe",
  age: 50,
  eyeColor: "blue"
};
```

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This example creates an empty JavaScript object, and then adds 4 properties:

```
// Create an Object
const person = {};

// Add Properties
person.firstName = "John";
person.lastName = "Doe";
person.age = 50;
person.eyeColor = "blue";
```

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Using the new Keyword

This example create a new JavaScript object using new Object(), and then adds 4
properties:

```
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// Create an object
const person = new Object();

// Add Properties
person.firstName = "John";
person.lastName = "Doe";
person.age = 50;
person.eyeColor = "blue";

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```

Note:

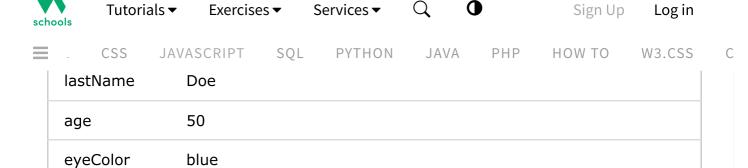
The examples above do exactly the same.

But, there is no need to use new Object().

For readability, simplicity and execution speed, use the **object literal** method.

Object Properties

The **named values**, in JavaScript objects, are called **properties**.



Objects written as name value pairs are similar to:

- Associative arrays in PHP
- · Dictionaries in Python
- Hash tables in C
- Hash maps in Java
- Hashes in Ruby and Perl

Accessing Object Properties

You can access object properties in two ways:

```
objectName.propertyName
objectName["propertyName"]
```

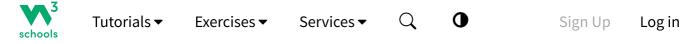
Examples

```
person.lastName;

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person["lastName"];
```

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Methods are function definitions stored as property values.

Property	Property Value
firstName	John
lastName	Doe
age	50
eyeColor	blue
fullName	function() {return this.firstName + " " + this.lastName;}

Example

```
const person = {
  firstName: "John",
  lastName : "Doe",
  id : 5566,
  fullName : function() {
    return this.firstName + " " + this.lastName;
  }
};
```

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In the example above, this refers to the **person object**:

this.firstName means the firstName property of person.

this.lastName means the lastName property of person.

In JavaScript, Objects are King.

If you Understand Objects, you Understand JavaScript.



Methods are Functions stored as Properties.

Properties can be primitive values, functions, or even other objects.

In JavaScript, almost "everything" is an object.

- Objects are objects
- Maths are objects
- Functions are objects
- Dates are objects
- Arrays are objects
- Maps are objects
- Sets are objects

All JavaScript values, except primitives, are objects.

JavaScript Primitives

A **primitive value** is a value that has no properties or methods.

3.14 is a primitive value

A **primitive data type** is data that has a primitive value.

JavaScript defines 7 types of primitive data types:

- string
- number
- boolean
- null
- undefined
- symbol
- bigint

Immutable

Primitive values are immutable (they are hardcoded and cannot be changed).



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Value	Туре	Type Comment						
"Hello"	string	"Hello" is always "Hello"						
3.14	number	umber 3.14 is always 3.14						
true	boolean	boolean true is always true						
false	boolean		false is always false					
null	null (obje	ct)	null is a	always nı	ıll			
undefined	undefined		undefined is always undefined					

JavaScript Objects are Mutable

Objects are mutable: They are addressed by reference, not by value.

If person is an object, the following statement will not create a copy of person:

```
const x = person;
```

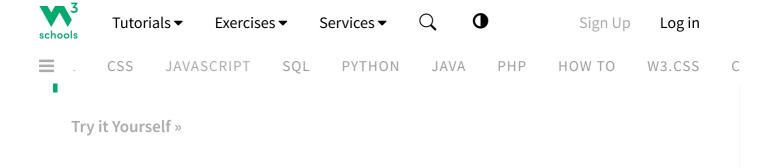
The object x is **not a copy** of person. The object x **is** person.

The object x and the object person share the same memory address.

Any changes to x will also change person:

Example

```
//Create an Object
const person = {
  firstName:"John",
  lastName:"Doe",
  age:50, eyeColor:"blue"
}
// Create a copy
```



Note:

You will learn a lot more about objects in the following chapters.

Exercise?

Consider the following object:

```
const car = {
  brand: 'Volvo',
  model: 'EX90'
};
```

How many properties do the object have?

- 0 0
- 0 1
- \bigcirc 2
- 0 3

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