JavaScript HTML DOM

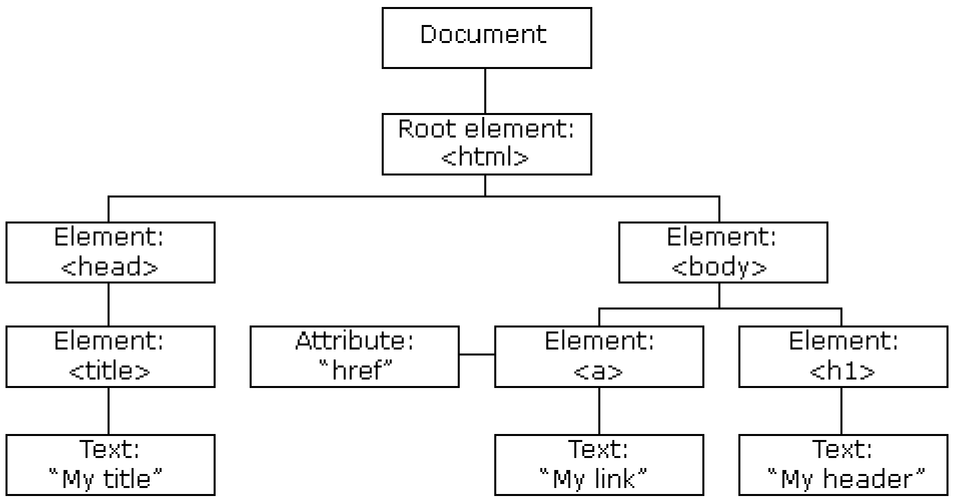
With the HTML DOM, JavaScript can access and change all the elements of an HTML document.

The HTML DOM (Document Object Model)

When a web page is loaded, the browser creates a **D**ocument **O**bject **M**odel of the page.

The **HTML DOM** model is constructed as a tree of **Objects**:

The HTML DOM Tree of Objects



With the object model, JavaScript gets all the power it needs to create dynamic HTML:

- JavaScript can change all the HTML elements in the page
- JavaScript can change all the HTML attributes in the page
- JavaScript can change all the CSS styles in the page
- JavaScript can remove existing HTML elements and attributes
- JavaScript can add new HTML elements and attributes
- JavaScript can react to all existing HTML events in the page
- JavaScript can create new HTML events in the page

What You Will Learn

In the next chapters of this tutorial you will learn:

- How to change the content of HTML elements
- How to change the style (CSS) of HTML elements
- How to react to HTML DOM events

- How to add and delete HTML elements.

What is the DOM?

The DOM is a W3C (World Wide Web Consortium) standard.

The DOM defines a standard for accessing documents:

"The W3C Document Object Model (DOM) is a platform and language-neutral interface that allows programs and scripts to dynamically access and update the content, structure, and style of a document."

The W3C DOM standard is separated into 3 different parts:

- Core DOM - standard model for all document types
- XML DOM - standard model for XML documents
- HTML DOM - standard model for HTML documents

What is the HTML DOM?

The HTML DOM is a standard **object** model and **programming interface** for HTML. It defines:

- The HTML elements as **objects**
- The **properties** of all HTML elements
- The **methods** to access all HTML elements
- The **events** for all HTML elements

In other words: **The HTML DOM is a standard for how to get, change, add, or delete HTML elements.**

JavaScript - HTML DOM Methods

HTML DOM methods are **actions** you can perform (on HTML Elements).

HTML DOM properties are **values** (of HTML Elements) that you can set or change.

The DOM Programming Interface

The HTML DOM can be accessed with JavaScript (and with other programming languages).

In the DOM, all HTML elements are defined as **objects**.

The programming interface is the properties and methods of each object.

A **property** is a value that you can get or set (like changing the content of an HTML element).

A **method** is an action you can do (like add or deleting an HTML element).

Example

The following example changes the content (the innerHTML) of the <p> element with id="demo":

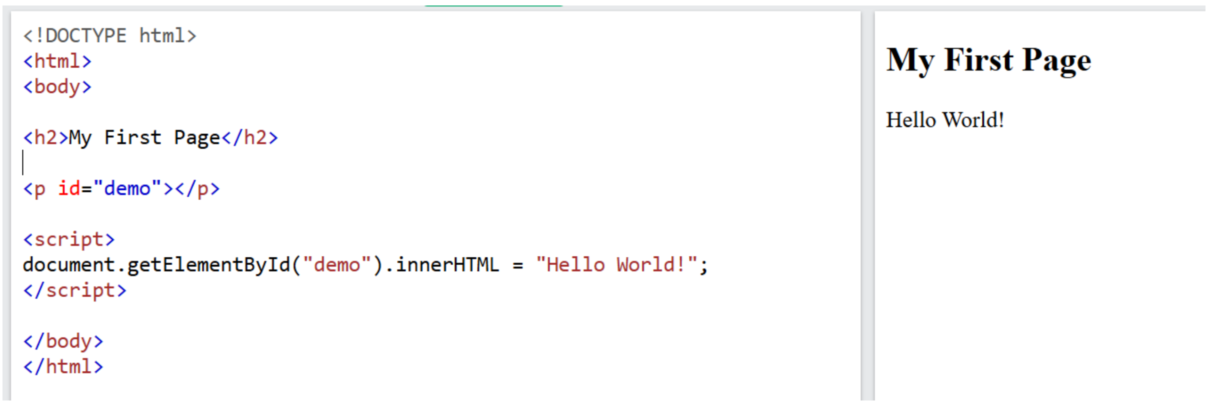
Example

```
<html>
<body>

<p id="demo">welcome to web technology </p>

<script>
document.getElementById("demo").innerHTML = "Hello World!";
</script>

</body>
</html>
```



```
<!DOCTYPE html>
<html>
<body>

<h2>My First Page</h2>

<p id="demo"></p>

<script>
document.getElementById("demo").innerHTML = "Hello World!";
</script>

</body>
</html>
```

```
My First Page

Hello World!
```

In the example above, getElementById is a **method**, while innerHTML is a **property**.

The getElementById Method

The most common way to access an HTML element is to use the id of the element.

In the example above the getElementById method used id="demo" to find the element.

The innerHTML Property

The easiest way to get the content of an element is by using the innerHTML property.

The innerHTML property is useful for getting or replacing the content of HTML elements.

The innerHTML property can be used to get or change any HTML element, including <html> and <body>.

JavaScript HTML DOM Document

The HTML DOM document object is the owner of all other objects in your web page.

The HTML DOM Document Object

The document object represents your web page.

If you want to access any element in an HTML page, you always start with accessing the document object.

Below are some examples of how you can use the document object to access and manipulate HTML.

Finding HTML Elements

Method	**Description**
document.getElementById(*id*)	Find an element by element id
document.getElementsByTagName(*name*)	Find elements by tag name
document.getElementsByClassName(*name*)	Find elements by class name

Property	**Description**
element.innerHTML = *new html content*	Change the inner HTML of an element
element.attribute = *new value*	Change the attribute value of an HTML element

element.style.*property* = *new style*	Change the style of an HTML element
Method	**Description**
element.setAttribute*(attribute, value)*	Change the attribute value of an HTML element

Changing HTML Elements

Adding and Deleting Elements

Method	**Description**
document.createElement(*element*)	Create an HTML element
document.removeChild(*element*)	Remove an HTML element
document.appendChild(*element*)	Add an HTML element
document.replaceChild(*new, old*)	Replace an HTML element
document.write(*text*)	Write into the HTML output stream

Adding Events Handlers

Method	**Description**
document.getElementById(*id*).onclick = function(){*code*}	Adding event handler code to an onclick event

Finding HTML Objects

The first HTML DOM Level 1 (1998), defined 11 HTML objects, object collections, and properties. These are still valid in HTML5.

Later, in HTML DOM Level 3, more objects, collections, and properties were added.

Property	**Description**

document.anchors	Returns all <a> elements that have a name attribute	1
document.applets	Deprecated	1
document.baseURI	Returns the absolute base URI of the document	3
document.body	Returns the <body> element	1
document.cookie	Returns the document's cookie	1
document.doctype	Returns the document's doctype	3
document.documentElement	Returns the <html> element	3
document.documentMode	Returns the mode used by the browser	3
document.documentURI	Returns the URI of the document	3
document.domain	Returns the domain name of the document server	1
document.domConfig	Obsolete.	3
document.embeds	Returns all <embed> elements	3
document.forms	Returns all <form> elements	1
document.head	Returns the <head> element	3
document.images	Returns all <img> elements	1
document.implementation	Returns the DOM implementation	3
document.inputEncoding	Returns the document's encoding (character set)	3
document.lastModified	Returns the date and time the document was updated	3
document.links	Returns all <area> and <a> elements that have a href attribute	1
document.readyState	Returns the (loading) status of the document	3

document.referrer	Returns the URI of the referrer (the linking document)	1
document.scripts	Returns all <script> elements	3
document.strictErrorChecking	Returns if error checking is enforced	3
document.title	Returns the <title> element	1
document.URL	Returns the complete URL of the document	1

JavaScript HTML DOM Elements

This page teaches you how to find and access HTML elements in an HTML page.

Finding HTML Elements

Often, with JavaScript, you want to manipulate HTML elements.

To do so, you have to find the elements first. There are several ways to do this:

- Finding HTML elements by id
- Finding HTML elements by tag name
- Finding HTML elements by class name
- Finding HTML elements by CSS selectors
- Finding HTML elements by HTML object collections

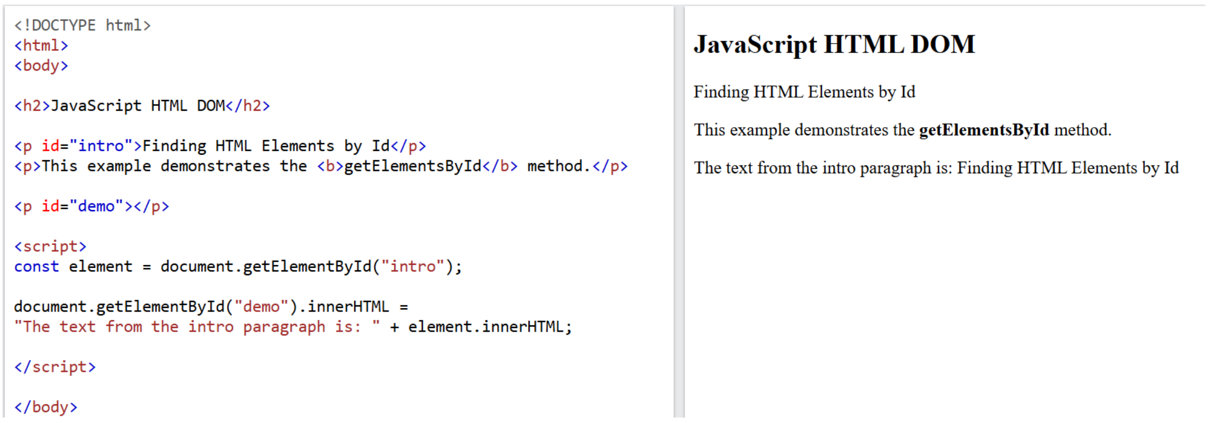
Finding HTML Element by Id

The easiest way to find an HTML element in the DOM, is by using the element id.

This example finds the element with id="intro":

Example

const element = document.getElementById("intro");



```
<!DOCTYPE html>
<html>
<body>

<h2>JavaScript HTML DOM</h2>

<p id="intro">Finding HTML Elements by Id</p>
<p>This example demonstrates the <b>getElementsById</b> method.</p>

<p id="demo"></p>

<script>
const element = document.getElementById("intro");

document.getElementById("demo").innerHTML =
"The text from the intro paragraph is: " + element.innerHTML;

</script>

</body>
```

JavaScript HTML DOM

Finding HTML Elements by Id

This example demonstrates the **getElementsById** method.

The text from the intro paragraph is: Finding HTML Elements by Id

If the element is found, the method will return the element as an object (in element).

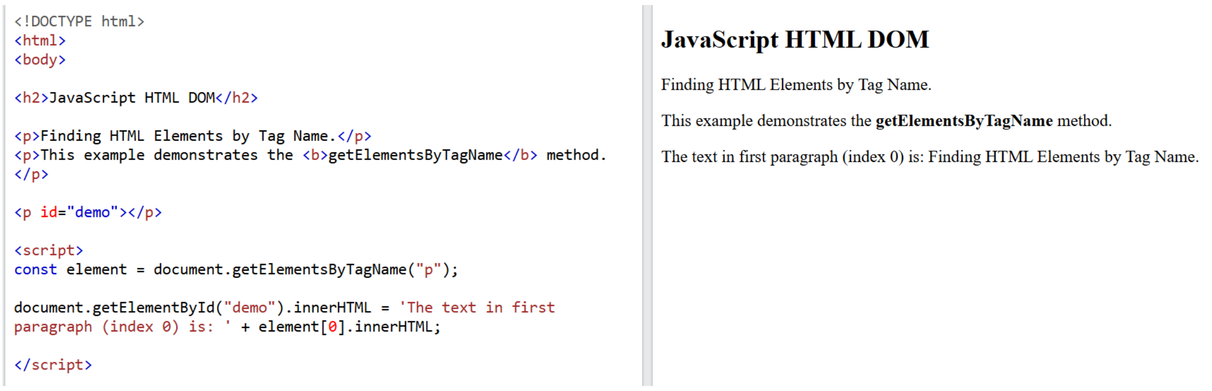
If the element is not found, element will contain null.

Finding HTML Elements by Tag Name

This example finds all <p> elements:

Example

const element = document.getElementsByTagName("p");



```
<!DOCTYPE html>
<html>
<body>

<h2>JavaScript HTML DOM</h2>

<p>Finding HTML Elements by Tag Name.</p>
<p>This example demonstrates the <b>getElementsByTagName</b> method.
</p>

<p id="demo"></p>

<script>
const element = document.getElementsByTagName("p");

document.getElementById("demo").innerHTML = 'The text in first
paragraph (index 0) is: ' + element[0].innerHTML;

</script>
```

JavaScript HTML DOM

Finding HTML Elements by Tag Name.

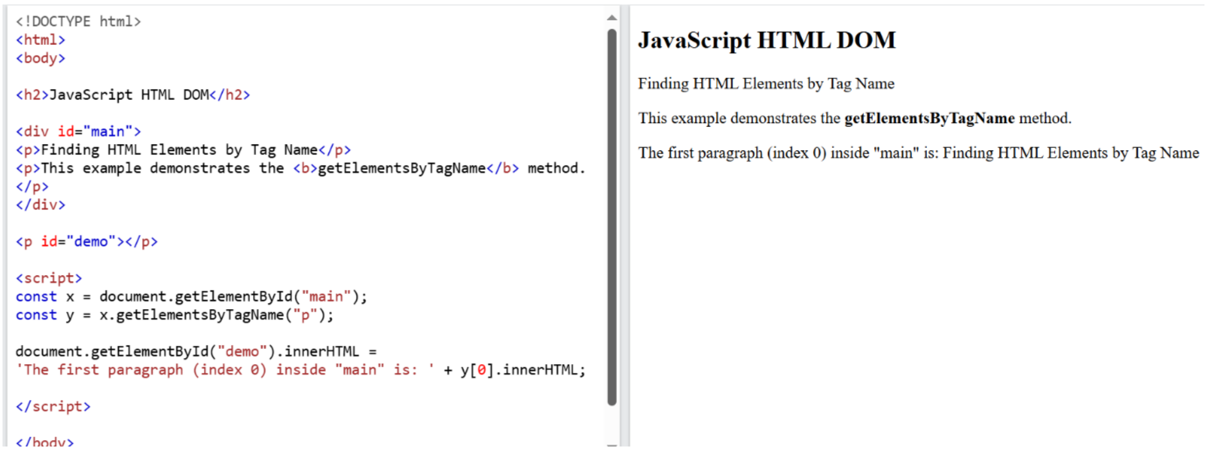
This example demonstrates the **getElementsByTagName** method.

The text in first paragraph (index 0) is: Finding HTML Elements by Tag Name.

This example finds the element with id="main", and then finds all <p> elements inside "main":

Example

const x = document.getElementById("main");
const y = x.getElementsByTagName("p");



```
<!DOCTYPE html>
<html>
<body>

<h2>JavaScript HTML DOM</h2>

<div id="main">
<p>Finding HTML Elements by Tag Name</p>
<p>This example demonstrates the <b>getElementsByTagName</b> method.
</p>
</div>

<p id="demo"></p>

<script>
const x = document.getElementById("main");
const y = x.getElementsByTagName("p");

document.getElementById("demo").innerHTML =
'The first paragraph (index 0) inside "main" is: ' + y[0].innerHTML;

</script>

</body>
```

JavaScript HTML DOM

Finding HTML Elements by Tag Name

This example demonstrates the **getElementsByTagName** method.

The first paragraph (index 0) inside "main" is: Finding HTML Elements by Tag Name

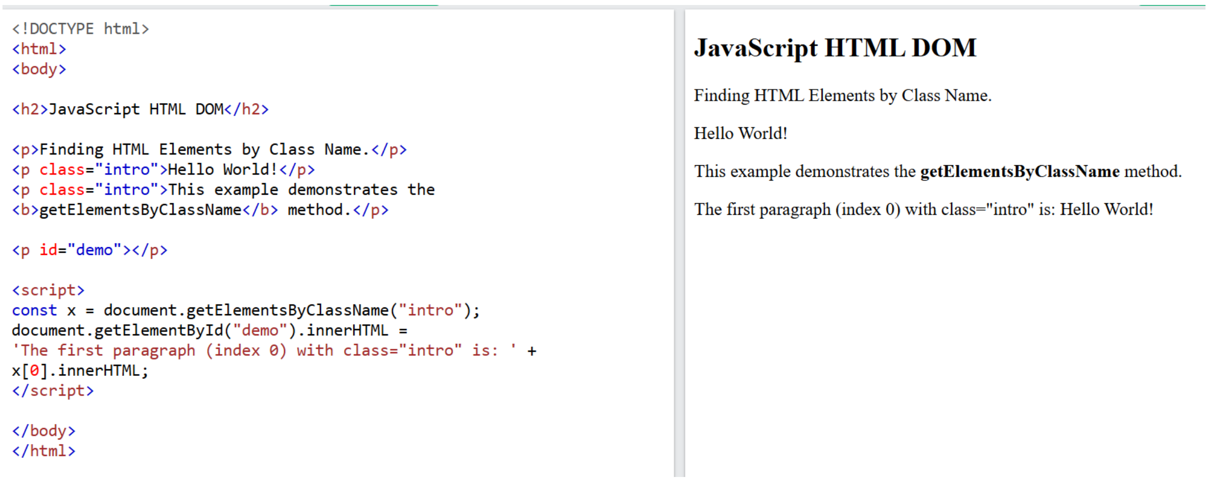
Finding HTML Elements by Class Name

If you want to find all HTML elements with the same class name, use getElementsByClassName().

This example returns a list of all elements with class="intro".

Example

const x = document.getElementsByClassName("intro");



```
<!DOCTYPE html>
<html>
<body>

<h2>JavaScript HTML DOM</h2>

<p>Finding HTML Elements by Class Name.</p>
<p class="intro">Hello World!</p>
<p class="intro">This example demonstrates the
<b>getElementsByClassName</b> method.</p>

<p id="demo"></p>

<script>
const x = document.getElementsByClassName("intro");
document.getElementById("demo").innerHTML =
'The first paragraph (index 0) with class="intro" is: ' +
x[0].innerHTML;
</script>

</body>
</html>
```

JavaScript HTML DOM

Finding HTML Elements by Class Name.

Hello World!

This example demonstrates the **getElementsByClassName** method.

The first paragraph (index 0) with class="intro" is: Hello World!

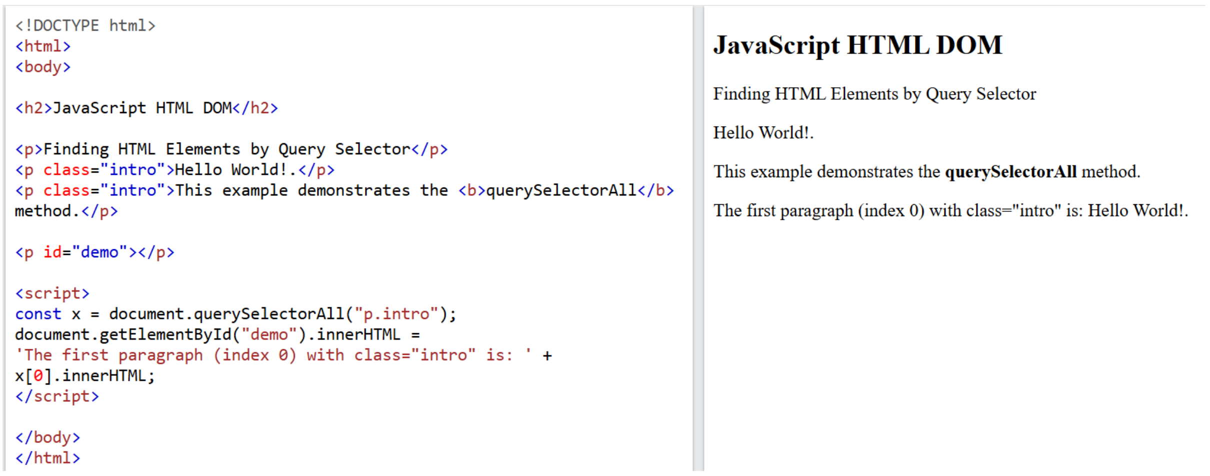
Finding HTML Elements by CSS Selectors

If you want to find all HTML elements that match a specified CSS selector (id, class names, types, attributes, values of attributes, etc), use the querySelectorAll() method.

This example returns a list of all <p> elements with class="intro".

Example

const x = document.querySelectorAll("p.intro");



```
<!DOCTYPE html>
<html>
<body>

<h2>JavaScript HTML DOM</h2>

<p>Finding HTML Elements by Query Selector</p>
<p class="intro">Hello World!.</p>
<p class="intro">This example demonstrates the <b>querySelectorAll</b>
method.</p>

<p id="demo"></p>

<script>
const x = document.querySelectorAll("p.intro");
document.getElementById("demo").innerHTML =
'The first paragraph (index 0) with class="intro" is: ' +
x[0].innerHTML;
</script>

</body>
</html>
```

JavaScript HTML DOM

Finding HTML Elements by Query Selector

Hello World!.

This example demonstrates the **querySelectorAll** method.

The first paragraph (index 0) with class="intro" is: Hello World!.

Finding HTML Elements by HTML Object Collections

This example finds the form element with id="frm1", in the forms collection, and displays all element values:

Example

```
const x = document.forms["frm1"];
let text = "";
for (let i = 0; i < x.length; i++) {
  text += x.elements[i].value + "<br>";
}
document.getElementById("demo").innerHTML = text;
```

Try it Yourself »

The following HTML objects (and object collections) are also accessible:

- document.anchors
- document.body
- document.documentElement
- document.embeds
- document.forms
- document.head
- document.images
- document.links
- document.scripts
- document.title