**Ques:- What is JavaScript?**

Ans- According to Wikipedia that JavaScript is a high level dynamic, untyped and interpreted programming language standardized in the ECMAScript language specification, that alongside HTML and CSS is one of the three core technologies of World Wide Web content.

In simple words, Consider a modern web page with great content, fancy design and layout, and advanced interactivity. What you see is the combined output of three distinct layers of code, put together by the browser. The first layer is the HTML document. This is where the content lives, marked up in a language that makes it easy for the browser to parse. When you visit a webpage you’re accessing this document. And without this HTML document there’s no web page. The second layer is a collection of CSS rules. This is the code that instructs the browser how to display the HTML Markup. HTML handles the content. CSS is presentation. That means even if you take the CSS away the content is still there. CSS is the presentational enhancement. The third layer is the JS. What I call the interactive layer. JS is the scripting language that runs in the browser and interacts with the HTML Markup and CSS Rules to change what you see and what you can do. In short, **JS is a scripting language that allows you to write small programs that run in the browser, and change the HTML and CSS of the current document.**

JavaScript is a loosely-typed client side scripting language that executes in the user's browser. JavaScript interact with html elements (DOM elements) in order to make interactive web user interface.

JavaScript implements [ECMAScript](https://www.tutorialsteacher.com/articles/what-is-ecmascript) standards, which includes core features based on [ECMA-262 specification](https://www.ecma-international.org/ecma-262/5.1/) as well as other features which are not based on ECMAScript standards.

**Advantages of JavaScript**

1. JavaScript is easy to learn.
2. It executes on client's browser, so eliminates server side processing.
3. It executes on any OS.
4. JavaScript can be used with any type of web page e.g. PHP, ASP.NET, Perl etc.
5. Performance of web page increases due to client side execution.
6. JavaScript code can be minified to decrease loading time from server.
7. Many JavaScript based application frameworks are available in the market to create Single page web applications e.g. ExtJS, AngularJS, KnockoutJS etc.

Html 4.x requires type attribute in script tag. Html 5 page does not require type attribute in the <script> tag, because in HTML 5 the default script language is JavaScript.

Make a separate file with .js extension and include it in a web page using <script> tag and reference the file via src attribute.

<script src="/PathToScriptFile.js"></<script> @\* External JavaScript file \*@

The browser loads all the scripts in head tag before loading and rendering body html. It is recommended to include scripts before ending body tag if scripts are not required while window is loading.

**Points to Remember :**

1. JavaScript code must be written within <script> tag.
2. External JavaScript file (.js) can be referenced using

 <script src="/PathToScriptFile.js"></script> where src attribute is used to specify the full path of .js file.

1. Html5 standard does not required type="text/javascript" attribute, whereas prior html standards requires type attribute.
2. The <script> tag can be added into <head> or <body> tag.
3. The script included into <head> tag may not be able to access DOM elements because <head> loads before <body>. Write script before ending of </body> tag if script code needs to access DOM elements.

**Case Sensitive**

JavaScript is a case sensitive scripting language. It means functions, variables and keywords are case sensitive.

**String**

String is a text in JavaScript. A text content must be enclosed in double or single quotation marks.

**Number**

JavaScript allows you to work with any kind of numbers like integer, float, hexadecimal etc. Number must NOT be wrapped in quotation marks.

Integer: 1000

Float: 10.2

**Boolean**

As in other languages, JavaScript also includes true or false as a boolean value.

**Semicolon**

JavaScript statements are separated by a semicolon. However, it is not mandatory to end every statement with a semicolon but it is recommended.

For example, JavaScript considers three different statements for following:

one = 1; two=2; three=3;

**Keywords**

Keywords are reserved words in JavaScript, which cannot be used as variable names or function names.

The following table lists some of the keywords used in JavaScript.

| Keywords | | |
| --- | --- | --- |
| var | function | if |
| else | do | while |
| for | switch | break |
| continue | return | try |
| catch | finally | debugger |
| case | class | this |
| default | false | true |
| in | instanceOf | typeOf |
| new | null | throw |
| void | width | delete |

**Ques Why Study JavaScript?**

Ans JavaScript is one of the 3 languages all web developers must learn:

   1. HTML to define the content of web pages

   2. CSS to specify the layout of web pages

   3. JavaScript to program the behavior of web pages

Web pages are not the only place where JavaScript is used. Many desktop and server programs use JavaScript. Node.js is the best known. Some databases (A Microsoft Excel spreadsheet or Microsoft Access are good **examples** of desktop database programs. These programs allow users to enter data, store it, protect it, and retrieve it when needed. ... They include **databases** like SQL Server, Oracle Database, Sybase, Informix, and MySQL), like MongoDB and CouchDB, also use JavaScript as their programming language.

**Ques What are JavaScript Data Types?**

Ans Following are the JavaScript Data types:

Number

String

Boolean

Object

Undefined

**Ques What is the use of isNaN function?**

Ans isNan function returns true if the argument is not a number otherwise it is false.

**Display Popup Message Box**

JavaScript provides different built-in functions to display popup messages for different purposes e.g. **to display a simple message or display a message and take user's confirmation on it or display a popup to take a user's input value.**

**Alert Box**

Use alert() function to display a popup message to the user. This popup will have OK button to close the popup.

alert("This is alert box!"); // display string message

alert(100); // display number

alert(true); // display boolean

The alert function can display message of any data type e.g. string, number, boolean etc. There is no need to convert a message to string type.

**Ques What can JS do?**

**JavaScript Can Change HTML Content**

1. One of many JavaScript HTML methods is getElementById().

This example uses the method to "find" an HTML element (with id="demo") and changes the element content (innerHTML) to "Hello JavaScript"

Ex:- document.getElementById("demo").innerHTML = "Hello JavaScript"

1. JavaScript changes the value of the src (source) attribute of an <img> tag.
2. JavaScript Can Change HTML Styles (CSS) like fontSize etc.
3. JavaScript Can Hide HTML Elements by changing the display style ‘none’.
4. Showing hidden HTML elements can also be done by changing the display style ‘block’.

\*see practice sheet

JavaScript code must be inserted between <script> and </script> tags. Old JavaScript examples may use a type attribute: <script type="text/javascript">.  
The type attribute is not required. JavaScript is the default scripting language in HTML.

**JavaScript Functions and Events**

A JavaScript function is a block of JavaScript code, that can be executed when "called" for.

For example, a function can be called when an event occurs, like when the user clicks a button.

Placing scripts at the bottom of the <body> element improves the display speed, because script interpretation slows down the display.

External scripts are practical when the same code is used in many different web pages.

JavaScript files have the file extension **.js**.

To use an external script, put the name of the script file in the src (source) attribute of a <script> tag: <script src="myScript.js"></script>

External scripts cannot contain <script> tags.

**External JavaScript Advantages**

Placing scripts in external files has some advantages:

* It separates HTML and code
* It makes HTML and JavaScript easier to read and maintain
* Cached JavaScript files can speed up page loads

To add several script files to one page  - use several script tags:

<script src="myScript1.js"></script>  
<script src="myScript2.js"></script>

**External References**

External scripts can be referenced with a full URL or with a path relative to the current web page.

Ex. <script src="https://www.w3schools.com/js/myScript1.js"></script>

This example uses a script located in a specified folder on the current web site:

Ex. <script src="/js/myScript1.js"></script>

This example links to a script located in the same folder as the current page:

Ex. <script src="myScript1.js"></script>

**JavaScript can "display" data in different ways:**

* Writing into an HTML element, using innerHTML.
* Writing into the HTML output using document.write().
* Writing into an alert box, using window.alert().
* Writing into the browser console, using console.log().

**Using innerHTML**

To access an HTML element, JavaScript can use the document.getElementById(id) method.

The id attribute defines the HTML element. The innerHTML property defines the HTML content:

document.getElementById("demo").innerHTML = 5 + 6;

**Using document.write()**

* For testing purposes, it is convenient to use document.write()
* Never call document.write after the document has finished loading. It will overwrite the whole document.
* Using document.write() after an HTML document is loaded, will **delete all existing HTML**.
* The document.write() method should only be used for testing.

**Using window.alert()**

You can use an alert box to display data:

window.alert(5 + 6);

**Using console.log()**

For debugging purposes, you can use the console.log() method to display data.

**JavaScript Statements**

JavaScript statements are composed of:

Values, Operators, Expressions, Keywords, and Comments.

This statement tells the browser to write "Hello Dolly." inside an HTML element with id="demo"

A **JavaScript program** is a list of **statements** to be executed by a computer.

EX: var x, y, z; // Statement 1

X = 6; // Statement 2

Y= 7; // Statement 3

Z = x + y; // Statement 4

document.getElementById("demo").innerHTML = "The value of z is " + z + ".";

**JavaScript Programs**

* A **computer program** is a list of "instructions" to be "executed" by a computer.
* In a programming language, these programming instructions are called **statements**.
* A **JavaScript program** is a list of programming **statements**.
* In HTML, JavaScript programs are executed by the web browser.

Most JavaScript programs contain many JavaScript statements.

The statements are executed, one by one, in the same order as they are written.

JavaScript programs (and JavaScript statements) are often called JavaScript code.

**Semicolons ;**

JavaScript statements are separated by semicolons

Add a semicolon at the end of each executable statement:

Var a, b, c \\ assign variables

a = 10; \\ assign 10 value to a

b = 50; \\ assinn 50 value to b

c = a + b; \\ assign the sum of a and b to c

* When separated by semicolons, multiple statements on one line are allowed.
* JavaScript ignores multiple spaces. You can add white space to your script to make it more readable.
* A good practice is to put spaces around operators ( = + - \* / )

**JavaScript Line Length and Line Breaks**

* For best readability, programmers often like to avoid code lines longer than 80 characters.
* If a JavaScript statement does not fit on one line, the best place to break it is after an operator.