Javascript

Today's to-do list
We will look at JavaScript, what it is what it does, and how it fits into our web pages.

Learning objectives:
By the end of this session, you will
Understand what JavaScript is used for
Understand the terminology and key features
Know what you can do on a site
Learn how to apply it

So what is it?
JavaScript is a programming language that adds complex functionality to our web pages and allows us to do all the clever stuff that we like to include like interactive elements and animations. JavaScript does all the stuff that isn't just basic static content.

We know it's more complicated than HTML and CSS so we aren't going to get too complex today. Most of the time you won't need to do anything with your JavaScript files on your website, but it is always useful to know how it interacts with everything else and what its part is in our overall architecture. We are going to look at what it does, what it looks like and some of the terminology so you can recognise it in use.

Where HTML gives us our basic structure and CSS our styles, JavaScript lets us add functionality, animated content and dynamic structures to our pages to add interest and movement.

Taking sides
We talk about server-side and Client-side code in Web Dev. It's all about where that script is actually run to perform its task. Client-side means the script is run on the viewer's side, in their browser. Like an animation or a pop-up window for example.

Server-side, as the name suggests, is run on the web server. This is usually the raw code that performs complex tasks like PHP, Ruby, Python and ASP.

But what does it look like?
We can add JavaScript directly to our pages, but best practice says we should keep it in its own little box like we do without CSS. It stops our pages from getting overloaded and slowing our site down. **We can apply our JavaScript like we would apply our CSS only we refer to it with <script> tags in our page code.** You would expect to see something like this

```
<script>
  // JavaScript goes here
</script>
```

If we are linking to an external file, like we would with our CSS we need to 'call' it in our code. External JavaScript files are saved in our directories/folders as .js files. So you would see something like this

```
<script src="script.js" defer></script>
```

Inside that file will be the actual instructions that create the script, they look something like this

```
function createParagraph() {
  const para = document.createElement("p");
  para.textContent = "Click me!";
  document.body.appendChild(para);
}

const buttons = document.querySelectorAll("button");

for (const button of buttons) {
  button.addEventListener("click", createParagraph);
}
```

One thing to remember is that too much JavaScript loaded into your site, especially at the top of our site, the <head> area will slow your site down. All that code has to be loaded before the screen displays, so too much code at the start will make your page really slow. We will look at this more later on in our sessions when we look at testing the performance of our site. That's why it is worth understanding the impact of JavaScript, even if you are not going to create any yourself.

Functions & Events
Most websites will feature reusable blocks of code. Things that do one particular job but are used multiple times. Like our CSS file that we save and then refer back to in our pages, one piece of code that then makes changes globally across our site. All that code you have just been working on classes as a function. Anything you see in your page code that sits inside a pair of these () is a function.

We aren't going to go into great depth about JavaScript structured objects, for what you need to know right now, you don't need to know! If you want to learn more you can work through all the Mozilla tutorials at your leisure, the links are in your useful links doc at the bottom of today's page.

Events
As the name implies, Events are things that happen. Events will pop up in your build so it's always useful to know what they are and what the term means. An event is a reaction that your website needs to take in response to an action.

Action – You click the submit button on your workbook form.
Reaction or 'Event' – the form is submitted and information is displayed on the screen.

To react to an event, we need to attach a piece of code – our JavaScript function – that tells our browser what to do when that action is taken. This piece of code is referred to as an event handler.

These bits of code work with event listeners, a clever bit of code that 'listens out' for the event happening and then tells the handler.

Think of it as your younger brother listening out for the Ice Cream Van – he's the event listener. When he hears it coming, he tells you – the event handler – and you go out and buy the ice cream.

Events have multiple triggers, the most common you will see are things like **"mouseover" a button or text that changes colour when the mouse is rolled over it or "onclick" an event that happens when you click on the element, like starting a video.**

These are not pieces of code you are likely to need to create but you will see the options in your builder, so you need to know what they mean and how they work.

Activity One
Let's have a look at some basic functions. Using the mini quizzes on W3
https://www.w3docs.com/exercise/javascript/9
https://www.w3docs.com/exercise/javascript/27
Let's go through some of the variables together.

API's
You will see this term pop up a lot. Application Programming Interfaces are pre-built blocks of code that we can add to our website to allow us to do things we normally wouldn't be able to do. That might be a finance calculator or an interactive map. In WooCommerce you might see options to Geolocate customers to work out their shipping costs that would use a Geolocation API. A Facebook API will let you embed like buttons or feeds on your page.

There are two types of API. Browser and Third-party. **Browser APIs are built into your web browser – who knew? They read the data that your website provides and then translate it into something visual on our page.** It might be a complex script allowing you to change the colour of the web page you are viewing or manipulating an image.

Third-party APIs are created by other people and not a default part of your page. You would normally get the code from someone else, like Meta Developer to embed an Instagram feed in your website footer or YouTube that lets you search, play and build playlists. Anything that is connected to an external site, to do something on your site will be running some form of third-party API.

Activity two
Just like CSS, some things are easier to do in practice than to talk about. The language can be confusing and daunting, and you feel like walking away and doing something else

instead. To help you get over this we are going to do a little practical with Mozilla again. Let's all go to this page and go through it step by step together.

https://developer.mozilla.org/en-US/docs/Learn/JavaScript/First_steps/A_first_splash

For your second activity, we are going to have a go at creating the Guess the Number Game. Let's start with all having a go at the game so we can see what it looks like when it's working.

Download the requested files and make sure you keep a copy of your JavaScript that you create as you will need to add it to your project website later in the sessions.

Coming up soon to extend these skills
Your JavaScript knowledge will give you a greater understanding of how web functions work and what functionality we can add.

Don't forget
Make sure you complete and submit your workbooks. Once you do you will get a copy of your completed workbook and links to download a copy of today's notes and slides.

Today's session page in your learner dashboard has a useful links document that will cover all the tools, resources and articles we have discussed in the session and some useful guides and articles to take you further.

Make sure you revisit your FABs and set yourself some goals specific to today's session.

Extra help
If you need any help with anything from today's session feel free to message me in the WhatsApp group. If you have any other issues or problems related to the course or the tools speak to Andrew and Irfana, they are here to help you.

Up next
See you tomorrow for Market Research in your **Research and practical** session.