Changing The DOM with DevTools and JavaScript

(https://github.com/learn-co-curriculum/phase-0-the-dom-dev-tools) (https://github.com/learn-co-curriculum/phase-0-the-dom-dev-tools/issues/new)

Learning Goals

- Demonstrate viewing the DOM through Chrome DevTools
- Select an element with Chrome DevTools
- Delete an element with Chrome DevTools
- Demonstrate that the source is not changed when the DOM is
- Demonstrate opening the DevTools' JavaScript console
- Select an element with JavaScript
- Delete an element with JavaScript
- Storing node references in variables

Introduction

We've read that updating the DOM will update the browser's rendered page. Let's try this out. We're going to change the DOM in two ways. First, we'll use Chrome's Developer Tools ("DevTools") and our mouse to remove an element from the DOM. Then we'll use the DevTools' JavaScript console to run JavaScript that does the same thing.

Demonstrate Viewing the DOM Through Chrome DevTools

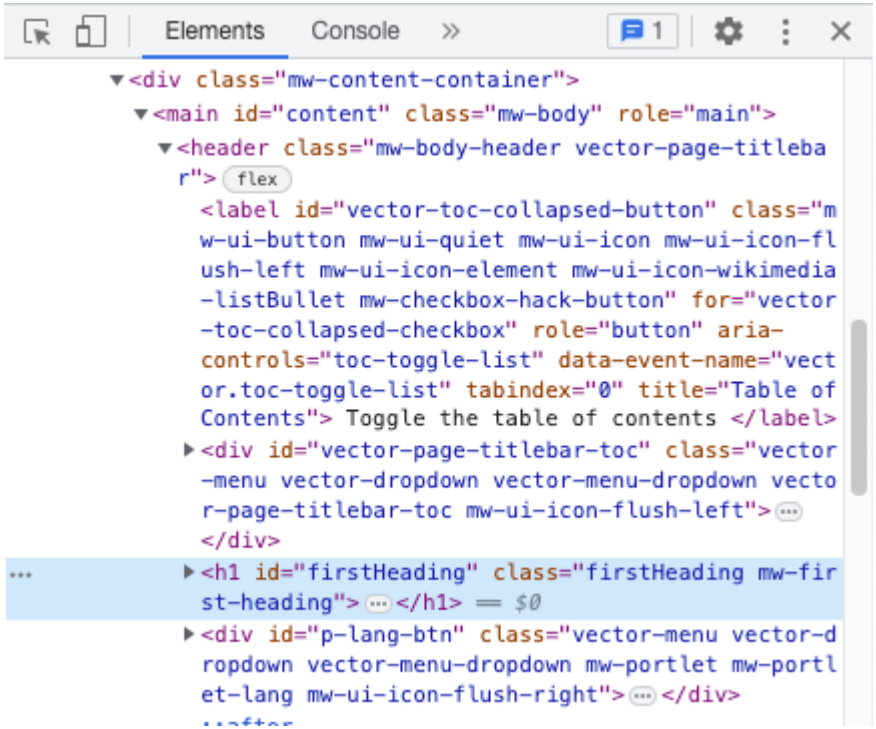
Let's head back to the **Wikipedia page for Ada Lovelace** (https://en.wikipedia.org/wiki/Ada_Lovelace). From this web page, look at the Chrome menu bar at the top of the page. Click on "View", then select "Developer", then "Developer Tools." This will open the Google Developer Tools. Click on the "Elements" tab. Here we see the DOM representation of the HTML source that was loaded into the browser.

Select an Element With Chrome DevTools

Scroll through the Elements panel. You will see some HTML: `head` tags, `body` tags, `div` s, etc. If the `body` element is collapsed, use the disclosure triangle to expand it. Notice that you can mouse over different elements in the Elements panel and see them highlighted in the browser window. We will continue to drill down until we get can see the DOM element for the page title:

- locate the `div` nested inside `body` that has a `class` of "mw-page-container";
- within that `div` , find the div with a `class` of "mw-page-container-inner";
- within that `div` , find the `div` with a class of "mw-content-container";
- within that `div` , find the `main` element with an `id` of "content";
- finally, within the `main` element, find the `header` element.

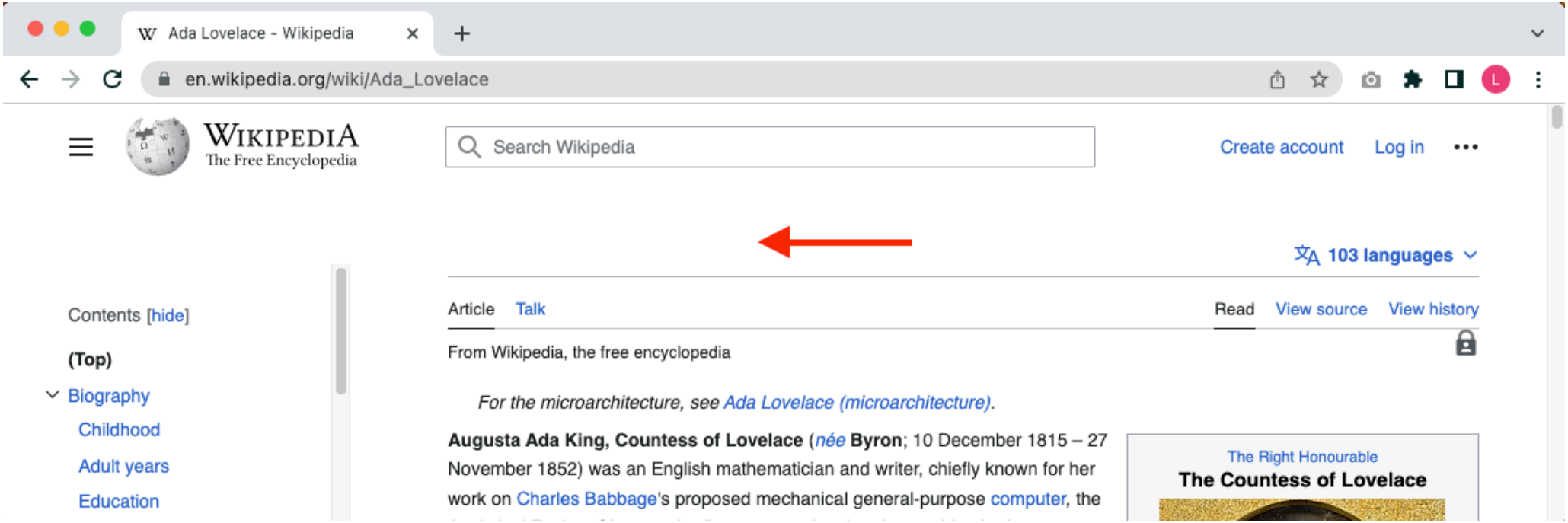
Next, locate the `h1` element nested inside the "header" element. It should look something like this:



Click on the `h1` element; you'll see that the title is now highlighted in the rendered browser page. You've now selected an element with the DevTools.

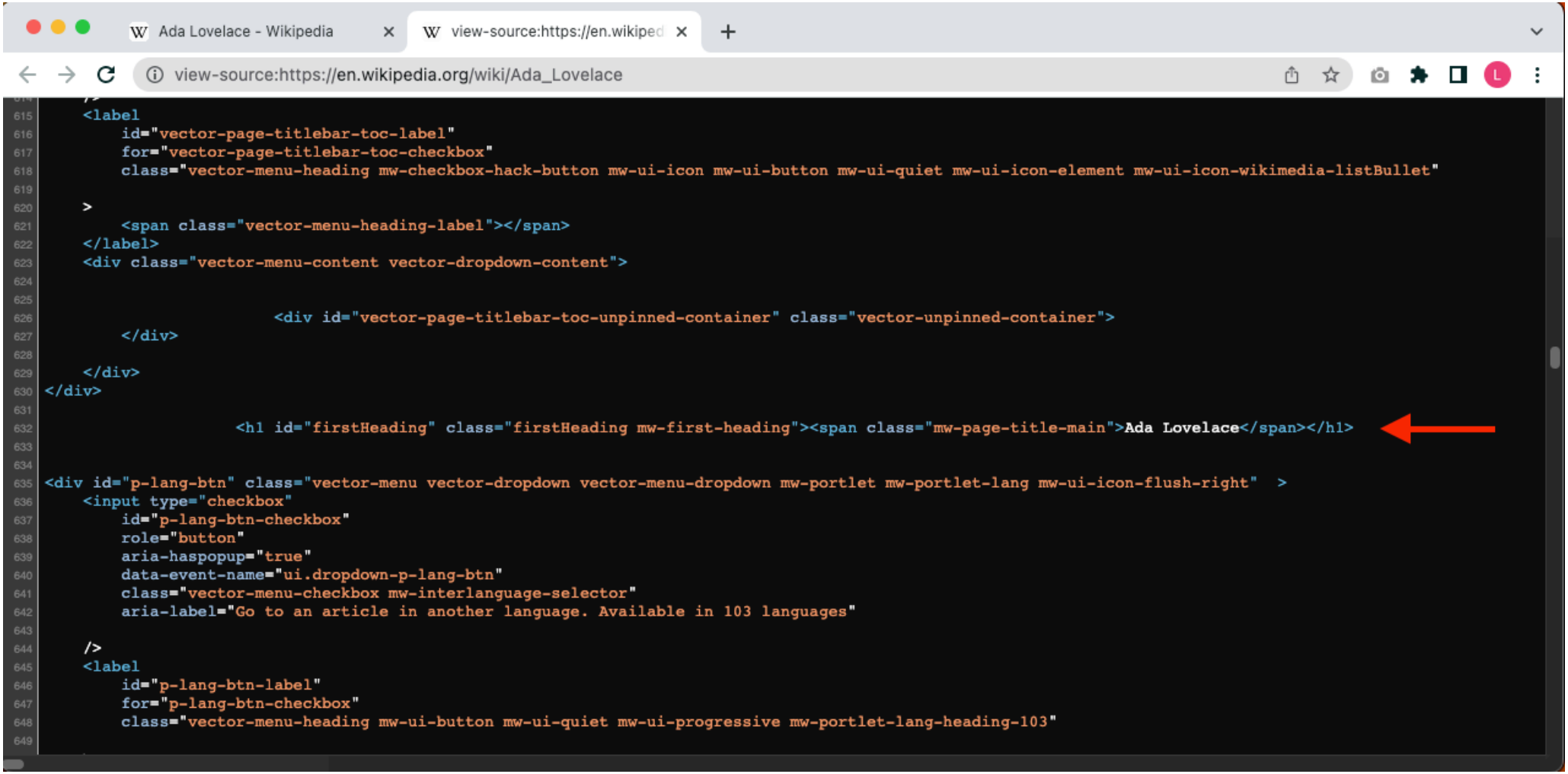
Delete an Element With Chrome DevTools

Press the delete button on your keyboard. The element will vanish from the browser's rendered page.



Demonstrate That the Source is Not Changed When the DOM Is

View the page source. In the Chrome menu bar, click on "View", then select "Developer", then "View Source." You will see that the HTML is just as it always was, with the deleted element still present. (Note that the `h1` element is quite far down on the page. To find it more easily, you might want to search the page for its `id`, "firstHeading".)



The changes in the DOM do not affect the HTML file on the server. When you think about it, that makes sense. If that were true then anyone could be changing carefully-written HTML. (Of course, in the case of Wikipedia, people *can* edit the content using Wikipedia's editor, but they aren't directly accessing the underlying HTML.)

The HTML, which lives on the server, **is unchanged**.

Refresh the page by going to "View" and choosing "Reload this Page." You will be reloading the DOM *from the source*. The page content will come back.

Demonstrate Opening the DevTools' JavaScript Console

Above, we deleted an element by selecting it in the DevTools and pressing the delete key. We can accomplish the same thing using JavaScript.

In DevTools, click the **Console** tab. At the prompt, type the word `document` and press "Enter." You'll get a `#document` returned. If you hover your mouse over the element, you'll see the entire page highlighted in the browser window. If you expand it, you'll see that it's the exact HTML that you saw in the **Elements** tab.

Recall that `document` is an `object`; as such, it has properties and `methods`, including a number of different methods that can be used to return elements. Let's find or `select` an element by speaking JavaScript with the DOM.

Select an Element With JavaScript

In the **Console** type:

```
document.querySelector("h1");
```

This will return something like this:

```
<h1 id="firstHeading" class="firstHeading mw-first-heading">
  ...
</h1>
```

Go ahead and click on that disclosure triangle to see more.

When we run `document.querySelector('h1');`, it returns the DOM node, which is also a JavaScript `object`. This means that it, in turn, can have methods called on it! This is called *method chaining*. Let's use *method chaining* to remove our node from the DOM.

Delete an Element with JavaScript

Now type:

```
document.querySelector("h1").remove();
```

The heading is gone! We called `document.querySelector('h1')` to get the node; we then used *method chaining* to call the `remove()` method on the node object. We use dot notation to *chain* the calls.

Follow the same process we used earlier to verify that the source has not changed. To restore it, simply refresh the page (i.e. reload the DOM).

Storing Node References in Variables

Query methods like `querySelector()` and the other methods we'll be learning about are expressions: they return a value (specifically, a DOM node). As such, we can save the results of the query into a variable. For example:

```
const header = document.querySelector("h1");
```

We now have a reference to that node with a meaningful name; we can simply use `header` any time we need to refer to our node, rather than always having to look it up with `document.querySelector()`.

You can perhaps imagine how, if we have a program that selects, creates, modifies, or removes a large number of nodes, using this approach will result in code that's easier to read, debug and maintain.

Conclusion

DOM programming is using JavaScript to:

1. Ask the DOM to find or `select` an HTML element or elements in the rendered page
2. Remove the selected element(s) and/or insert new element(s)
3. Adjust a property of the selected element(s)

In this lesson you just did all that stuff! Learning to duplicate what you can do in DevTools with JavaScript ***is*** DOM programming. The next lessons are going to give you more methods for selecting elements and changing them, but you just changed the DOM. High fives are in order.