Module #10 - Jiggle into JavaScript (Required)

You've been through a lot already, but now it's time to bring out the big guns!

Using JavaScript, you'll be able to power your websites with effects, with interactivity, with data communication, and with much more. Throughout the course of the bootcamp, you'll be spending nearly 15 weeks on JavaScript alone. It's a critical tool in every web developer's arsenal so let's take an introductory look now.

The Joys of JavaScript

JavaScript (or JS for short) is a high-level dynamic programming language that underpins the web. JavaScript, along with HTML and CSS, is one of the core technologies that makes our web experience what it is.

Like C++, Java, Ruby, and Python, JavaScript is written with all the fixings expected of a complete programming language. In it, you will find variables, conditionals, loops, functions, and so much more. We'll be using JavaScript extensively to create the logic that defines the behavior of our web applications.

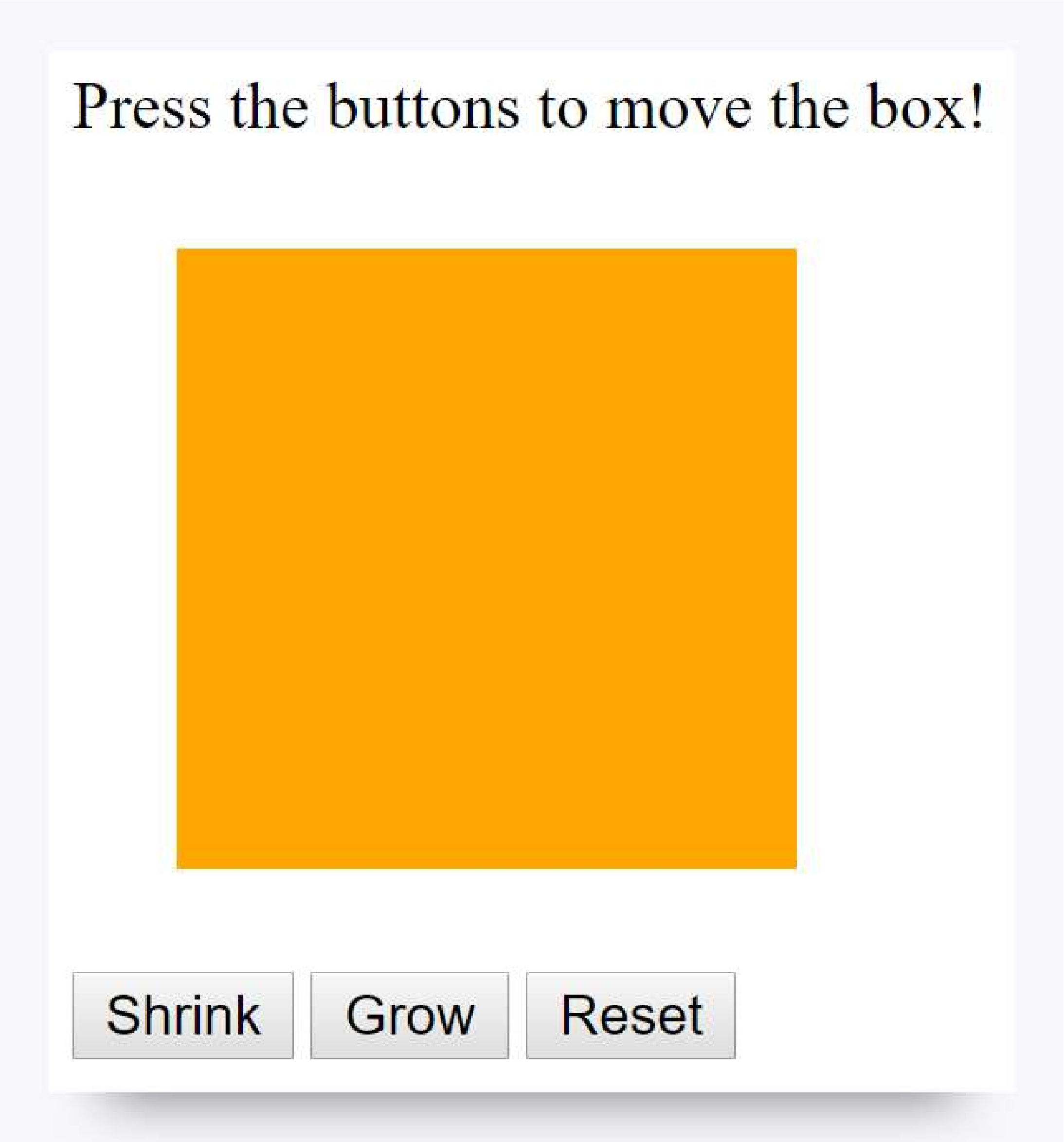
How to JavaScript

While the full power of JavaScript is beyond the scope of this pre-work, let's get a small taste of what's possible.

Go ahead and open Visual Studio Code and create a new file called `index.html`. Then copy the below code into this file and save it somewhere on your computer.

```
<!DOCTYPE html>
<html>
<head>
    <title>Jiggle Into JavaScript</title>
</head>
<body>

    <p>Press the buttons to move the box!</p>

    <div id="box" style="height:150px; width:150px; background-color:orange; margin:25px"></div>

    <button id="shrinkBtn">Shrink</button>
    <button id="growBtn">Grow</button>
    <button id="resetBtn">Reset</button>

    <script type="text/javascript">

    </script>

</body>
</html>
```

If you view this page in the browser, you should see a page that looks like the below.



Press the buttons to move the box!

Pretty fancy!

The thing is... if you try clicking the buttons, you will quickly realize that they have no impact on the position of the box. No fun whatsoever. This is where JavaScript comes in.

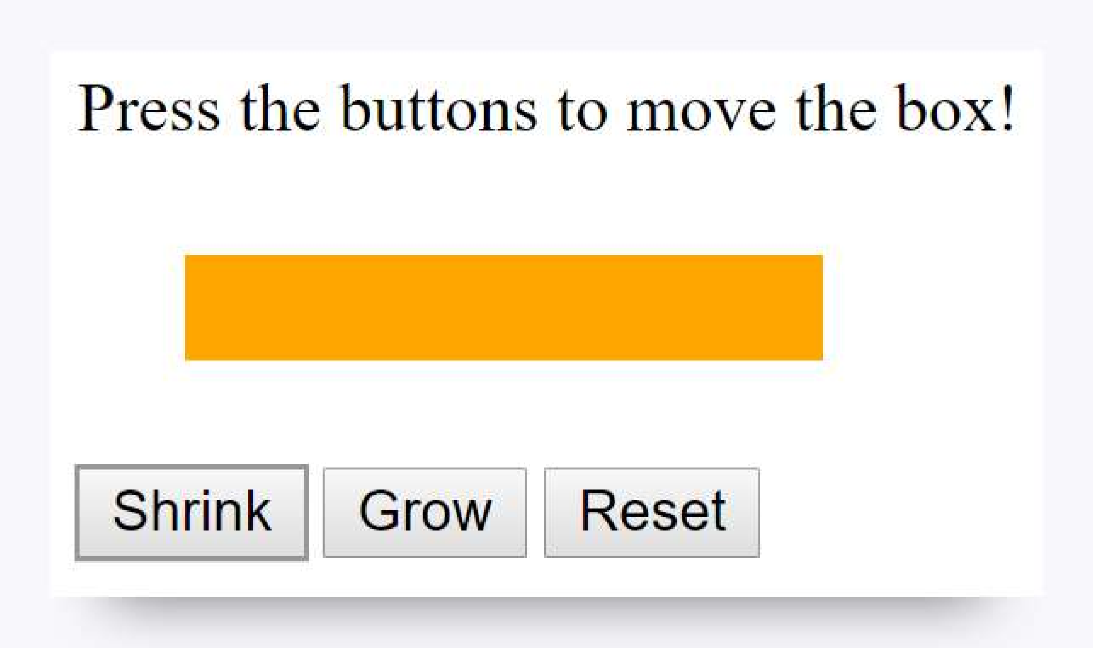
Copy the below code over your previous HTML file and re-save.

```html
<!DOCTYPE html>
<html>
<head>
    <title>Jiggle Into JavaScript</title>
</head>
<body>

    <p>Press the buttons to move the box!</p>

    <div id="box" style="height:150px; width:150px; background-color:orange; margin:25px"></div>

    <button id="shrinkBtn">Shrink</button>
    <button id="growBtn">Grow</button>
    <button id="resetBtn">Reset</button>

```

```
16      <script type="text/javascript">
17
18          document.getElementById("shrinkBtn").addEventListener("click", function(){
19
20              document.getElementById("box").style.height = "25px";
21
22          });
23
24          document.getElementById("growBtn").addEventListener("click", function(){
25
26              document.getElementById("box").style.height = "250px";
27
28          });
29
30          document.getElementById("resetBtn").addEventListener("click", function(){
31
32              document.getElementById("box").style.height = "150px";
33
34          });
35
36      </script>
37
38  </body>
39
```

Now open the file once again in the browser.

This time, clicking the buttons will lead to changes in box height.



Press the buttons to move the box!

The Magic Behind the Magic

So how did that work?

The essence of this interactivity sits between our two `script` tags on lines 16 and 36. There you'll see a series of code blocks responsible for the changes being made. Let's take a moment to dissect the components:

1. The lines each begin with `document.getElementById`. In a way, this is simply a reference to say, "If you ever click the button with an id that matches then do *something*". These id's (e.g. `shrinkBtn`, `growBtn`, and `resetBtn`) correlate with the id's of the buttons in the HTML.

2. The lines then continue, to say that we'll `addEventListener("click"...)`. This code effectively means that we'll be *watching* for any clicks on our targeted buttons.

3. We then open up a `function` with some code inside. This code targets the `box` id and re-styles the height to an arbitrary pixel size. In a way, we're using JavaScript to dynamically change the CSS of our box in response to button clicks.

While the syntax may seem scary, the concepts are simple. Take a few moments to experiment some more. Here you can find an entire table of changes you can make using the `document.style` syntax we're using above.

Is That All?

Unfortunately, this simple example doesn't even scratch the surface. Through JavaScript (and its cousin jQuery), you can build truly powerful web applications with complex user interfaces, with dynamic live-reloading data visualizations, with geolocation tools, and with so much more. There's so much that JavaScript can do so come prepared to have your mind blown repeatedly over the course of the coming six months.

Your Turn!

Now it's time to step up to the JS bat. For the final assignment of this pre-work, you'll be taking your elementary knowledge of JavaScript to create a similar box-modifying application. The syntax might be tricky, but through a little persistence, you'll be box-changing in no time.

Assignment (Required):

- Watch That Box

Additional Reading:

- W3 Schools - Intro to JS

Supplemental Resources (Recommended):

- Learn JavaScript - CodeCademy
- JavaScript Road Trip - Code School

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