Making Websites for Beginners

Clarissa Littler

What we'll cover

- The basic technology that goes into a webpage
- Simple examples of how to use HTML and CSS and a little JavaScript
- Resources to continue your learning

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- How to build the back-end of a site
- How to program in JavaScript in general
  - Though there are free supplements for that
- A majority of CSS and HTML

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Client and server

Two pieces that talk to each other to make a site

Server

- Sends data to the browser
- Saves information for long term use
- Receives requests from the client

Client

- Receives data from the server
- Renders server data into a usable page
- Handles the user interface

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How do you share a site?

- You can load a site locally in your browser
- To share a site you need a server to host
- Free hosting option: `neocities.org`

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The three pieces of a web page

- HTML
- CSS
- JavaScript

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HTML

What does HTML do?

HTML describes the content of the page, but not how it looks

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CSS

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CSS describes how a page looks, but not its content

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JavaScript

What does JavaScript do?

The dynamics and the user interface of the page

What is HTML?

HyperText Markup Language

- HyperText
- Markup

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Tags and Elements

```
<body>
 <h1>This is a header</h1>
 <p>
     This is a paragraph of text,
   where some of the text is <b>bold</b>, and
     after this paragraph, there will be a numbered list
 </p>

 <ol>
   <li>lists are made of "list items"</li>
   <li>like these</li>
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Whence closing tags

```
<body>
  <ol>
    <li>This is a list
    <li>but
    <li>there's ambiguity here

  <ol>
   <li> where does this part go?
   <li> is it a sublist or a second list?
```

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The basic template

```
<!doctype html>
<html>
  <head>
    ...
  </head>
  <body>
    ...
  </body>
</html>
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  </head>
  <body>
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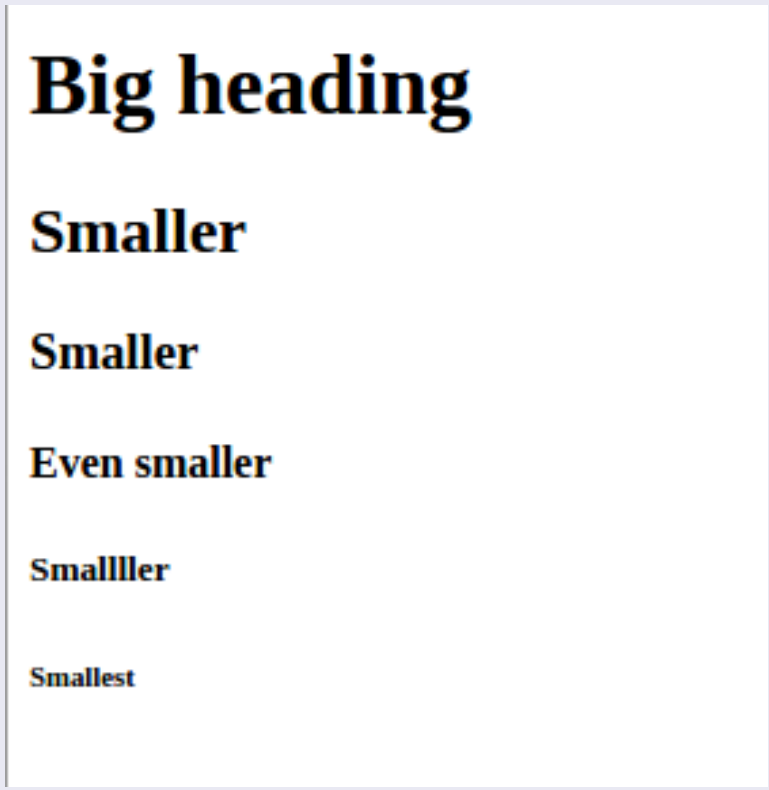
Headings

```
<!doctype html>
<html>
  <body>
    <h1>Big heading</h1>
    <h2>Smaller</h2>
    <h3>Smaller</h3>
    <h4>Even smaller</h4>
    <h5>Smallller</h5>
    <h6>Smallest</h6>
  </body>
</html>
```



Lists

```
<!doctype html>
<html>
  <body>
    <ol>
      <li>This is an ordered list</li>
      <li>And here we have a nested list
        <ul>
          <li>and this is an unordered list</li>
          <li>which is by default</li>
          <li>a bulleted list</li>
        </ul>
      </li>
    </ol>
  </body>
</html>
```

Lists

1. This is an ordered list
2. And here we have a nested list
    - and this is an unordered list
    - which is by default
    - a bulleted list

Exercise 1

Let's try making a simple web page ourselves!

- Right-click on the file `FirstEx.html`
- Select "open in notepad++"
- Type along the instructions
- Save the file
- Right click and open in the browser

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<!doctype html>
<html>
 <body>
  <h1>This is our heading</h1>
```

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  <p>Here is our text.</p>
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<html>
 <body>
  <h1>This is our heading</h1>
  <p>Here is our text.</p>
  <p>Here's more <b>text</b></p>
```

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<html>
 <body>
  <h1>This is our heading</h1>
  <p>Here is our text.</p>
  <p>Here's more <b>text</b></p>
 </body>
</html>
```

Exercise 2

Try making your own simple page using

- `<p>`
- `<h1>`
- `<ol>`
- `<ul>`
- `<li>`

tags, following the process of the last example

Anchors and Attributes

```
<a href="https://multcolib.org">This is a link</a>
```

Exercise 3

Create your own page that uses at least two links and test them to ensure they work

Cascading Style Sheets

What is CSS?

Cascading style sheets control the appearance of elements

CSS Entries

```
selector {
    property: value;
    property: value;
    property: value;
}
```

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selector {
    property: value;
    property: value;
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```

CSS Entries

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selector {
    property: value;
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```

Adding CSS to a page

Style tags

```
<!doctyle html>
<html>
  <head>
    <style>
      ...
    </style>
  </head>
  <body>
    ...
  </body>
</html>
```

Adding CSS to a page

Style tags

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<!doctyle html>
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    <style>
      ...
    </style>
  </head>
  <body>
    ...
  </body>
</html>
```

Selecting elements by ID

```
<!doctype html>

<html>
  <head>
    <style>
      #para {
         color: blue;
      }
    </style>
  </head>
  <body>
    <p id="para">This is the text within our paragraph.</p>
  </body>
</html>
```

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  <head>
    <style>
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  </body>
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<html>
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    <style>
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  </head>
  <body>
    <p id="para">This is the text within our paragraph.</p>
  </body>
</html>
```

Selecting elements by ID

This is the text within our paragraph.

Exercise 4

Let's use CSS

- Right click the file "exer4.html"
- Fill in the style element within the <head> tags
- Turn the middle heading green

```
<!doctype html>
<html>
  <head>
    <style>
      fill this in
    </style>
  </head>
  <body>
    <h1 id="heading1">First</h1>
    <h2 id="heading2">Second</h2>
    <h3 id="heading3">Third</h3>
  </body>
</html>
```

Selecting elements by ID

This is the text within our paragraph.

Selecting elements by class

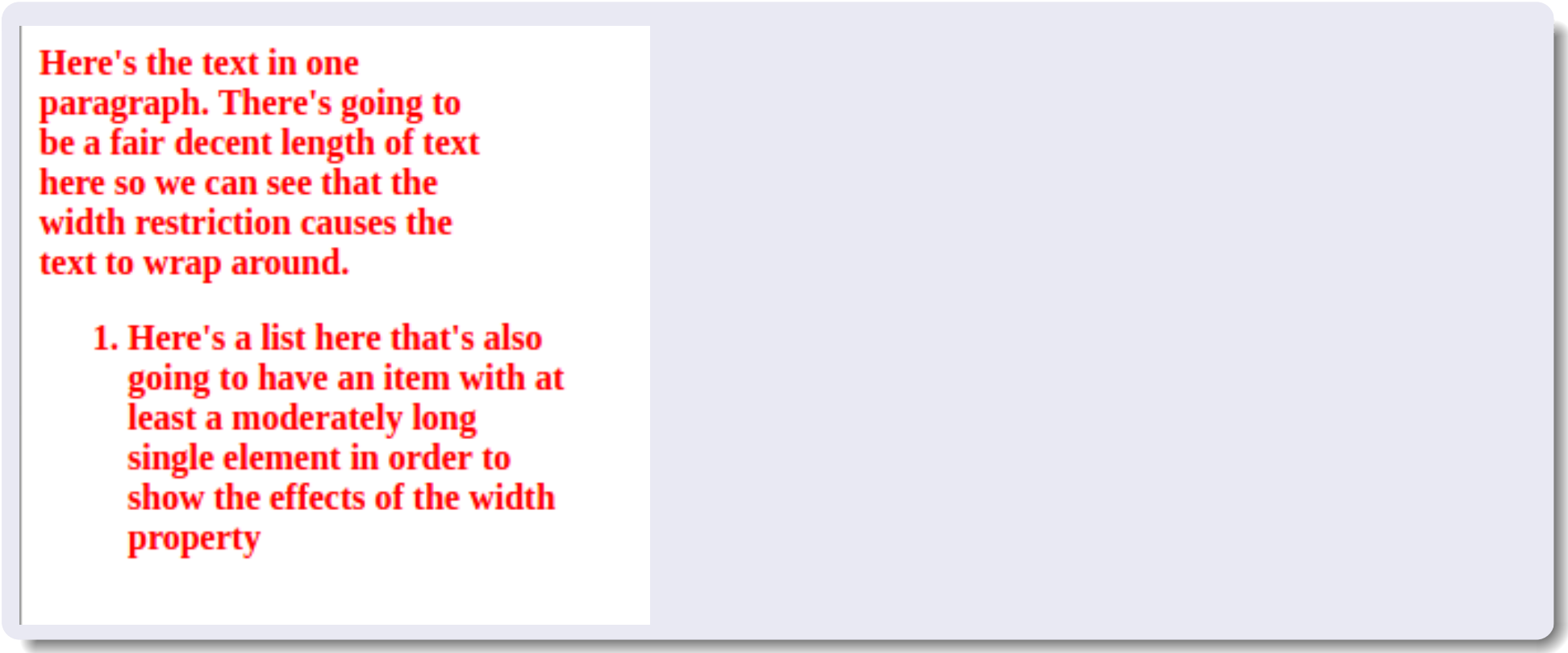
```
.ourClass {
    color: red;
    width: 200px;
    font-weight: bold;
}
```

Selecting elements by class

```
<p class="ourClass">Here's the
text in one paragraph.
There's going to be a fair
decent length of text here so we
can see that the width
restriction causes the text to wrap around.</p>

<ol class="ourClass">
  <li>Here's a list here that's
  also going to have an item
  with at least a moderately long
  single element
  in order to show the
  effects of the width property</li>
</ol>
```

Selecting elements by class



Exercise 5

Open the file `exer5.html` and then add in CSS declarations to make both paragraphs have `width: 200px` and the first paragraph have a color of `blue`

```
<!doctype html>
<html>
  <head>
  </head>
  <body>
    <p class="theClass" id="firstPara">
    This is a paragraph that has some text in it
    and, y'know, stuff and things</p>
    <p class="theClass" id="sndPara">
      This is the second paragraph by gum</p>
  </body>
</html>
```

Selecting elements by type

```
p {
    font-size: large;
    background-color: green;
    color: blue;
    width: 200px;
}
```

Selecting elements by type

```
<p>Our first paragraph is here.
  There's some text and things of that ilk.</p>
<p>This is our second paragraph,
  beholden to no one but itself.
  A wild rebel of a paragraph</p>
<p>Our third paragraph lies here,
  relentless in its comformity.
  There's not much to say about ol' thirdy,
  they're simply stoic and
  resolute in their paragraphness.</p>
```

Selecting elements by type

Our first paragraph is here. There's some text and things of that ilk.

This is our second paragraph, beholden to no one but itself. A wild rebel of a paragraph

Our third paragraph lies here, relentless in its comformity. There's not much to say about ol' thirdy, they're simply stoic and resolute in their paragraphness.

Specificity

combining type and class

```
p {
    font-size: large;
    background-color: green;
    color: blue;
    width: 200px;
}
p.rebel {
    width: 300px;
    background-color: white;
}
```

Specificity

```
<h1 class="rebel">This time we also have a rebellious header,
which should be unchanged</h1>

<p>Our first paragraph is here.
  There's some text and things of that ilk.</p>
<p class="rebel">This is our second paragraph,
  beholden to no one but itself.
  A wild rebel of a paragraph</p>
<p>Our third paragraph lies here,
  relentless in its comformity.
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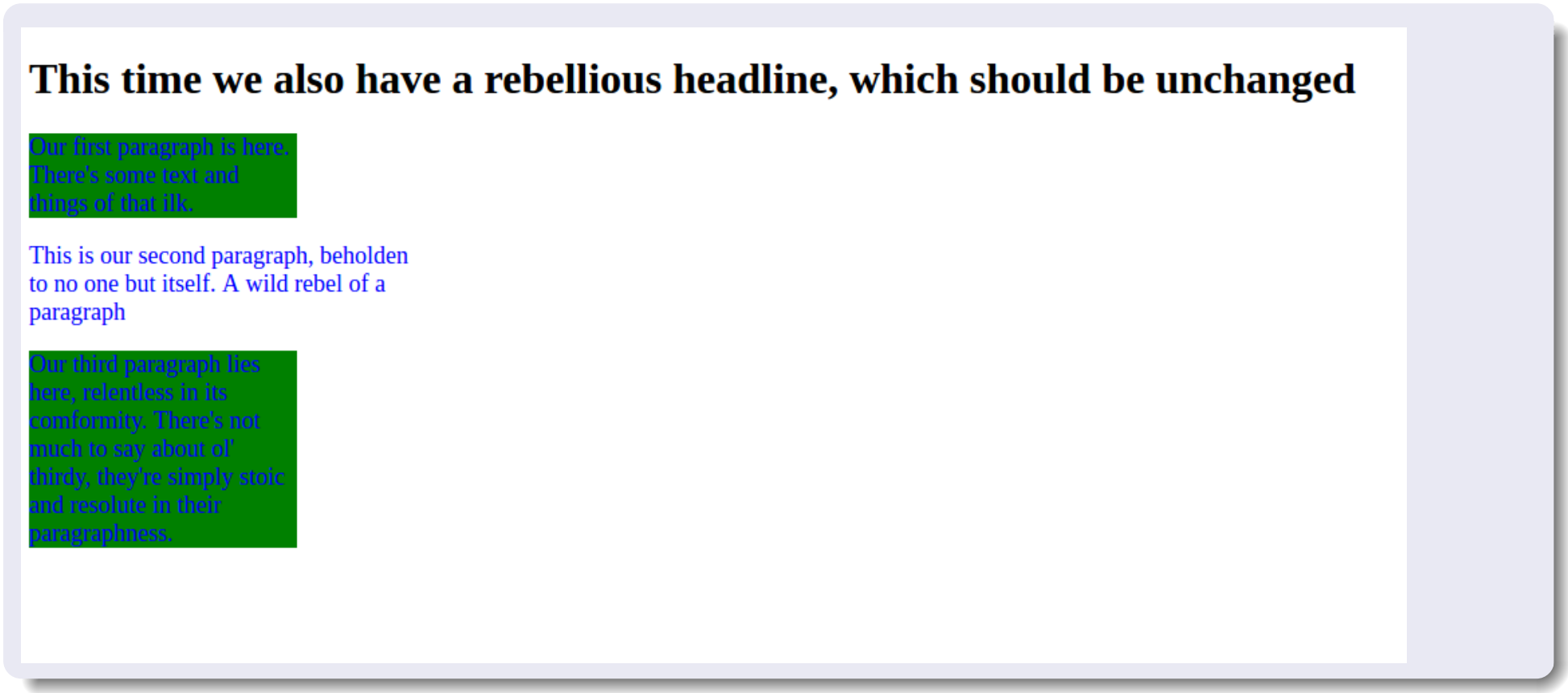
</div>
```

Specificity



Div and span

- Div and span are used to group related elements together
- *But they don't have an appearance themselves*

Specificity

choosing children of an element

```
#divvy p{
  width: 200px;
  font-weight: bold;
}
```

Specificity

choosing children of an element

```
<div id="divvy">
  <p> Here we're going to have some text </p>
  <p> and a little more even, in a separate paragraph. </p>

  <ul>
    <li>but this shouldn't be effected by our code at all</li>
  </ul>
</div>
<p>Neither should anything in here, either</p>
```

Specificity

Here we're going to have some text

and a little more even, in a separate paragraph.

- but this shouldn't be effected by our code at all

Neither should anything in here, either

Exercise 6

Using the following skeleton, found in `exer6.html`, add CSS declarations so that the first paragraph has *blue* text, the second paragraph has *red* text, and the third paragraph has *green* text.

```
<body>
  <p>our first paragraph</p>
  <div>
    <p>our second paragraph</p>
    <div>
      <p>our third paragraph </p>
    </div>
</body>
```

What is JavaScript?

JavaScript is a programming language that runs in the browser and provides the dynamics, the interaction in any web site

Evaluation of code

- Syntax doesn't do anything
- Saying "I have a trillion dollars" doesn't make it so
- An *interpreter* runs (or *evaluates*) code

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Arithmetic

Numbers

- 1
- 0.5
- -20
- ...

Operations

- +
- −
- *
- ...

Sequences

- Need to do more than a single step of code at a time
- List the steps line by line separate by semicolons

Sequences

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Sequences

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Variables

I have a friend, let's call her "Cassandra"...

Variables function both as storage containers and pronouns

Creating Variables

```
var nameOfVariable = initialValueInIt;
var numberOfToes = 10;
```

Assigning variables

```
var musicalsThatShouldExist = "The Walking Dead on Ice";
musicalsThatShouldExist = "Werner Herzog Sings The Blues";
```

Mini-exercise

Test yourself

Go to your console and try to

- create a variable
- change a variable

Objects

- Phone books
- Contact lists
- Mall directories
- Dictionaries

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Making Objects

```
var obj = {prop1 : 0, prop2 : 1};
var otherObject = {};
```

Objects

Type the following in your console

```
var obj = {prop1 : 0, prop2 : 1, prop3 : "thing"};
obj.prop1;
obj.prop2;
obj.prop3;
```

Objects

Type the following in your console

```
var obj = {};
obj.numberOfChickens = 2;
obj.numberOfChickens;
```

Functions

Functions in math

$$f(x) = x + 10$$

Functions

Functions in JavaScript

```
function f(x) {
    return x + 10;
}
```

Using functions

First example of a function, a function that writes data to the console

```
console.log
```

Example

Navigate to the file `consoleExample.html` and then check the console to see what happened

Example

```
<!doctype html>
<html>
  <head>
    <script>
      console.log("we're printing one message");
      console.log("and another message!");
    </script>
  </head>
  <body>
    Check your console!
  </body>
</html>
```

Multi-argument functions

```
function moreFun (anArgument,anotherArgument) {
    console.log(anArgument + anotherArgument);
}

moreFun(10, 20);
```

Functions with no arguments

```
function noArgs () {
    return 10;
}
```

What is the Document Object Model?

The DOM

The document object model (DOM) is the representation of the web page *as JavaScript objects*

Putting the document in DOM

`document` is the object that holds most of the important methods

When to load code

```
window.onload = function () {
    ...
};
```

Creating elements in code

- `document.createElement`
- `document.createTextNode`
- `document.body`
- `.appendChild`

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- `.appendChild`

Creating elements in code

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Creating elements

```
<!doctype html>
<html>
  <head>
    <script>
      window.onload = function () {
          var newHeader = document.createElement("h1");
          var textNode = document
            .createTextNode("This is a header!");
          newHeader.appendChild(textNode);
          document.body.appendChild(newHeader);
      };
    </script>
  </head>
  <body>
  </body>
</html>
```

Exercise 4

Exercise

use the `document.createElement` function to make a single

```
<!doctype html>
<html>
  <head>
    <script>
    </script>
  </head>
  <body>
  </body>
</html>
```

Finding elements

- `document.getElementById`
- `.firstChild`
- `.nodeValue`

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getElementById

```
<body>
  <ol id="list1">
    <li>This is a list</li>
  </ol>
  <ol id="list2">
    <li>This is our second list</li>
  </ol>
</body>
```

getElementById

```
window.onload = function () {
    var newItem =
      document.createElement("li");
    var newText =
        document
        .createTextNode("item in the second list");
    newItem.appendChild(newText);
    var secondList = document.getElementById("list2");
    secondList.appendChild(newItem);
};
```

Changing CSS properties

```
<!doctype html>
<html>
  <head>
    <script>
      window.onload = function () {
        var h = document.getElementById("header");
        h.style.color = "red";
      }
    </script>
  </head>
  <body>
    <h1 id="header">This is a header!</h1>
  </body>
</html>
```

Exercise 5

Exercise

use `document.getElementById` and the `.style` property to change the text color of the paragraph to green

```
<!doctype html>
<html>
  <head>
    <script>
    </script>
  </head>
  <body>
    <p id="para">Here's our text.</p>
  </body>
</html>
```

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  - CSS
  - JavaScript

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  - Tags
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  - Content, not appearance

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  - Classes

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- So much more CSS
- Frameworks for styling
  - Bootstrap is a very popular one
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Thanks for attending!

Thanks for being in this class