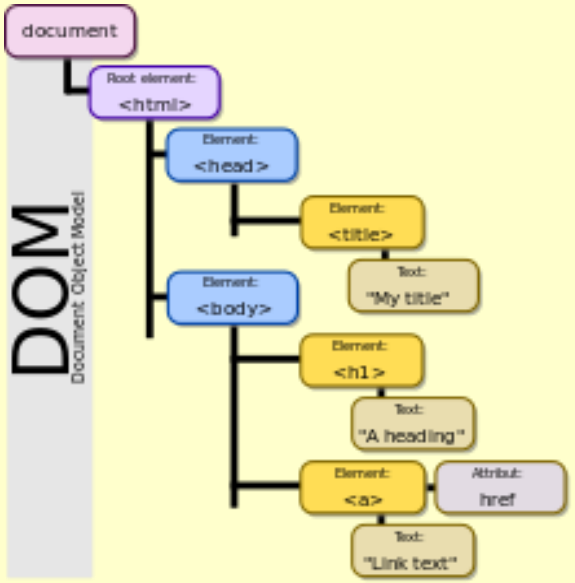
Ref Card: **Intermediate** JavaScript [ES6]

©2017 Howard Bates

DOM [Document Object Model]



The DOM is essentially a programming interface that browsers use to render source HTML 'sections' as objects that contain all parts of a web page. The DOM can be manipulated dynamically by JavaScript via the process of Event Listening/Handling. A simple event could be a button click. JS can be programmed to listen/handle the click then modifying the DOM, e.g. Hiding a div & displaying a new div. REFERENCE 1 & REFERENCE 2 + TUTORIAL VIDEO

Functional Programming [Asynchronous]

```
let myVar = function doStuff(stuff) {
    console.log(stuff);
}  //Function expression (function assigned to variable)
```

```
function doStuff(age) {
    const INTRO = `Your age is: `;
    function showAge() {
        return INTRO + age;
    } //Closure
    return showAge();
}
doStuff(41); //Calls function with closure. Your age is 41
```

```
function doStuff(age, () => {
    console.log(age);
}); //Callback is the anonymous arrow function
```

Terms:
~ **Pure function:** Doesn't depend on or modify variables out of its scope.
~ **Function expression:** Function assigned to variable.
~ **Closure:** Inner function with access to outer function data as reference (not value) including parameters.
~ **Callback:** Function expression passed as parameter to other function or anonymous arrow function in parameter list.
~ **IIFE:** Immediately Invoked Function Expression. Now simply: **{alert(`Hello!`};**

Maps & Sets

```
let myMap = new Map(); //Instatiate a new Map()
myMap.set(73301, 'Austin'); //Key=zip, value=city
console.log(myMap.size); //Print Map() size
console.log(myMap.get(73301)); //Prints Austin
myMap.clear(); //Erase Map()
myMap.delete(73301); //Delete value from key
for (let value of myMap.values()) {
    console.log(value);
} //Print all values in Map(). keys() for keys

let mySet = new Set();
mySet.add('Thaumaturgy'); //Adds new item to set
console.log(mySet.size) //Print Set() size
mySet.clear() //Clears the Set()
mySet.delete('Thaumaturgy'); //Delete entry
Iterate as Map() above
```

Maps are similar to arrays except they access data via keys vs. index values. Use **WeakMap()** to store by reference vs. **Map()** which stores by value.

Sets are simply arrays that can't contain duplicate data, but methods are similar to **Map()**.

Random

```
myRand = Math.floor((Math.random() * 20) + 1);
```

Code above generates a random number from 1-20. For 0-20 do this:

```
myRand = Math.floor((Math.random() * 21);
```

Ajax [Client-Side] (Becoming Deprecated to Fetch API)

```
performAjax(requestNum, sendToNode, callback) {
    let bustCache = '?' + new Date().getTime();
    const XHR = new XMLHttpRequest(); //THIS is Ajax!!
    XHR.open('POST', document.url + bustCache, true);
    XHR.setRequestHeader('X-Requested-with', requestNum);
    XHR.send(sendToNode);
    XHR.onload = () => {
        if (XHR.readyState == 4 && XHR.status == 200 && callback) {
            return callback(XHR.responseText);
        } else {
            return `ERROR`;
        }
    };
}
```

Simple client method to pass data to Node.js server & handle server response. Use **JSON.stringify()** to send & **JSON.parse()** to receive.

Respond to Client Ajax [Server-Side]

```
if (request.method === 'POST' && request.headers['x-requested-with'] === 'XMLHttpRequest0') {
    const FORMIDABLE = require('formidable');
    let formData = {};
    new FORMIDABLE.IncomingForm().parse(request).on('field', (field, name) => {
        formData[field] = name;
        }).on('error', (err) => {
             next(err);
        }).on('end', () => {
            DATA_HANDLER.addData(formData); //points to external class that writes data to DB
            formData = JSON.stringify(formData);
            response.writeHead(200, {'content-type': 'application/json'});
            response.end(formData);
        });
    }
}
```

Simple Node.js routine to receive data from DOM & return results using **JSON.stringify()**.

Ref Card: **Intermediate** JavaScript [ES6]

©2017 Howard Bates

Asynchronous File I/O [Server-Side]

```
const IO = require('fs');  //Library for file I/O
handleUserData(data, callback) {
    data = JSON.parse(data);
    const FILE_PATH = 'data/users.csv';
    IO.readFile(FILE_PATH, 'utf8', (err, file) => {
         let user = {};
         const COLUMNS = 4;
         let tempArray, finalData = [];
         tempArray = file.split(/\r?\n/); //Remove newlines
         for (let i = 0; i < tempArray.length; i++) {
              finalData[i] = tempArray[i].split(/,/).slice(0, COLUMNS);
         }
         for (let i = 0; i < finalData.length; i++) {
              if (data === finalData[i][0]) {
                   user = JSON.stringify({
                        'email': finalData[i][0],
                        'position': finalData[i][1],
                        'lastName': finalData[i][2],
                        'firstName': finalData[i][3]
                   });
                   break;
              } else {
                  user = 'false';
              }
         }
         callback(user);
    });
}
```

Local & Session Storage [Client-Side] (Pseudo-browser DB functionality)

```
sessionStorage.setItem('day', document.getelementById('day').value;
sessionStorage.getItem('day'); //Returns value stored at 'day' key
localStorage.setItem('day', document.getelementById('day').value;
localStorage.getItem('day'); //Returns value stored at 'day' key
removeItem('key'); //Remove 1 item
clear(); //Erase all storage
```

localStorage is non-volatile, **sessionStorage** is volatile.
Stores data in Map (key/value pair) format.

Module Support [Server-Side (for now)]

```
module.exports = ClassName; //use @ bottom of class file to export to
instantiator/consumer of this class

const CLASS_NAME = require('./ClassName'); //Use @ top of consumer to
import external class file
```

Modules is simply the mechanism to keep you class files separate and pull them together with **module.exports** so foreign classes can instantiate objects of each other.

DOM Event Listening/Handling [Client-Side]

```
document.getElementById('continue').addEventListener('click', () => {
    this.performAjax('XMLHttpRequest0',
      JSON.stringify(document.getElementById('getEmail').value), (response) => {
        if (response === 'false') {
            alert('You must provide your proper email address to continue.');
        } else {
            this.user = JSON.parse(response);
            document.getElementById('login').style.display = 'none';
            document.getElementById('log').style.display = 'block';
            document.getElementById('name').innerHTML = `${this.user.firstName
                                                          ${this.user.lastName}`;
        }
});
```

Simple method that demonstrates **addEvenListener()** technique for listening for DOM events & **anonymous arrow function callback** for handling event. Events list HERE.
Important DOM stuff:
http request ~ client -> server. Use GET to receive from server, use POST to transmit to server.
Node.js http response ~ server -> client. Use **writeHead()**, **write()**, & **end()** to return data to client.

```
document.getElementById('wiggles') //Affect one element with tag attribute id value 'wiggles'
document.getElementByTagName() //Affect all elements of tag type. e.g. spans, divs
document.getElementByName('woot') //Affect all elements with the same tag attribute name woot
document.getElementById('wiggles').value //Sets or gets element value. Mostly used with forms
```

Miscellaneous

Regular Expressions: Technique for querying data for patterns, i.e searching for matches in a string. e.g.: **if(/^cat/).test(myVar)) {}** //true if word starts with 'cat'
VERY useful for validating. Must-have skill for any programming career. RegEx tester

Date/Time:

```
let myDate = new Date(); //Creates new date object
myDate.getFullYear(); //Returns 4-digit year
myDate.getMonth(); //Returns 0-11 month
myDate.getHours(); //Returns 0-23 hour
```

Hiding/Showing Elements:

```
document.getElementByID('woot').style.visibility = 'hidden'; //Invisible element
document.getElementByID('woot').style.visibility = 'visible'; //Shows element
document.getElementByID('woot').style.display = 'none';  //Essentially removes element
document.getElementByID('woot').style.display = 'block'; //Shows element
```

Proper way to start client-side JavaScript:

```
window.addEventListener('load', () => {
    new main(); //Instantiate new object of your main.js class
});
```

Find elements in the DOM:
Use **querySelector()** & **querySelectorAll()** to find elements by CSS selector (id or class).

```
e.g.: let element = document.querySelector(".row"); //returns first div with class=row
```