Introduction to

Javascript

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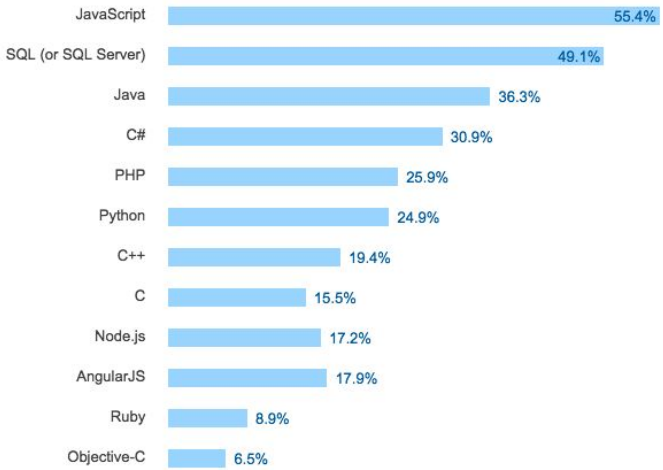
Why Javascript?

I. Most Popular Technologies

2016 | 2015 | 2014 | 2013



49,397 responses

More people use JavaScript than use any other programming language. PHP appears to be falling out of favor as Node and Angular emerge.

StackOverflow Developer Survey 2016

easy to get started

easy to get started

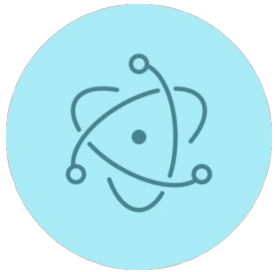
did I ask you to install anything? :p

it's everywhere!

(almost, but working on it)

from browsers-side

to servers-side



to desktop applications

even operating systems!

Part I

The Language

Data Types

`true` `false`

booleans

1 2 3 4 5

1.2 2.3 3.4 4.5

numbers

```
'I am a string'

"I am an awesome string"
```

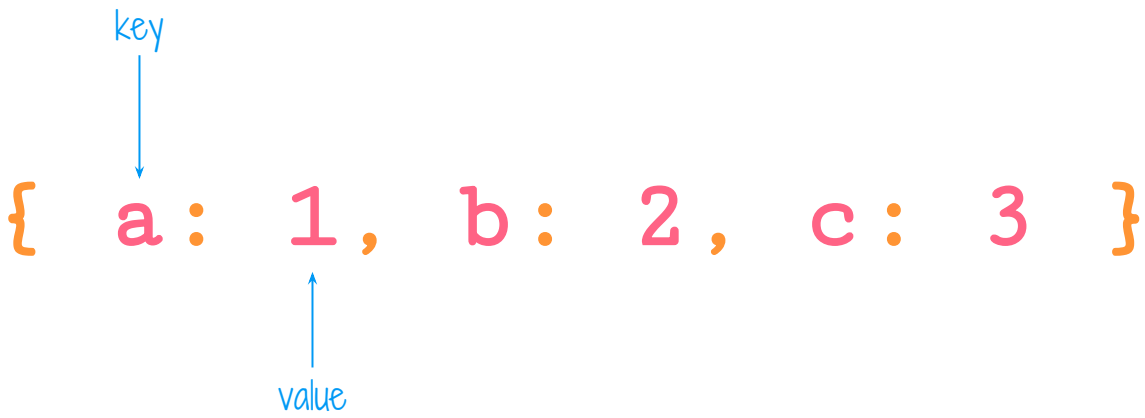
strings

```
[ 1, 2, 3, 4, 5 ]
```

arrays

```
{ a: 1, b: 2, c: 3 }
```

objects



objects

```
function name() {}
```

functions

```
var name = 'Javascript';
```

we can store them in variables!

```
1 + 2 * (3 - 4) / 5
```

numbers

arithmetic operations

```
1 + 2 * (3 - 4) / 5

= 0.6
```

numbers

arithmetic operations

```
Math.pow(2, 2);

Math.sqrt(4);

etc.
```

numbers
other math stuff

```
'Javascript is awesome!'
```

strings

```
'hello' + 'world'
```

strings

concatenation

```
'hello' + 'world'

= 'helloworld'
```

strings

concatenation

```
'Javascript'.length
```

strings

number of characters

```
'Javascript'.length
```

⇒ 10

strings

number of characters

```
var name = 'Javascript';
```

strings

individual characters

```
var name = 'Javascript';

name[0];
```

strings

individual characters

```
var name = 'Javascript';

name[0];
```

strings

individual characters

```
var name = 'Javascript';

name.substring(0, 4);
```

strings

substrings

```
var name = 'Javascript';

name.substring(0, 4);
```

strings

substrings

bit.ly/javascript-string

strings
reference

```
[ 1, 2, 3, 4, 5 ]
```

arrays

```
[ 1, 2.3, 'string', [1] ]
```

arrays

can contain anything

```
[ 1, 2, 3 ].length
```

⇒ 3

arrays

number of items

```
var array = [ 1, 2, 3 ];
```

arrays

getting values

```
var array = [ 1, 2, 3 ];

array[0];
```

arrays

getting values

```
var array = [ 1, 2, 3 ];

array[0];
```

arrays

getting values

```
var array = [ 1, 2, 3 ];

array[0] = 4;
```

arrays

setting values

```
var array = [ 4, 2, 3 ];

array[0] = 4;
```

arrays

setting values

```
var array = [ [1], [2] ];
```

arrays

nested arrays

```
var array = [ [1], [2] ];

array[0];
```

arrays

nested arrays

```
var array = [ [1], [2] ];

array[0];
```

arrays

nested arrays

```
var array = [ [1], [2] ];

array[0][0];
```

arrays

nested arrays

```
var array = [ [1], [2] ];

array[0][0];
```

arrays

nested arrays

```
[1, 2].concat([3, 4])
```

arrays

concatenation

arrays

concatenation

```
var stack = [ 1, 2, 3 ];
```

arrays

stack operations

```
stack.push(4);
```

arrays

stack operations

arrays

stack operations

```
var top = stack.pop();
```

arrays

stack operations

```
top    ⇒ 4
```

arrays

stack operations

```
top   ⇒ 4

stack ⇒ [ 1, 2, 3 ]
```

```
var queue = [ 1, 2, 3 ];
```

arrays

queue operations

```
queue.push(4);
```

arrays

queue operations

```
queue.push(4);
```

it's not called "enqueue" ಠ∩ಠ

arrays

queue operations

arrays

queue operations

```
var front = queue.shift();
```

arrays

queue operations

```
var front = queue.shift();
```

it's not called "dequeue" either 。° (`д´)° 。

front ⇒ 1

```
front ⇒ 1

queue ⇒ [ 2, 3, 4 ]
```

bit.ly/javascript-array

arrays

reference

```
{ a: 1, b: 2, c: 3 }
```

objects

```
{
    a: 1,
    b: 2,
    c: 3
}
```

objects

objects

simplest form

```
var object = {};
```

objects

simplest form

```
object.key = 'value';
```

objects

adding key-value pairs

```
object.key = 'value';
```

or

```
object['key'] = 'value';
```

objects

adding key-value pairs

objects

adding key-value pairs

```
delete object.key;
```

objects

removing key-value pairs

objects

removing key-value pairs

```
var object = {
  key: { a: 1, b: 3 }
};
```

objects

nested objects

```
var object = {
  key: { a: 1, b: 3 }
};

object.key;
```

objects

nested objects

```
var object = {
  key: { a: 1, b: 3 }
};
```

```
object.key;
```

objects

nested objects

```
var object = {
  key: { a: 1, b: 3 }
};

object.key.a;
```

objects

nested objects

```
var object = {
  key: { a: 1, b: 3 }
};

object.key.a;
```

objects

nested objects

bit.ly/javascript-object

objects
reference

`null` `undefined`

Challenge Set 1

javascript-workshop/01-data-types

Control Structures

```
if (condition) {}
else if (condition) {}
else {}
```

if...else if...else

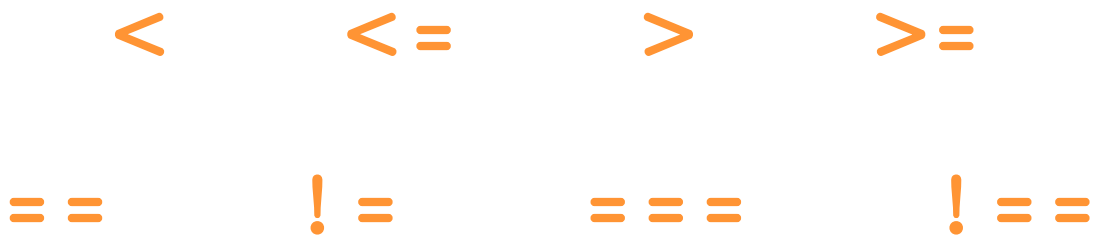
```
if (condition) {}
else if (condition) {}
else if (condition) {}
else if (condition) {}
else {}
```

if...else if...else

can have as many “else if”s as needed

conditions resolve to either

`true` or `false`



conditions

equality comparisons

```
condition && condition

condition || condition
```

conditions

compound conditions

```
false   null   undefined

''   0   NaN
```

conditions
falsy values

everything else

conditions

truthy values

```
var number = 12;
if (number > 20) {
    // (a) do something
} else if (number > 10) {
    // (b) do another thing
} else {
    // (c) do something else
}
```

if...else if...else

```
var number = 12;
if (number > 20) {
    // (a) do something
} else if (number > 10) {
    // (b) do another thing
} else {
    // (c) do something else
}
```

if...else if...else

```
var string = '';
if (string) {
    // (a) do something
} else {
    // (b) do something else
}
```

if...else if...else

```
var string = '';
if (string) {
    // (a) do something
} else {
    // (b) do something else
}
```

if...else if...else

```
var string = 'hello';
if (string) {
    // (a) do something
} else {
    // (b) do something else
}
```

if...else if...else

```
var string = 'hello';
if (string) {
    // (a) do something
} else {
    // (b) do something else
}
```

if...else if...else

```
switch (something) {
    case value: /* do something */;
    case value: /* do something */;
    default: /* do something */;
}
```

switch...case

```
var number = 12;
switch (number) {
    case  6: /* (a) */;
    case 12: /* (b) */;
    case 18: /* (c) */;
    default: /* (d) */;
}
```

switch...case

```
var number = 12;
switch (number) {
    case  6: /* (a) */;
    case 12: /* (b) */;
    case 18: /* (c) */;
    default: /* (d) */;
}
```

switch...case

```
var number = 12;
switch (number) {
    case  6: /* (a) */;
    case 12: /* (b) */;
    case 18: /* (c) */;
    default: /* (d) */;
}
```

switch...case

```
var number = 12;
switch (number) {
    case  6: /* (a) */;
    case 12: /* (b) */;
    case 18: /* (c) */;
    default: /* (d) */;
}
```

switch...case

```
var number = 12;
switch (number) {
    case  6: /* (a) */;
    case 12: /* (b) */;
    case 18: /* (c) */;
    default: /* (d) */;
}
```

"fallthrough"

```
var number = 12;
switch (number) {
    case  6: /* (a) */; break;
    case 12: /* (b) */; break;
    case 18: /* (c) */; break;
    default: /* (d) */;
}
```

switch...case

```
var number = 12;
switch (number) {
    case  6: /* (a) */; break;
    case 12: /* (b) */; break;
    case 18: /* (c) */; break;
    default: /* (d) */;
}
```

switch...case

```
while (condition) {
    // do something while
    // condition is true
}
```

while loop

```
var number = 0;
```

while loop

```
var number = 0;
while (number <= 10) {}
```

while loop

```
var number = 0;
while (number <= 10) {
    number = number + 1;
}
```

while loop

```
while (true) {
    // infinite loop!
}
```

while loop

```
while (true) {
    // infinite loop!
    break;
}
```

while loop

```
for (declaration; condition; update) {}
```

for loop

```
for ( var i = 1 ; condition; update) {}
```

for loop

```
for ( var i = 1 ;  i <= 10 ; update) {}
```

for loop

```
for ( var i = 1 ;  i <= 10 ; i += 1) {}
```

for loop

```
for ( var i = 1 ;  i <= 10 ; i += 1) {}
```

eye = eye + one :)

for loop

```
var letters = [ 'a', 'b', 'c' ];
var length = letters.length;
```

for loop

```
var letters = [ 'a', 'b', 'c' ];
var length = letters.length;

for (var i = 0; i < length; i++) {}
```

for loop

```
var letters = [ 'a', 'b', 'c' ];
var length = letters.length;

for (var i = 0; i < length; i++) {
    var letter = letters[i];
}
```

for loop

```
var letters = [ 'a', 'b', 'c' ];
var length = letters.length;

for (var i = 0; i < length; i++) {
    var letter = letters[i];
    // i ⇒ 0, letter ⇒ 'a'
}
```

for loop

```
var letters = [ 'a', 'b', 'c' ];
var length = letters.length;

for (var i = 0; i < length; i++) {
    var letter = letters[i];
    // i ⇒ 1, letter ⇒ 'b'
}
```

for loop

```
var letters = [ 'a', 'b', 'c' ];
var length = letters.length;

for (var i = 0; i < length; i++) {
    var letter = letters[i];
    // i ⇒ 2, letter ⇒ 'c'
}
```

for loop

```
for (key in object) {}
```

for..in loop

for..in loop

```
var object = { a: 1, b: 2, c: 3 };
```

for..in loop

```
var object = { a: 1, b: 2, c: 3 };

for (var key in object) {}
```

for..in loop

```
var object = { a: 1, b: 2, c: 3 };

for (var key in object) {
    // key ⇒ 'a'
}
```

for..in loop

```
var object = { a: 1, b: 2, c: 3 };

for (var key in object) {
    // key ⇒ 'b'
}
```

for..in loop

```
var object = { a: 1, b: 2, c: 3 };

for (var key in object) {
    // key ⇒ 'c'
}
```

for..in loop

Challenge Set 2

javascript-workshop/02-control-structures

Functions

```
function name() {
    // function body
}
```

functions

```
function name(parameter) {
    // function body
}
```

functions
with parameter

```
function name(para, meter) {
    // function body
}
```

functions

with multiple parameters

```
function add(x, y) {
    var sum = x + y;
    return sum;
}
```

functions

example: “add” function

```
function add(x, y) {
    var sum = x + y;
    return sum;
}

add(12, 34);
```

functions

example: invoking the “add” function

```
function add(x, y) {
    var sum = x + y;
    return sum;
}

add(12, 34);  // ⇒ 46
```

functions

example: invoking the “add” function

```
function transform(name, fn) {
    return fn(name);
}
```

functions
as parameters

```
function transform(name, fn) {
    return fn(name);
}
```

functions
as parameters

```
function uppercase(name) {
    return name.toUpperCase();
}
```

functions
as parameters

```
function uppercase(name) {
    return name.toUpperCase();
}

transform('Javascript', uppercase);
```

functions
as parameters

```
function uppercase(name) {
    return name.toUpperCase();
}

transform('Javascript', uppercase);
// ⇒ 'JAVASCRIPT'
```

functions
as parameters

```
function lowercase(name) {
    return name.toLowerCase();
}

transform('Javascript', lowercase);
```

functions
as parameters

```
function lowercase(name) {
    return name.toLowerCase();
}

transform('Javascript', lowercase);
// ⇒ 'javascript'
```

functions
as parameters

```
var array = [ 1, 2, 3, 4, 5 ];
var doubles = array.map(function(number) {
    return number * 2;
});
```

functions

example: Array.map

```
var array = [ 1, 2, 3, 4, 5 ];
var doubles = array.map(function(number) {
    return number * 2;
});
```

functions

example: Array.map

```
var array = [ 1, 2, 3, 4, 5 ];
var doubles = array.map(function(number) {
    return number * 2;
});
// doubles ⇒ [ 2, 4, 6, 8, 10 ]
```

functions

example: Array.map

```
function outer() {
    return function inner() {
        // function body
    };
}
```

functions

returning functions

```
function outer() {
    return function inner() {
        // function body
    };
}
```

functions

returning functions

```
function adder(x) {
    return function add(y) {
        return x + y;
    };
}
```

functions

example: adder

```
function adder(x) {
    return function add(y) {
        return x + y;
    };
}

var addFive = adder(5);
```

functions

example: adder

```
function adder(x) {
    return function add(y) {
        return x + y;
    };
}

var addFive = adder(5);
```

functions

example: adder

```
function adder(x) {
    return function add(y) {
        return x + y;
    };
}

var addFive = adder(5);
```

functions

example: adder

```
function adder(x) {
    return function add(y) {
        return x + y;
    };
}

var addFive = adder(5);
```

functions

example: adder

```
function adder(x) {
    return function add(y) {
        return x + y;
    };
}

var addFive = adder(5);
addFive(10);
```

functions

example: adder

```
function adder(x) {
    return function add(y) {
        return x + y;
    };
}

var addFive = adder(5);
addFive(10);
```

functions

example: adder

```
function adder(x) {
    return function add(y) {
        return x + y;
    };
}

var addFive = adder(5);
addFive(10); // ⇒ 15
```

functions

example: adder

```
function adder(x) {
    return function add(y) {
        return x + y;
    };
}

adder(5)(10); // ⇒ 15
```

functions

example: adder

```
function adder(x) {
    return function add(y) {
        return x + y;
    };
}

adder(5)(10); // ⇒ 15
```

functions

example: adder

```
function adder(x) {
    return function add(y) {
        return x + y;
    };
}

adder(5)(10); // ⇒ 15
```

functions

example: adder

```
var addTen = adder(10);
var addTwenty = adder(20);

addTen(15);     // ⇒ 25
addTwenty(35); // ⇒ 55
```

functions

example: adder

Challenge Set 3

javascript-workshop/03-functions

Part II

Javascript in the Browser

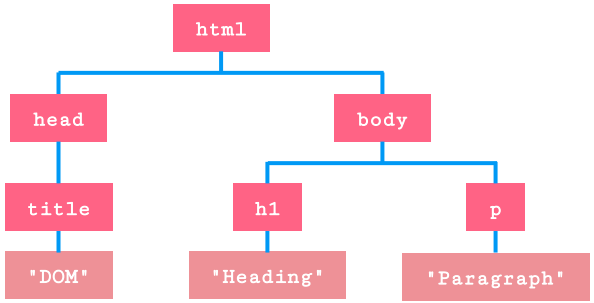
Interacting with HTML

```
<html>
  <head>
    <title>DOM</title>
  </head>
  <body>
    <h1>Heading</h1>
    <p>Paragraph</p>
  <body>
</html>
```

HyperText Markup Language

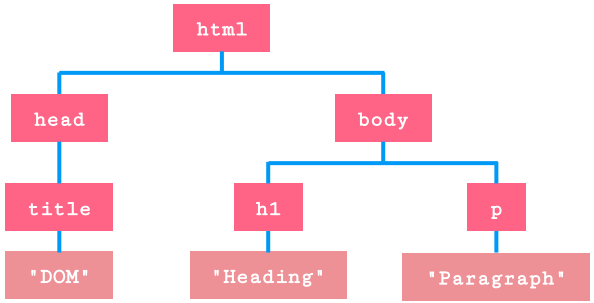
aka HTML

```
<html>
  <head>
    <title>DOM</title>
  </head>
  <body>
    <h1>Heading</h1>
    <p>Paragraph</p>
  <body>
</html>
```



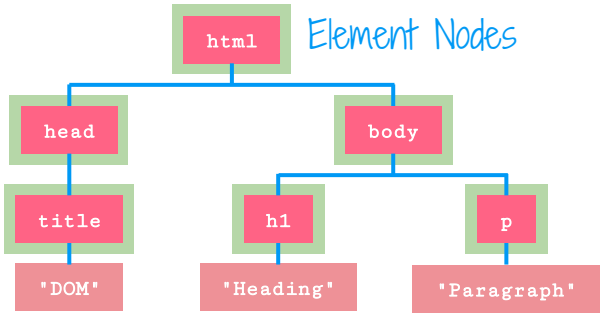
Document Object Model

aka DOM



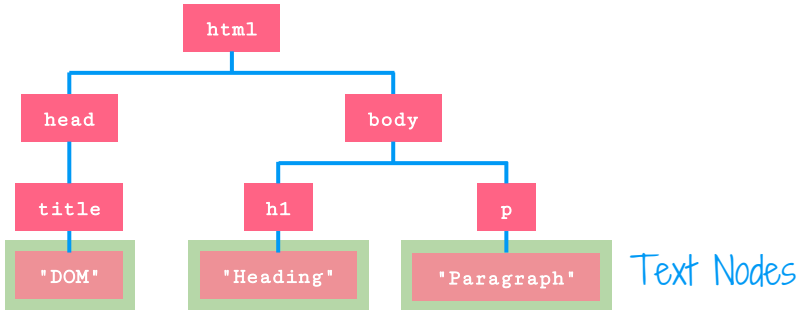
Document Object Model

aka DOM



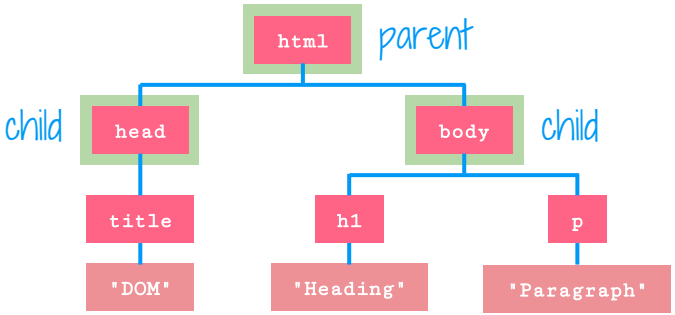
Document Object Model

element nodes



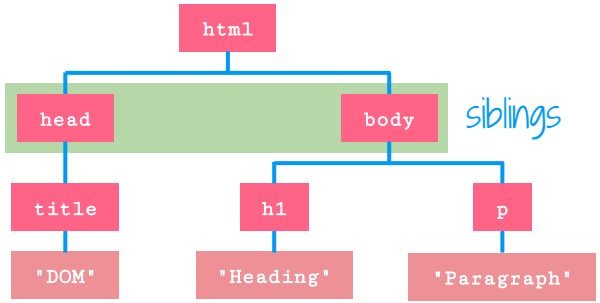
Document Object Model

text nodes



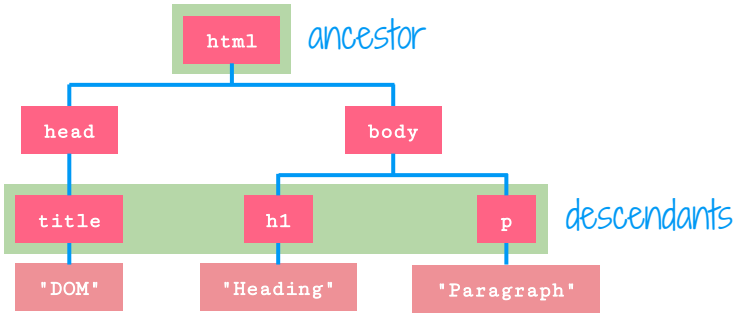
Document Object Model

"family tree"



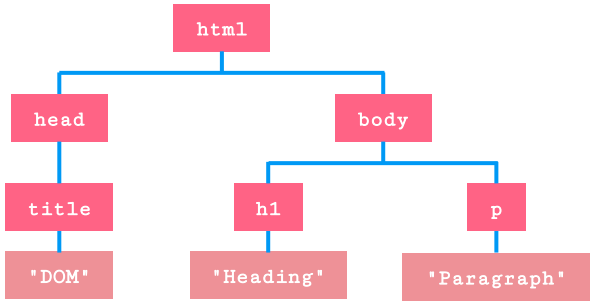
Document Object Model

"family tree"

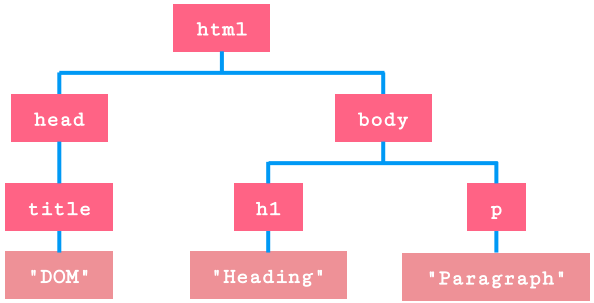


Document Object Model

"family tree"

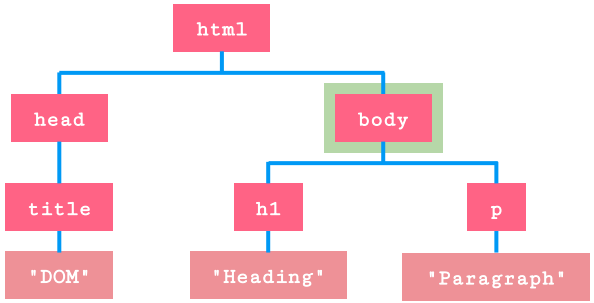


selectors



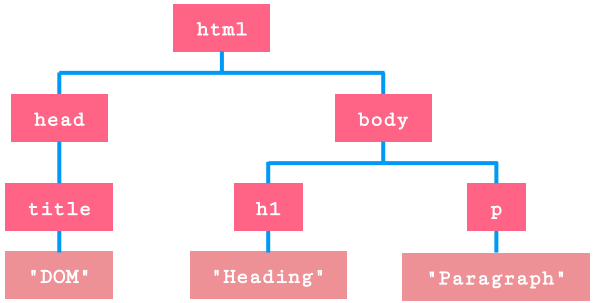

```
selector: 'body'
```

selectors



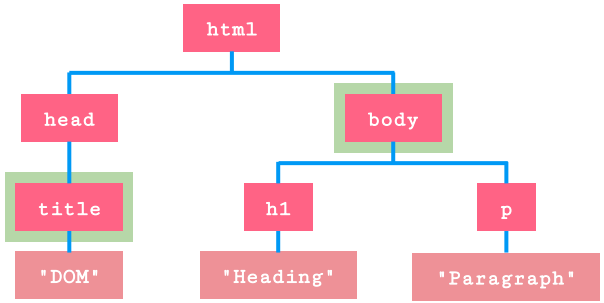

```
selector: 'body'
```

selectors




```
selector: 'body, title'
```

selectors



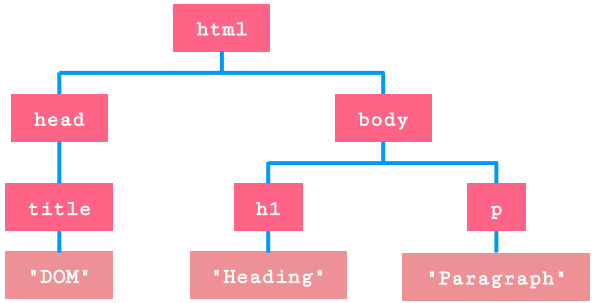

```
selector: 'body, title'
```

selectors

bit.ly/selectors-reference

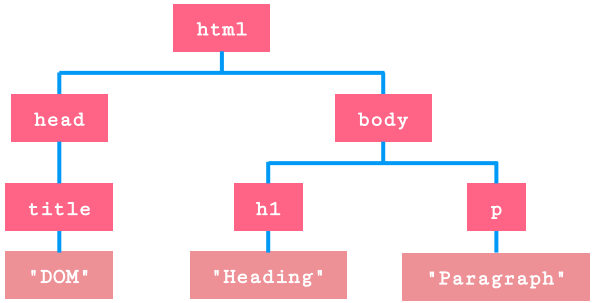
selectors

more information about selectors



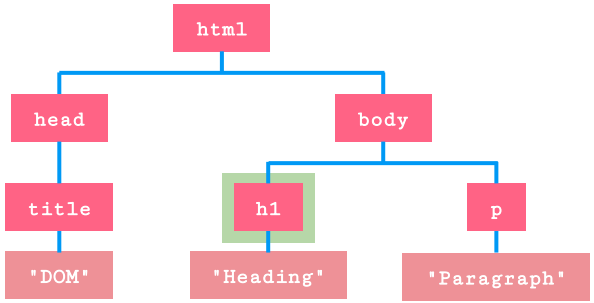

```
document.querySelector(selector);
```

selecting elements



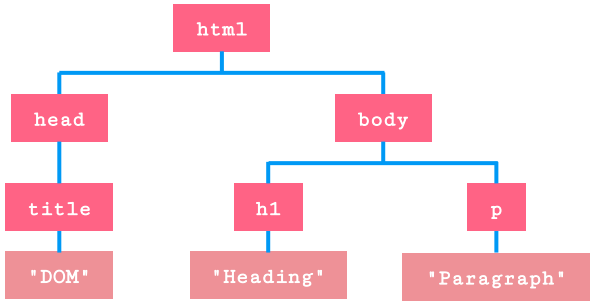

```
document.querySelector(   'h1'   );
```

selecting elements



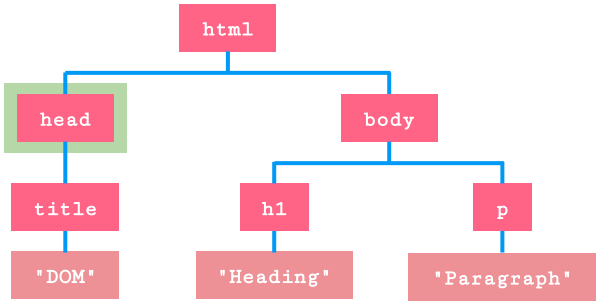

```
document.querySelector(  'h1'  );
```

selecting elements



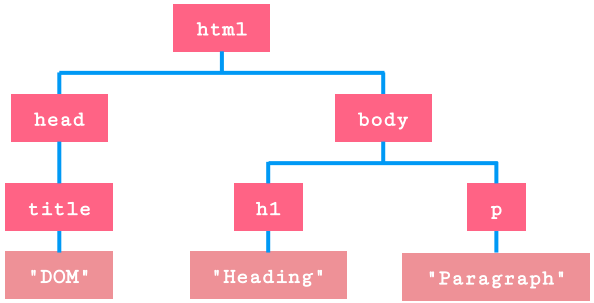

```
document.querySelector( 'head' );
```

selecting elements



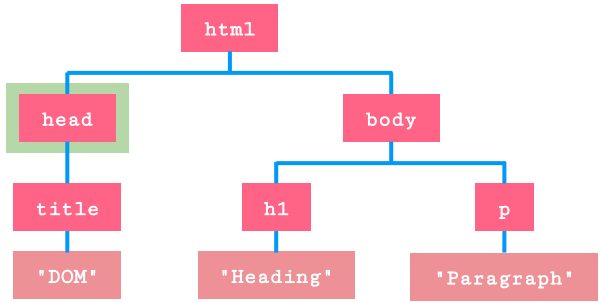

```
document.querySelector( 'head' );
```

selecting elements



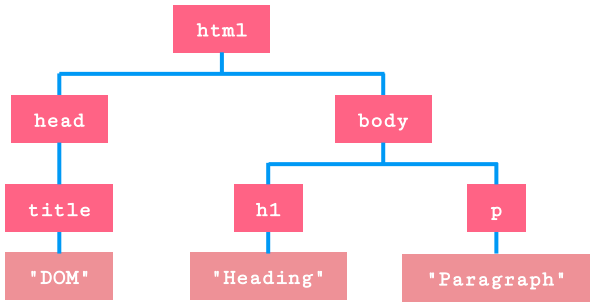

```
document.querySelector('h1, head');
```

selecting elements



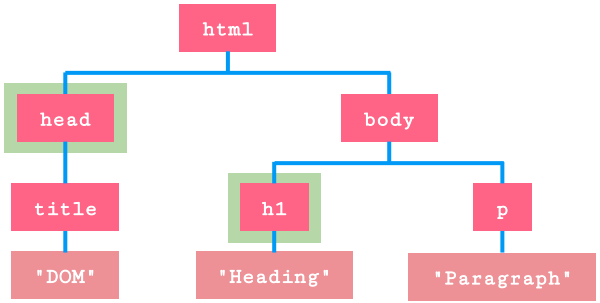

```
document.querySelector('h1, head');
```

selecting elements



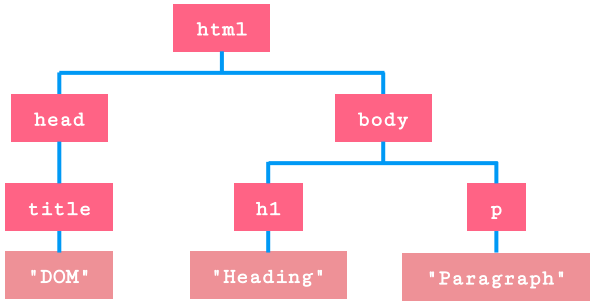

```
document.querySelectorAll('h1, head');
```

selecting elements

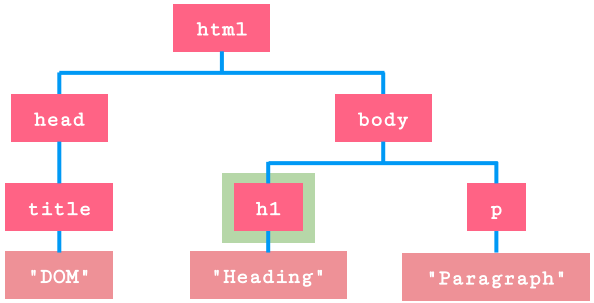



```
document.querySelectorAll('h1, head');
```

selecting elements



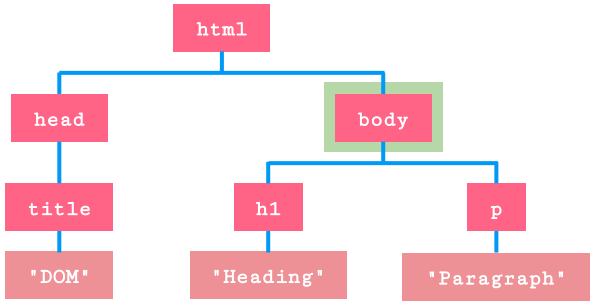
moving around the DOM tree




```
var h1 = document.querySelector('h1');
```

moving around the DOM tree

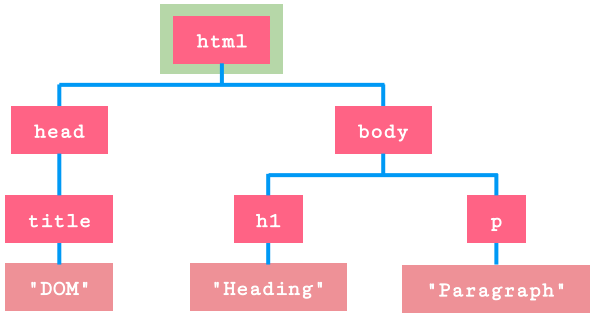
getting the parent element




```
var h1 = document.querySelector('h1');
h1.parentElement;
```

moving around the DOM tree

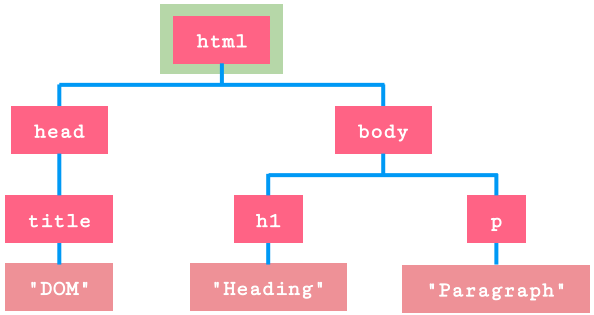
getting the parent element




```
var h1 = document.querySelector('h1');
h1.parentElement.parentElement;
```

moving around the DOM tree

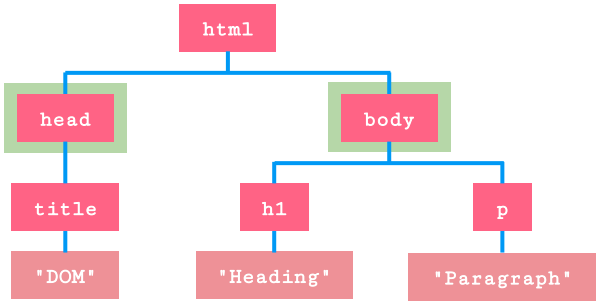
getting the parent element




```
var html = document.querySelector('html');
```

moving around the DOM tree

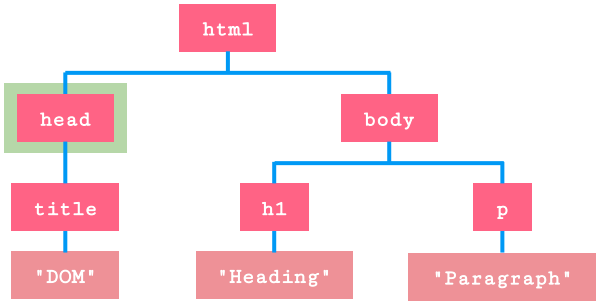
getting element children




```
var html = document.querySelector('html');
html.children;
```

moving around the DOM tree

getting element children

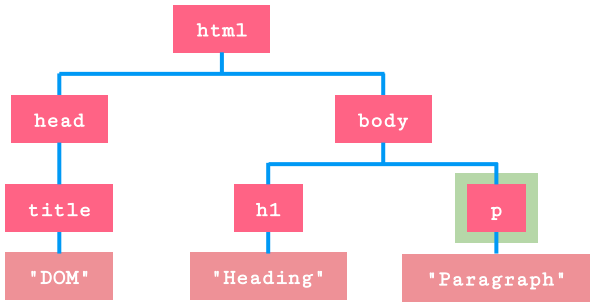



```
var html = document.querySelector('html');
html.children[0];
```

moving around the DOM tree

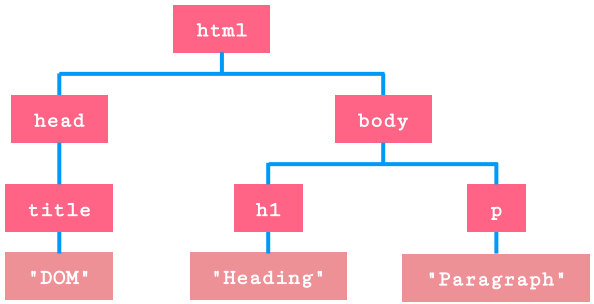
getting element children

lol got tired of making slides...
sorry ╚(ಠ_ಠ)=┐



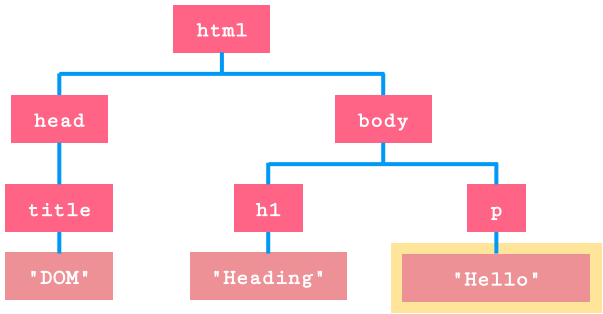

```
var p = document.querySelector('p');
```

manipulating elements




```
var p = document.querySelector('p');
p.textContent = 'Hello';
```

manipulating elements




```
var p = document.querySelector('p');
p.textContent = 'Hello';
```

manipulating elements

```
var h2 = document.querySelector('h2');
h2.style.color = 'red';
h2.style.backgroundColor = 'blue';
```

manipulating elements

manipulating their styles

```
var h2 = document.querySelector('h2');
h2.style.color = 'red';
h2.style.backgroundColor = 'blue';
```

manipulating elements

manipulating their styles

```
var h2 = document.createElement('h2');
h2.textContent = 'World';
```

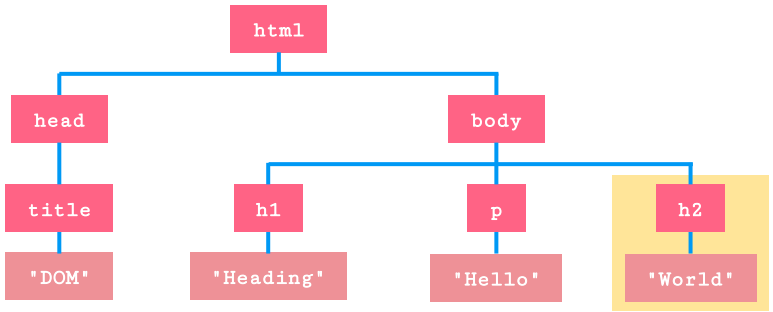
inserting elements

create them first

```
var h2 = document.createElement('h2');
h2.textContent = 'World';
// <h2>World</h2>
```

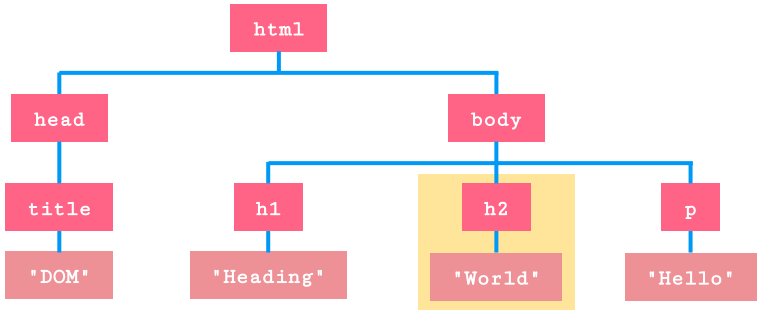
inserting elements

create the element first



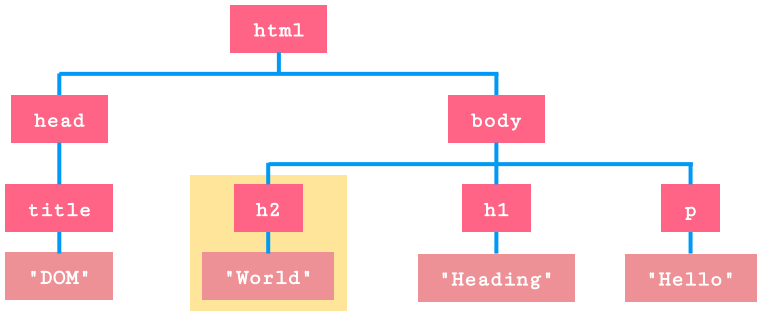

```
var body = document.querySelector('body');
body.appendChild(h2);
```

inserting elements



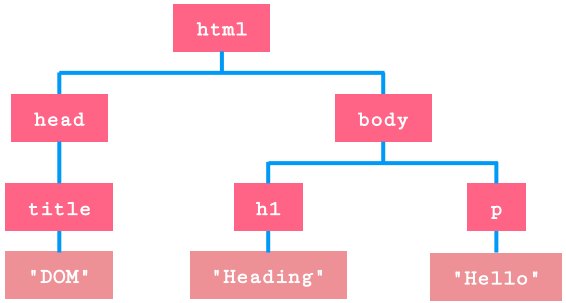

```
var body = document.querySelector('body');
var p = document.querySelector('p');
body.insertBefore(h2, p);
```

inserting elements

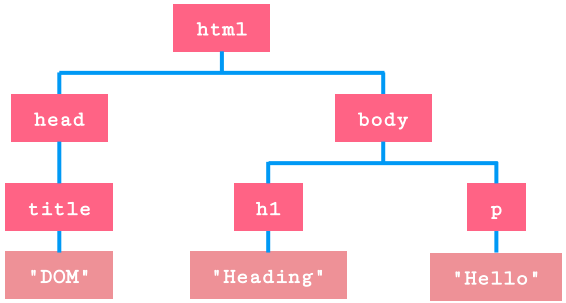



```
var body = document.querySelector('body');
var h1 = document.querySelector('h1');
body.insertBefore(h2, h1);
```

inserting elements

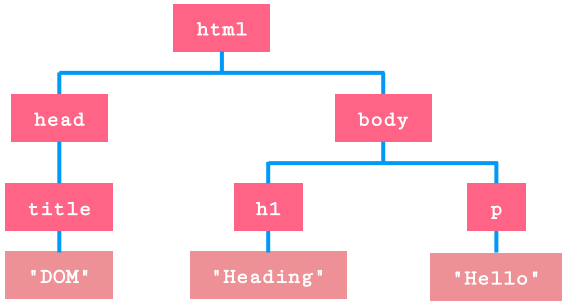


replacing elements



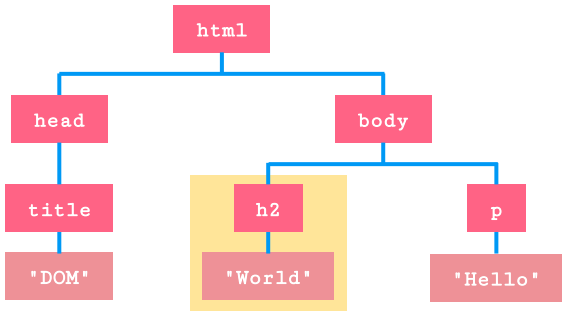

```
var body = document.querySelector('body');
var h1 = document.querySelector('h1');
```

replacing elements



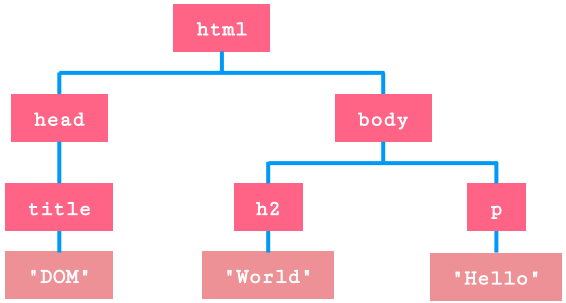

```
var body = document.querySelector('body');
var h1 = document.querySelector('h1');
body.replaceChild(h2, h1);
```

replacing elements

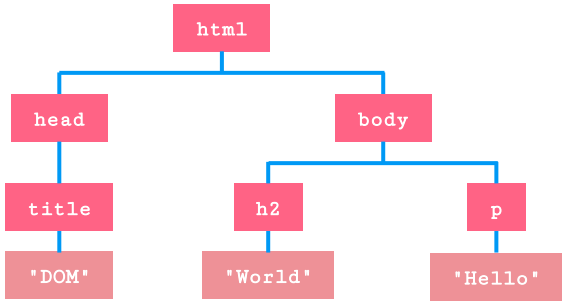



```
var body = document.querySelector('body');
var h1 = document.querySelector('h1');
body.replaceChild(h2, h1);
```

replacing elements

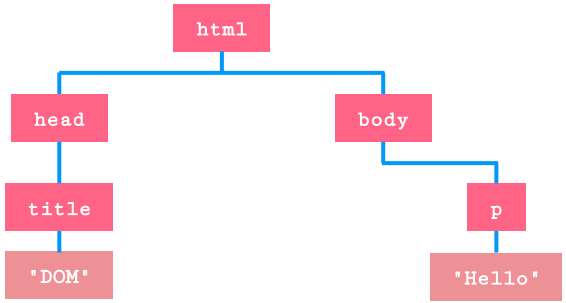


removing elements




```
var h1 = document.querySelector('h1');
h1.remove();
```

removing elements




```
var h1 = document.querySelector('h1');
h1.remove();
```

removing elements

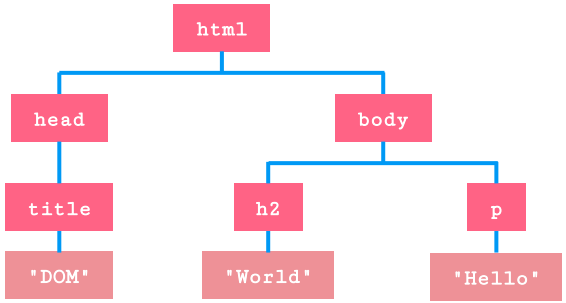
bit.ly/html-node

HTML nodes
reference

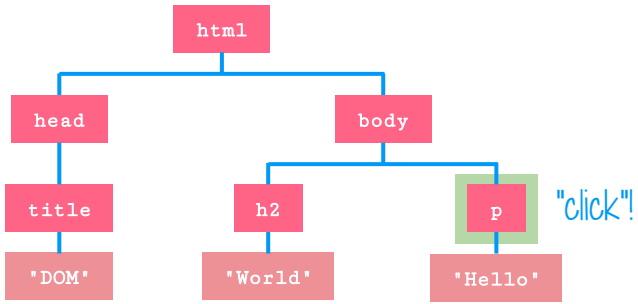
Challenge Set 4

javascript-workshop/04-dom

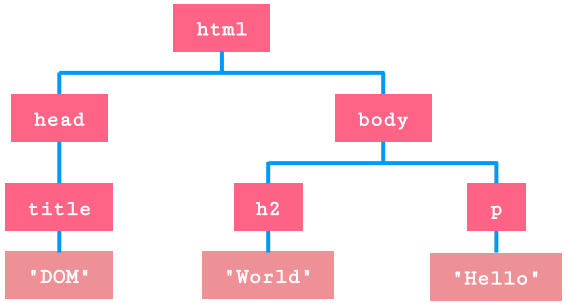
Javascript Events



events



events




```
var p = document.querySelector('p');
```

events

```
subject.addEventListener(name, callback);
```

events

```
p.addEventListener(name, callback);
```

events

```
p.addEventListener('click', callback);
```

events

```
p.addEventListener('click', function(e) {
    // handle click event
});
```

events

```
p.addEventListener('click', function(e) {
    // handle click event
});
```

events

Challenge Set 5

javascript-workshop/05-events

Part III

Bonus Part: Web APIs

Canvas API

bit.ly/canvas-api

Geolocation API

bit.ly/geolocation-api

Notifications API

bit.ly/notifications-api

bit.ly/all-web-apis

web apis are cool

The End

(ノ◕ワ◕)ノ*:･ﾟ✧ ✧ﾟ･: *ヽ(◕ワ◕ヽ)

/tilde-community/javascript-workshop

For updates and future talks

@tildecommunity

Special thanks to

ChannelFix.com