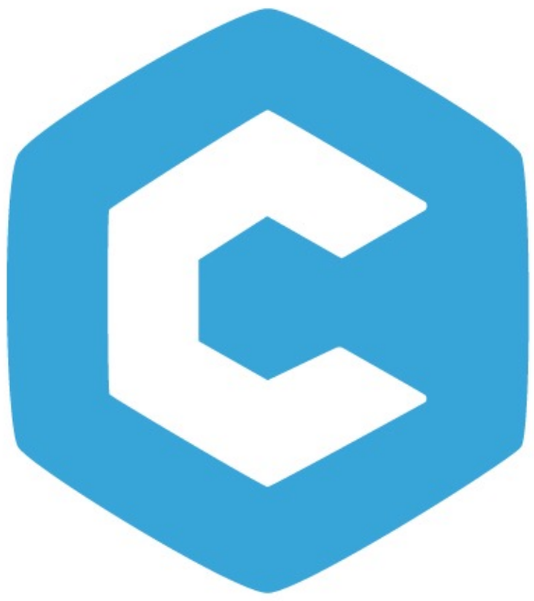
JAVASCRIPT ES6

(the best vanilla you've ever tasted)

github.com/ryanhagerty/dc-es6

RYAN HAGERTY

Front-End Developer



CHROMATIC

chromatichq.com

@HOTPIZZAS

INTRO

JavaScript Releases

ES7

Why use ES6?

jQuery

Babel

WHAT YOU'RE HERE FOR

const & let

scope

default & rest

arrow functions

implicit returns

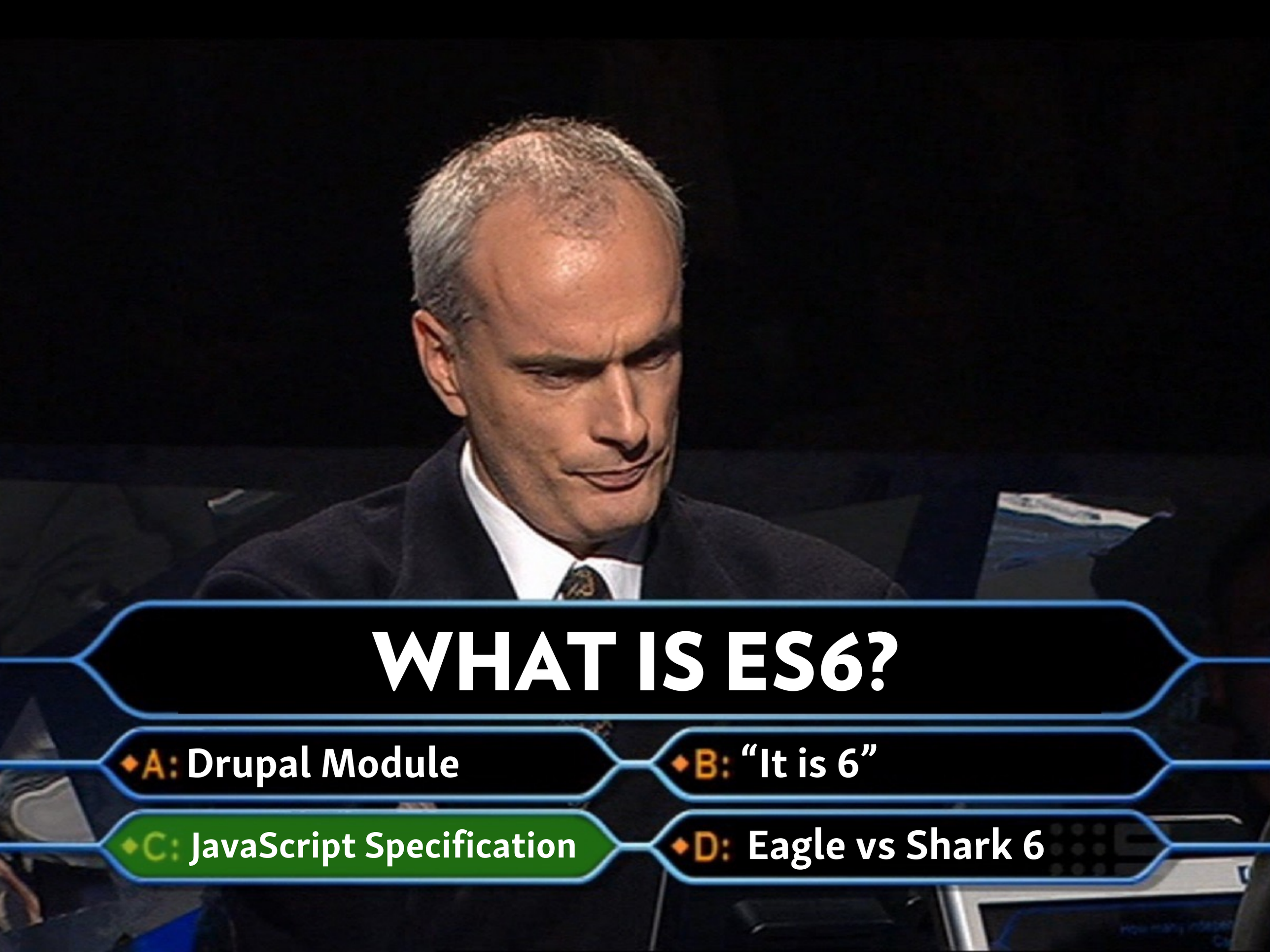
promises

classes

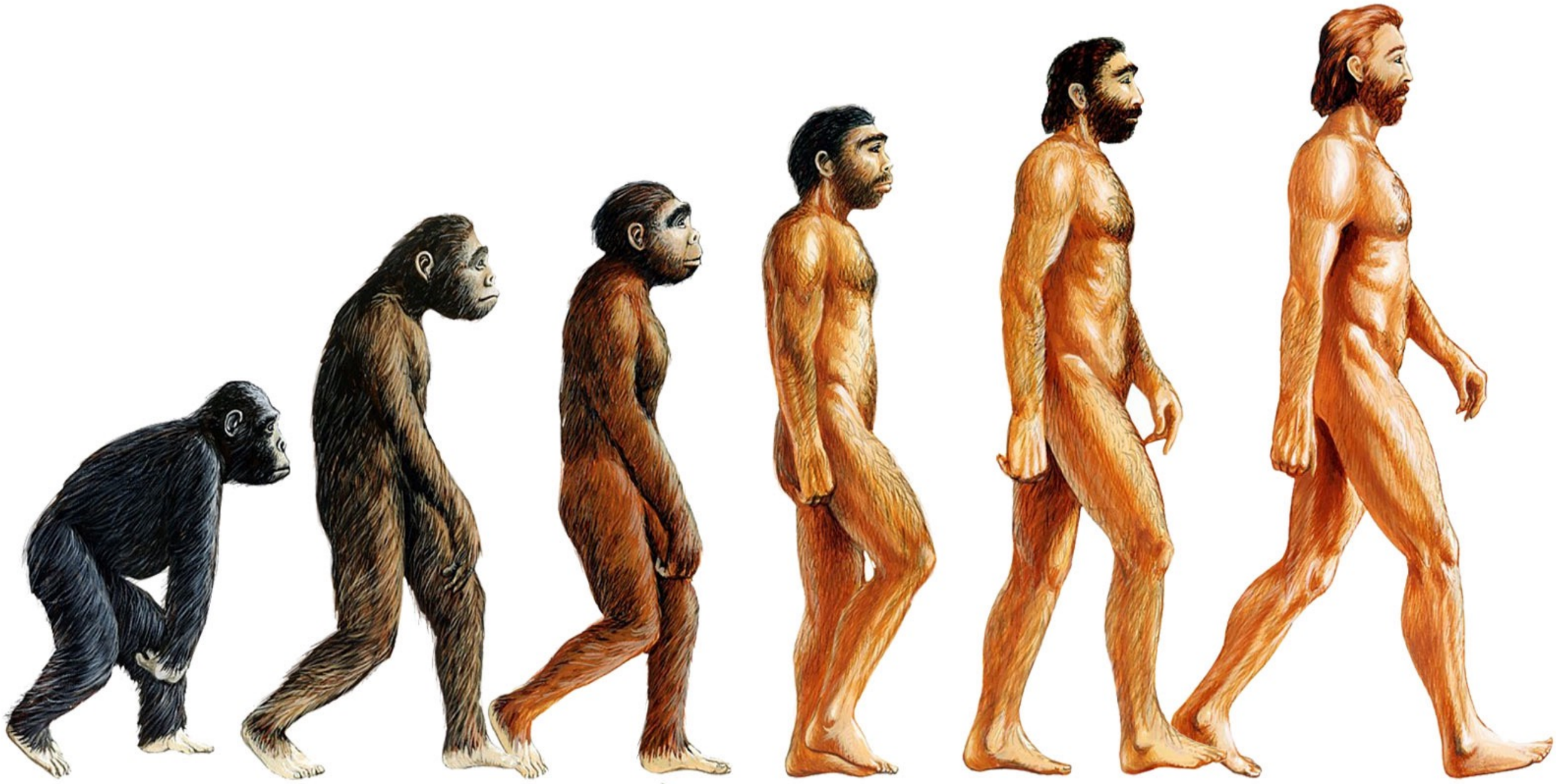
template literals

destructuring

modules


WHAT IS ES6?
A: Drupal Module
B: “It is 6”
C: JavaScript Specification
D: Eagle vs Shark 6

ECMASCRIPT



97 98 99 07 09 15

ES1 ES2 ES3 ES4 ES5 ES6

“In a very real sense, the completion of the sixth edition is the culmination of a fifteen year effort.”

— Allen Wirfs-Brock
6th Edition Project Editor

THE FUTURE

“The sixth edition provides the foundation for regular, incremental language and library enhancements.”

— Allen Wirfs-Brock
6th Edition Project Editor

YEARLY UPDATES! 

ECMASCRIPT2016

(ES7)

ES7

Array.prototype.includes

```
[1, 2, 3].includes(1); // true

[1, 2, 3].includes(4); // false
```

ES7

Exponentiation Operator

```
3 ** 2; // 9

Math.pow(3, 2); // 9
```

YOU DID IT!

COOL.

BUT WHY?

SOLVES

PROBLEMS

scope

scope

promises

scope

promises

“this”

scope

“this”

promises

modules

scope

promises

“this”

modules

parameters

scope

“this”

promises

modules

parameters

classes

scope

promises

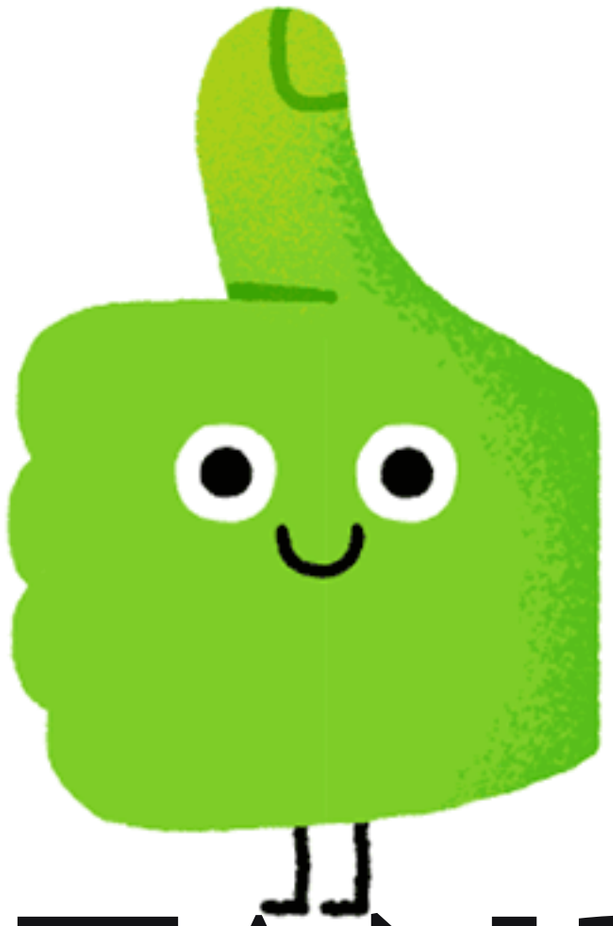
“this”

modules

parameters

classes

AND MORE!



WEB STANDARDS

BUT MAH JQUERY


jQuery
write less, do more.

ES6 VS JQUERY

SOLVES DIFFERENT PROBLEMS

PERFORMANCE

21 FLAVORS IN MY CACHE


BETTER
UNDERSTANDING
OF JS
[adult swim]

NATIVE SOLUTIONS

addClass

hasClass

find

attr

toggleClass

$.map

PROBABLY USE ES6


It is so hard to stop.

LET'S GET STARTED

IE 7	IE 8	IE 9	IE 10	IE 11	Edge 12[4]	Edge 13[4]	Edge 14[4]	FF 38 ESR	FF 44	FF 45 ESR	FF 46	FF 47	FF 48	FF 49	FF 50	FF 51	FF 52	C 1
0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0
0/7	0/7	0/7	0/7	0/7	0/7	0/7	7/7	3/7	4/7	4/7	4/7	4/7	4/7	4/7	4/7	6/7	6/7	0
0/5	0/5	0/5	0/5	0/5	5/5	5/5	5/5	4/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	0
0/15	0/15	0/15	0/15	0/15	12/15	15/15	15/15	15/15	15/15	15/15	15/15	15/15	15/15	15/15	15/15	15/15	15/15	0/
0/6	0/6	0/6	0/6	0/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	0
0/9	0/9	0/9	0/9	0/9	6/9	7/9	7/9	7/9	7/9	7/9	7/9	7/9	7/9	7/9	7/9	7/9	7/9	0
0/4	0/4	0/4	0/4	0/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	0
0/5	0/5	0/5	0/5	0/5	4/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	0
0/5	0/5	0/5	0/5	0/5	2/5	5/5	5/5	2/5	2/5	2/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	0
0/22	0/22	0/22	0/22	0/22	0/22	0/22	21/22	19/22	19/22	19/22	19/22	21/22	21/22	21/22	21/22	21/22	21/22	0/
0/24	0/24	0/24	0/24	0/24	0/24	0/24	23/24	20/24	21/24	21/24	21/24	23/24	23/24	23/24	23/24	23/24	23/24	0/
0/23	0/23	0/23	0/23	0/23	0/23	0/23	22/23	18/23	18/23	18/23	18/23	19/23	19/23	19/23	19/23	20/23	20/23	0/
0/2	0/2	0/2	0/2	0/2	2/2	2/2	2/2	0/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	0
0/2	0/2	0/2	0/2	0/2	0/2	1/2	2/2	0/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	0

compatibility table

Arrow functions - OTHER

Global 70.76%

Function shorthand using `=>` syntax and lexical `this` binding.

Current aligned | Usage relative | Date relative | Show all

IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
			49						
			55			9.3		4.4	
		51	56	10		10.2		4.4.4	
11	14	52	57	10.1	44	10.3	all	56	57
	15	53	58	TP	45				
		54	59		46				
		55	60						

Notes | Known issues (0) | Resources (6) | Feedback

No notes

caniuse.com

BABEL

WHAT'S A BABEL?

“Babel is a compiler that transforms ES6 into legacy browser ES5 code. Yes, even IE9.”

— Ryan Hagerty
The guy speaking right now.

```es6
// ES6
[1, 2, 3].map(n => ** 2);

// Compiled ES5
[1, 2, 3].map(function(n) {
  return Math.pow(n, 2);
});
```

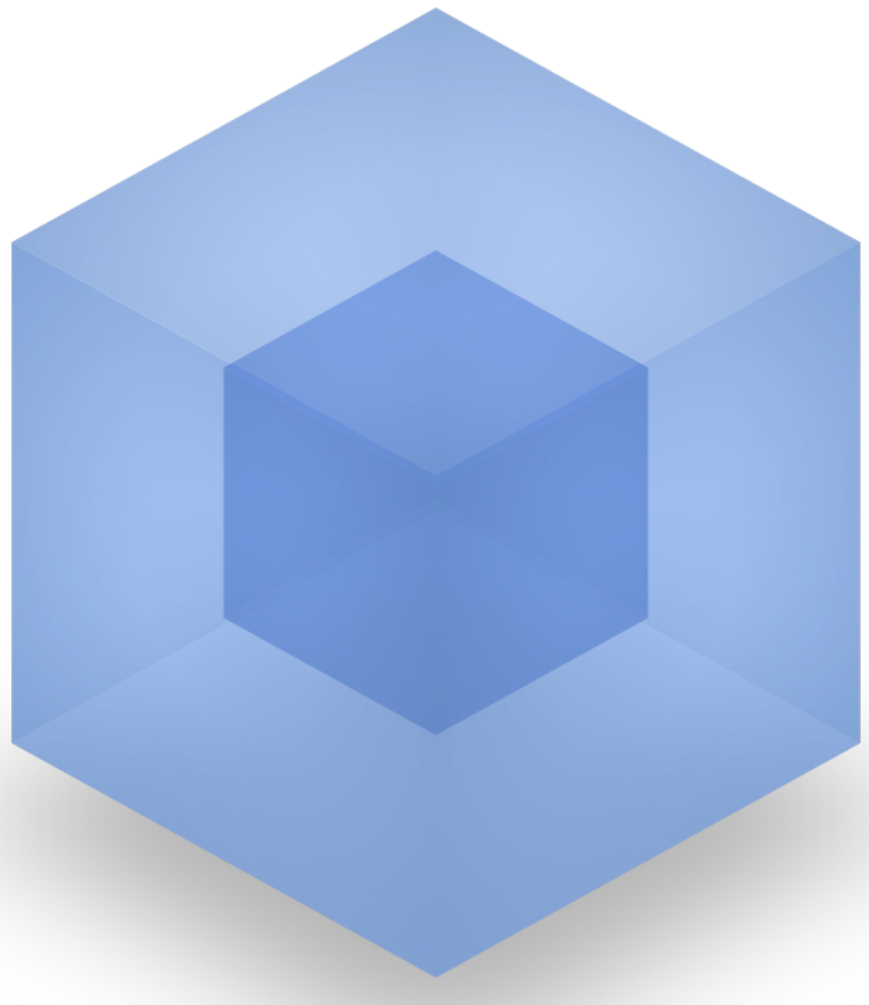
test yourself!

NPM

or

YARN 

Gulp



webpack

MODULE BUNDLER

BABEL CLI

PACKAGE.JSON

```
"scripts": {
  "babel-cli": "./node_modules/.bin/babel src --out-dir dist"
},
```

SRC/

```
const implicitReturn = ((food) => 'I LOVE ' + food)('pizza!')
```

CLI

```
ryanhagerty@Ryans-MacBook-Pro /Applications/MAMP/htdocs/dc-es6 npm run babel-cli

> dc-es6@1.0.0 babel-cli /Applications/MAMP/htdocs/dc-es6
> babel src --out-dir dist

src/javascript/babel_cli.js -> dist/javascript/babel_cli.js
ryanhagerty@Ryans-MacBook-Pro /Applications/MAMP/htdocs/dc-es6
```

DIST/

```
var implicitReturn = function (food) {
  return 'I LOVE ' + food;
}('pizza!');
```

Gulp

CLI

```
AMP/htdocs/dc-es6  npm install --save-dev gulp gulp-babel babel-preset-es2015
```

GULPFILE.JS

```
gulp.task('js', () => {
  return gulp.src("./src/javascript/*.js")
    .pipe(babel({
      presets: ['es2015']
    }))
    .pipe(gulp.dest("./dist/javascript"));
});

// Default Gulp task.
gulp.task('default', ['js']);
```

```
ryanhagerty@Ryans-MacBook-Pro /Applications/MAMP/htdocs/dc-es6 gulp
[16:48:35] Using gulpfile /Applications/MAMP/htdocs/dc-es6/gulpfile.js
[16:48:35] Starting 'js'...
[16:48:35] Finished 'js' after 505 ms
[16:48:35] Starting 'default'...
[16:48:35] Finished 'default' after 35 µs
ryanhagerty@Ryans-MacBook-Pro /Applications/MAMP/htdocs/dc-es6
```

DEBUG? 

SOURCE MAPS

babel_cli.js × babel_cli.js [sm]

```
3  /**
4   * @file
5   * An example file for babel-cli
6   */
7
8  var implicitReturn = function (food) {
9    return 'I LOVE ' + food;
10 }('pizzaaaa!');
11 //# sourceMappingURL=data:application/json;charset=utf8;base64,eyJ2ZXJzaW9uIjozLCJzb
12
```

{} Line 10, Column 16

babel_cli.js babel_cli.js [sm] ×

```
1  /**
2   * @file
3   * An example file for babel-cli
4   */
5
6  const implicitReturn = ((food) => 'I LOVE ' + food)('pizzaaaa!');
7
```

{} Line 1, Column 1 (source mapped from babel_cli.js)


REAL
ES6
TIME!

(FINALLY)

CONST/LET

(the new var)

VAR

```
var dc = "Drupalcon";
dc = "Durpalcon";

console.log(dc); // Durpalcon
```

(can update)

VAR

```
var dc = "Drupalcon";
var dc = "Durrrrrrrrrpalcon";

console.log(dc); // Durrrrrrrrrpalcon
```

(can redefine!)

GROSS

LET

```
let number = 41;
number = 42;

console.log(number); // 42
```

(can update)

LET

```
let number = 41;
let number = 42;

console.log(number);
// Uncaught SyntaxError: Identifier 'number'
// has already been declared
```

(can’t redefine)

VAR

```
for(var i = 0; i < 5; i++) {
  setTimeout(function () {
    console.log(i); // Logs 5 five times
  }, 100);
}
```

(loops)

LET

```
for(let i = 0; i < 5; i++) {
  setTimeout(function () {
    console.log(i); // 0 1 2 3 4
  }, 100);
}
```

(loops)

CONST

```
const name = "Ryan";
name = "Rye";

console.log(name);
// Uncaught TypeError:
//Assignment to constant variable.
```

(can’t update)

CONST

```
const name = "Ryan";
const name = "Ryerye";
```

```
console.log(name);
// Uncaught SyntaxError: Identifier
// 'name' has already been declared
```

(can’t redefine)

CONST

```
const person = {
  name: "Ryan",
};
```

```
person.name = "Ryerye";

console.log(person.name); // Ryerye
```

(not immutable!)

CONST vs. LET

A WINNER IS CONST

SCOPE

SCOPE

```
const name = "Ryan";

{
  const name = "Ryerye";
  console.log(name); // Ryerye
}

console.log(name); // Ryan
```

DEFAULT & REST PARAMETERS

DEFAULT

DEFAULT

```
function logFavoriteFood(food = "pizza") {
  console.log(food);
}

logFavoriteFood(); // pizza
logFavoriteFood("is beer a food?"); // is beer a food?
```

DEFAULT

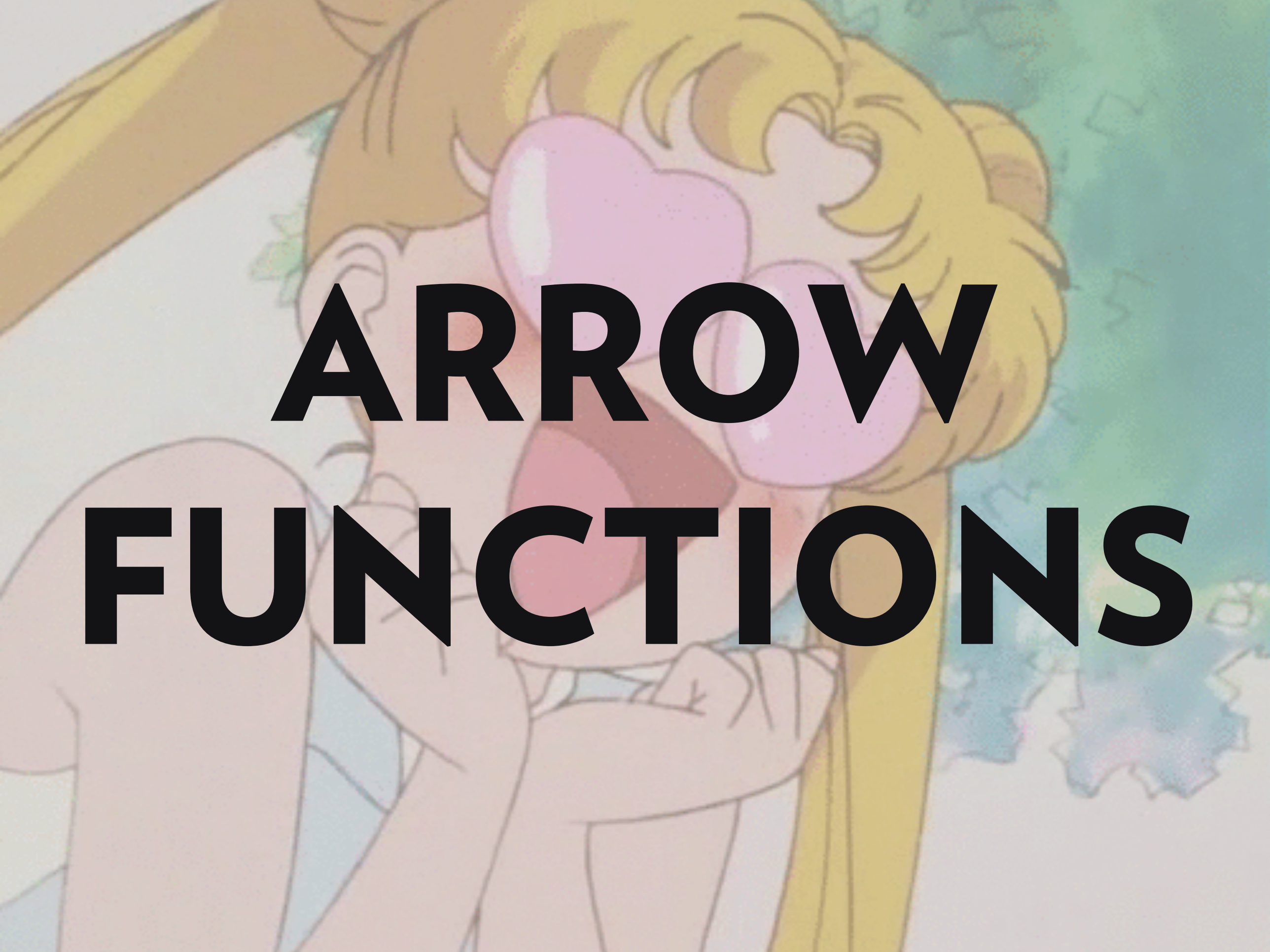
```
function changeBodyColor(color = "dodgerblue") {
  document.body.style.backgroundColor = color;
}

changeBodyColor();
changeBodyColor("#e7e7e7");
```

REST

REST

```
function logNumbers(...numbers) {
  console.log(numbers.length);
}
```

```
logNumbers(1); // 1
logNumbers(1,2,3,4); // 4
```



ARROW FUNCTIONS

ARROW FUNCTIONS

```
var logName = function(name) {
  console.log(name);
};

logName("Ryan"); // Ryan
```

(old)

ARROW FUNCTIONS

```
const logName = (name) => {
  console.log(name);
};

logName("Ryerye"); // Ryerye
```

(new)

so...

WHAT'S THE BIG DEAL

Lexically binds “this”


gifbin.com
THIS!#%$

ARROW FUNCTIONS

```
const buttonStuff = {
  init() {
    this.listenClick();
  },

  listenClick() {
    const button = document.getElementById('button');
    button.addEventListener(`click`, function() {
      this.logClick();
    });
  },

  logClick() {
    console.log(`click`);
  },
}

buttonStuff.init();
```

WE COULD...

```
listenClick() {
  const button = document.getElementById('button');
  button.addEventListener(`click`, this.logClick);
},
```

SUSPEND

DISBELIEF

ARROW FUNCTIONS

```
listenClick() {
  const button = document.getElementById('button');
  button.addEventListener(`click`, function() {
    this.logClick(); // this.logClick is not a function
  });
},
```

ARROW FUNCTIONS

```
listenClick() {
  const button = document.getElementById('button');
  const that = this;

  button.addEventListener(`click`, function() {
    that.logClick();
  });
},
```

(shame!🔔🔔🔔)

ARROW FUNCTIONS

```
listenClick() {
  const button = document.getElementById('button');
  button.addEventListener(`click`, function() {
    this.logClick();
  }.bind(this));
},
```

(better)

ARROW FUNCTIONS

```
listenClick() {
  const button = document.getElementById('button');
  button.addEventListener(`click`, () => {
    this.logClick();
  });
},
```

(yea!)

IMPLICIT RETURNS

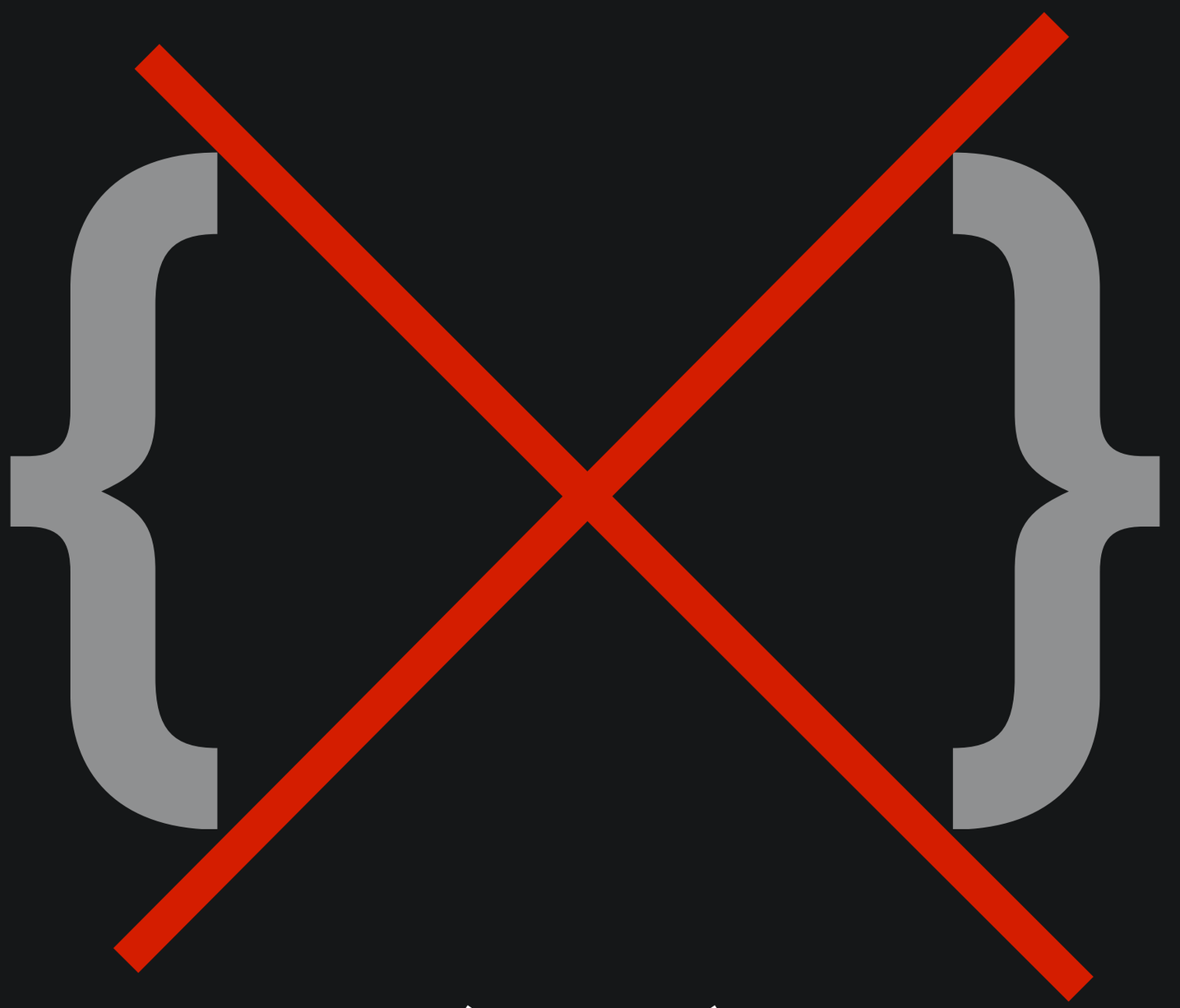
IMPLICIT RETURNS

```
const number = (x) => {
  x * x;
};

console.log(number(2)); // undefined
```

(nope)

IMPLICIT RETURNS

IMPLICIT RETURNS



(bye!)

IMPLICIT RETURNS

```
const number = (x) => x * x;

console.log(number(2)); // 4
```

(awww yes)

PROMISES

CALLBACKS

```
getData(function(dataA) {
    getOtherData(dataA, function(dataB) {

    });
});
```

CALLBACKS

```
getData(function(dataA) {
    getOtherData(dataA, function(dataB) {
        getOtherData(dataB, function(dataC) {
            getOtherData(dataC, function(dataD) {
            });
        });
    });
});
```

CALLBACKS

```
getData(function(dataA) {
    getOtherData(dataA, function(dataB) {
        getOtherData(dataB, function(dataC) {
            getOtherData(dataC, function(dataD) {
                getOtherData(dataD, function(dataE) {
                    getOtherData(dataE, function(dataF) {
                        getOtherData(dataF, function(dataG) {
                            getOtherData(dataG, function(dataH) {
                                getOtherData(dataH, function(dataI) {
                                    getOtherData(dataI, function(dataJ) {
```


CALLBACKS

(source)

PROMISES

```
const yourPromise = new Promise((resolve, reject) => {
  setTimeout(() => {
    resolve("Your data!");
  }, 1000);
});
```

PROMISES

```
const yourPromise = new Promise((resolve, reject) => {
  setTimeout(() => {
    resolve("Your data!");
  }, 1000);
});

yourPromise.then((message) => {
  console.log("What did I get? " + message);
  // What did I get? Your data!
});
```

PROMISES

```
const amazonAWS = true;

const yourPromise = new Promise((resolve, reject) => {
  if (amazonAWS) {
    setTimeout(() => {
      resolve("Your data!");
    }, 1000);
  }
  else {
    reject("It's down.")
  }
});
```

PROMISES

```
yourPromise.then(function (message) {
  console.log("What did I get? " + message);
  // What did I get? Your data!
}, function (err) {
  console.log("Oh no! " + err);
  // Oh no! It's down.
});
```

PROMISES

```
const amazonAWS = true;

const yourPromise = new Promise((resolve, reject) => {
  if (amazonAWS) {
    setTimeout(() => {
      resolve("Your data!");
    }, 1000);
  } else {
    reject("It's down.");
  }
});

yourPromise.then((message) => {
  console.log("What did I get? " + message);
  // What did I get? Your data!
}, function (err) {
  console.log("Oh no! " + err);
});
```

PROMISES

```
const amazonAWS = false;

const yourPromise = new Promise((resolve, reject) => {
  if (amazonAWS) {
    setTimeout(() => {
      resolve("Your data!");
    }, 1000);
  } else {
    reject("It's down.");
  }
});

yourPromise.then((message) => {
  console.log("What did I get? " + message);
}, function (err) {
  console.log("Oh no! " + err);
  // Oh no! It's down.
});
```

PROMISES

```
const newPromise = new Promise((resolve, reject) => {
  const result = 2;
  resolve(result);
});

newPromise.then((result) => {
  const newResult = result * 2; // 4
  return newResult;
}).then((result) => {
  const newResult = result * 2; // 8
  console.log(newResult);
});
```

(chained)

PROMISES

```
const errorFunction = () => {
  console.log('here be an errrrrror!');
};

newPromise.then((result) => {
  const newResult = result * 2; // 4
  //return newResult;
  return Promise.reject();
}).catch(errorFunction).then((result) => {
  const newResult = result * 2; // 8
  console.log(newResult);

  // here be an errrrrror!
});
```

(catch)

PROMISES

```
const apis = ['site1', 'site2', 'site3'];

Promise.all(apis).then((results) => {
  results.forEach((api) => {
    console.log(api);
    // site1
    // site2
    // site3
  });
});
```

(all)

CLASSES

CLASSES

```
class Food {
  constructor(name) {
    this.name = name;
  }

  describe() {
    console.log(this.name + " is the best food.");
  }
}

const pizza = new Food("Pizza");
pizza.describe(); // Pizza is the best food.
```

(ES6)

CLASSES

```
var Food = function(name) {
  this.name = name;
};

Food.prototype.describe = function() {
  console.log(this.name + " is the best food.");
};

var pizza = new Food("Pizza");
pizza.describe(); // Pizza is the best food.
```

(ES5)

SYNTACTIC SUGAR

CLASSES

```
var Food = function(name) {
  this.name = name;
};
```

```
Food.prototype.describe = function( ) {
  console.log(this.name + " is the best food.");
};
```

(prototype!)


CLASSES

CLASSES

```
class Food {
  constructor(name) {
    this.name = name;
  }

  describe() {
    console.log(this.name + " is the best food.");
  }
}

const pizza = new Food("Pizza");

Food.prototype.describe = () => {
  console.log("Food is altered!")
};

pizza.describe(); // Food is altered!
```

CLASSES

```
class Pizza extends Food {
  toppings(ingredients) {
    console.log("I like " + ingredients + " on mine.")
  }
}

const myStyle = new Pizza();
myStyle.toppings("mushrooms and onions");
// I like mushrooms and onions on mine.
```

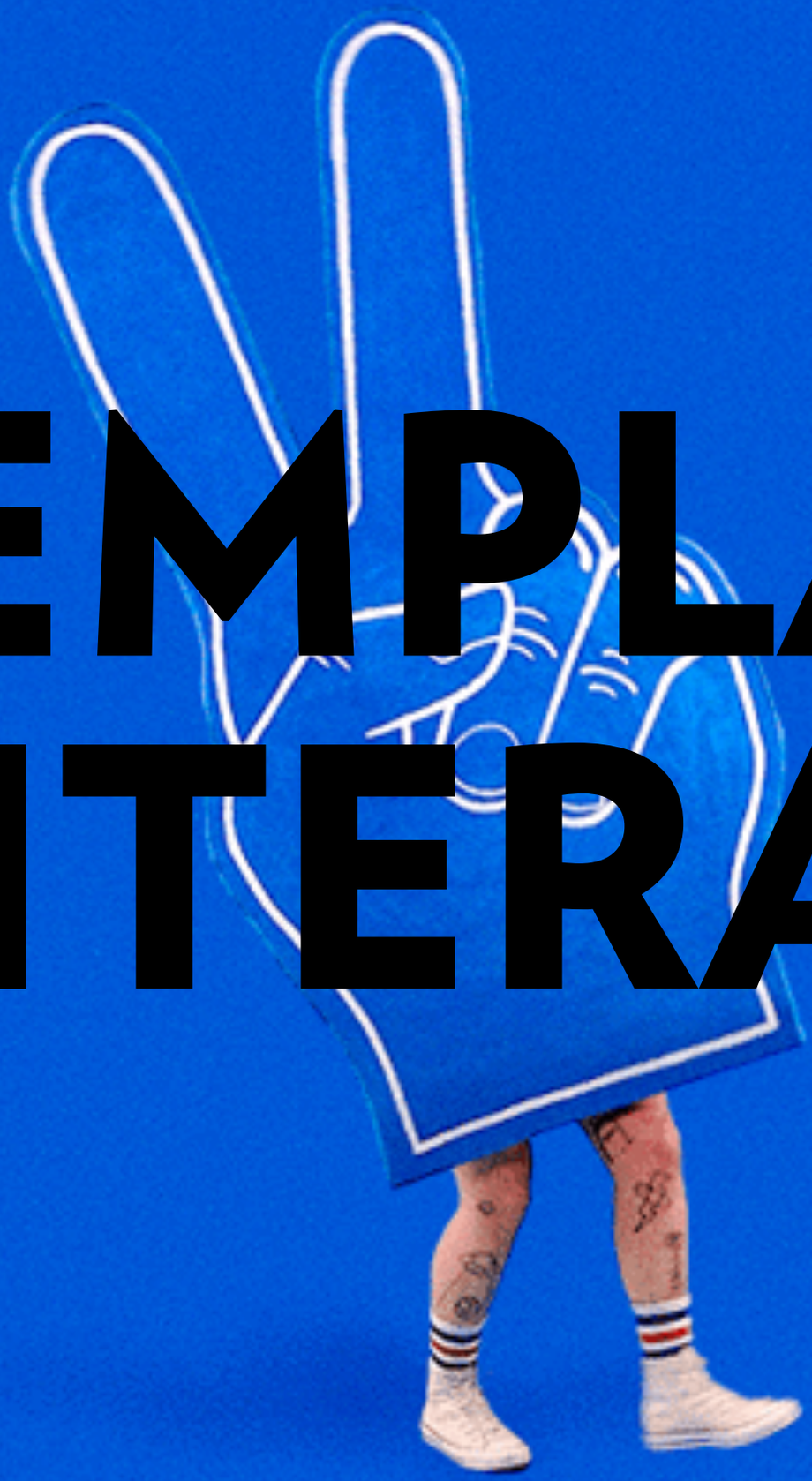
(extend)

CLASSES

```
class Pizza extends Food {
  constructor(name) {
    super();
    this.name = "Pizza";
  }

  toppings(ingredients) {
    super.describe();
    console.log("I like " + ingredients + " on mine.");
  }
}

const myStyle = new Pizza();
myStyle.toppings("mushrooms and onions");
// Pizza is the best food.
// I like mushrooms and onions on mine.
```

(super)

TEMPLATE LITERALS



TEMPLATE LITERALS

```
var beverage = "BEER";
console.log("Time to go drink " + beverage + "!");
// Time to go drink BEER!
```

(ES5)

TEMPLATE LITERALS

```
const beverage = `BEER`;
console.log(`Time to go drink ${beverage}!`);
// Time to go drink BEER!
```

(ES6)

TEMPLATE LITERALS

```
const beverage = "BEER";
console.log("Time to go drink ${beverage}!!");
```

```
Time to go drink ${beverage}!!
```

(use backticks!)

TEMPLATE LITERALS

```
const beverage = `BEER`;
console.log(`Time to go drink ${beverage}!`);
// Time to go drink BEER!
```

(with backticks)

TEMPLATE LITERALS

```
const isPizza = true;
const cheer = () => `
  YEAAAAAA!
`;

const template = () => `
  <div>
    ${isPizza ? `${cheer()}` : `I'm so sad. :(`}
  </div>
`;
// YEAAAAAA!

const nextLink = document.querySelector(`.next`);
nextLink.insertAdjacentHTML(`afterend`, template());
```

(ternary)

DESTRUCTURING

DESTRUCTURING

```
var name1 = 'Ryan';
var name2 = 'Rye';
var name3 = 'Ryerye';
```

(ES5)

DESTRUCTURING

```
const [ name1, name2, name3 ] = [ `Ryan`, `Rye`, `Ryerye` ];
console.log(name2);
// Rye
```

(ES6)

DESTRUCTURING

```
const names = [ `Ryan`, `Rye`, `Ryerye` ];
const [name1, name2, name3] = names;
console.log(name2);
// Rye
```

(ES6)

DESTRUCTURING

```
const superHero = {
  alias: `Spider-man`,
  name: `Peter Parker`
};
```

```
const { alias, name } = superHero;
console.log(alias);
// Spider-man
```

(objects)

DESTRUCTURING

```
const superVillain = {
  alias: `Sandman`,
  name: `William Baker`,
  weaknesses: {
    weakness: `Water`,
    weakness2: `Planning heists`
  }
}

const { alias, weaknesses: { weakness } } = superVillain;
console.log(alias, weakness);
// Sandman Water
```

(nested)

MODULES

PROBLEMS

MODULES

```
<script src="https://ajax.googleapis.com/ajax/libs/
jquery/1.6.2/jquery.min.js"></script>
<script src="jquery.flexslider.js"></script>
```

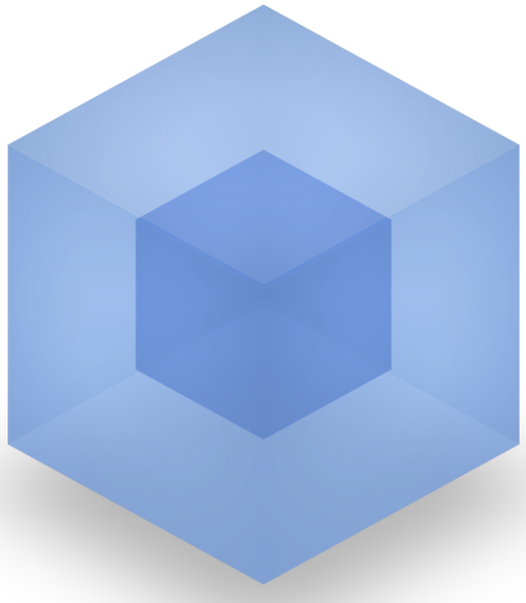
(old)

MODULES

```
$(window).load(function( ) {
  $('.flexslider').flexslider({
    animation: "slide"
  });
});
```

(old)


NOPE



webpack

MODULE BUNDLER


TREE
SHAKING

IMPORT/EXPORT

MODULES

```
export const ColorChange = {
  changeColor(color, el) {
    el.style.backgroundColor = color;
  }
};
```

(modules/colorChange.js)

MODULES

```
import { ColorChange } from './modules/colorChange.js';
ColorChange.changeColor(`dodgerblue`, document.body);
```

(10_modules.js)

MODULES

```
import { ColorChange, AnotherModule } from './modules/moduleList.js';
```

(multiple modules)

MODULES

hi.js

```
export default function () { console.log(`hi!`) }
```

```
import hi from `.modules/hi.js`
hi();
```

(functions)

MODULES

Can also import:

classes

objects

primitives


ES6!

WHAT'S NEXT

ECMASCRIPT2016

(ES7)

ECMASCRIPT2017

(ES8)

WHAT DID WE LEARN?

const & let

scope

default & rest

arrow functions

implicit returns

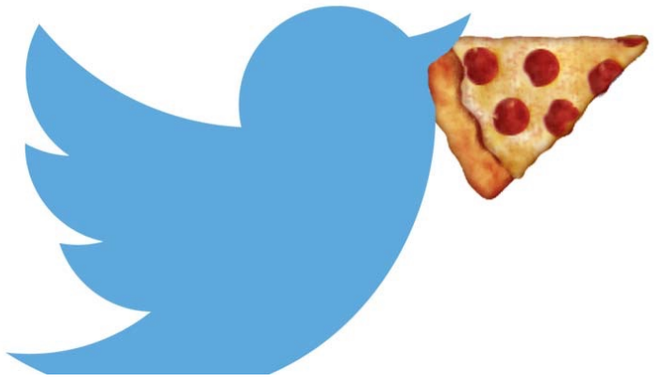
promises

classes

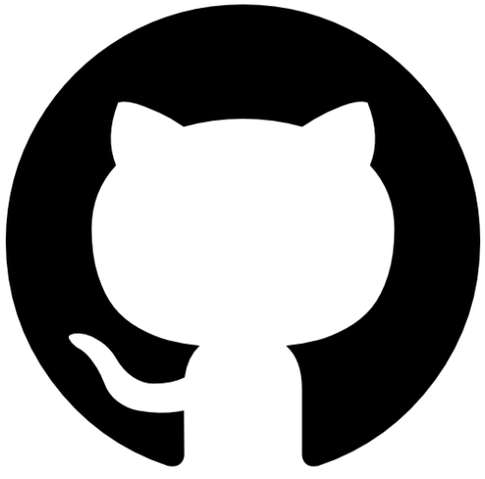
template literals

destructuring

modules



twitter.com/hotpizzas



github.com/ryanhagerty/dc-es6


THANK
YOU!