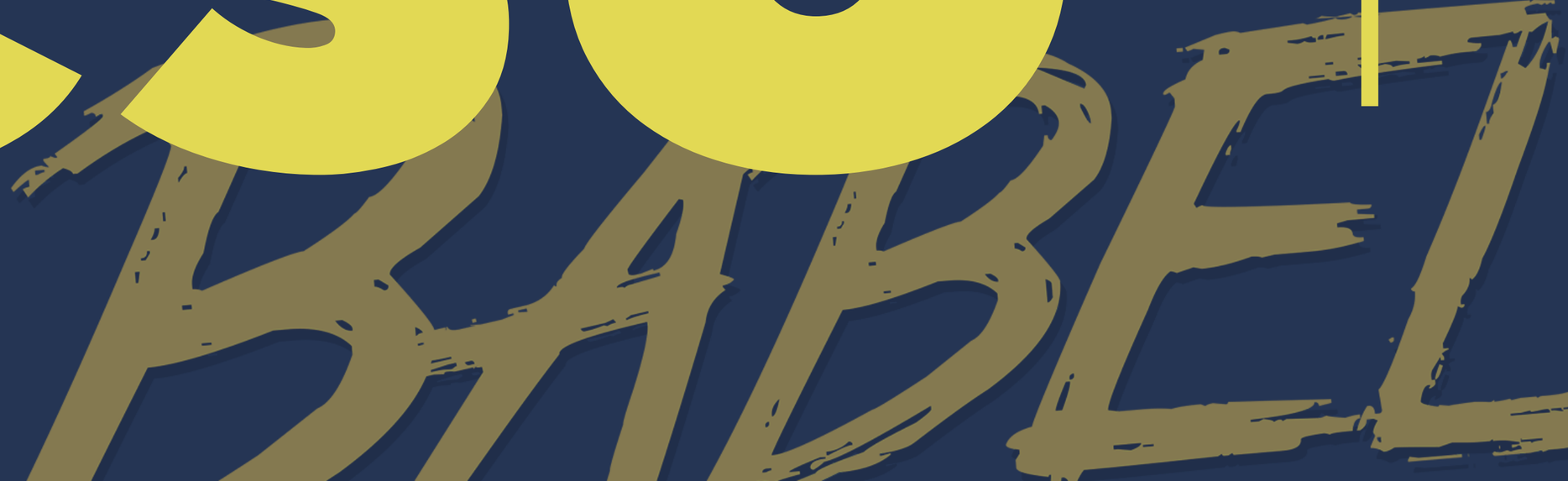

es6
ES2015

# es6+



# ***arrow***
# functions

# arrow functions

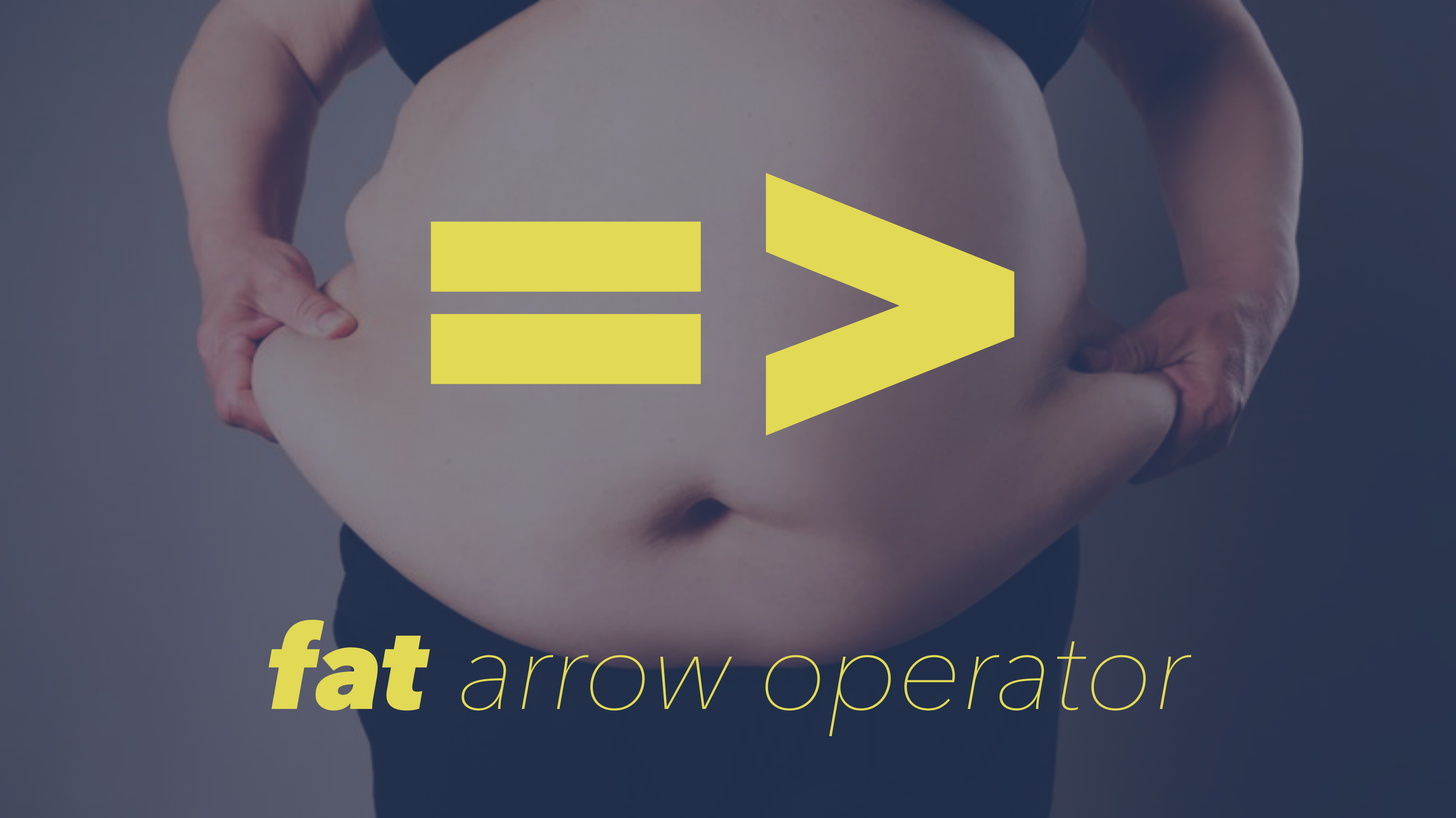
```
var redLetterMedia = [
    'Mike',
    'Jay',
    'Rich Evans'
];

redLetterMedia.forEach(
    name => console.log( name )
);
```

# es5

```
redLetterMedia.map( function(name) {
    return name.length;
});
```

# es6

```
redLetterMedia.map( name => name.length );
```

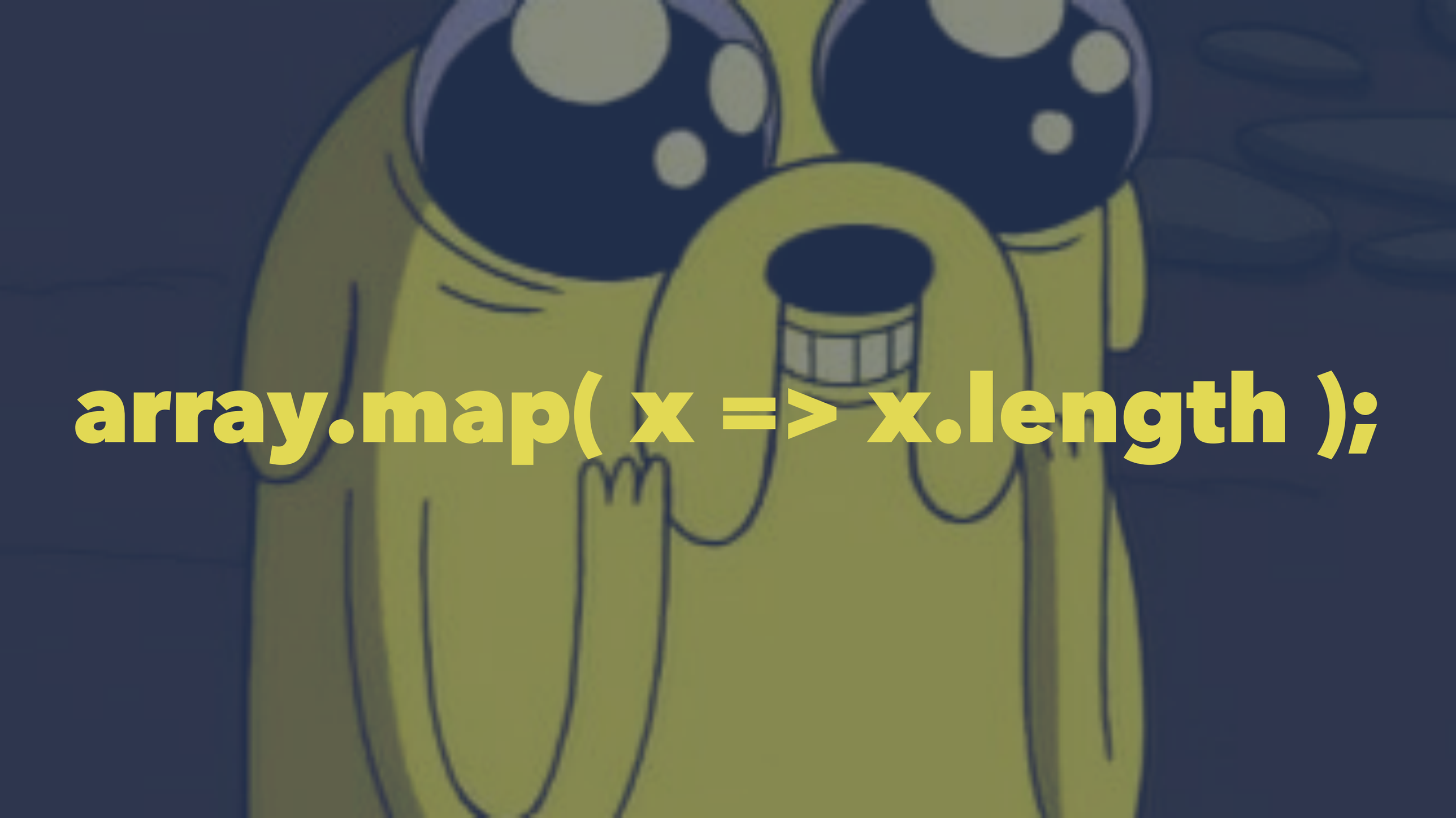

=>
fat arrow operator

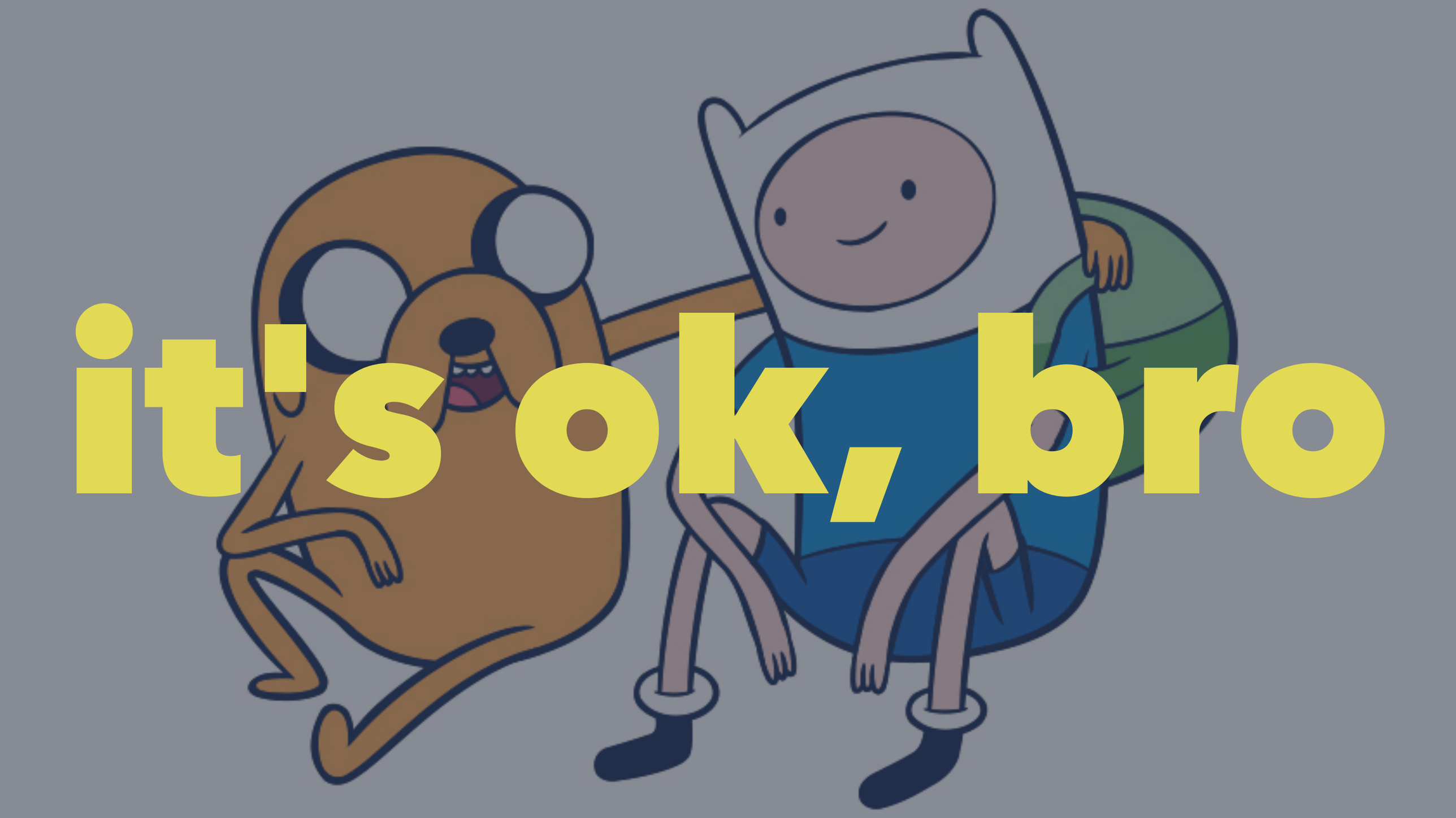
## 1 argument

**no** function
**no** return, no woman, no cry?
**no** { }

## more arguments

```
redLetterMedia.map( (name, i) => {
    let times = 100;
    return name.length * times;
});
```


array.map( x => x.length );


it's ok, bro

# functions get a **this** parameter

**it's value depends on function invocation**

1.

## METHOD, this = rich

```
var rich = {
    name: 'Rich Evans',
    disease: 'diabetes',
    cry: function() {
        console.log('rich cries!!')
    }
}

rich.cry();
```

*2.*

## FUNCTION, this = global object

```
function funeral() {  };
funeral();
```

*window*
*or undefined*

3.

## CONSTRUCTOR, this = rich

```
var Fraud = function(name, disease) {
    this.name = name;
    this.disease = disease;
}

var rich = new Fraud('Rich Evans', 'diabetes');
```

4.

# CALL / APPLY

```
var redLetterMedia = ['Mike', 'Jay', 'Rich Evans'];

function kill () {
    console.log( this );
}

kill(); // this = Window
kill.call( redLetterMedia ); // this = redLetterMedia
```

arrow

**no this**

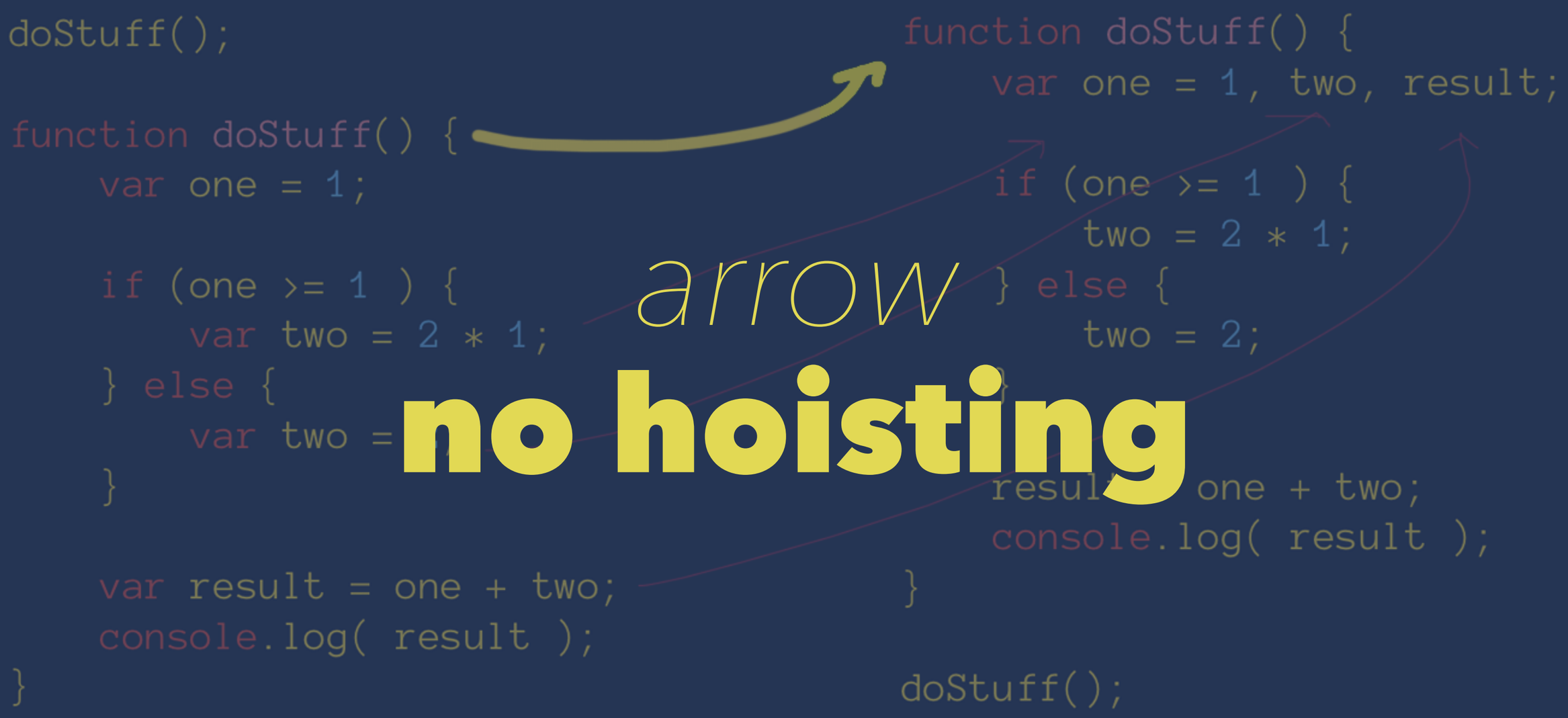
*you gonna need some* **=>** *homie*

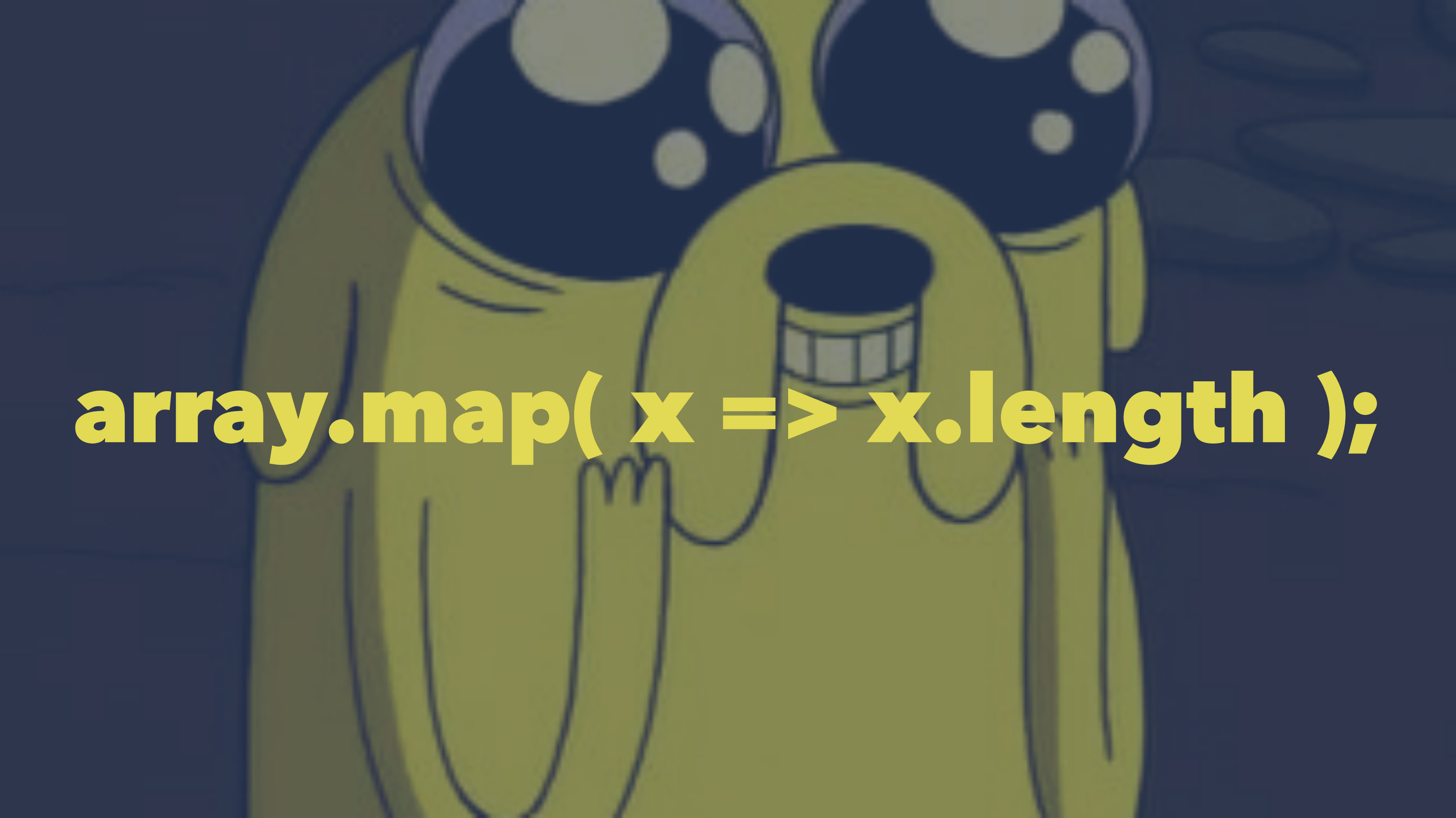
```
function Fraud() {
    this.name = 'Rich Evans';
    this.disease = 'diabetes';
    this.health = 23;

    setInterval( function fade() {
        this.health--;
        console.log(this.health);
    }, 1000);
}

var rich = new Fraud();
```

```
setInterval( function fade() {
    this.health--;
}, 1000);
```

**vs**

```
setInterval( () => {
    this.health--;
}, 1000);
```


doStuff();
function doStuff() {
var one = 1;
if (one >= 1 ) {
var two = 2 * 1;
} else {
var two =
}
var result = one + two;
console.log( result );
}
function doStuff() {
var one = 1, two, result;
if (one >= 1 ) {
two = 2 * 1;
} else {
two = 2;
}
result = one + two;
console.log( result );
}
doStuff();
arrow
no hoisting


array.map( x => x.length );


block
scope

# es5 only has **function (scope)**

```
function myDudes() {
    var RLM = [
        'Mike',
        'Jay',
        'Rich Evans'
    ];

    return RLM;
}

RLM; // can't touch this
```

# es6 adds **{ block scope }**

```
var RLM = [ 'Mike', 'Jay' ];

{
    let disease = 'AIDS';
}

disease; // can't touch this
```

keyword **let**

or **const**

## *implicit* ***block***

```
if ( bool ) {
    let thing = 'a boob';
    console.log(thing);
}
```

## *explicit* ***block***

```
if ( bool ) {
    {
        let thing = 'a boob';
        console.log(thing);
    }
}
```

# let me loop

```
for ( let i = 0; i < 10; i++ ) {
    console.log( i );
}

console.log( i ); // ReferenceError
```

# **es6** kicking **ass**

```
for ( let i=1; i<=5; i++ ) {
    setTimeout( () =>
        console.log(i),
    i * 1000 );
}
```

*now try that in es5*

# **in es6** you can use **a block** instead of this

```
(function() { // IIFE

    var name = 'My Library';
    var version = 0.1;
    var fun = function() {}

    window.yabRary = {
        name: name,
        version: version,
        fun: fun
    }

}());
```

# const

*vs let vs var*

# **const** me up, before you go go

```
const RLM = [
    'Mike',
    'Jay',
    'Rich Evans'
];

RLM.forEach(
    name => console.log( name );
);
```

# **can't re-assign** a const

```
const tax = 0.5;
tax = 0.2; // error
```

but you **can** change a const array

```
const RLM = [ 'Mike', 'Jay' ];
RLM.pop();
```


object literal
extensions

```
let name = 'Marceline';
```

## es5

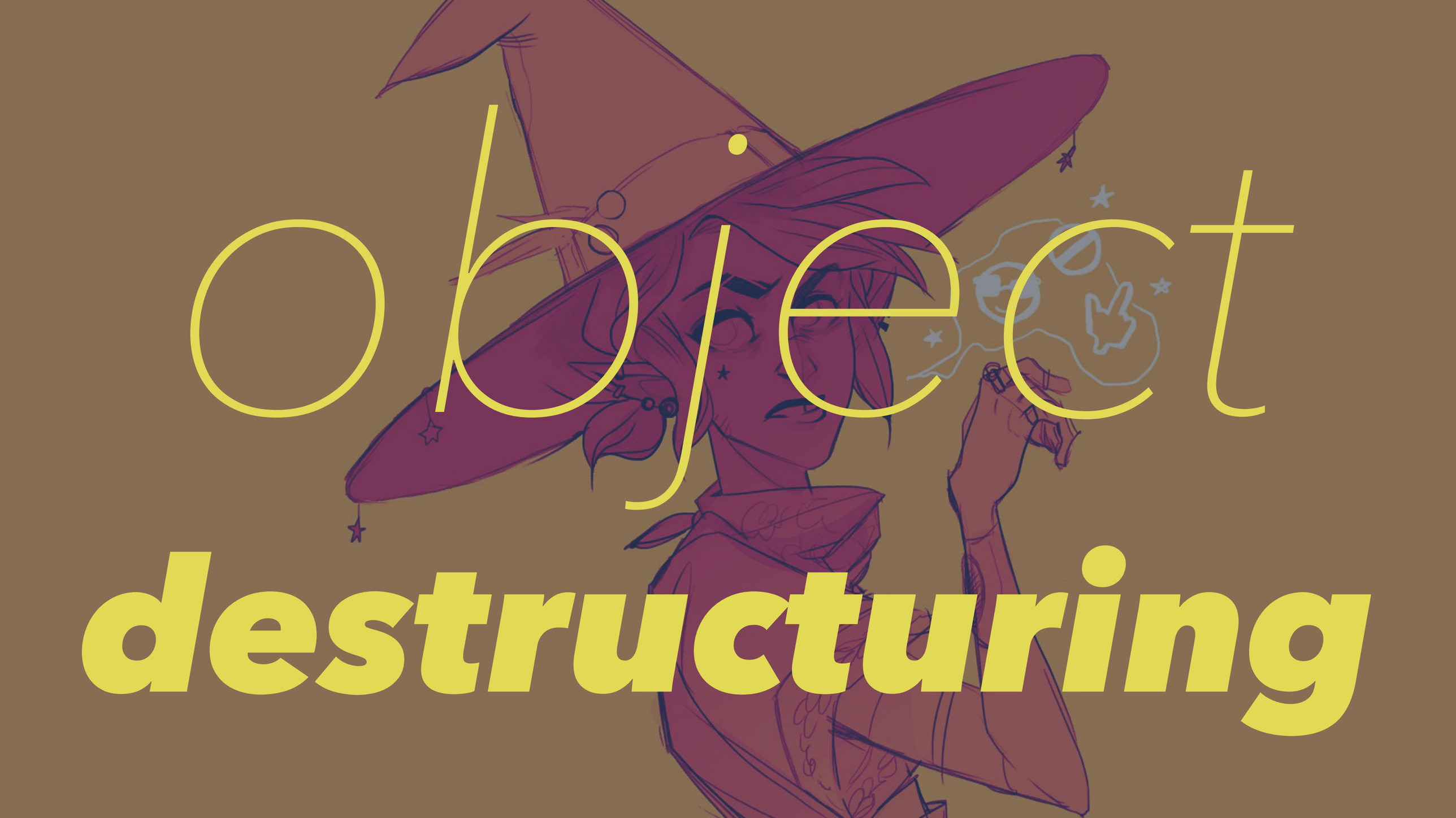
```
let player = {
    name: name,
    getName: function() {
        return this.name;
    }
};
```

## es6

```
let player = {
    name,
    getName() {
        return this.name;
    }
};
```

# computed property names

```
let name = 'Marceline';

let player = {
    name,
    getName() {
        return this.name;
    },
    [ 'pretty' + name ]: true // <- this bit here
};

player.prettyMarceline; // true
```



# object

# destructuring

# *object* **destructuring**

```
let hornyBoy = {
    name: 'Taako',
    race: 'Elf',
    weapon: 'Umbra Staff',
    level: 12
}

let { name, level } = hornyBoy;
```

# even with **functions** and **arrays**

```
// function params
function getData( { name, level } ) {
    console.log( name + ' ' + level );
}

getData( hornyBoy );


// array
const RLM = [ 'Mike', 'Jay', 'RichEvans' ];
let [ one, two, three ] = RLM;
```


rest
spread

# **...rest** parameters

```
function doMath( ...rest ) {
    let sum = 0;
    rest.forEach( num => sum += num );
    return sum;
}

doMath( 1, 2, 3 )
```

# **...rest** parameters have to go **last**

```
function doMath( times, ...rest ) {
    return rest.reduce(
        ( sum, value ) => sum + value
    ) * times;
}
```

# the opposite of rest, **spread**

```
const adventureZone = [
    'Magnus',
    'Taako',
    'Merle'
];

function spread( one, two, three ) {
    console.log(one, three);
}

spread( ...adventureZone );
```


default
parameters

# **defualt** *parameters*

```
function discount(price = 10, perc = 10*2, tax = getTax()) {
    // fancy math...
}
```

**can be**

- a value
- an expression
- result of a function

# template

# strings

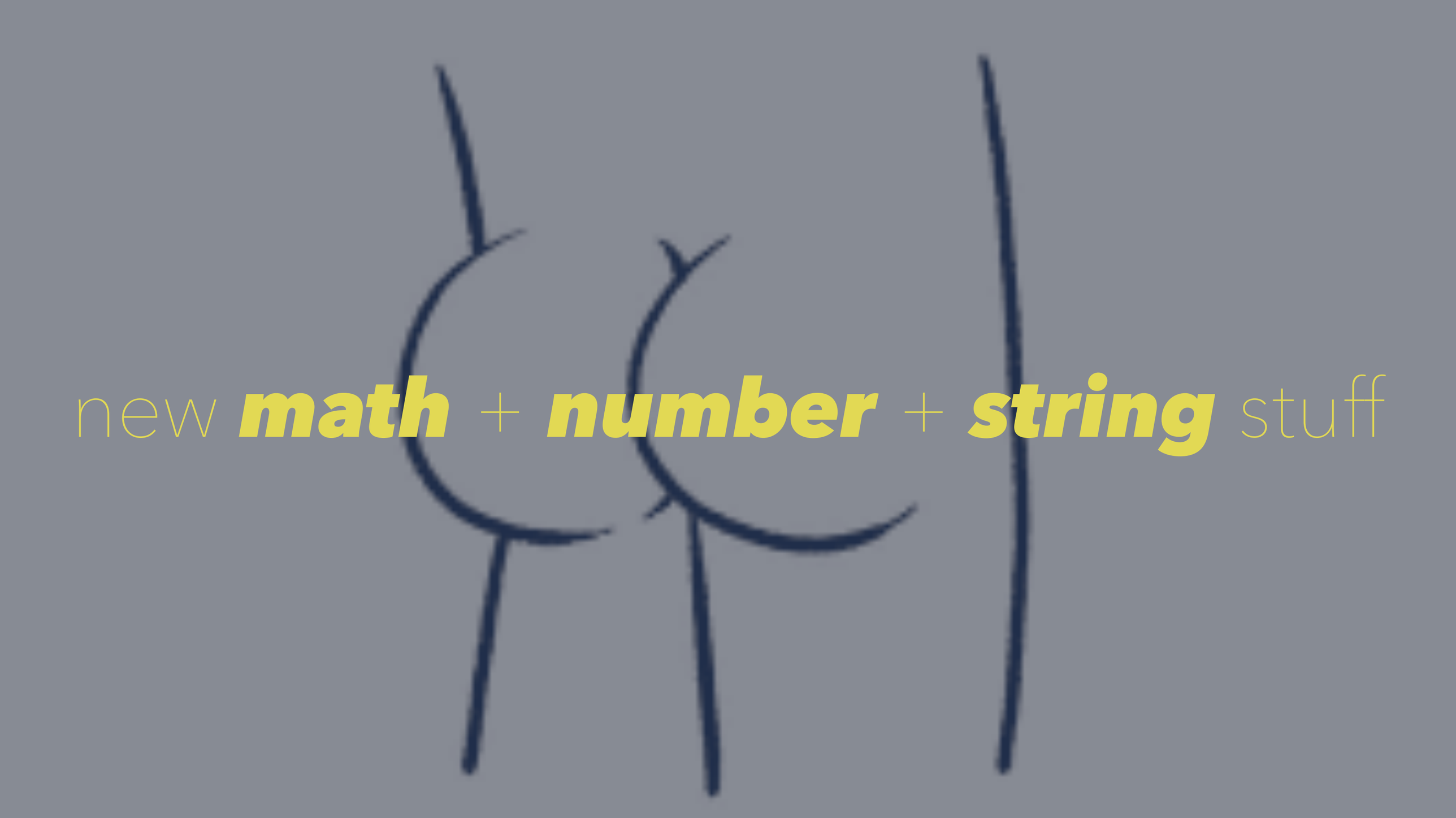
# **multi-line,** "smart"

```
let title = 'hot piss';

`<article>
    <h1>${title}</h1>
</article>`


let className = 'active';
`<img class="${className}">`
```

# **use expressions,** still just a string

```
`Pieseň od ${artist} sa volá ${song} a 2 + 2 je ${ 2+2 }`
```

```
`
    Pieseň od ${artist}
    sa volá ${song}
    a 2 + 2 je ${ 2+2 }

`.toUpperCase();
```


new **math** + **number** + **string** stuff

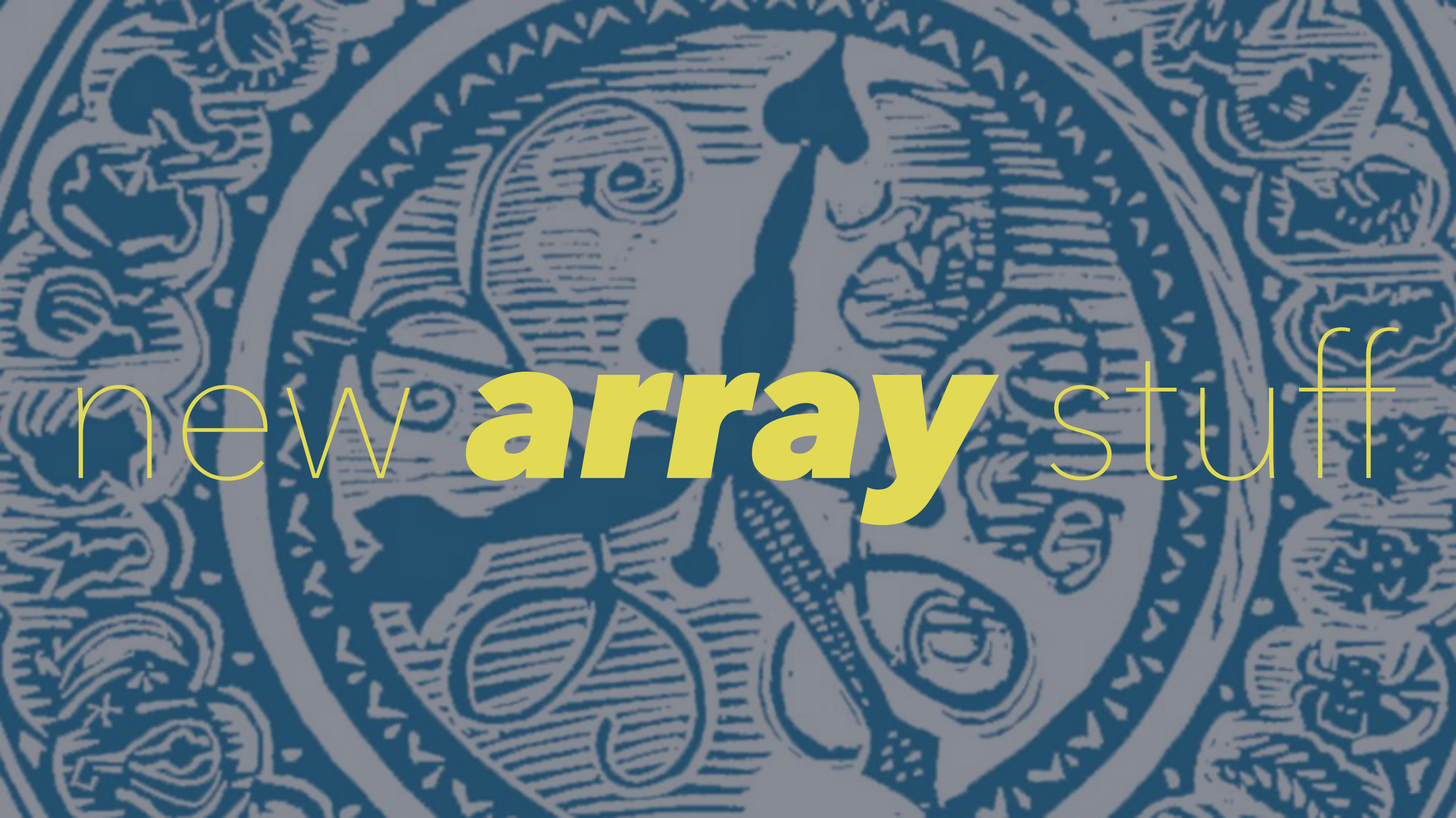
# **String** APIs

```
'I suck butts.'.includes('suck')
'I suck butts.'.startsWith('I suck')
'I suck butts.'.endsWith('ts.')
```

```
let name = 'Vasho';
`<li>${name}</li>`.repeat(5)
```

# **Number** / **Math** APIs

```
Number.EPSILON
Number.isFinite()
Number.isInteger()
Number.isNaN()


Math.cosh()
Math.sinh()
Math.hypot()
...
```


new array stuff

# **Array** APIs

```
// Jay in array?
const RLM = [ 'Mike', 'Jay', 'Rich Evans' ];
RLM.includes('Jay');

// find 1st with name longer than 4
RLM.find( name => name.length > 4 )

// find his location
RLM.findIndex( name => name.length > 4 )
```

# **Array** APIs

```
// check MDN for these
Array.from(), Array.of()
[].fill(), [].copyWithin()


// does ANYONE have more than 4 letters?
RLM.some( name => name.length > 4 )

// does EVERYONE?
RLM.every( name => name.length > 4 )
```

# **Array** APIs

```
// any admins in da house?
const users = [
    { name: 'Marceline' },
    { name: 'Lyra', administrator: true },
    { name: 'Matilda' }
];

users.some( user => 'administrator' in user );



// iterator? wat??
users.values()
users.keys()
users.entries()
```

# iterators

## *for...of*

# Iterator

```
const RLM = [ 'Mike', 'Jay', 'Rich Evans' ];
let iterator = RLM.entries();

// gimme the next one
iterator.next();

// and so on
iterator.next().value;

// are we done?
iterator.next().done;
```

# **for...of** loop

```
// loop through iterator
for ( let val of RLM.entries() ) {
    console.log( val );
}

// it loops through everything
(function(){
    for ( let arg of arguments ) console.log( arg );
}(1, 2, 3));
```

# generator

## functions

# a function **you can step through**

```
// * = generator
function *kittenMe() {
    yield 'Liz McClarnon';
    yield 'Kerry Katona';
    yield 'Heidi Range';
}

// returns an iterator object
let iter = kittenMe();

// .next() starts the dance
iter.next();
iter.next().value;
```

# **id me,** please

```
function *idGenerator() {
    let id = 0;

    // this is fine (in generators)
    while ( true ) {
        yield ++id;
    }
}

let gen = idGenerator();
gen.next();
gen.next();
```


Promise

# promise

a value we **don't have yet** but will **in the future**

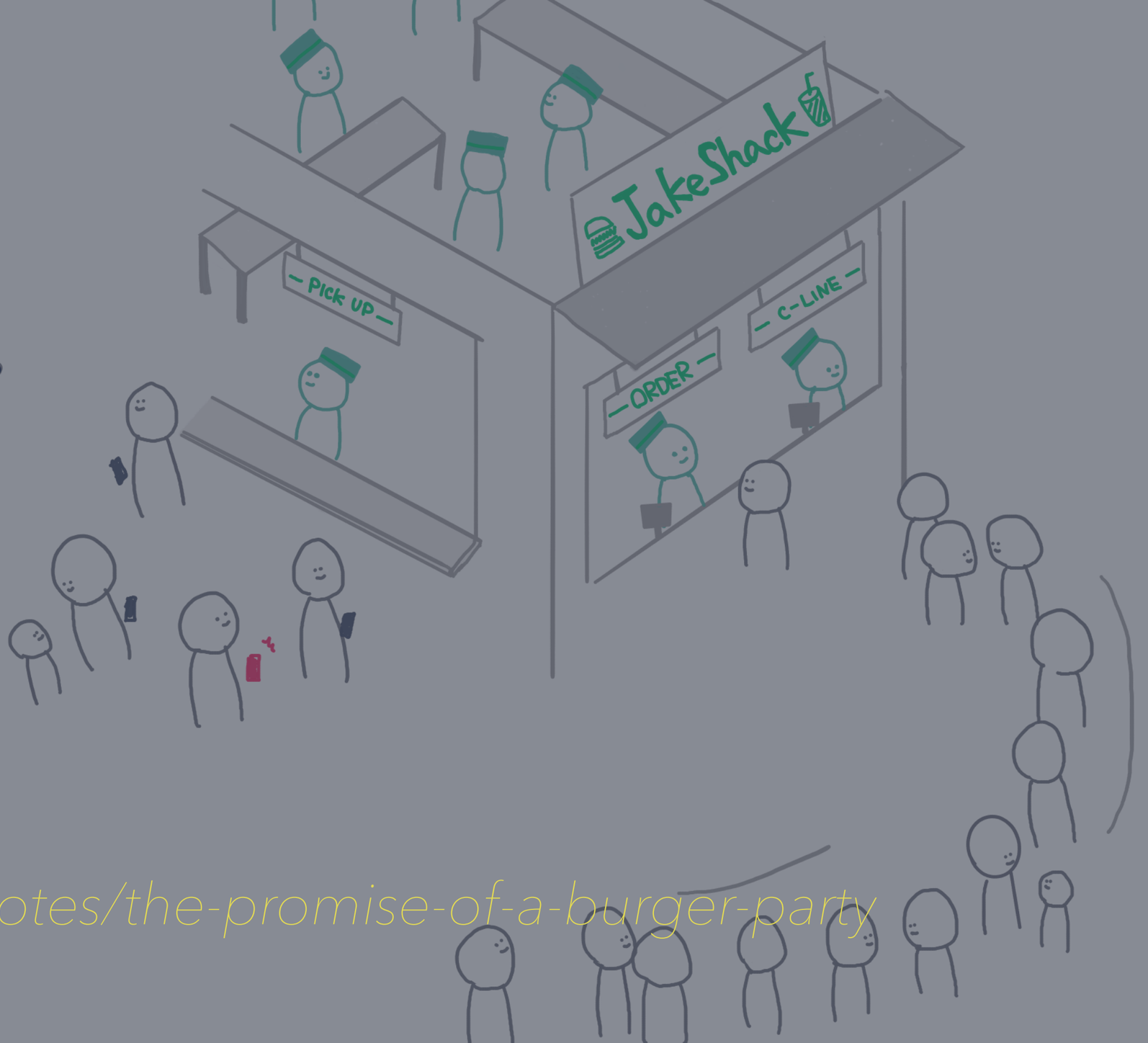
```
let data = fetch(
    'https://itunes.apple.com/search?term=kolowrat'
);

data.then( res => res.json() )
    .then( out => console.log(out) );
```

**when** we get the answer **then()** we do stuff

# The Promise of a BURGER PARTY

written by @kosamari

A quest to understanding JavaScript Promise




https://kosamari.com/notes/the-promise-of-a-burger-party

# **promise** template

```
var promise = new Promise(function(resolve, reject) {
  // do a thing, possibly async, then…

  if (/* everything is ok */) {
    resolve("Stuff worked!");
  }
  else {
    reject(Error("It broke"));
  }
});
```

# how you **use it**

```
// many libraries are built on promises
// this is how you USE them

promise.then(function(result) {
  console.log(result); // "Stuff worked!"
});

promise.catch(function(err) {
  console.log(err); // Error: "It broke"
});
```

# let's imagine **get()** fetches json

```
// these do the same thing
let promise = get('search?term=kolowrat');
promise.then( res => 'yay!' )
       .catch( err => 'oh:(' );

// or
promise.then(
    res => 'yay!', err => 'oh:('
);

// or even
get('search?term=kolowrat')
    .then(  res => 'yay!' )
    .catch( err => 'oh:(' )
```

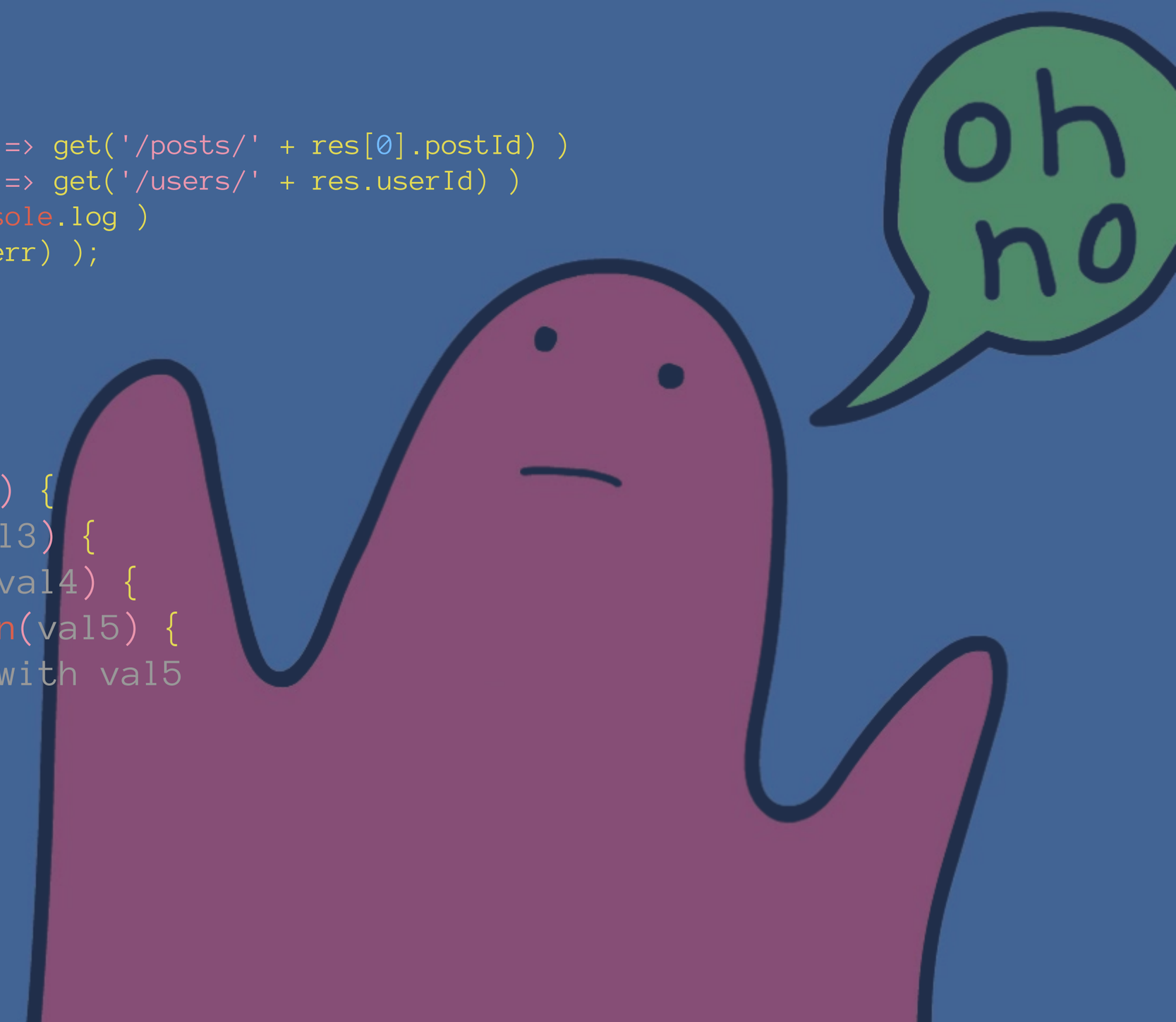
# Promise.all( ) / Promise.race( )

```
// starts timer, returns promise
function start(id, time) {
    return new Promise( (res, rej) => setTimeout( () => res(`${id} done`), time ) );
}

// start 3 timers
let timers = [ start(1, 4000), start(2, 1000), start(3, 2500) ];
```

```
// when ALL finish
Promise.all( timers ).then(  res => 'all done' )
                     .catch( err => 'damn:(' );

// when FIRST finishes
Promise.race( timers ).then(  res => '1st found' )
                      .catch( err => 'damn:(' );
```

```
get('/comments')
    .then( JSON.parse ).then( res => get('/posts/' + res[0].postId) )
    .then( JSON.parse ).then( res => get('/users/' + res.userId) )
    .then( JSON.parse ).then( console.log )
    .catch( err => console.error(err) );
```

```
func1(function(val1) {
  func2(val1,function(val2) {
    func3(val2,function(val3) {
      func4(val3,function(val4) {
        func5(val4,function(val5) {
          // Do something with val5
        })
      })
    })
  })
})
```




async await

# write **async code** like it was **sync**

goodbye, callback hell (you piece of shit)

```
(async function() {
    try {
        let comments = await get('/comments');
        let post = await get('/posts/' + comments[0].postId);
        let user = await get('/users/' + post.userId);

        console.log( user.name );
    }
    catch (err) {
        console.log('nope', err);
    }
}())
```

# *sequential*

```
// takes 6,5 seconds
let timer1 = await start(1, 4000);
let timer2 = await start(2, 2500);
```

# VS. *parallel*

```
let timer1 = start(1, 4000);
let timer2 = start(2, 2500);

// takes 4 seconds
await timer1; await timer2;
```


# map & set

# SET

collection of **unique** values

```
let tags = new Set([
    'petite',
    'ebony',
    'ebony',
    'scat'
])

set.forEach( val => console.log(val) ) // petite, ebony, scat

for ( let val of set ) {
    console.log(val) // petite, ebony, scat
}
```

# SET

collection of **unique** values

```
let set = new Set()
set.add('one').add('two').add('two') // one, two

set.size                // 2
set.delete('two')  // one
set.has('two')       // false

// remove duplicates from array
var arr = [...new Set([1, 3, 2, 3, 3])]
```

# MAP

**key-value** pairs where **key** can be **anything**

```
let logo = document.querySelector('#logo')

// the key can even be an HTML node
var meta = new Map()
meta.set(logo, {
    animated: false,
    nice: true
})
```

# **MAP** (dictionary)

```
for ( let item of meta.keys() ) { // meta.values(), meta.entries()
    console.log( item )
}

meta.size
meta.has(logo)
meta.delete(logo)
meta.clear()
```

# **WeakMap**

```
// can be garbage collected
let weak = new WeakMap().set(logo, { 'nice': true });
```


Symbol

# Symbol

for creating **unique names** for **object properties**

```
let one = Symbol('hey')
let two = Symbol('hey')
one === two // false


// these won't overwrite each other (good for libraries)
{
    name: 'vasho',
    [Symbol('name')]: 'jquery',
    [Symbol('name')]: 'beyoncé',
    [Symbol('name')]: 'wat'
}
```


getters
setters

# Getter

calls a **function** when you access a **property**

```
let legend = {
    first: 'Vašo',
    last: 'Patejdl',

    // you can format things before output (like time & date)
    get fullName() {
        return this.first + ' ' + this.last;
    }
}

legend.fullName // Vašo Patejdl
```

# Setter

calls a **function** when you try to **set a property**

```
let legend = {
    first: 'Vašo',
    last: 'Patejdl',
    oldness: 31,

    // good for VALIDATION
    set age( val ) {
        if ( ! Number.isInteger(val) ) return 'error';
        this.oldness = val;
    }
}

legend.age = 'balls' // error
legend.age = 69 // 69
```


proxy

# Proxy

## add **validation** or **behaviour** to objects

```
let legend = {
    first: 'vašo',
    last: 'patejdl',
    age: 31
}

// set a TRAP for when a property gets set
legend = new Proxy(legend, {
    set: function( target, name, val ) {
        if ( name === 'age' ) {
            if ( ! Number.isInteger(val) ) return;
        }

        target[name] = val;
    }
});
```

# other good stuff

## *exponentiation*

```
2 ** 6 // Math.pow(2, 6)
```

## *.padStart() .padEnd()*

```
console.log( '0.00'.padStart(20) )                    0.00
console.log( '10,000.00'.padStart(20) )           10,000.00
console.log( '250,000.00'.padStart(20) )         250,000.00
```

# *better unicode*

```
// es5
let text = '🏇👨❤️';
text.length; // 5? wat

for (let i = 0; i < text.length; i++) {
    console.log(text[i]); // 🏇 👨 ❤
}


// es6+
for (let char of '🏇👨❤️') {
    console.log(char) // 🏇👨❤️
}
```


class

# class syntax

```
class Human {
    // properties
    constructor( first, last, age ) {
        this.first = first;
        this.last = last;
        this.age = age;
    }

    // getters setters
    get fullName() {
        return this.first + ' ' + this.last;
    }

    // methods
    who() {
        return `${this.fullName} is ${this.age} years old.`;
    }
}
```

# create **new** objects

```
// use the NEW keyword
let people = [
    new Human( 'Mária', 'Trošková', 15 ),
    new Human( 'Tomáš', 'Maštalír', 33 ),
    new Human( 'Tim',  'Heidecker', 40 )
];

// iterate over them
people.map( person => person.who() )
```

# **inheritance** (extends Class)

```
class Legend extends Human {
    constructor( first, last, age ) {
        super( first, last, age ); // call constructor of parent
        this.hits = [ 'Voňavky dievčat', 'Kamarátka nádej', ... ]; // add new props
    }

    // add new methods
    writeHit() {
        let hit = _.random(this.hits);
        return super.who() + `\n Just wrote ${hit}.`; // call .who() of the parent
    }
}

let legend = new Legend('Vašo', 'Pat', 33);
legend.who();
```

# modules

# Modules

because we wanna forget these

AMD, UMD, CommonJS,
RequireJS, Browserify...

```
// and this
var ModulePattern = (function () {

  return {
    publicMethod: function () { // code }
  };

})();
```

# import / export

lets us split js into **multiple files** each has its **own scope**

```
// math.js
export let bestNumber = 69;
export function doMath(...rest) {
    return rest.reduce((sum, val) => sum + val);
}

// app.js
import { bestNumber, doMath } from "./math.js";
import * as math from "./math.js";
```

# import / export

```
// rename stuff (works with export too)
import {
    bestNumber as nice,
    doMath as sum
} from "./math.js";

console.log( nice, sum(1,2,3) );


// DEFUALT export, skip the { } in import
export default class Mario { ... }
import Mario from "./math.js";
```

# great job!

*u pro @ es6 now*