# Before we begin...

- Open up these slides:
  - https://bit.ly/2s1E6RN
- Open up the documentation:
  - THREE.js Docs
- Have a look through some examples:
  - THREE.js Examples

# Projects


# Learning Objectives

- **Understand** WebGL and requestAnimationFrame
- **Understand** X, Y and Z planes
- **Use** THREE.js effectively
- **Figure** out where to go next

# Agenda

- THREE.js
- Project Presentations
- Wrap up
- Where next?
- Grad!

# Review

- THREE.js

# THREE.js


# Examples

# What are we building?

# Background

# What is THREE.js?

The aim of the project is to create a lightweight 3D library with the lowest level of complexity

More or less, it is an attempt to make 3D stuff easier in browsers

# Who made THREE.js?

- A guy named Ricardo Cabello (but everyone calls him Mr. Doob)
  - Website
  - Github
  - Twitter

# What is it created with?

# What is it built with?

- It's built on top of WebGL, a JavaScript API
- It uses a renderer to show the 3D environment
  - Renderers for Canvas, SVG, CSS3D

# How do we include it?

- Just like any other JavaScript library
- We reference the Three.js script before our own (or use NPM)
- There are also a bunch of helper files that you can use too, like:
  - Orbit Controls
  - datGui

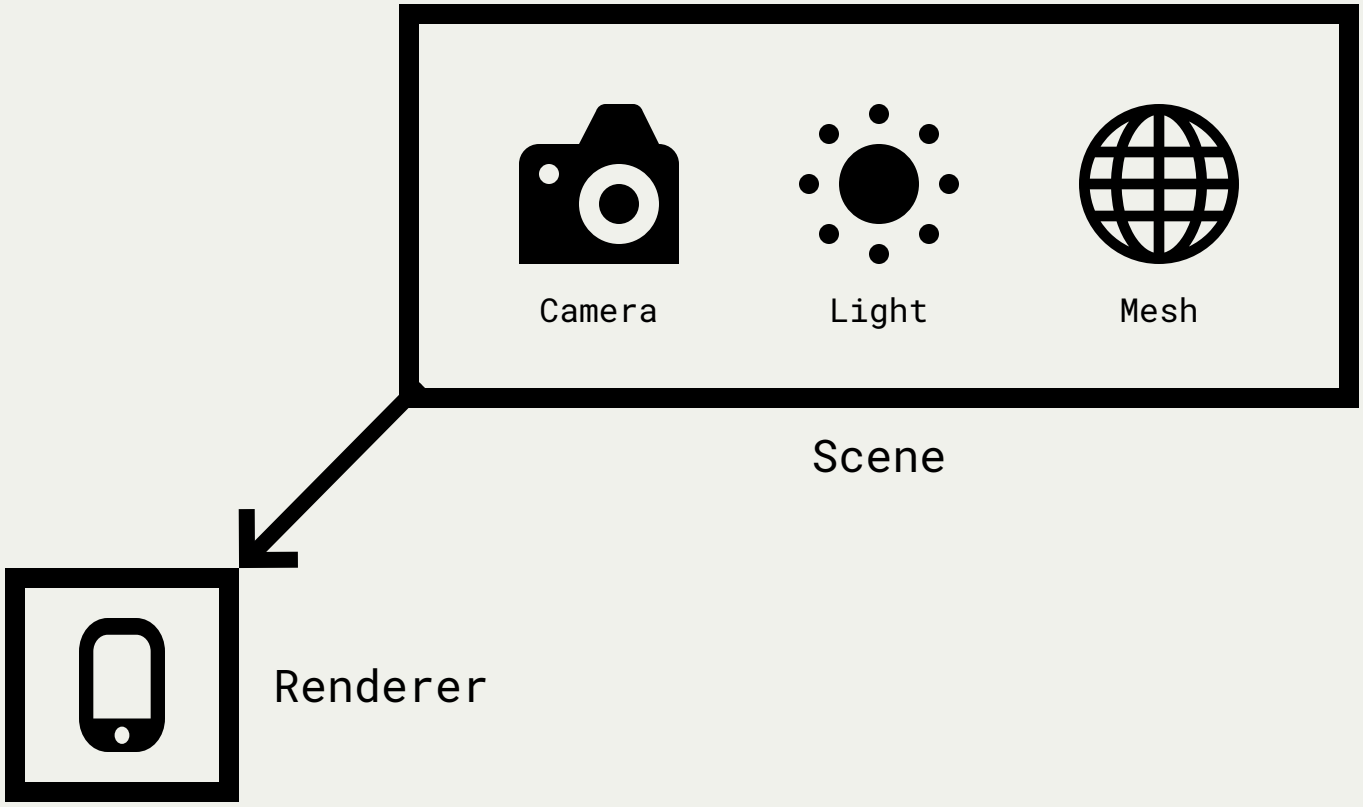
# Key Components

# Key Components

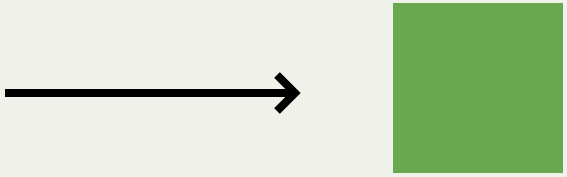
- Camera
- Scene
- Renderer
- Light(s)
- Mesh(es)

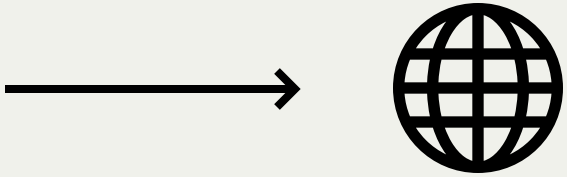
We extend the stuff that Three.js provides

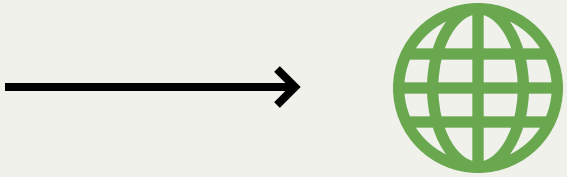
# Key Components



# What is a mesh?

Material 

Geometry 

Mesh 

# What will we be using?

# What will we be using?

- Three.js
- OrbitControls.js ?
- Stats.js ?
- datGui.js ?

# requestAnimationFrame

In order to show changes in a Three.js scene, we need to re-render it. **setInterval** used to be the way we do that, but now we use **requestAnimationFrame**. Why?

- It runs as quickly as possible (higher FPS)
- It stops when the tab or window is no longer active (better battery life)
- It times it correctly for optimum performance
- Is often hardware-boosted

# Coding time!

# Scene & Camera

```
const scene = new THREE.Scene();

let width = window.innerWidth;
let height = window.innerHeight;

let camera = new THREE.PerspectiveCamera(45, width / height, 0.1, 1

camera.position.x = -30;
camera.position.y = 40;
camera.position.z = 30;

camera.lookAt(scene.position);
```

# Renderer

```
let renderer = new THREE.WebGLRenderer();
renderer.setClearColor("#ECEFF1");
renderer.setSize(window.innerWidth, window.innerHeig

document.querySelector("#output")
        .appendChild(renderer.domElement);

renderer.render(scene, camera);
```

# Our first shape

```
let cubeGeometry = new THREE.BoxGeometry(4, 4, 4);
let cubeMaterial = new THREE.MeshBasicMaterial({
  color: "#FF8F00",
  wireframe: true
});

let cube = new THREE.Mesh(cubeGeometry, cubeMateria
```

# Project Time!


# Send out your links!

- GitHub Repository
- Hosted Website

# What to cover?

- An overview of your idea
- An overview of your code's structure
- A walkthrough of your code
  - Talk about anything you used that we didn't cover
- Sore bits
- Cool beans
- What did you learn?
- Where next? What will you add?
- Q & A

Let's get into it!

# It's all over!


We don't care about final projects

The real project is inside you

And it will never be finished

Mwahahaha!

# You now know enough!

It's been 10 weeks, and you know a lot more than you would expect or realise

But you have so much more to learn

We all do

That is a great thing!

# So, what now?


# What now?

You never have to see me again!

- Don't stop coding: practice
- Learning new languages and frameworks makes you better at other ones
- Participate: meetups, conferences, events, Twitter, GA
- Stay in touch with each other
- Enjoy: it's going to be easier that way
- ***Get great: blow my mind!***

# Roadmap Time!

# Lots of stuff...

- Practice
- Learn
  - Read
  - Watch
- Passive Consumption
- Meetups
- Conferences

# Practice

- Code every day
  - Do things like Codevember
- John Resig - Write code every day
- Exercism, CodeWars, CodeKatas, Project Euler
- Learn something new!
  - It doesn't have to just be something web-related
    - Audio
    - Visual

# Learn - Read

- Eloquent JavaScript
- Speaking JavaScript
- You Don't Know JS
- JavaScript: The Definitive Guide
- JavaScript: The Good Parts
- Exploring JS
- Functional-Light
- Essential JS Design Patterns

# Learn - Watch

- CodeAcademy
- CodeSchool
- Egghead
- FrontEndMasters
- Udacity
- Udemy
- Tyler McGinnis

# Passive Consumption

- Twitter
- Newsletters
- GitHub
- Podcasts (some more here)
- Inspiration

# Passive Consumption

- SydJS
- SydCSS
- CodeBar
- NodeSchool
- GA Events, Classes and Workshops
- Hackathons (e.g. Random Hacks of Kindness)
- Plus, just browse Meetup (like this page)

# Conferences

- Web Directions
- JS Conf and CSS Conf
- LevelsConf
- CampJS
- International Stuff (e.g. JSConfs)
- Videos of them

# Me Time!


# Why do I teach?

- Lots of reasons!

# Stay in touch!

- Email: wolf@ga.co
- Twitter: @threequal
- Hang around at GA!

# Thank you!

# You Time!


# Surveys!

# That's all, folks!