Three.js

Brait Ōispuu
Three what?

- Three.js is a JavaScript library that helps us create 3D computer graphics using WebGL
- WebGL is a js API for rendering 3D graphics in a browser without plug-ins
Lights, camera, action!

- Three.js
- Script tags
- Scene
- Camera
- Renderer
Scene

- As is
- Can add fog
  - Linear growth with distance
  - Exponential growth with distance
Camera

- PerspectiveCamera
- Field of view
- Aspect ratio
  - Width divided by height
- Near and far clipping pane
  - When to render something
- Different kinds
  - CubeCamera
  - OrthographicCamera
  - StereoCamera
Different kinds

- WebGLRenderer
- Others usually as fallbacks

Size

- Innerwidth, innerheight

Resolution

- updateStyle
Lights, camera, actors?

- Geometry
  - Size
  - Shape
- Material
  - Color
  - Characteristics
- Objects
  - Mesh
  - A mix of the two
  - Position
function render()
- 60 fps
- `requestAnimationFrame`
  - An optimized `setInterval`
- Everything you change goes in here!
Lines!

- There are new materials for achieving this
  - LineBasicMaterial
  - LineDashedMaterial
- Geometry is different too
  - Push vertices
Step up

- Updating
  - Use functions inside render()
  - Change positions
  - Change color
  - Create randomness
Geometry

- Being outperformed by BufferGeometry
  - Stores all data in buffers
  - Reduces cost of passing everything to the GPU
  - Harder to manipulate, work with attribute buffers
  - Best for static solutions
Geometry (2)

- Box
- Circle
- Cone
- Cylinder
- Dodecahedron
- Edges
- Extrude
- Icosahedron
- Lathe
- Ochtahedron
- Parametric
- Plane
- Polyhedron
- Ring
- Shape
- Sphere
- Tetrahedron
- Text
- Torus
- TorusKnot
- Tube
- TubeBuffer
- Wireframe
Material

- LineBasicMaterial
- LineDashedMaterial
- Material
- MeshBasicMaterial
- MeshDepthMaterial
- MeshLambertMaterial
- MeshNormalMaterial
- MeshPhongMaterial
- MeshPhysicalMaterial
- MeshStandardMaterial
- MeshToonMaterial
- MultiMaterial
- PointsMaterial
- RawShaderMaterial
- ShaderMaterial
- ShadowMaterial
- SpriteMaterial
Material (2)

- LineBasicMaterial, LineDashedMaterial
  - Wireframe-style geometries
- Material
  - Abstract base class
- MeshBasic
  - Not affected by lights
- MultiMaterial
  - Different materials by face
Let there be light!

- A lot of different kinds
- AmbientLight
  - Global light, no direction, no shadows
- DirectionalLight – Sunshine!
- HemisphereLight – The sky!
- PointLight – A lightbulb
- RectAreaLight – A window
- SpotLight
  - One point, one direction, but emitted along a cone
Shadows!

- Enable shadows in the renderer
- CastShadow
- ReceiveShadow
That’s it for the basics!