AR/VR Workshop
Part 2: **A-Frame basics**

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Learning plan

Introduction	Overview – outline goals Setting up google cardboard with glitch.com & github
A-frame basics	Simple A-frame examples Work with glitch.com
Foundations	JavaScript, DOM, events, Web-Components
A-frame components	Defining A-frame components
Three.JS and A-frame	Basics of Three.js for A-frame
Entity component architecture (ECA)	Three.js and ECA with standard OO paradigm
A-frame and planets	Complex 3D a-frame, work with complex a-frame detail and basic planetary math; illustrate ECA, geometries, controls, etc.
A-frame and animations	Goal: show how to do basic animation
Conclusion	Goal: review our learning

Outline

A-frame scenes

Basic A-frame geometric objects

New web tab: Hex Color picker - Color Picker (colors-picker.com)
https://colors-picker.com/hex-color-picker/

Getting a-frame from aframe.io

```
<head>
   <script src="https://aframe.io/releases/1.4.1/aframe.min.js">
   </script>
</head>


Or
 <body>
  <script src="js/aframe.io_releases_1.4.1_aframe.min.js"></script>
```

Basics

Primitive	What	Link
a-scene	Global root object contains all entities	https://aframe.io/docs/1.4.0/core/scene.html
a-text	Text	https://aframe.io/docs/1.4.0/primitives/a-text.html
a-box	3D Box	https://aframe.io/docs/1.4.0/primitives/a-box.html
a-sphere	3D Sphere	https://aframe.io/docs/1.4.0/primitives/a-sphere.html

3D geometric terms

Mesh or geometry

Vertices, edges and faces defining a 3D object

Texture

Color and appearance of a surface

Full representation: mesh and texture

Textures

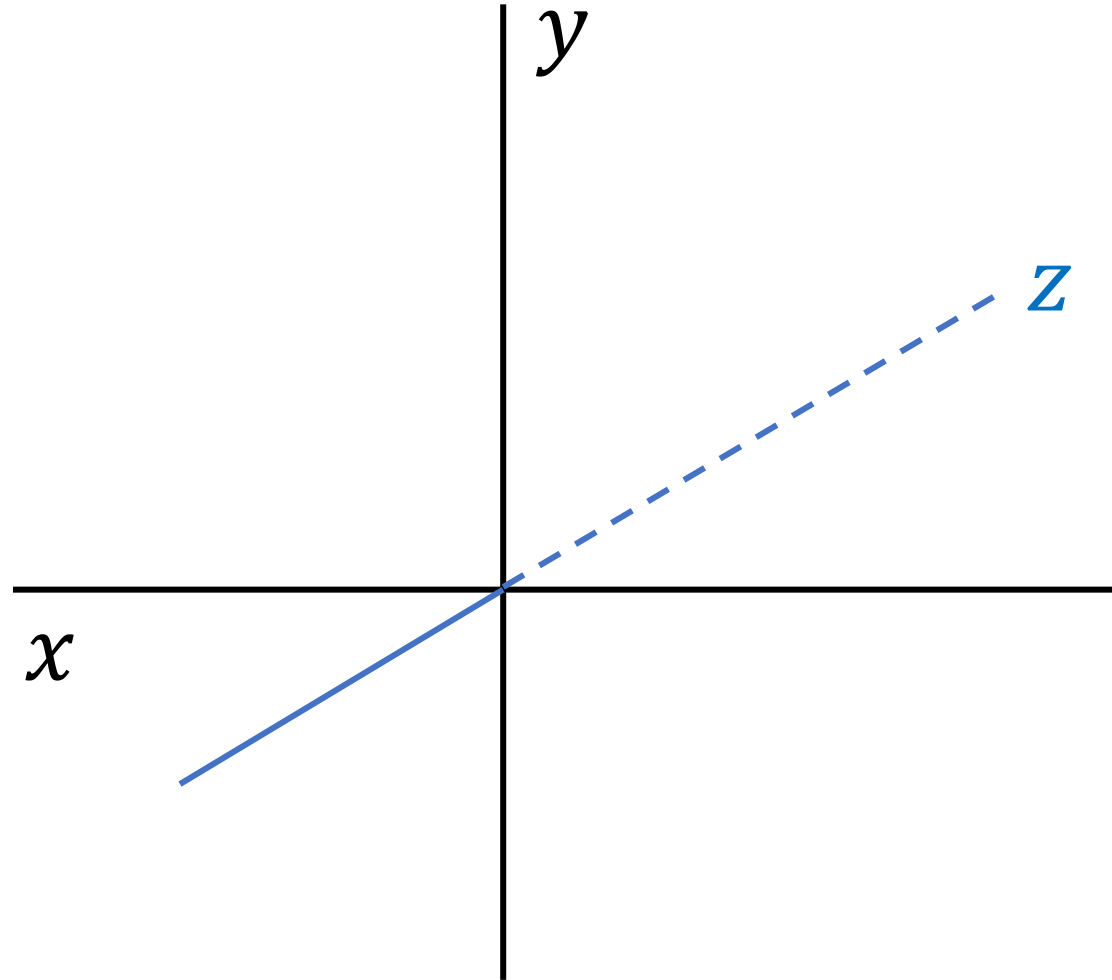https://github.com/aframevr/sample-assets/tree/master/assets/images

Make our own src

A-box – in a scene

```
<a-box position="-1.5  1  -1.5"
       rotation="0 0 0"
        color="blue">
</a-box>
```
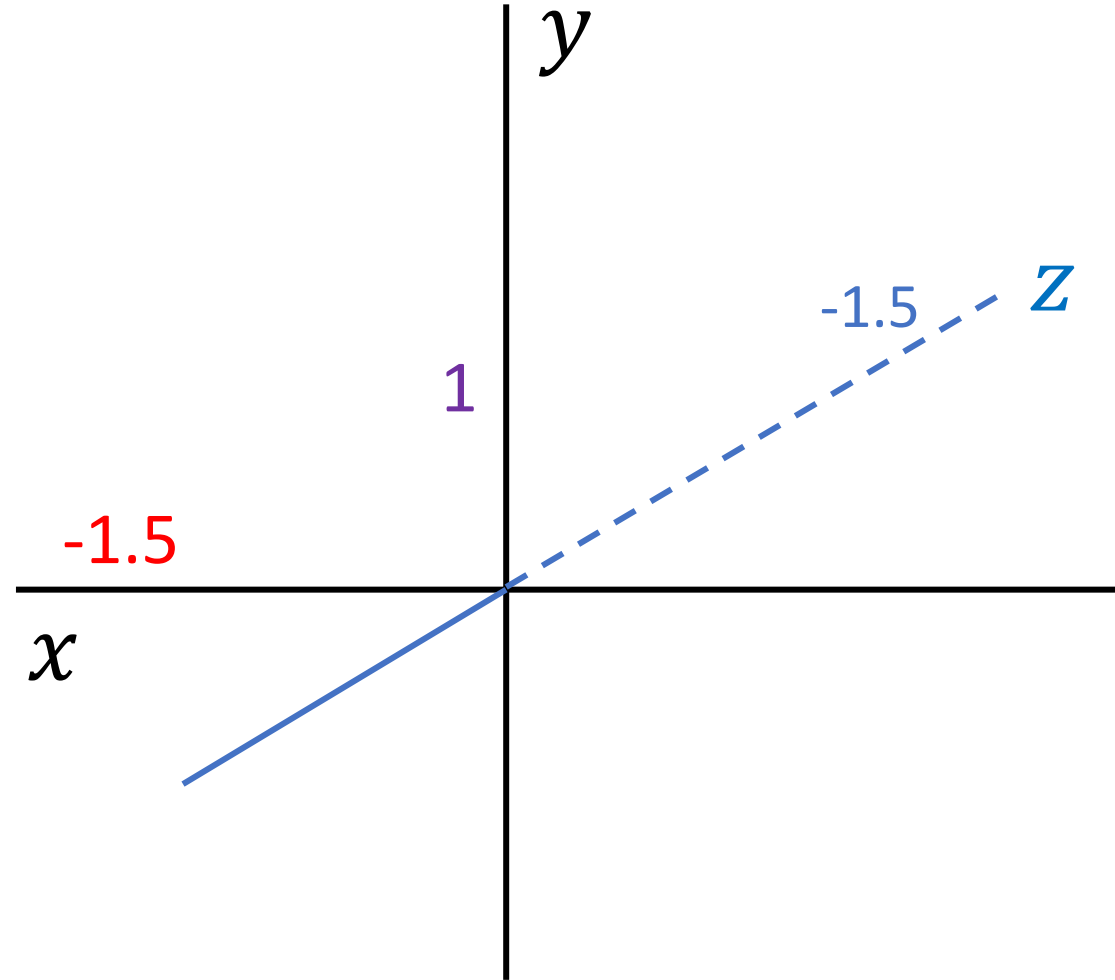
x: pitch

y: yaw

z: roll

A-box

```
<a-box position="-1.5  1  -1.5"
       rotation="0 0 0"
        color="blue">
</a-box>
```

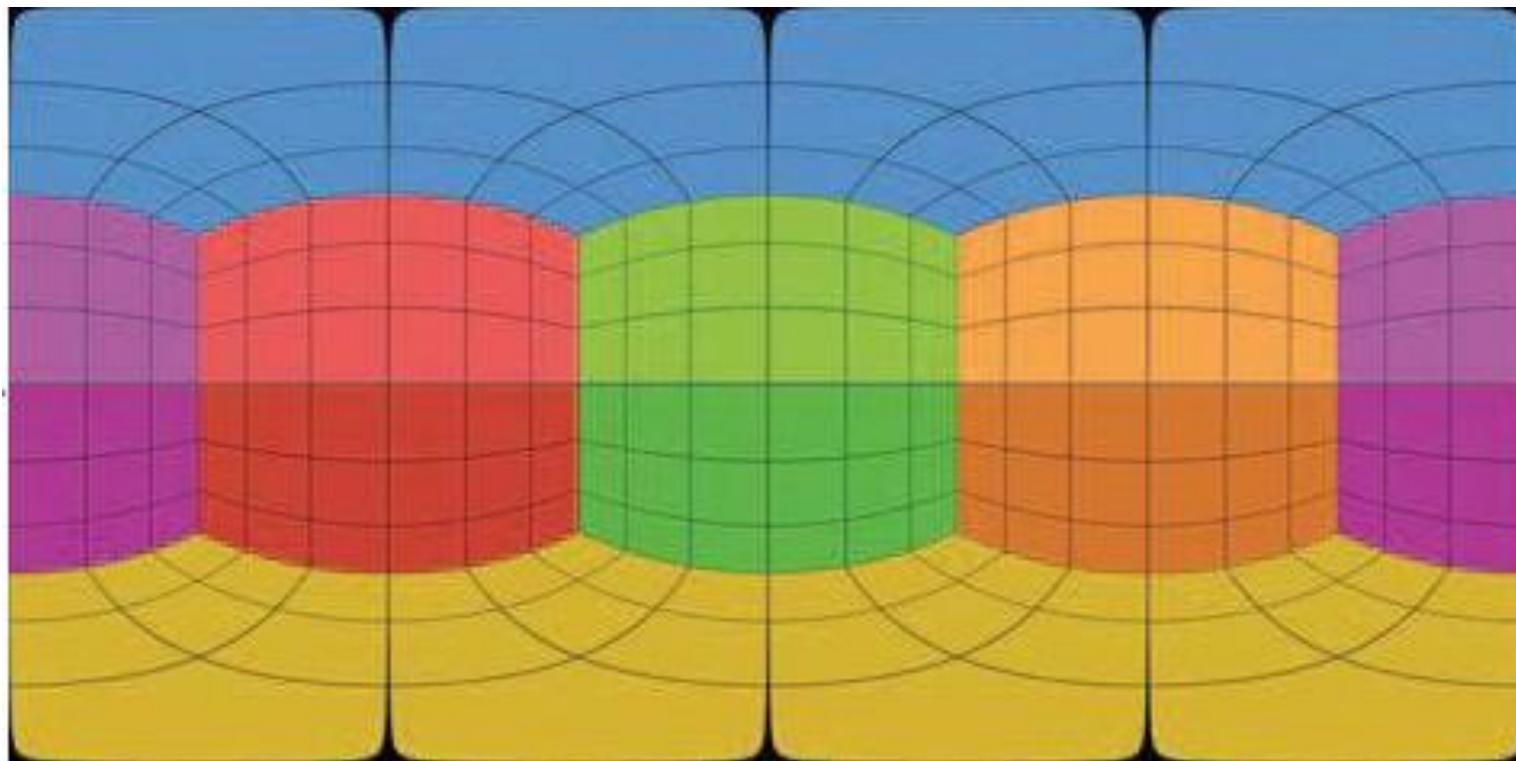# VR images / videos

360º images / videos

Put in the camera's perspective

Camera defaults to (0,0,0)

VR Images

A-box

```
<html>
 <head>
  <script src="https://aframe.io/releases/1.4.1/aframe.min.js"></script>
 </head>
 <body>
  <a-scene>
   <a-box position="-1.5  1  -1.5" rotation="0 0 0" color="green"></a-box>
  </a-scene>
 </body>
</html>
```

Several geometric components

```
<a-box position="-1 0.5 -3" rotation="0 45 0" color="red">
</a-box>
<a-sphere position="0 1.25 -5" radius="1.25" color="blue">
</a-sphere>
<a-cylinder position="1 0.75 -3" radius="0.5" height="1.5" color="purple">
</a-cylinder>
<a-plane position="0 0 -4" rotation="-90 0 0" width="4" height="4"
color="3cb371"></a-plane>

<a-sky color="#e9f7ff "></a-sky>
```

Texture 1

```
<html><head>  <script src="https://aframe.io/../aframe.min.js"></script>  </head>
 <body>
   <a-scene>
    <a-assets>
      <img id="pinktexture" src="pinktexture.png" />
    </a-assets>
    <a-box position="-1.5 1 -1.5" src="https://cdn.glitch.global/8d8368d6-c6ab-4980-a31d-4e5719b18320/pinktexture.png?v=1697040308772"></a-box>
   </a-scene>
 </body> </html>
```

Texture 2 & movement

```html
<html> <head>  <script src="https://aframe.io/releases/1.3.0/aframe.min.js"></script> </head>
  <body>
   <a-scene>
          <a-assets>
                  <img id="boxTexture" src="https://i.imgur.com/mYmmbrp.jpg">
          </a-assets>
          <a-box src="#boxTexture" position="0 2 -5" rotation="0 45 45" scale="2 2 2"
          animation="property: object3D.position.y; to: 2.2; dir: alternate;
          dur: 2000; loop: true"></a-box>
    </a-scene>
  </body> </html>
```

Texture 2 & movement

```
<a-box src="#boxTexture" position="0 2 -5" rotation="0 45 45"
           scale="2 2 2"

         animation="property: object3D.position.y;
         to: 2.2;
       dir: alternate;
       dur: 2000; loop: true">

</a-box>
```