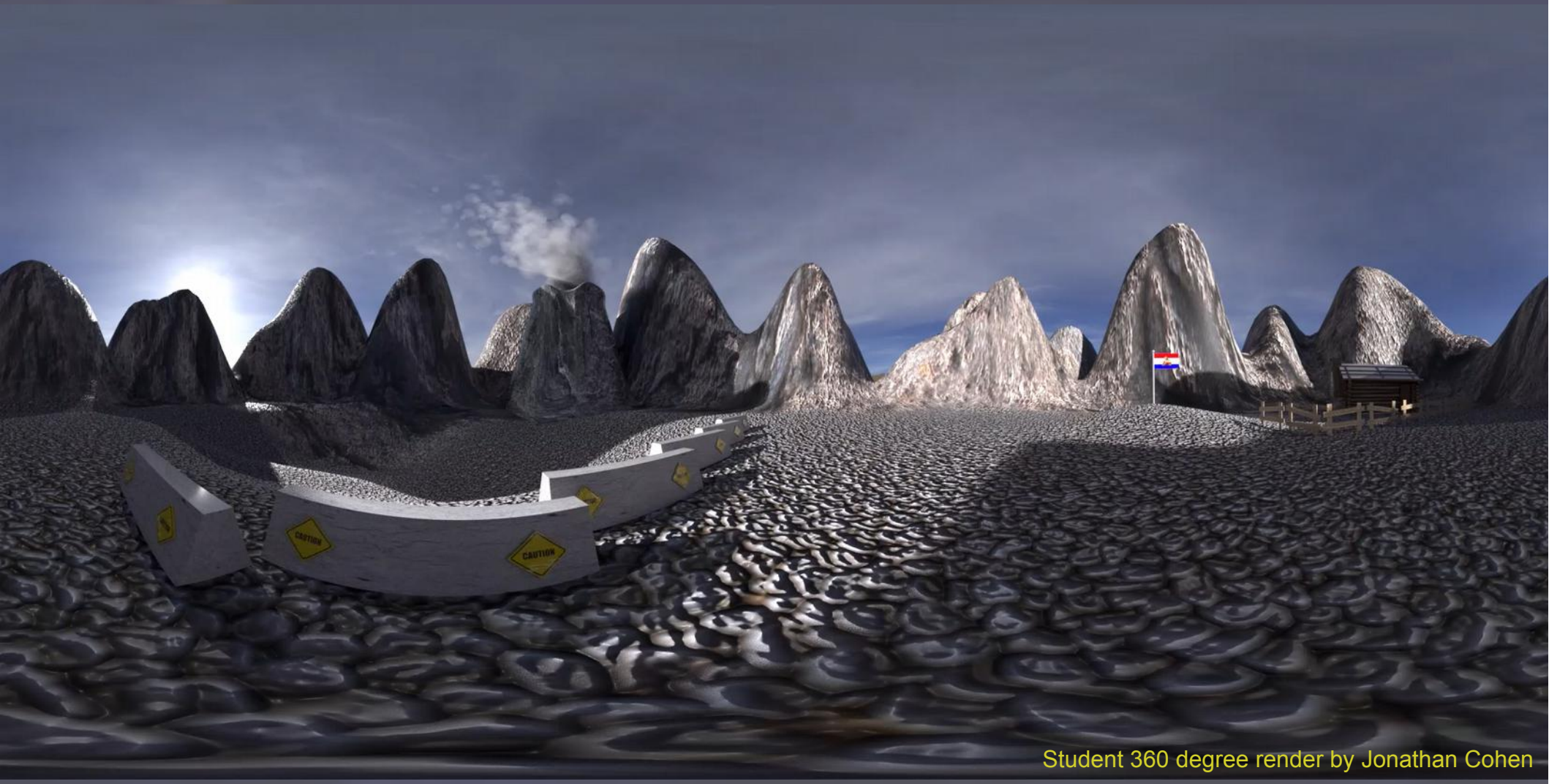
Virtual Reality & 360 Rendering



Student 360 degree render by Jonathan Cohen

Instructor: Wobbe F. Koning

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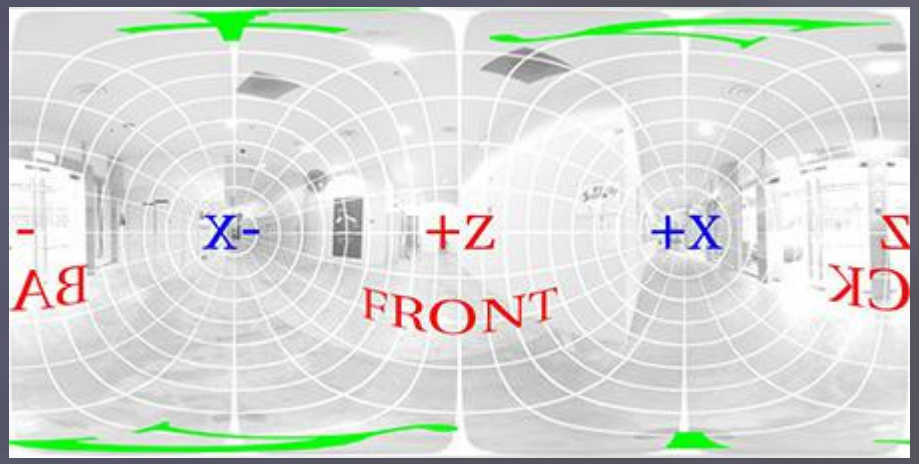
360º Video

- Pre-rendered
  - Shot with multiple cameras and stitched together
  - CGI
- Can be Stereoscopic
  - Really hard to shoot properly
- Needs to be Hi Res
  - 4K and up

JauntVR 360º camera

Lat Long (equirectangular) Image



- Panorama image format
  - Images: http://admvfx.com/knowledge-base/panorama-formats/

Lat Long (equirectangular) Image

- "Help," directed by Justin Lin, VFX: The Mill
  - Google Spotlight Stories platform.

Lat Long Conversion

- Only part of full 360 video is viewed full screen
- Original needs to be extremely Hi-Res: 4K or 8K

Virtual Reality (VR) vs. 360° Video

VR

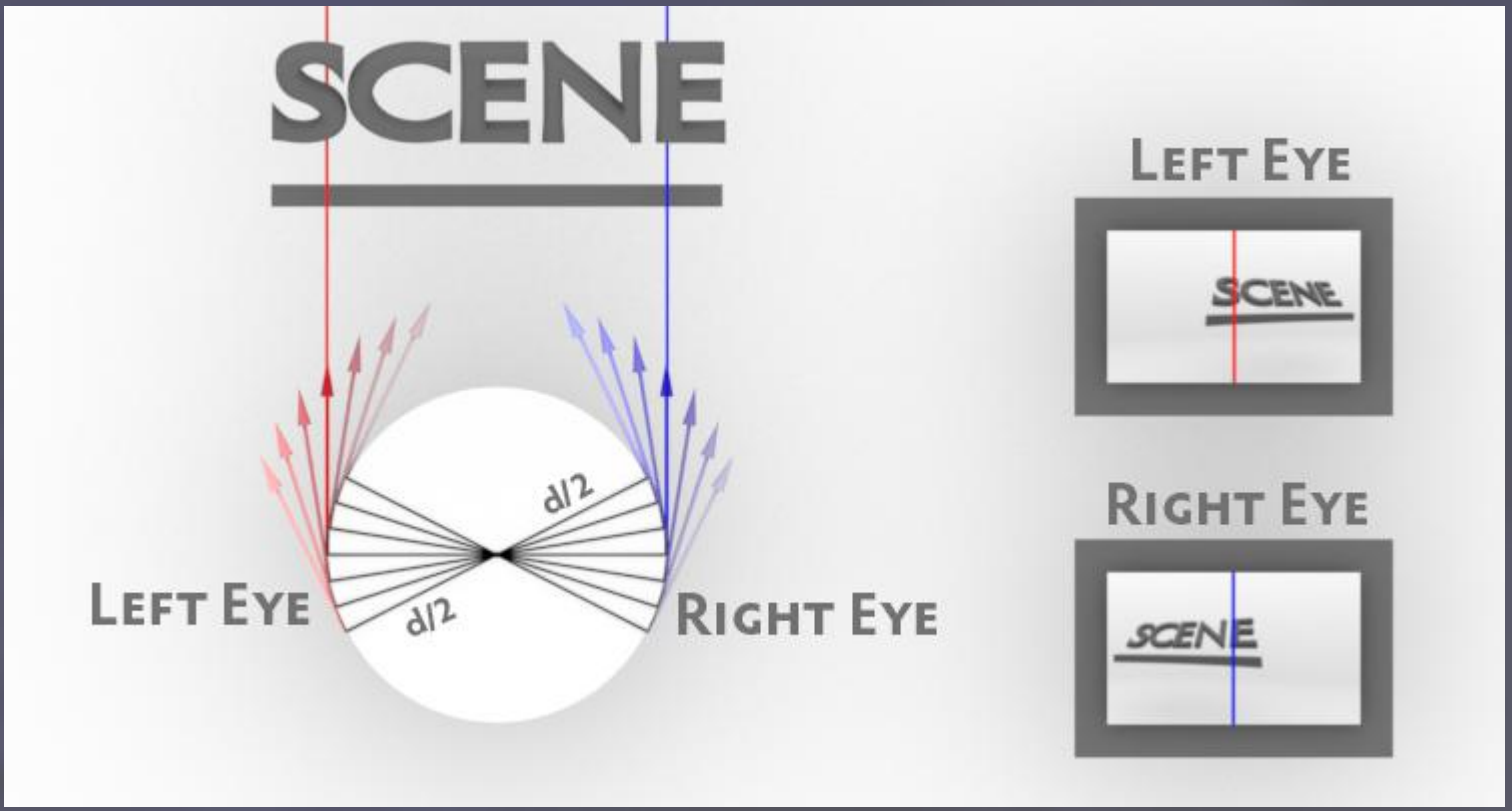
- Real Time rendered
- Stereoscopic
- Full Head Tracking
  - Can include movement
- Controllers add more interactivity.

360° Video

- Prerecorded / Rendered
- Can be Stereoscopic
- Head Tracking
  - Rotation only
    - look around
- Linear / Non-Interactive

- Both can be experienced through a Head Mounted Display (HMD)
  - Can be combined :)

Rendering 360º Stereoscopic CGI



- Arnold 5 has a camera for that.
  - Image: solid angle

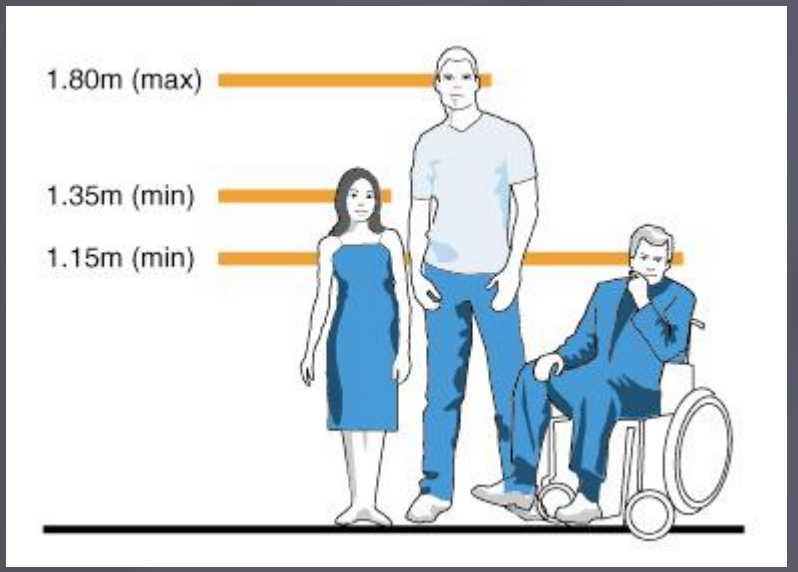
Mixing VR & 360° Video

- Pre-rendered footage has fixed camera position
  - Moving HMD does not change perspective
- Real time rendered object support full parallax

- Scale
  - Maya default unit = 1 centimeter
  - Unity default unit = 1 meter

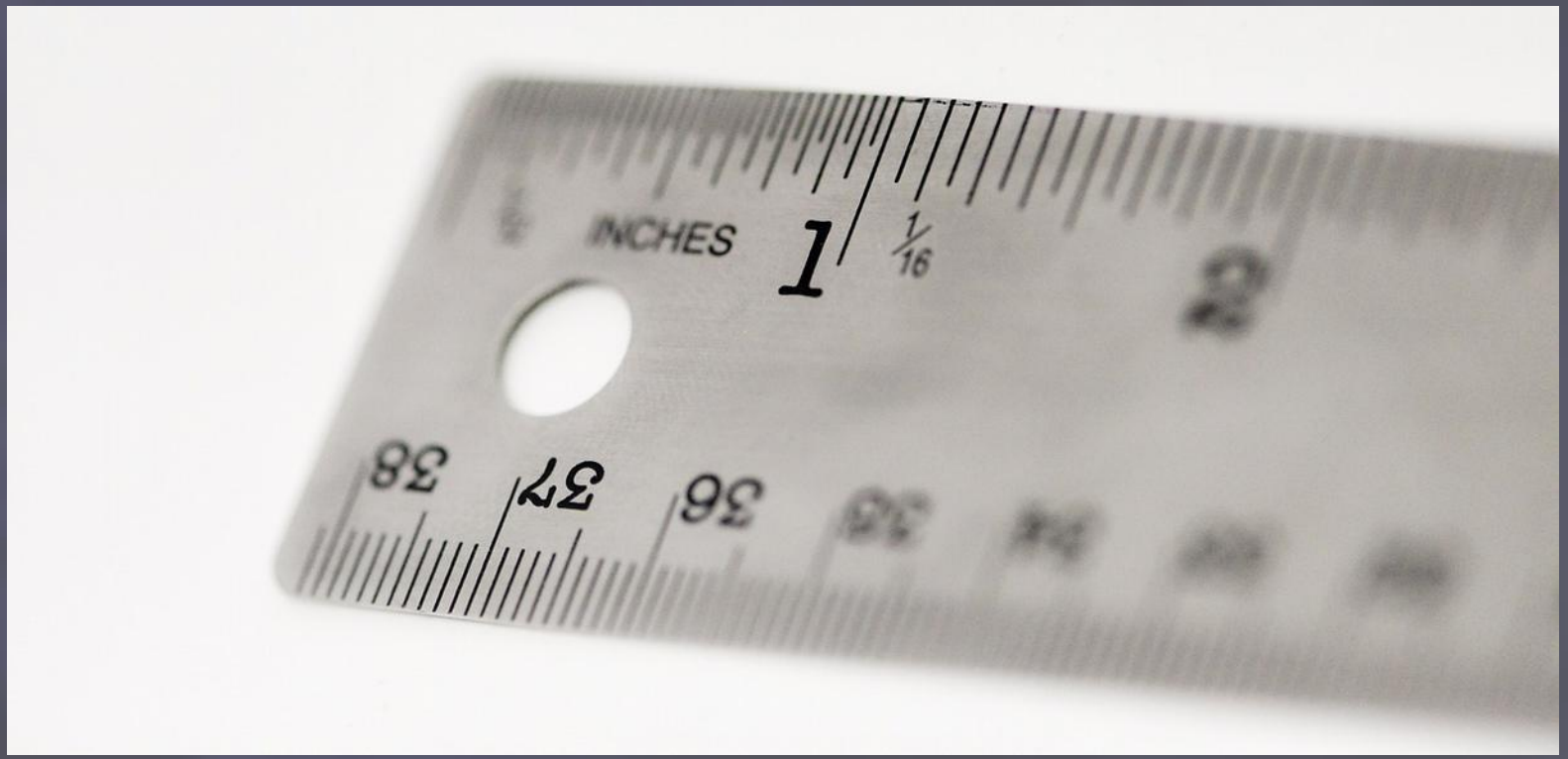
Placing you Camera

- Camera should be placed at eye level
  - Rotation X and Z should be 0 (zero)
- Average height of U.S. Adults (age 20+, Wikipedia)
  - 175.7 cm (5 ft 9 in) for men
  - 161.8 cm (5 ft 3 1⁄2 in) for women
- Image right: Eye levels
  - Irish National Disability Authority

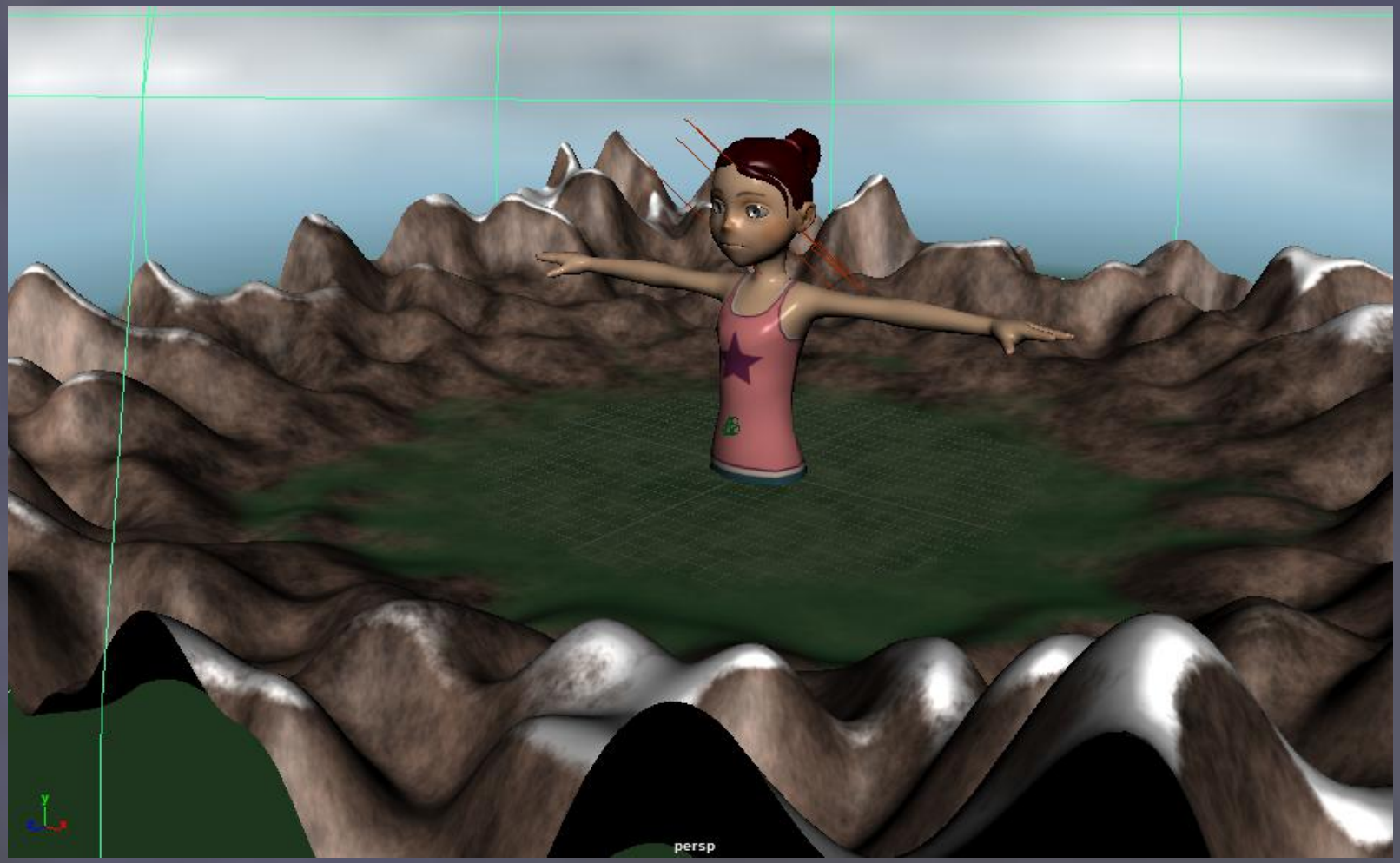


How big is my scene?

- Maya Units by default set to centimeter

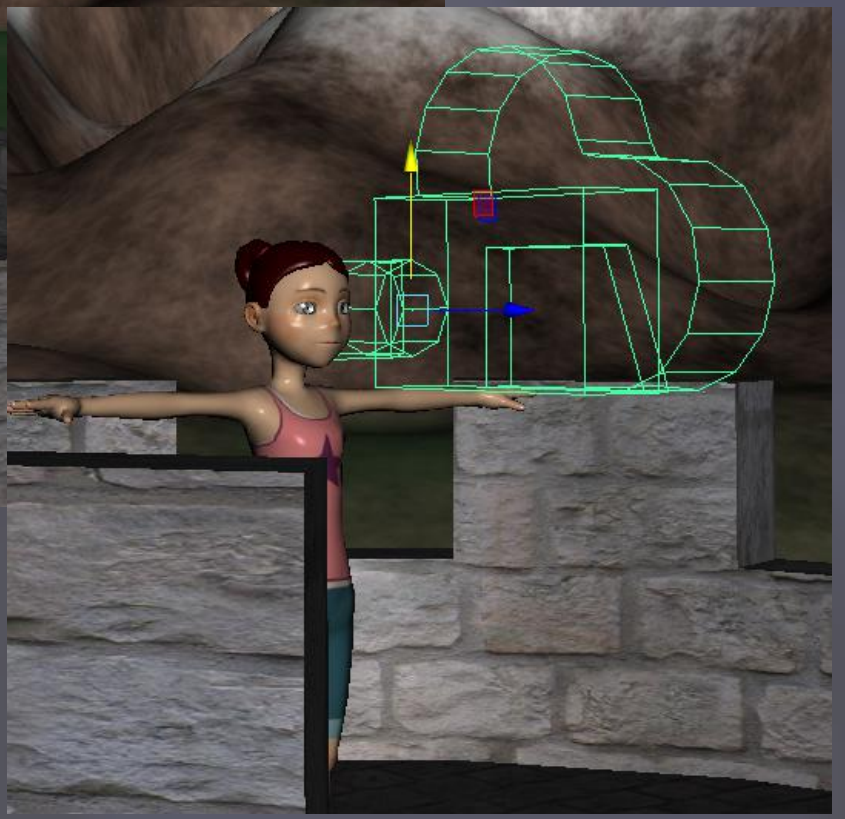


Use Reference to Estimate Scale



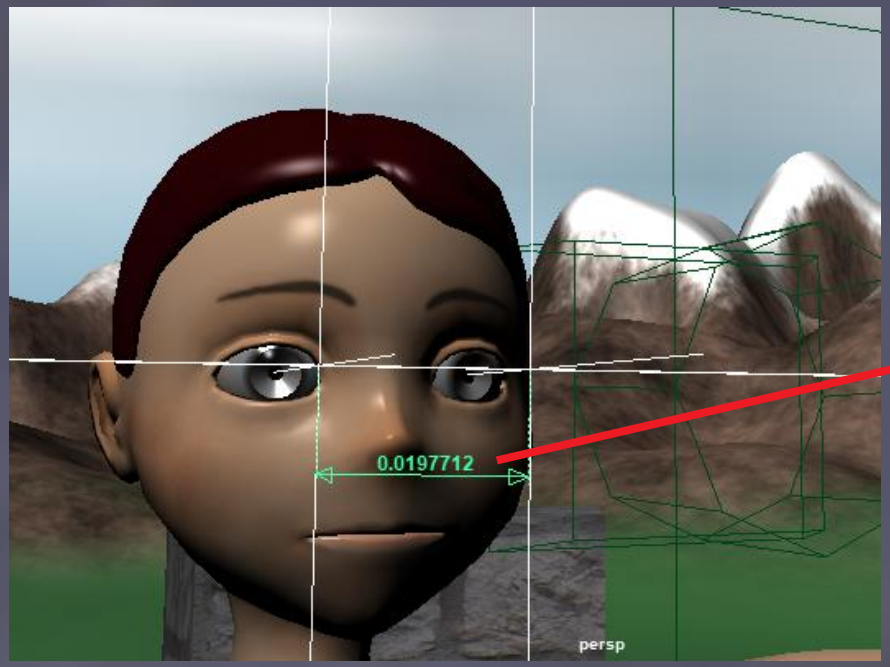
- Andy, for instance
  - Andy Rig by John Doublestein

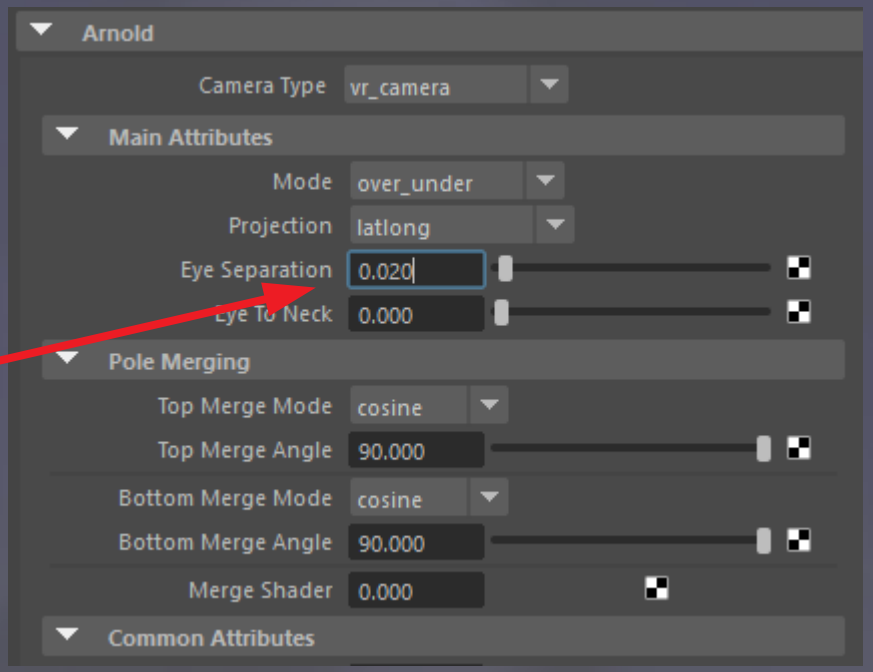
Use reference to Place Camera



- Place Camera at Eye Level

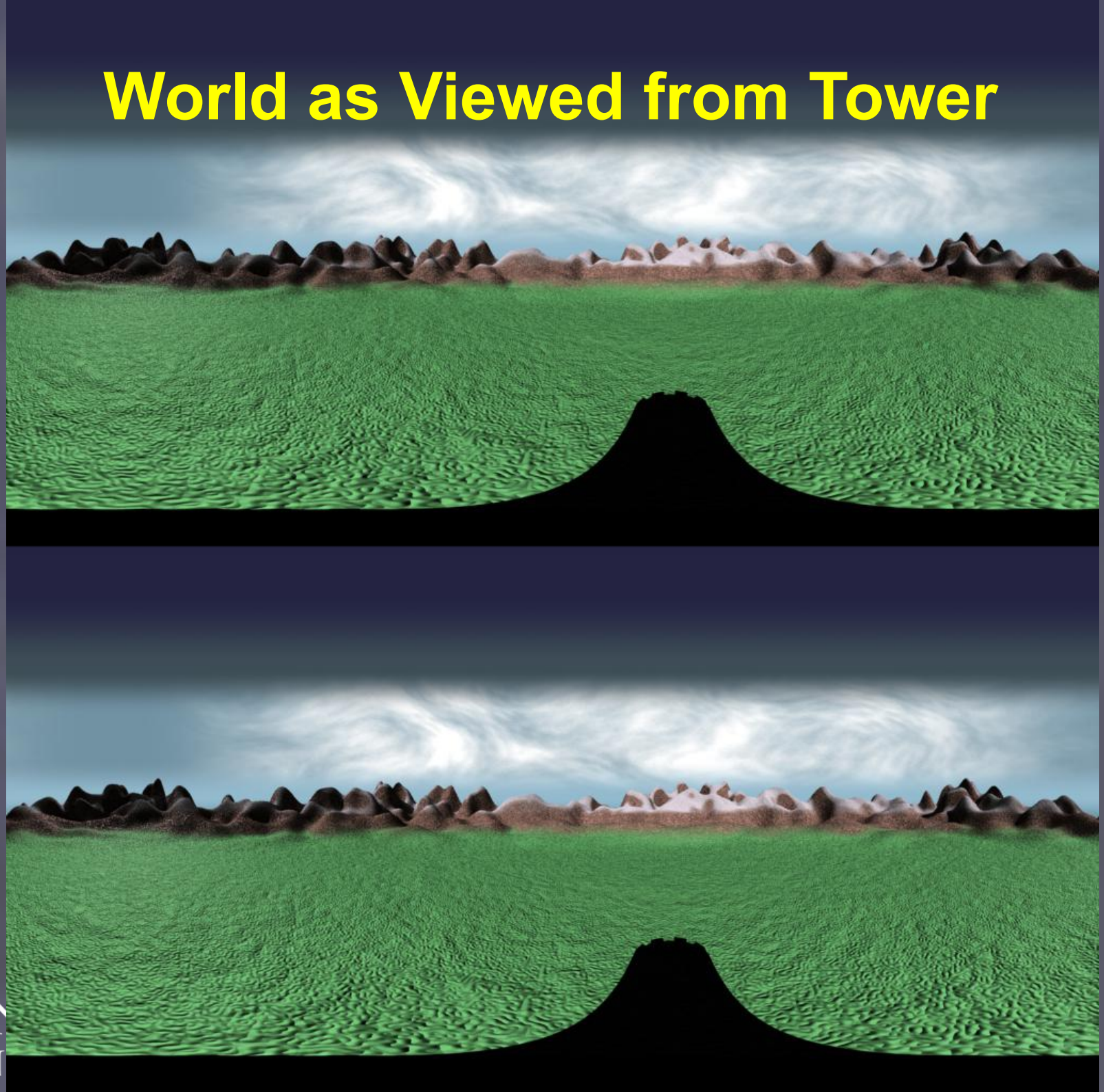
Render 360 View Without "Platform"





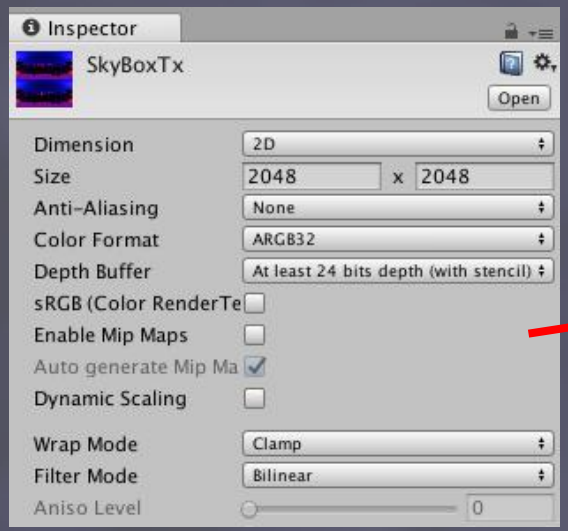
- Object that are to be real time rendered in Unity are NOT included in Render
- Set Eye Separation to match scale of scene

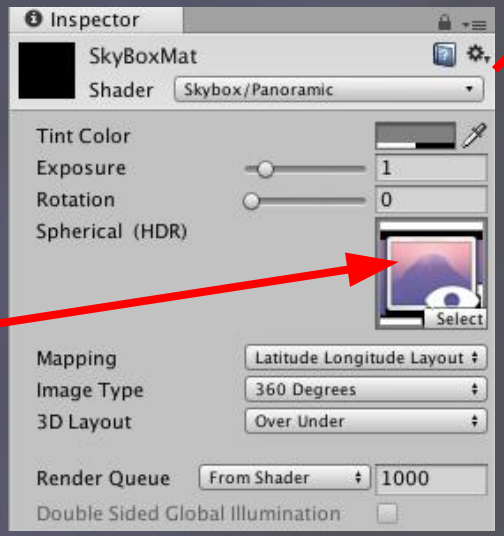
World as Viewed from Tower

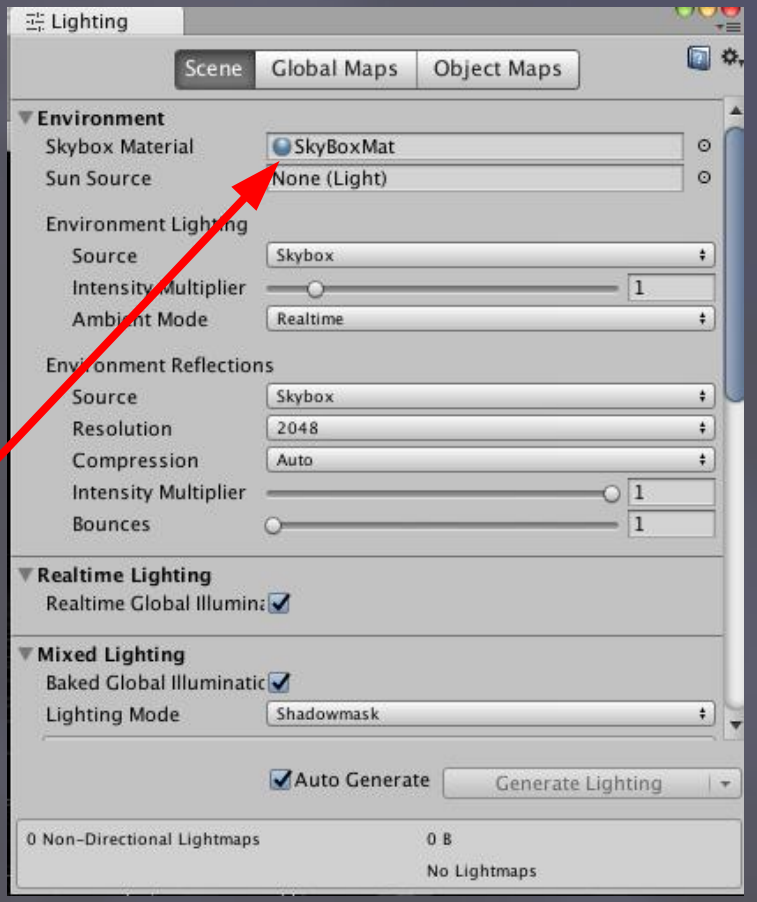


Playing 360 video in Unity

- Create a SkyBox Material
- Set this as Environment
  - Window > Lighting > Settings
- Create a Render Texture
  - Select it as input for the material







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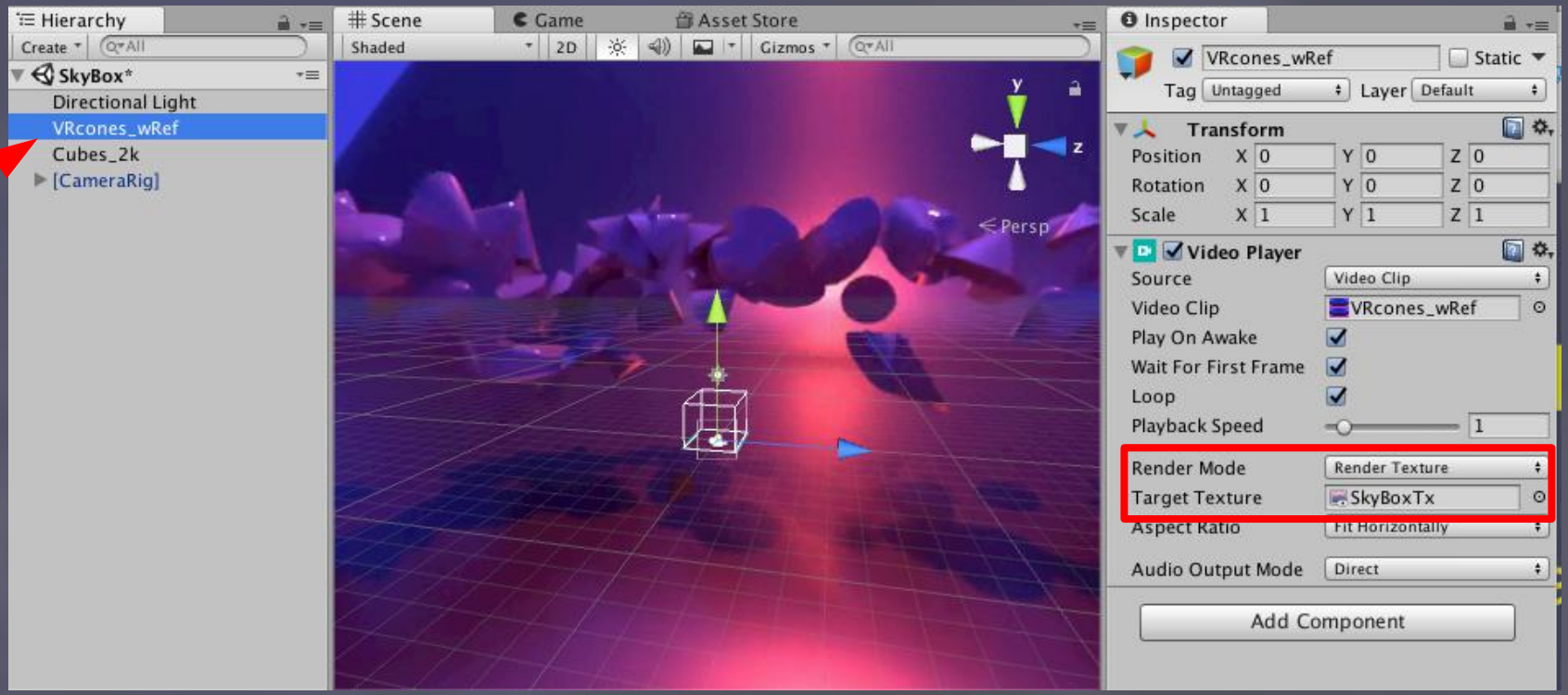
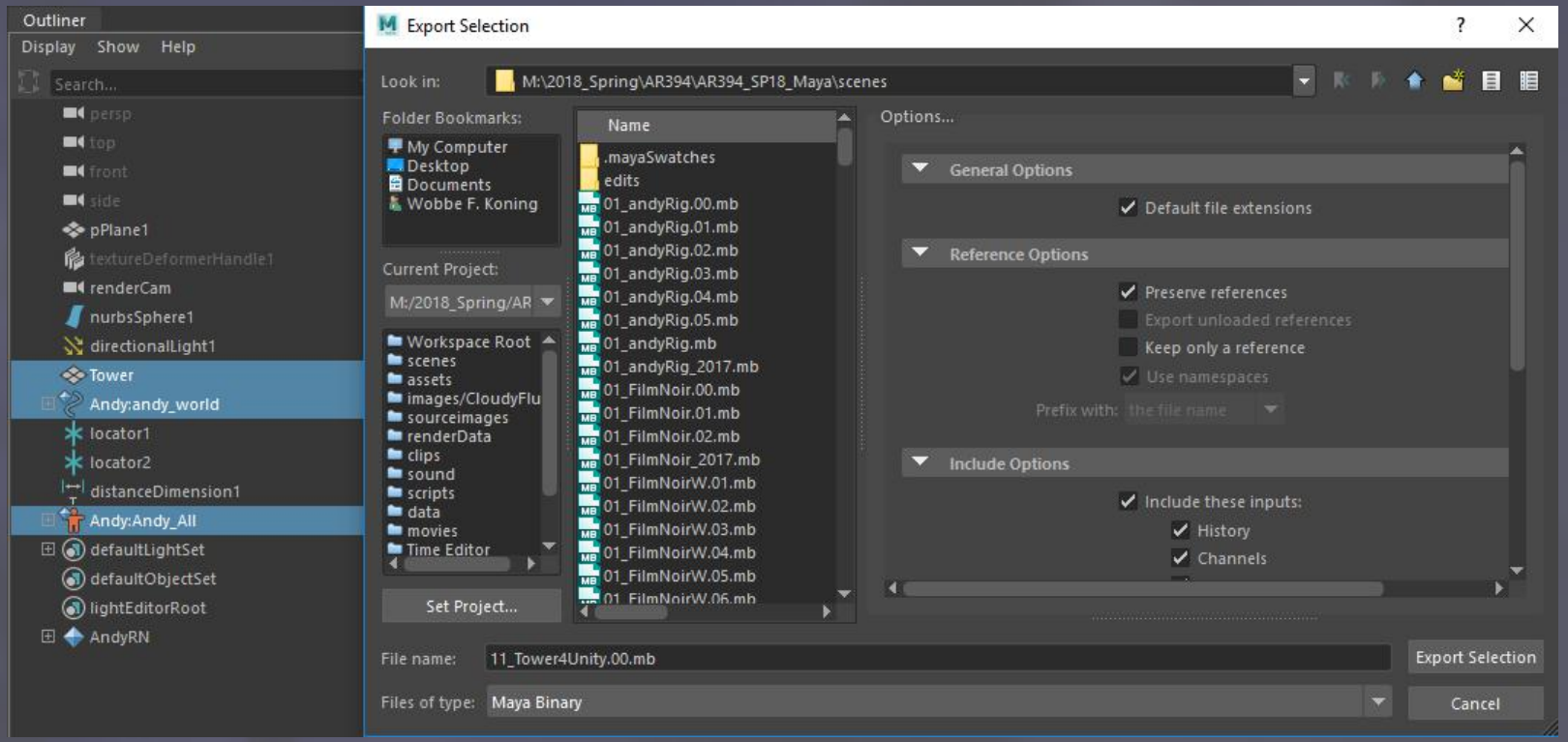
Put your video in your scene



- Set to Render Texture with SkyBoxTexture as target

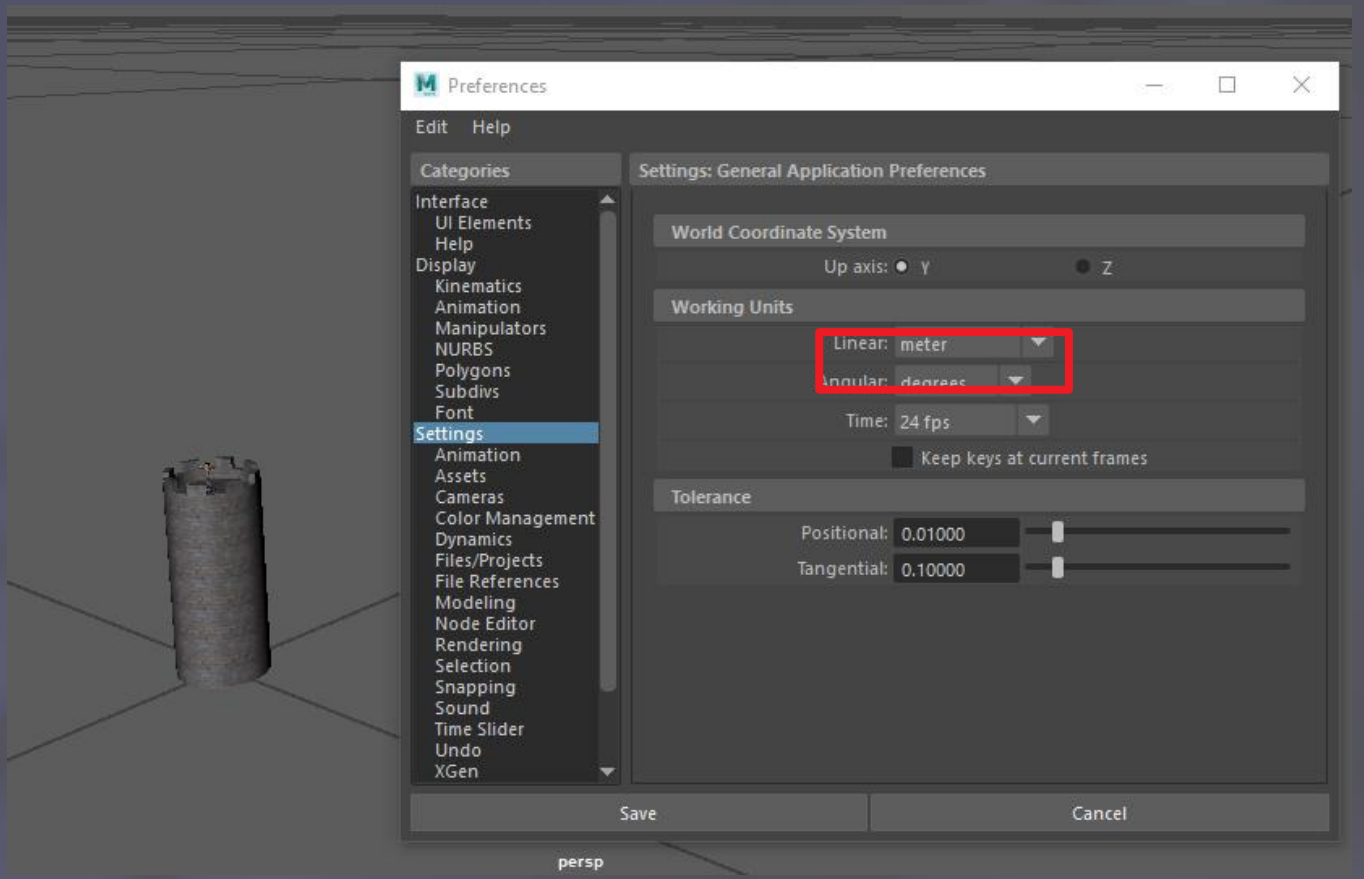
Getting "Platform" to Unity

- Export "Platform" (in this case, the Tower)
  - as Maya Binary
  - You can include reference object

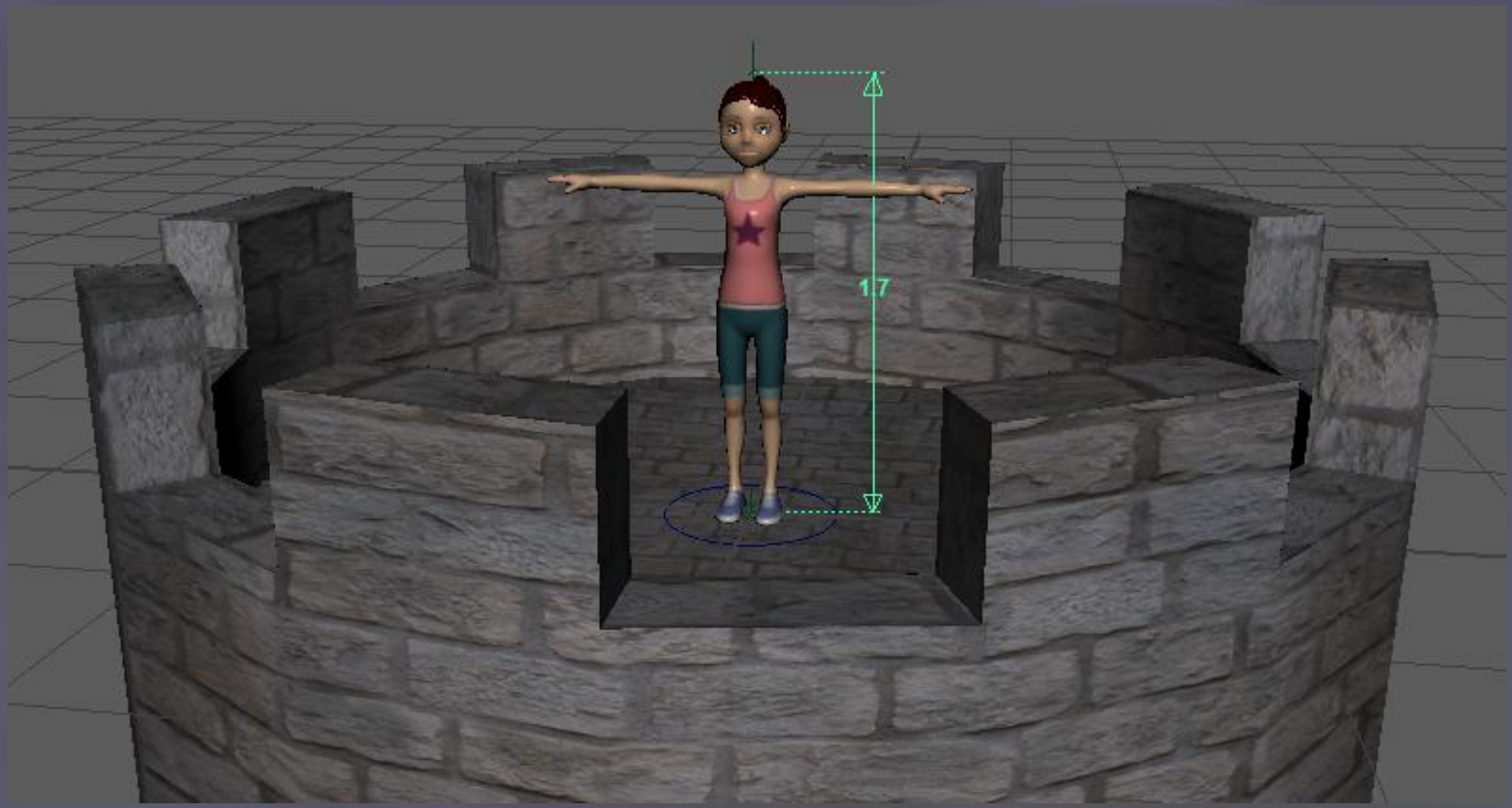


Open Exported Scene

- Set Working Units to Meter
  - Windows > Settings Preferences > Settings



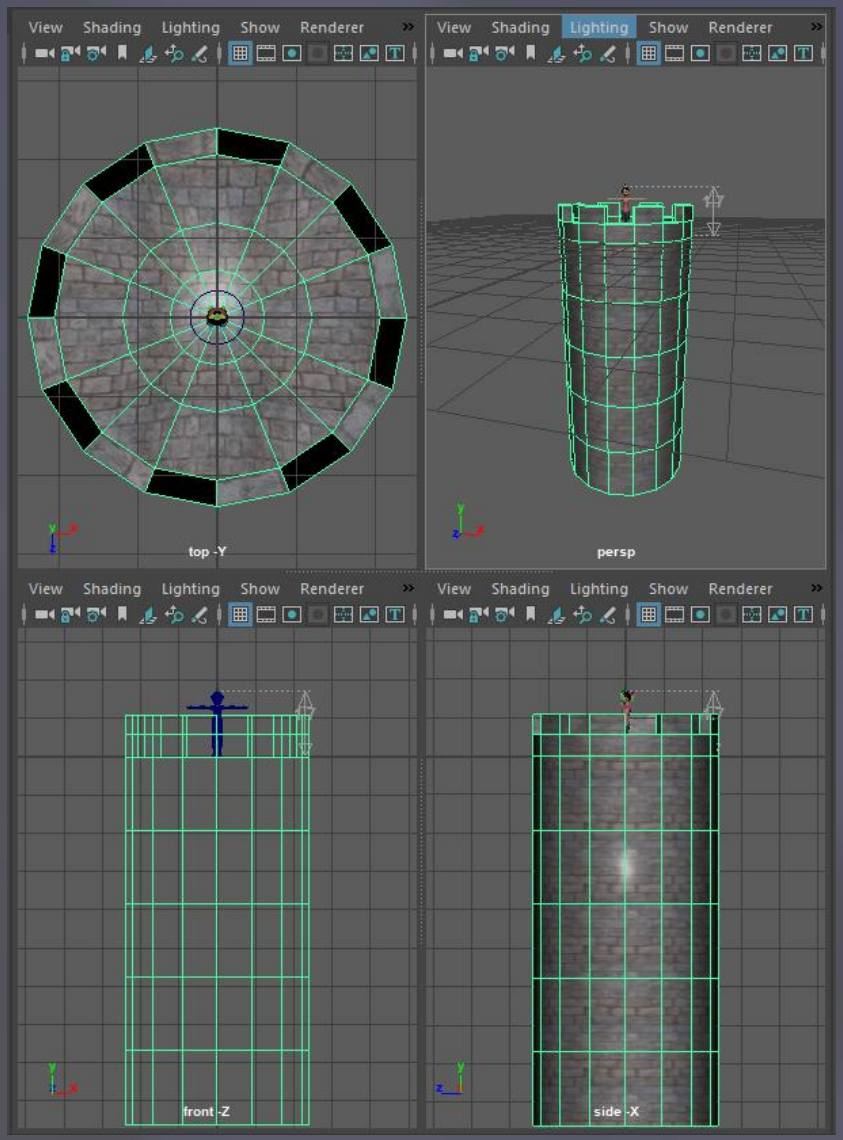
Scale Object to Match Working Units



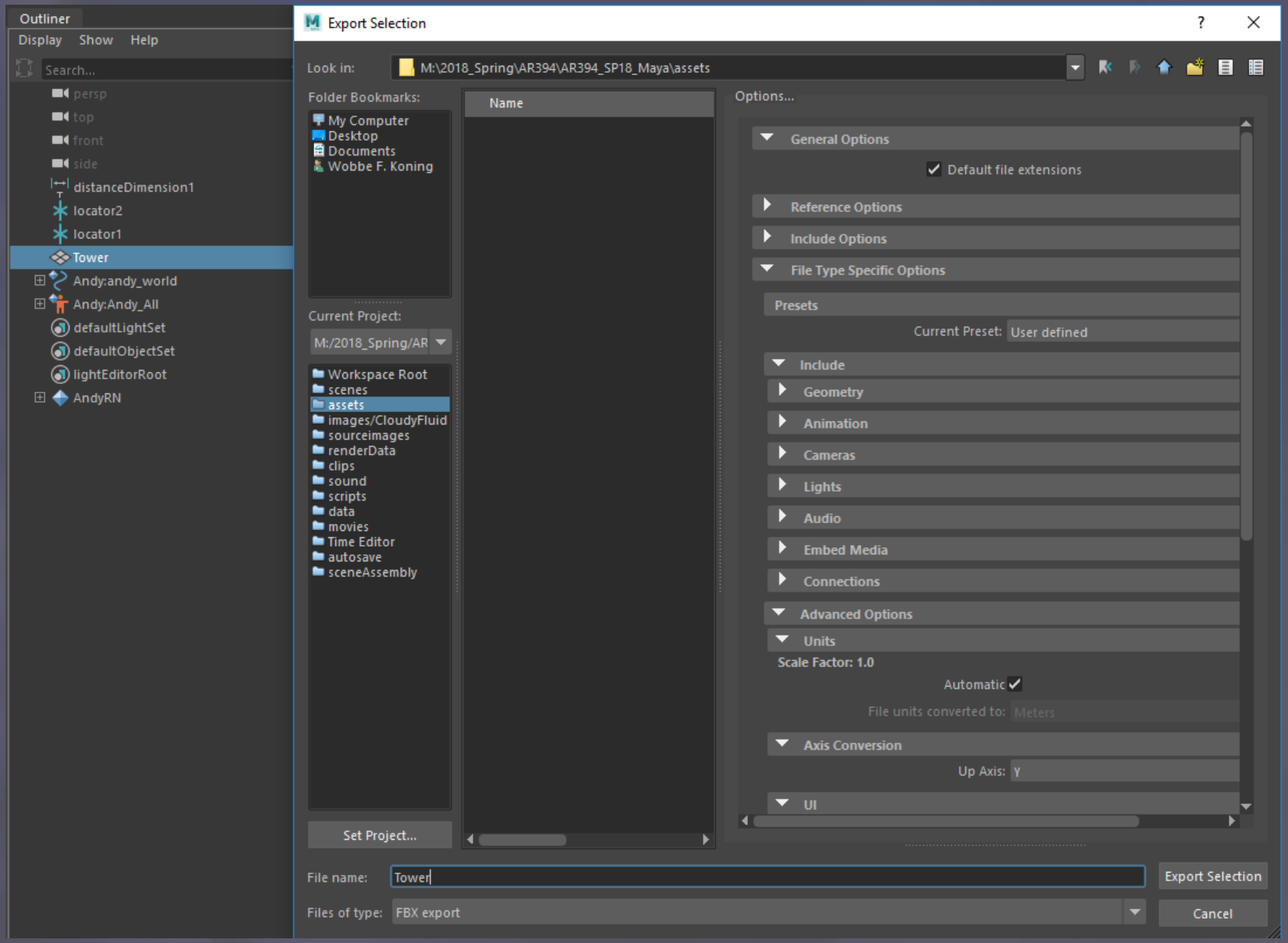
- You may use measure tool, or create reference cube
  - Reference object helps

Freeze Scale, Place

- On the object you want to be rendered in real time
- Camera in Unity is placed at Origin
- Move object so the origin is exactly where you would be standing to view world as rendered

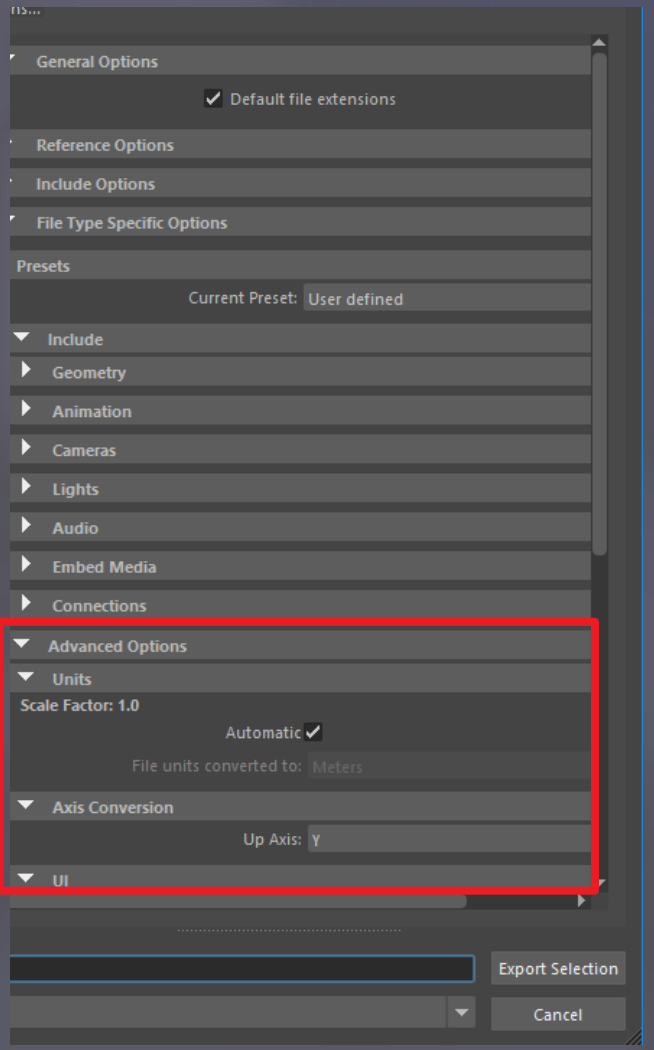


Export as FBX



Export as FBX
File Type Specific Options

- Export Selection
  - Include settings not crucial
- Units: Scale Factor 1.0
  - When using mm as unit, this should be 100
- Axis Conversion - Up Axis: Y



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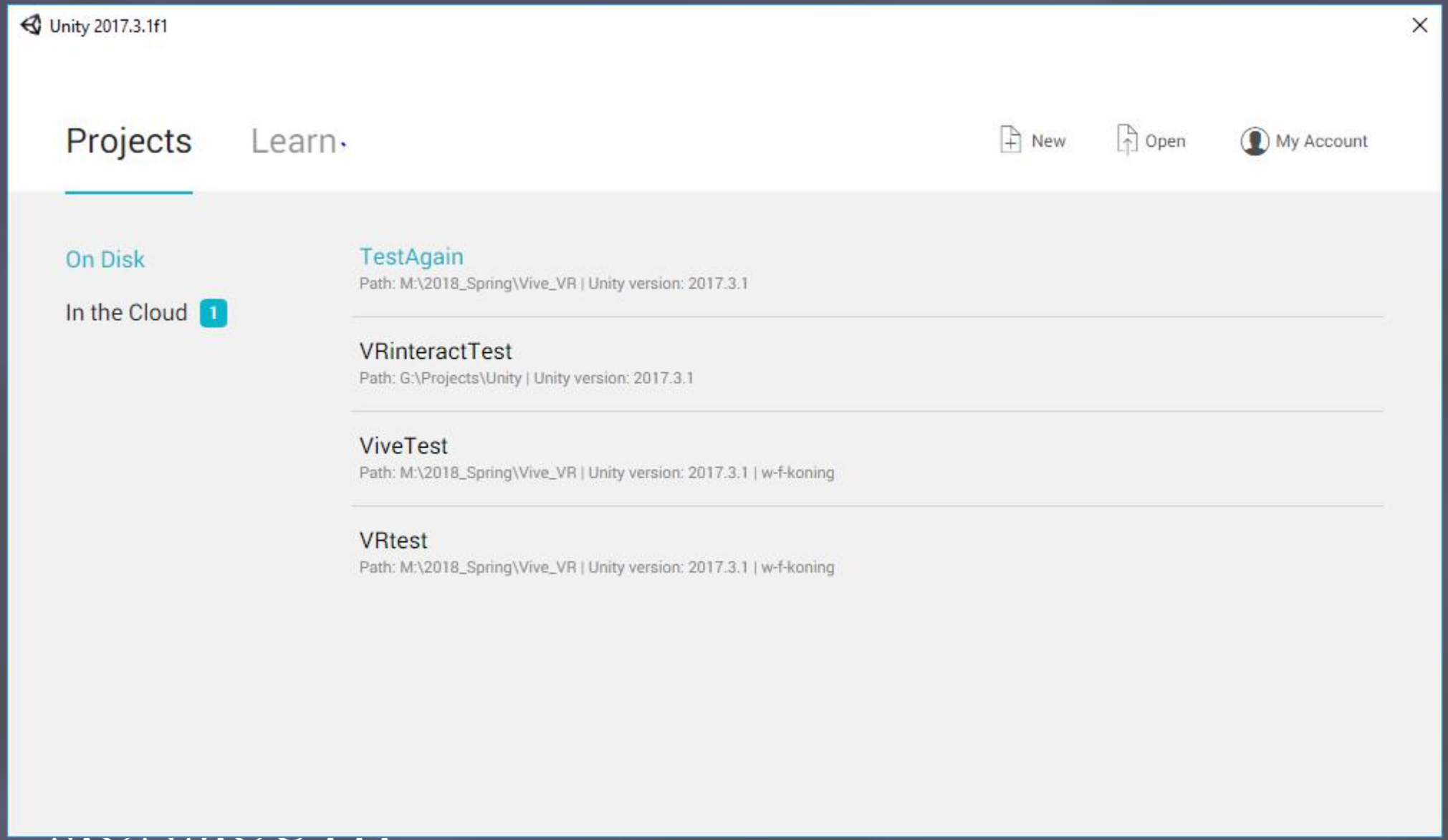
Open the Unity Project

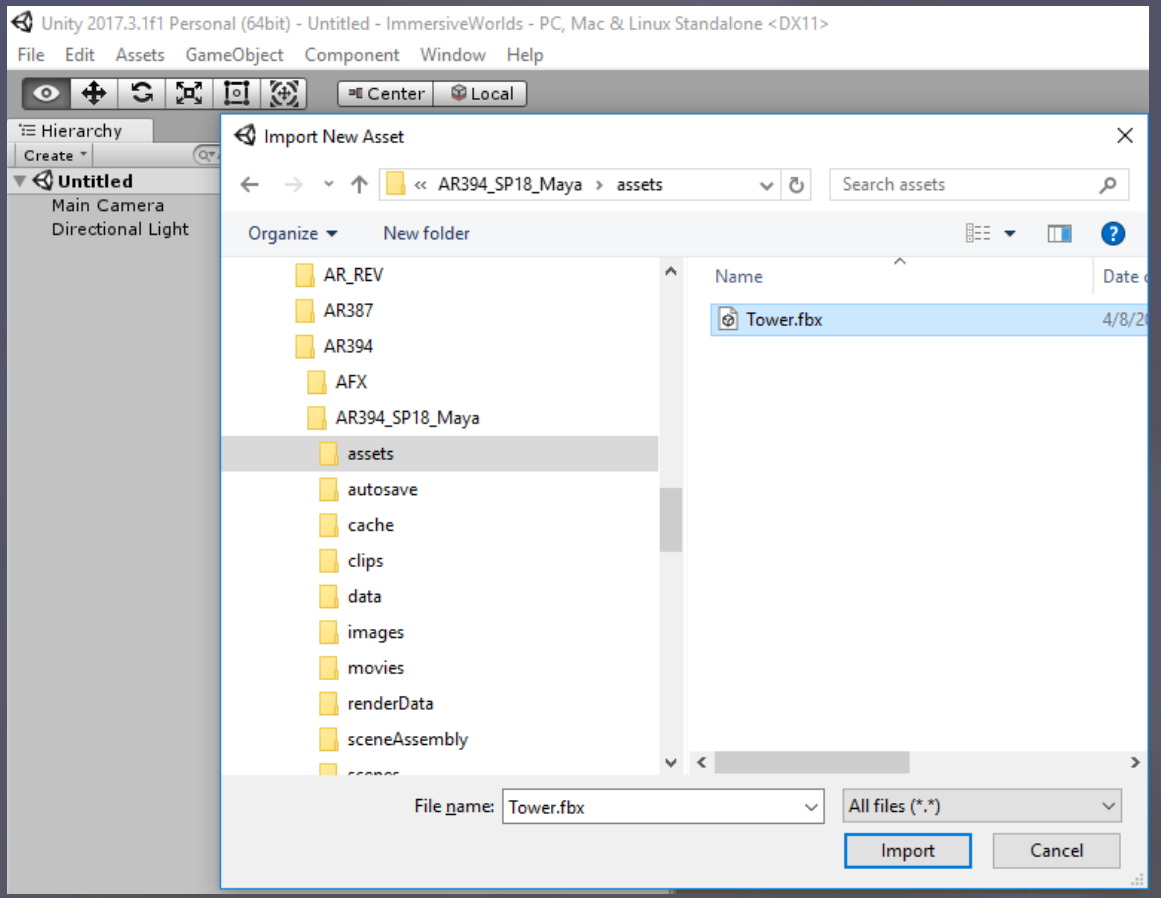


Import the FBX file

- Assets > Import New Asset

OR

- Export directly to Unity project's Asset folder



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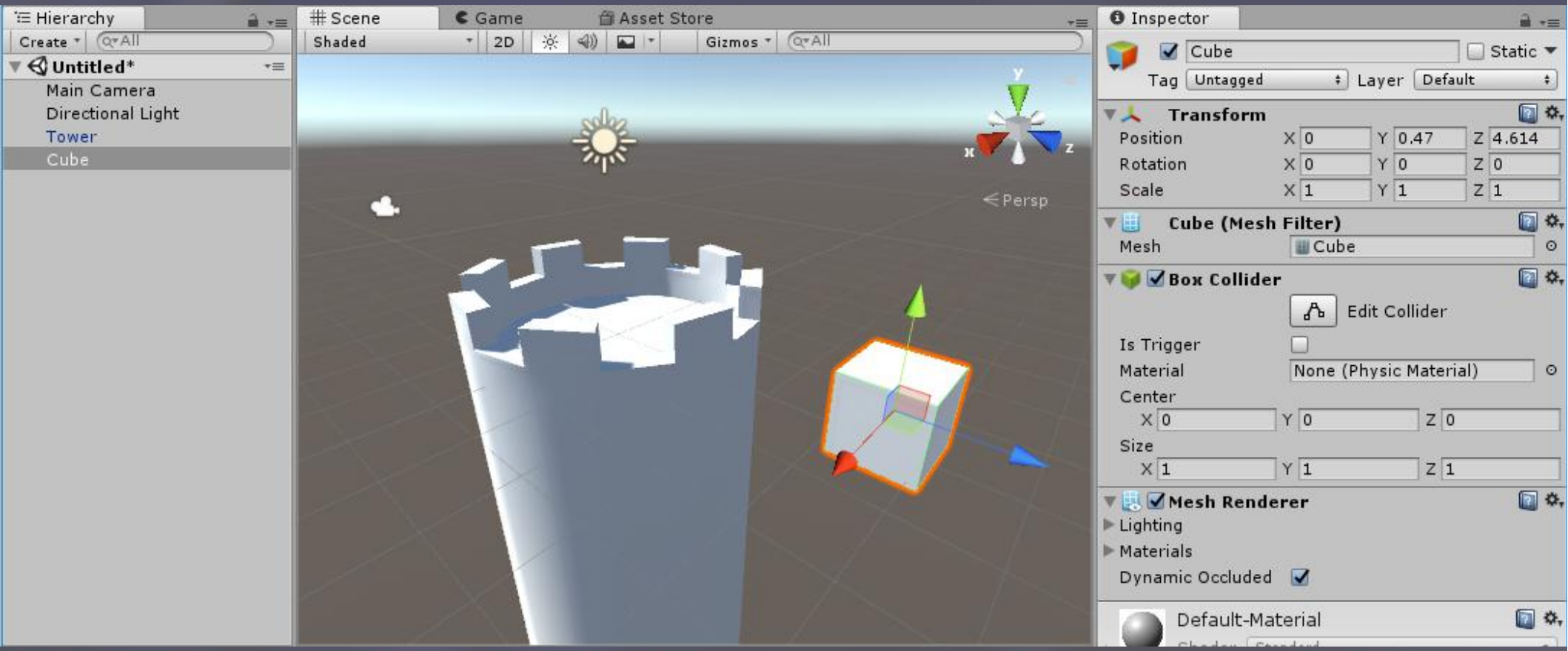
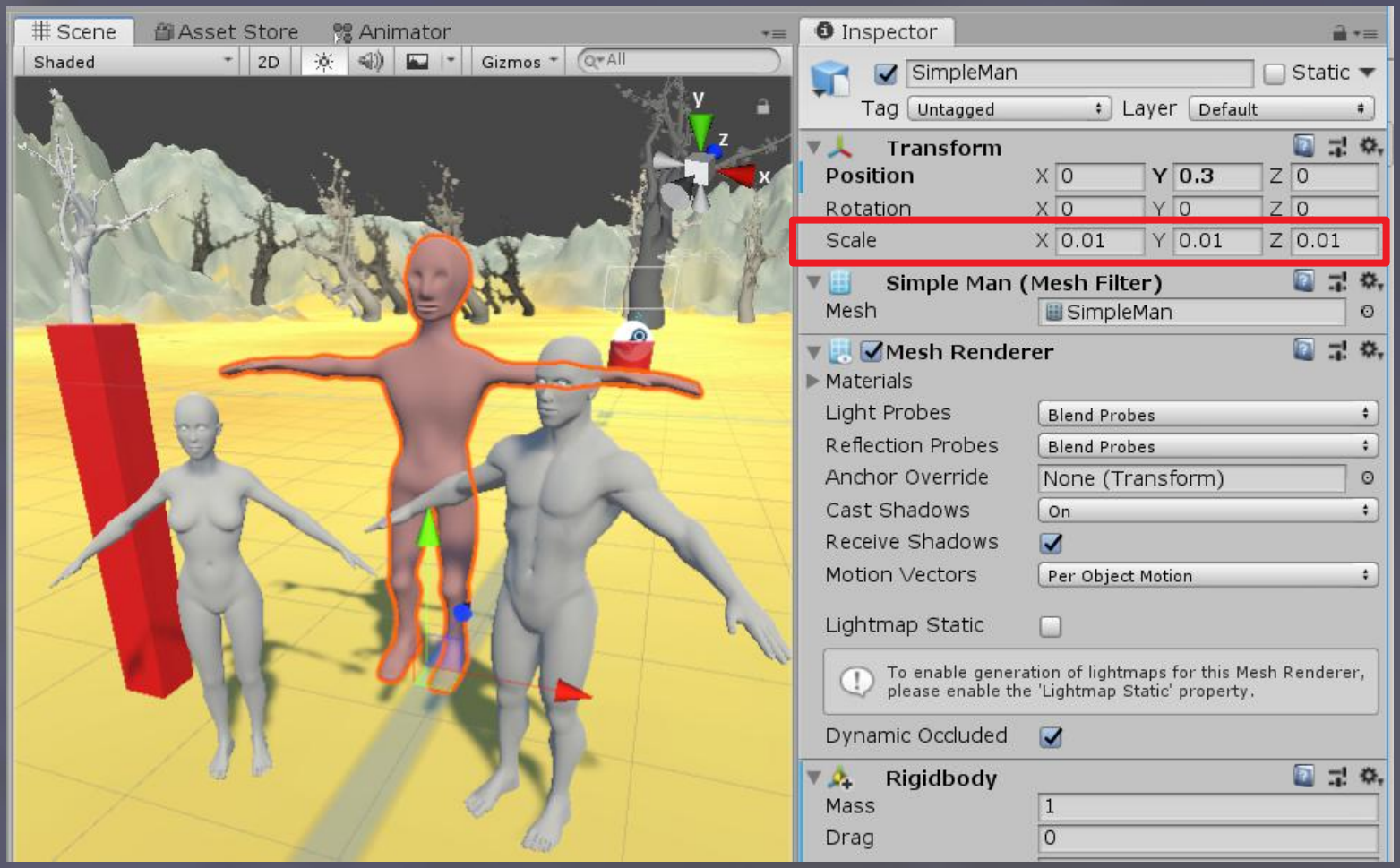
Unity Scene with Tower



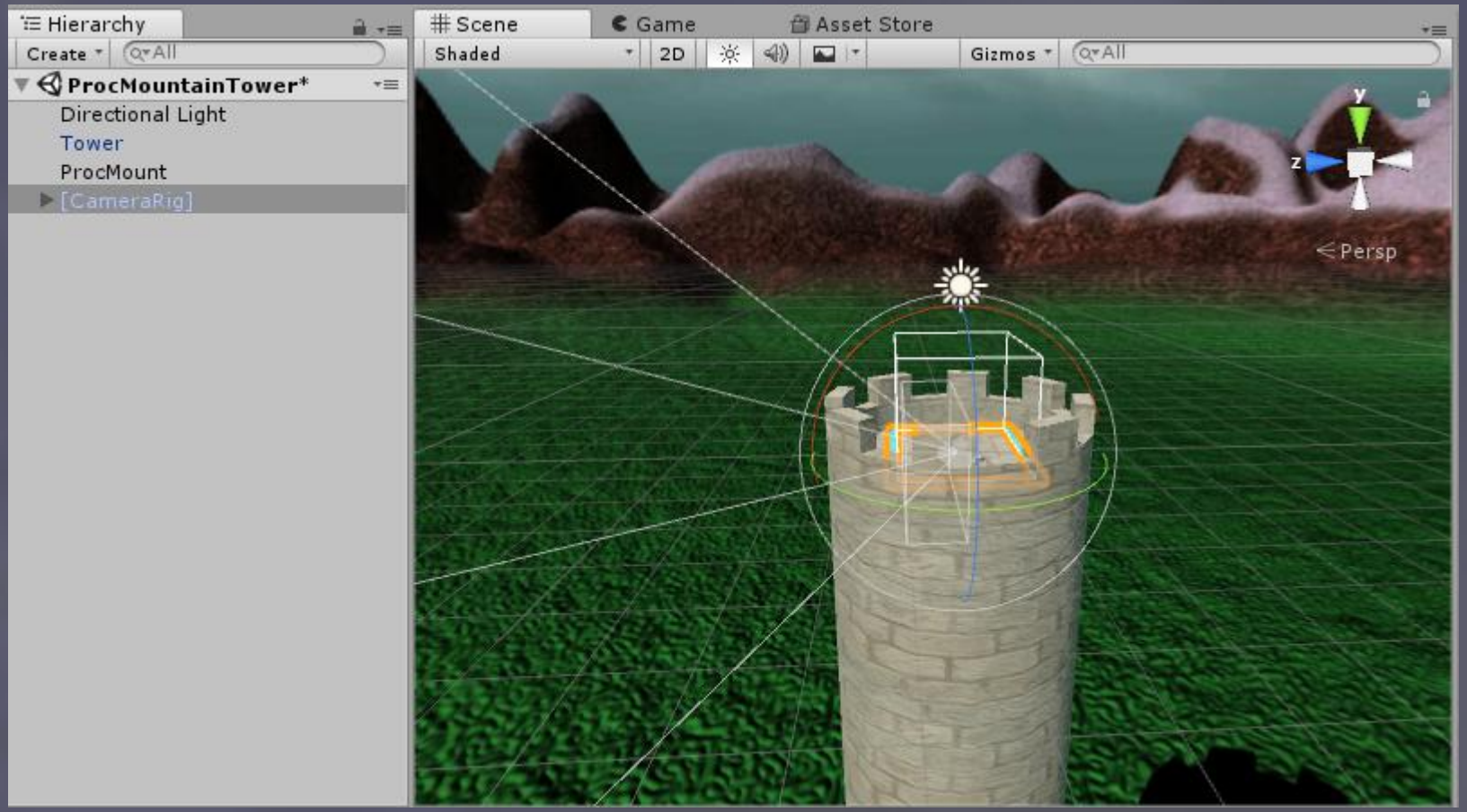
- Cube added as extra check
  - Scale 1x1x1 Units > Meter Cube
    - Game Object > 3D Object > Cube

In Unity: Scale is set to 0.01!



- Exported correctly, comes in at correct size
  - Legacy setting - kept for consistency

Textured & World in SkyBox



- SteamVR camera added (SteamVR Package)
  - Package also required for stereoscopic SkyBox