Daydreaming about Cardboards

Virtual Reality in Android

contentful

- 🔧: headless CMS: contentful.com
- 🐦: @MarioBodemann
- 📄: bit.ly/mbvrberlin
  - Please interrupt 👄 👅 !

Agenda

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  - Please interrupt 🙈🙉!

Cardboard

Google Cardboard

- easy to produce
- available from different companies
- in different styles/interactions
- You just need a phone™

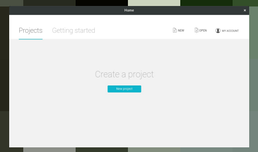
How does Cardboard work?

- use 3D data and movement to draw two images
  - one for the left and right eye
- contains Lenses to move things away
- brain combines image to 3D scene

How do I write a Unity App?

Prerequisites

- clone Googles github for unity https://github.com/googlevr/gvr-unity-sdk repsoitory
- install and open Unity
  - 🍎 / 🖥: https://store.unity.com/
  - 🐧: http://forum.unity3d.com/threads/unity-on-linux-release-notes-and-known-issues.350256/



Daydream

Daydream SDK features

- Same as Cardboard SDK
- Controlling the controller
  - orientation/acceleration
  - input (Clickpad: x,y, clicked, App Button, Vol+/-)
- spatial audio engine

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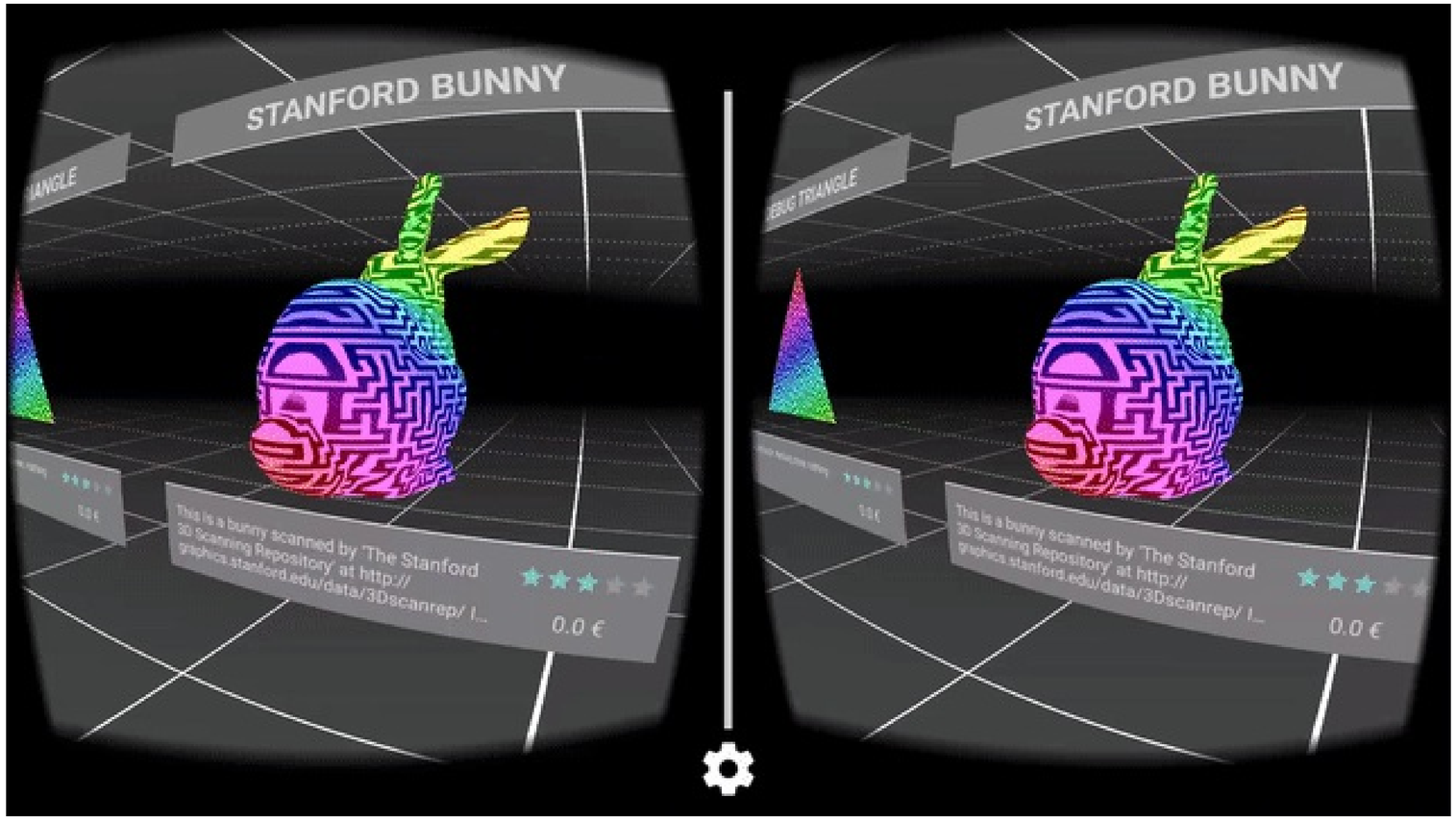
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STANFORD BUNNY
This is a bunny scanned by 'The Stanford 3D Scanning Repository' at http://graphics.stanford.edu/data/3Dscanrep/ I...
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How do you program for it?

Googles SDK are available for

- Android (OpenGL)
- IOS (Objective C)
- Unity Engine (C# /JS) x (🍎 , G, 🖳, 🐧)

What do those SDKs provide?

- lens distortion correction
- spatial audio
- head tracking
- 3D calibration
- side-by-side rendering

What else do they provide?

- stereo geometry configuration
- user input event handling
- see developer.google.com/vr/android/

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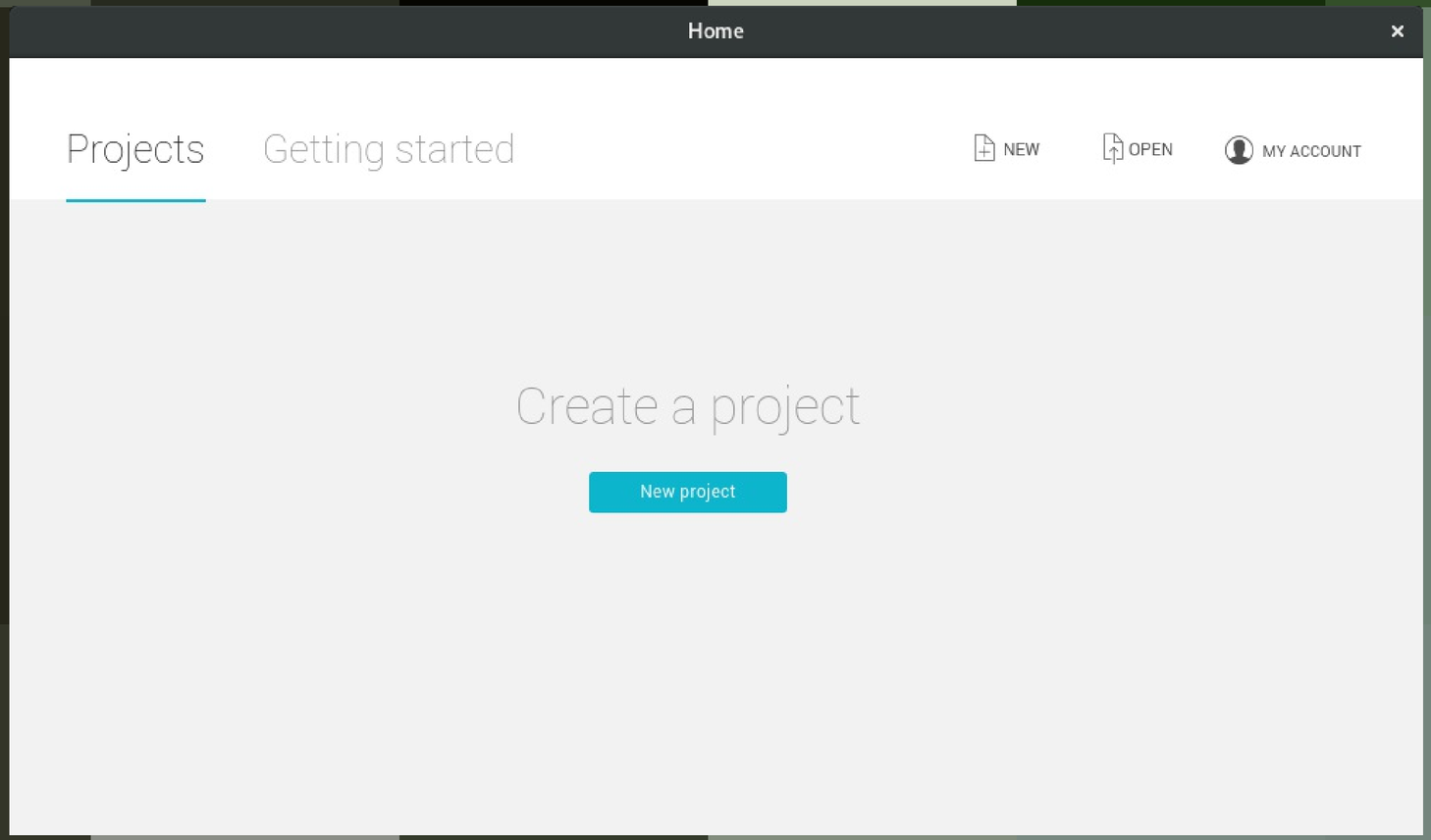
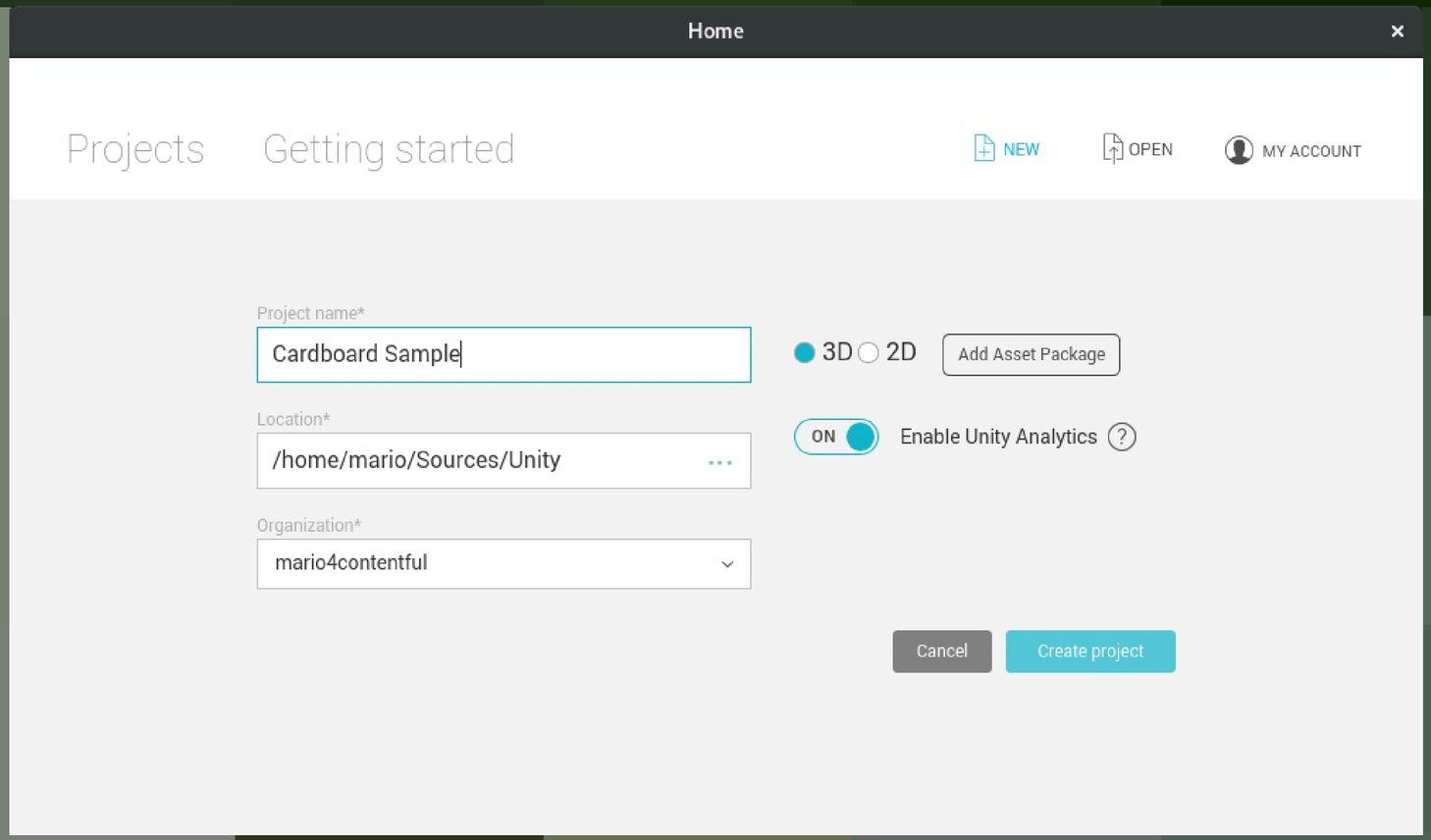

Home
Projects
Getting started
NEW
OPEN
MY ACCOUNT
Create a project
New project


Home
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Getting started
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MY ACCOUNT
Project name*
Cardboard Sample
3D
2D
Add Asset Package
Location*
/home/mario/Sources/Unity
ON
Enable Unity Analytics
Organization*
mario4contentful
Cancel
Create project

Unity - Unity 5.5.0xb2Linux Personal (64bit) - Untitled - Cardboard Sample - PC, Mac & Linux Standalone <OpenGL 4.3>

File Edit Assets GameObject Component Help Window

Center Local

Account Layers Layout

Hierarchy

Create All

Untitled

Main Camera

Directional Light

Scene Game Asset Store

Shaded 2D Gizmos All

Persp

Inspector Services

Go to Dashboard

Cardboard Sample

SERVICES

Unity provides you a suite of integrated services for creating games, increasing productivity and managing your audience.

SERVICES MEMBERS AGE DESIGNATION SETTINGS

Collaborate OFF
Create together seamlessly

In-App Purchasing OFF
Simplify cross-platform IAP

Ads OFF
Monetize your games

Multiplayer
Easily implement multiplayer

Analytics ON
Discover player insights

Performance Reporting OFF
Discover app errors

Cloud Build OFF
Build games faster

Project Console

Create

Favorites

All Materials

All Models

All Prefabs

All Scripts

Assets

Assets

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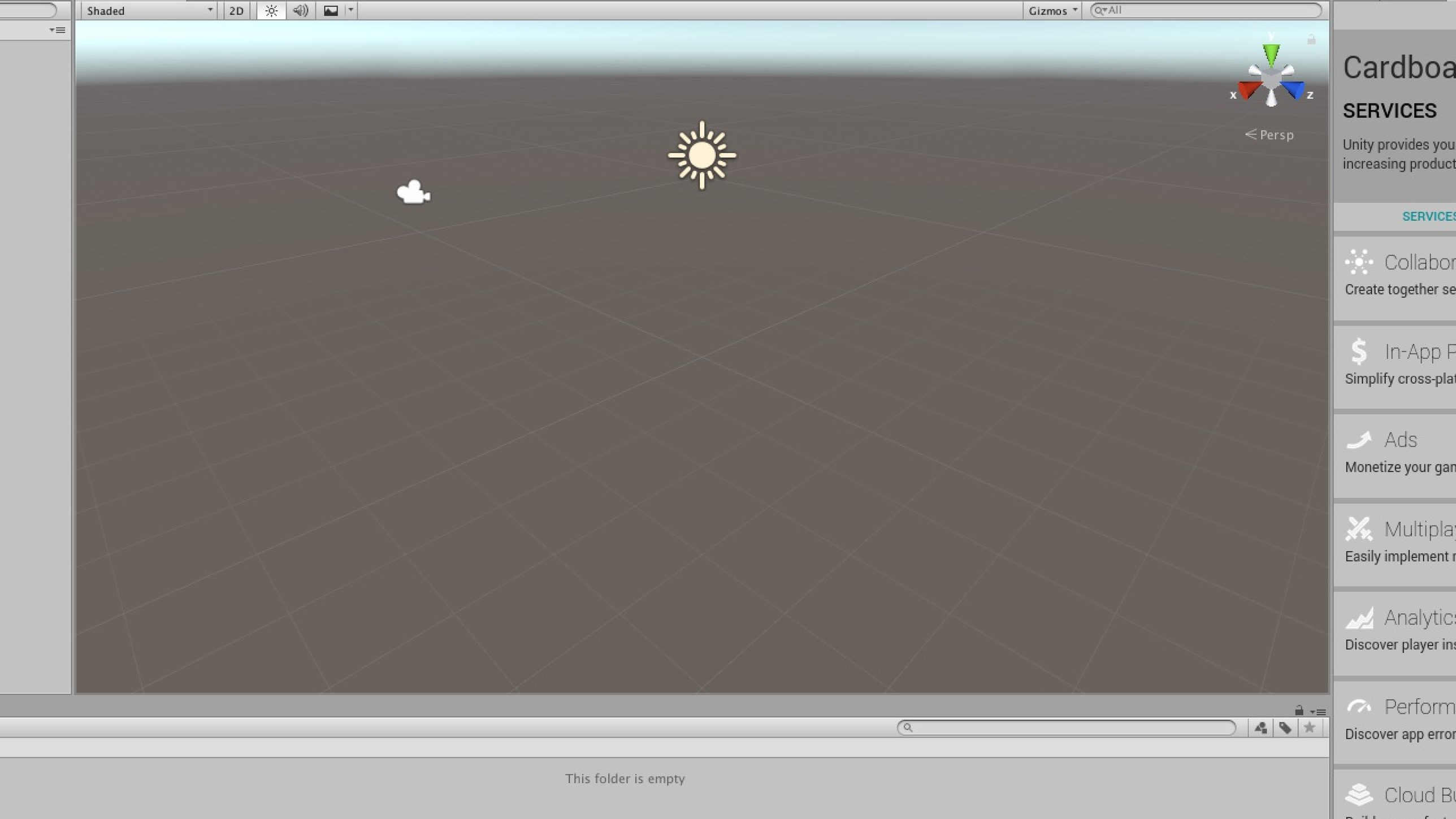
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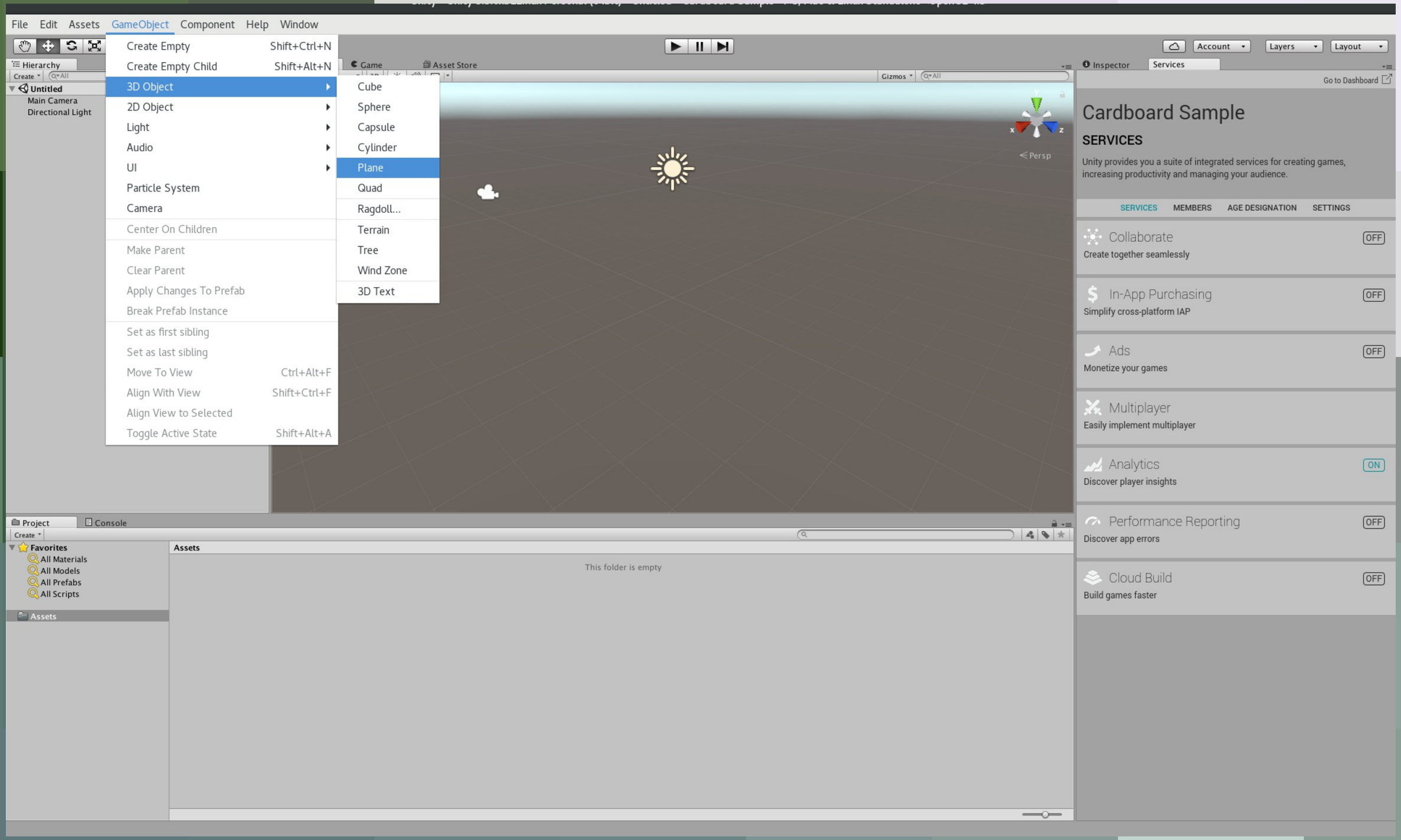
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Camera
Center On Children
Make Parent
Clear Parent
Apply Changes To Prefab
Break Prefab Instance
Set as first sibling
Set as last sibling
Move To View Ctrl+Alt+F
Align With View Shift+Ctrl+F
Align View to Selected
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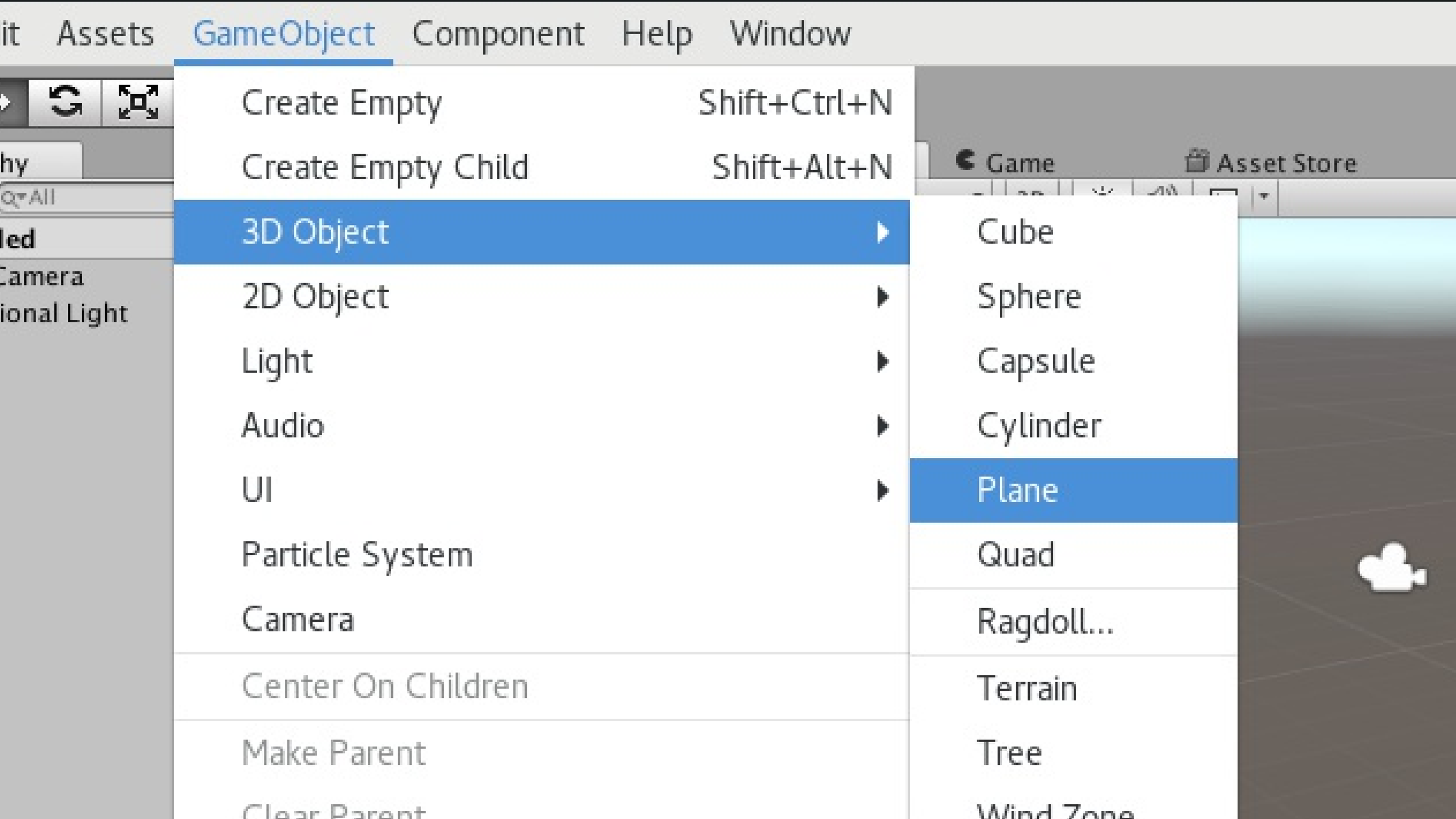
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Inspector Services

Plane Static

Tag Untagged Layer Default

Transform

Position X 0 Y 0 Z 0

Rotation X 0 Y 0 Z 0

Scale X 1 Y 1 Z 1

Plane (Mesh Filter)

Mesh Plane

Mesh Collider

Convex

Inflate Mesh

Skin Width 0.01

Is Trigger

Material None (Physic Material)

Mesh Plane

Mesh Renderer

Cast Shadows On

Receive Shadows

Motion Vectors Per Object Motion

Materials

Light Probes Blend Probes

Reflection Probes Blend Probes

Anchor Override None (Transform)

Default-Material

Shader Standard

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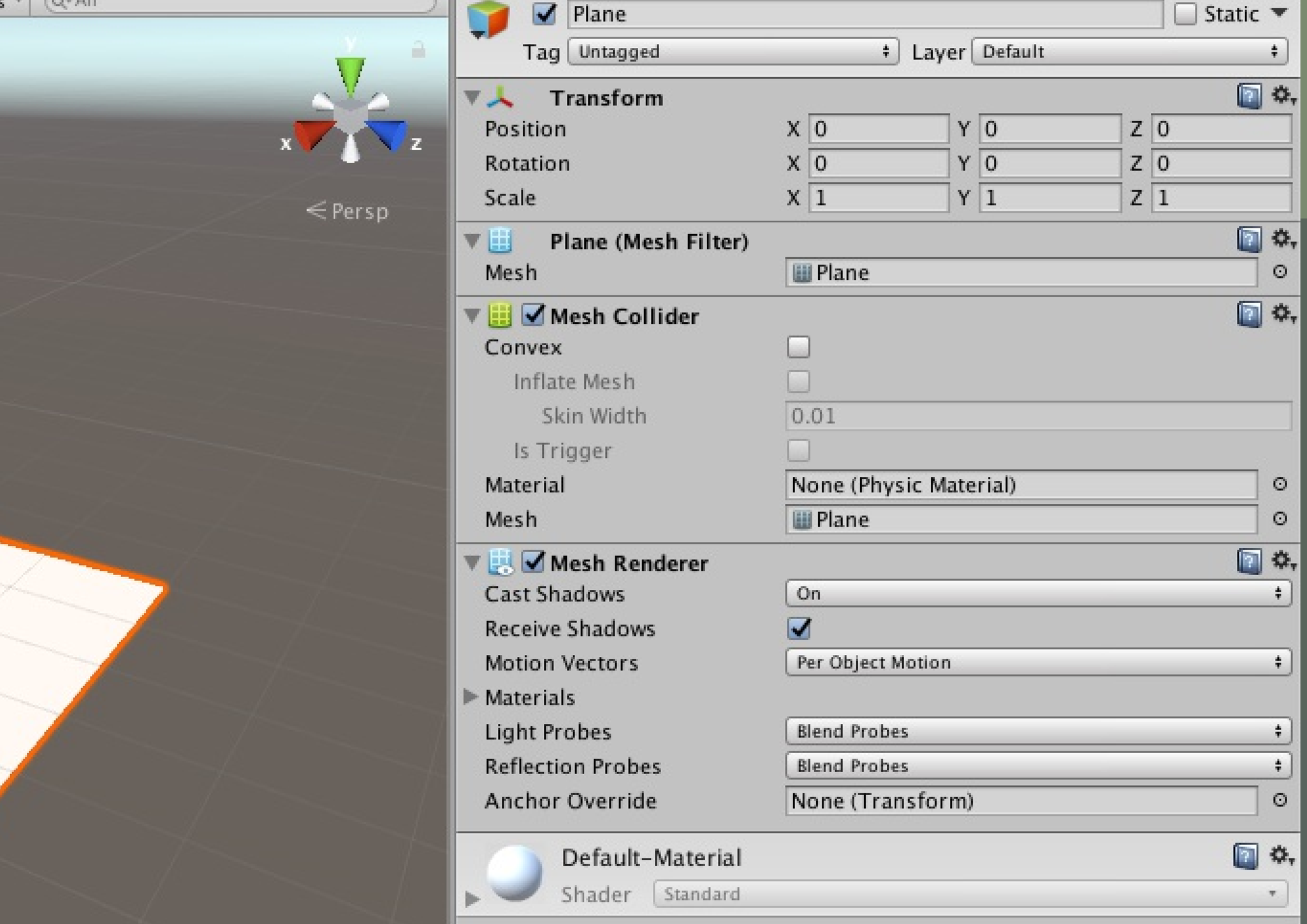
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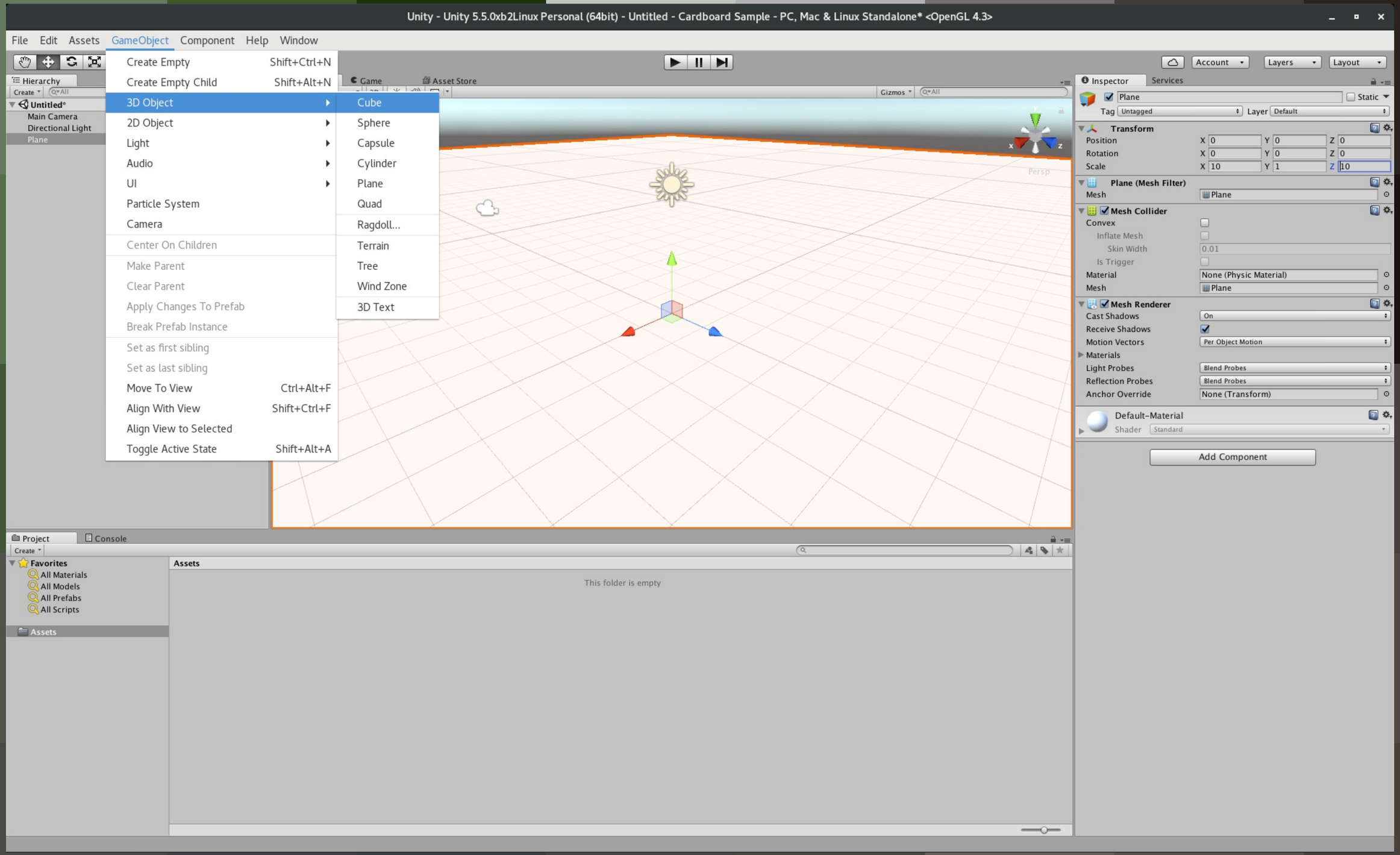
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Create All

Untitled*

- Main Camera
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Scene Game Asset Store

Shaded 2D Gizmos All

Persp

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Inspector Services

Cube Static

Tag Untagged Layer Default

Transform

Position	X 0	Y 0	Z 0
Rotation	X 0	Y 0	Z 0
Scale	X 1	Y 1	Z 1

Cube (Mesh Filter)

Mesh Cube

Box Collider

Edit Collider

Is Trigger

Material None (Physic Material)

Center	X 0	Y 0	Z 0
Size	X 1	Y 1	Z 1

Mesh Renderer

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Cube Static

Tag Untagged Layer Default

Transform

Position	X 1.22	Y 0.88	Z 0.11
Rotation	X 0	Y 0	Z 0
Scale	X 1	Y 1	Z 1

Cube (Mesh Filter)

Mesh: Cube

Box Collider

Edit Collider

Is Trigger

Material: None (Physic Material)

Center	X 0	Y 0	Z 0
Size	X 1	Y 1	Z 1

Mesh Renderer

Cast Shadows: On

Receive Shadows

Motion Vectors: Per Object Motion

Materials

Light Probes: Blend Probes

Reflection Probes: Blend Probes

Anchor Override: None (Transform)

Default-Material

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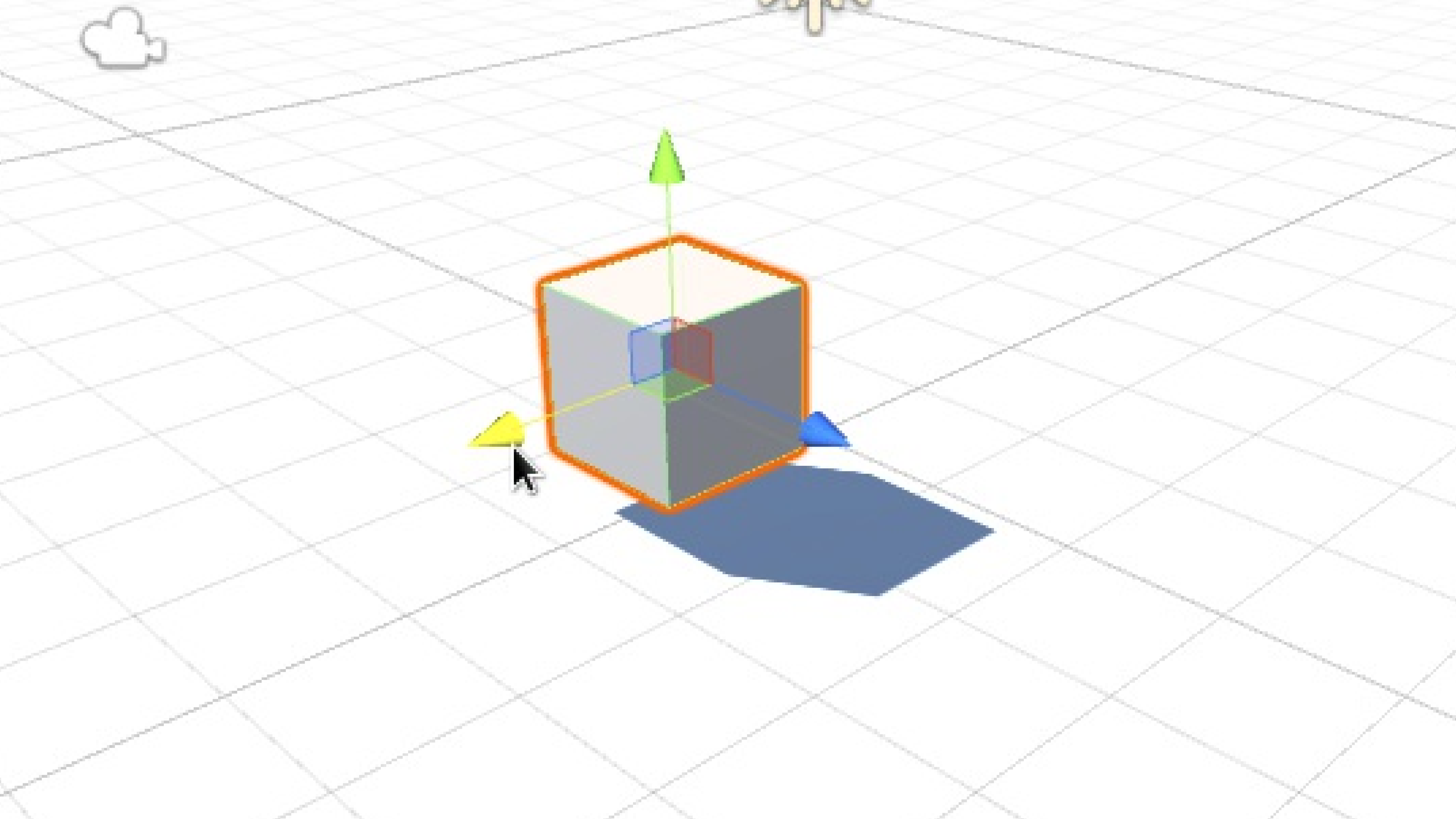

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- Main Camera
- Directional Light
- Plane
- Cube
- Sphere
- Capsule
- Cylinder

Scene Game Asset Store

Shaded 2D Gizmos All

Persp

Camera Preview

Inspector Services

Main Camera Static

Tag MainCamera Layer Default

Transform

Position	X 0	Y 1	Z -10
Rotation	X 0	Y 0	Z 0
Scale	X 1	Y 1	Z 1

Camera

Clear Flags	Skybox
Background	
Culling Mask	Everything
Projection	Perspective
Field of View	60
Clipping Planes	Near 0.3, Far 1000
Viewport Rect	X 0, Y 0, W 1, H 1
Depth	-1
Rendering Path	Use Player Settings
Target Texture	None (Render Texture)
Occlusion Culling	☑
HDR	☐
Target Display	Display 1

GUI Layer

Flare Layer

Audio Listener

Add Component

Project Console

Create

Favorites

- All Materials
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- All Prefabs
- All Scripts

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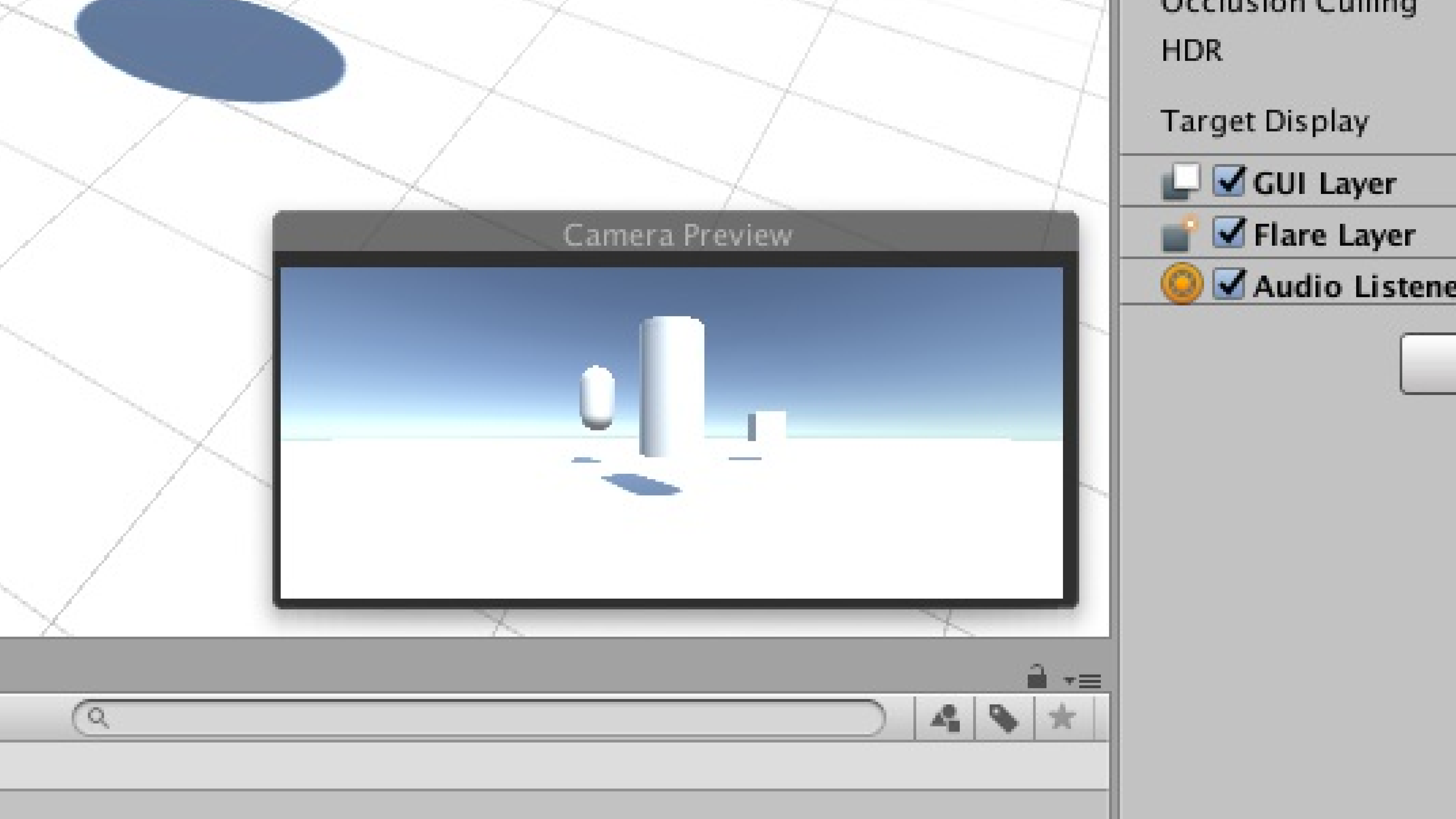
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Scene Game Asset Store

Shaded 2D Gizmos All

Persp

Inspector Services

Asset Store: RedBeard_Bluestone WallV2.sbsar

Type	ProceduralMaterial
Part of package	
Name	Free Material 5 Pack
Version	1.0
Price	free
Rating	5 of 5
Size	559.74 KB
Asset count	8
Web page	http://u3d.as/r9x
Publisher	Russ Denny

Import package Open Asset Store

Project Console

Create t:Material

Favorites
- All Materials
- All Models
- All Prefabs
- All Scripts

Assets

Search: Assets Selected folder Asset Store: 999+ / 999+

Free Assets 16184 Total

Material, Crafter FREE, Ninja, RedBeard_Bl..., Gun01_Low..., Gun01_Low..., Gun01_Low..., House_01_a..., House_02_1..., WoodMain, ChairFabric, Plane, SteelFrame_L..., SteelFrame_R..., SteelFrame_L...

SteelLadder A, SteelLadder B, Mapping Pre..., Digital Scree..., Radar Preview, Directional B..., Spherize Prev..., Blur Preview, Numbers Pre..., ComingSoon..., Distort By Te..., Distort By Te..., Pixelated No..., Bar Graph Pr..., Crystal Green

Crossed Wre..., Flags Green, Battery Black, Arrows Green, Coin Silver, Diamond Gr..., Heart Purple, Medipack Red, Cup Silver, Lightning Bl..., Jerry Can Gr..., Magnet Blue..., Bomb Red, Skull Red, Poison Purple

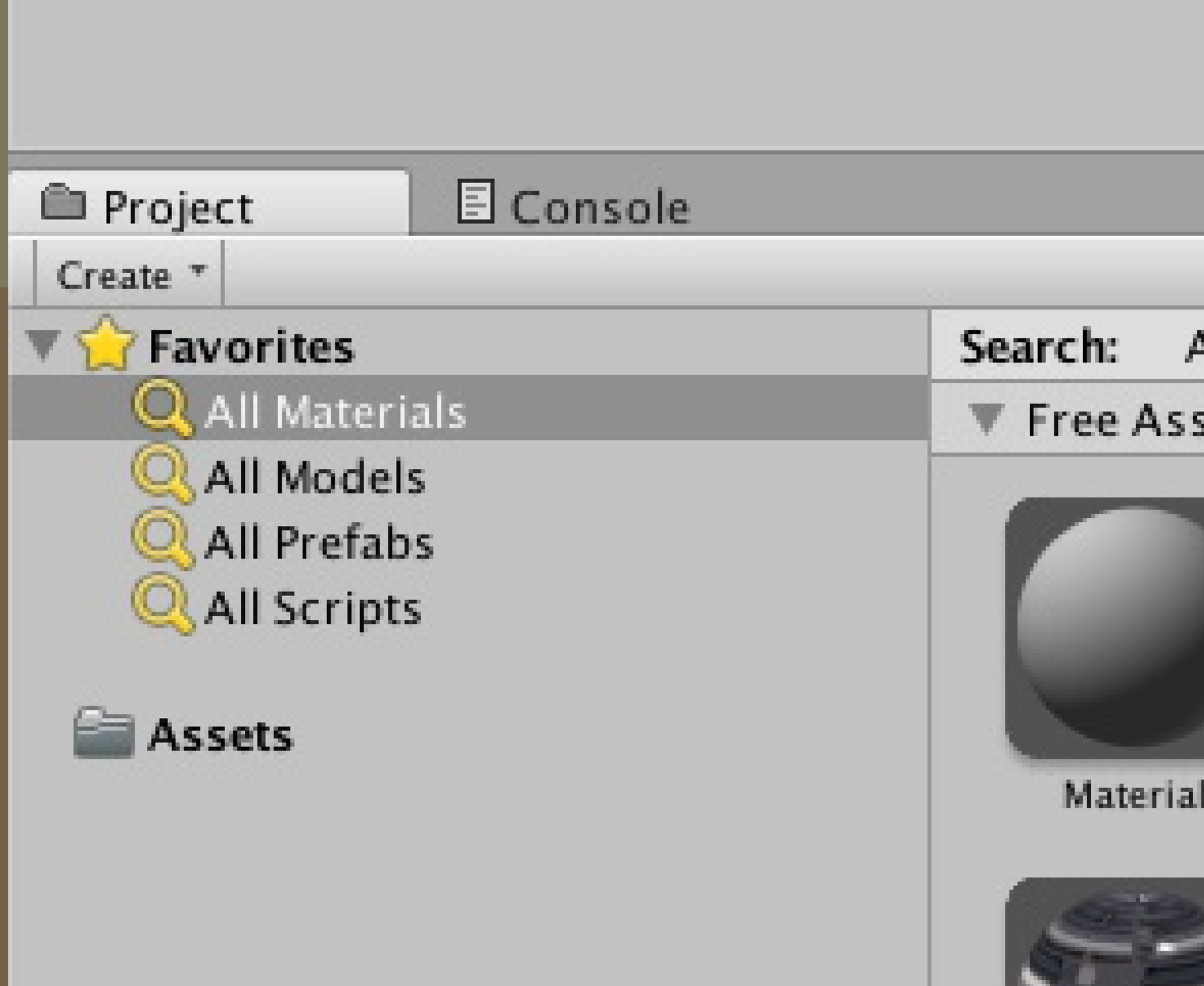
Procedural Properties

Random Seed	Randomize	0
Randomizer		1
Uniform / Random		

Generated Textures

Asset Store Preview

Asset Store: RedBeard_Bluestone WallV2.sbsar
512x512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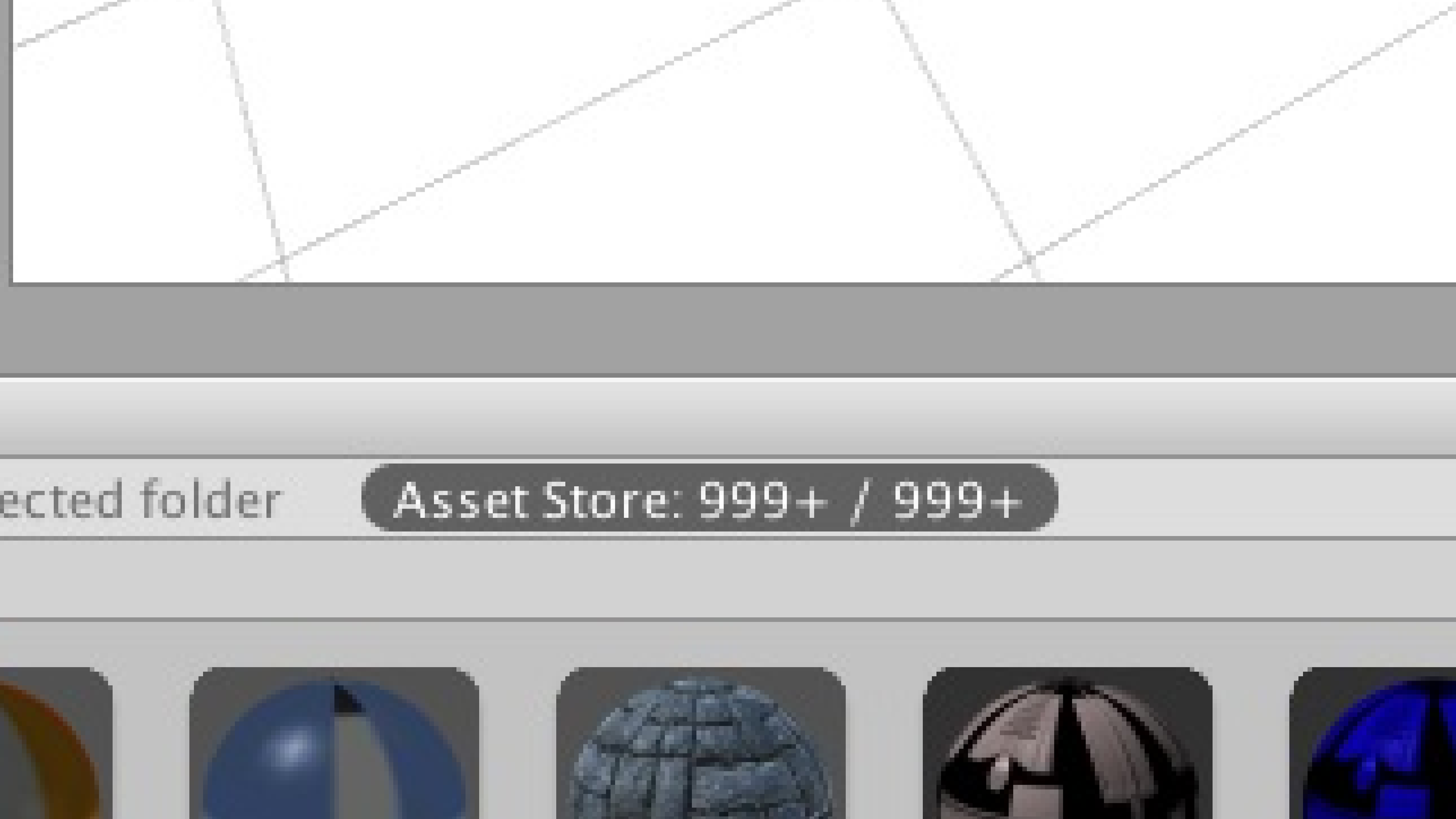
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Asset Store: 999+ / 999+

Asset Store: 5554 / 5554
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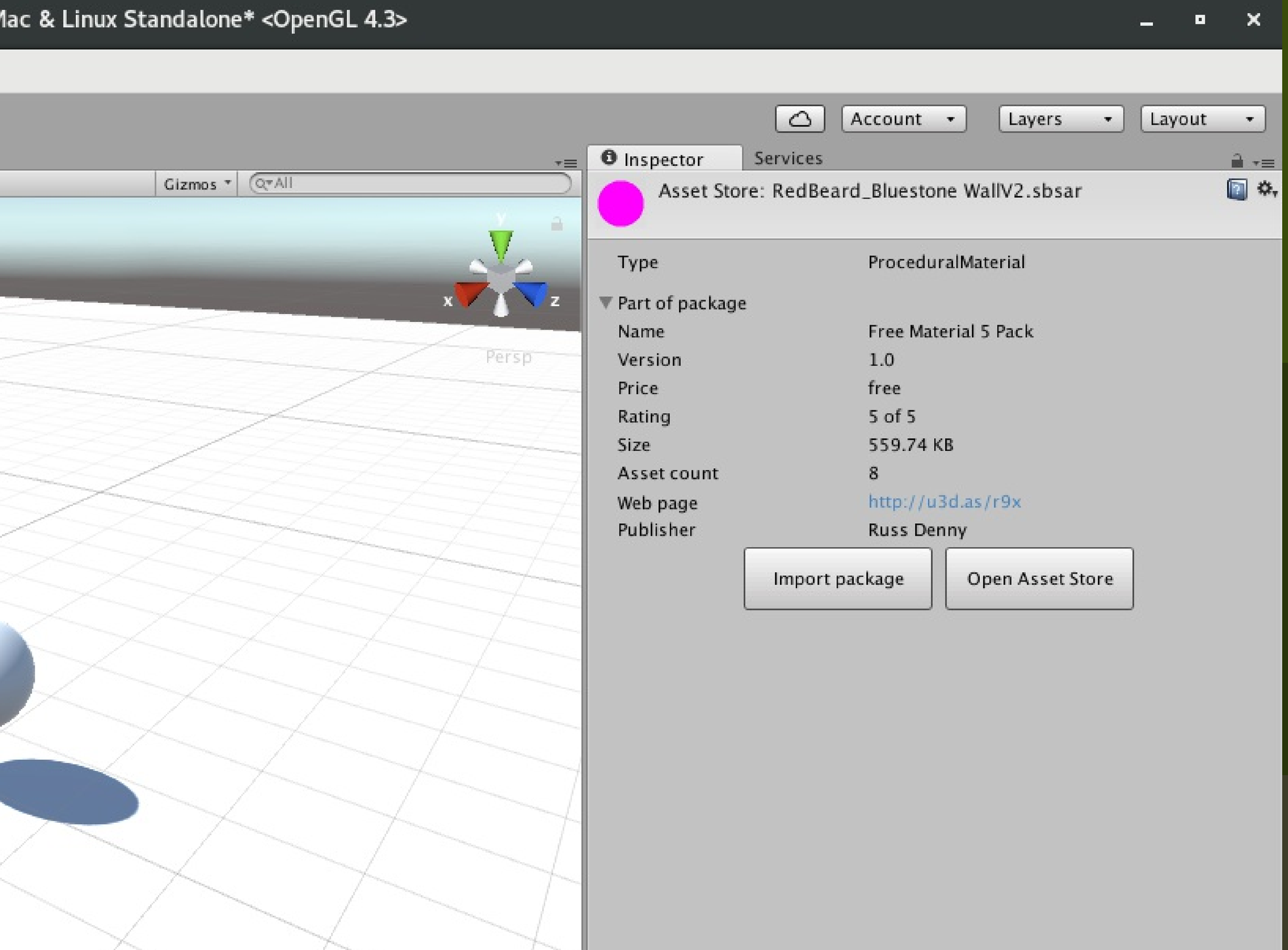
Ninja
RedBeard_Bl...
Gun01_Low...
Gun01_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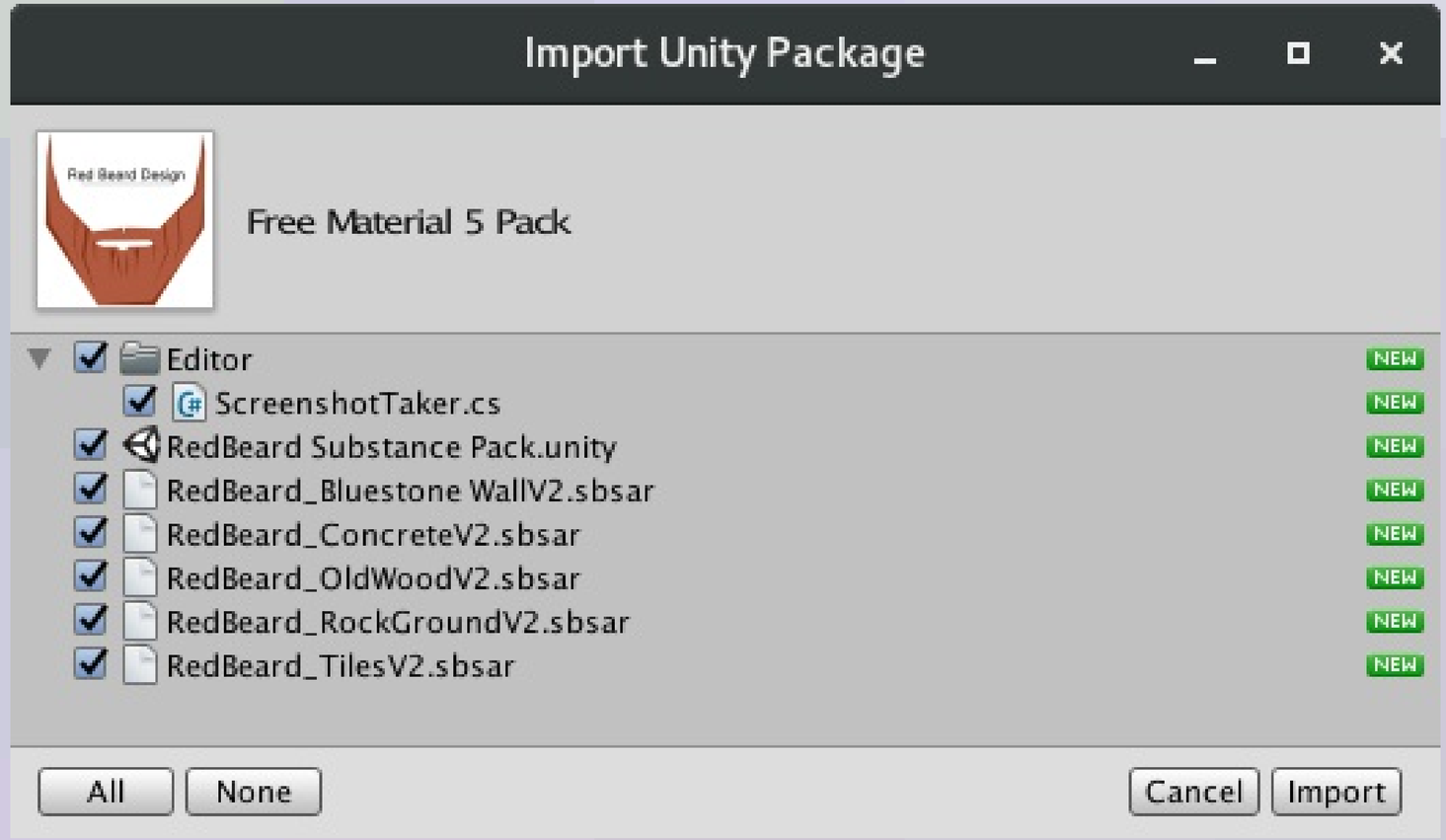
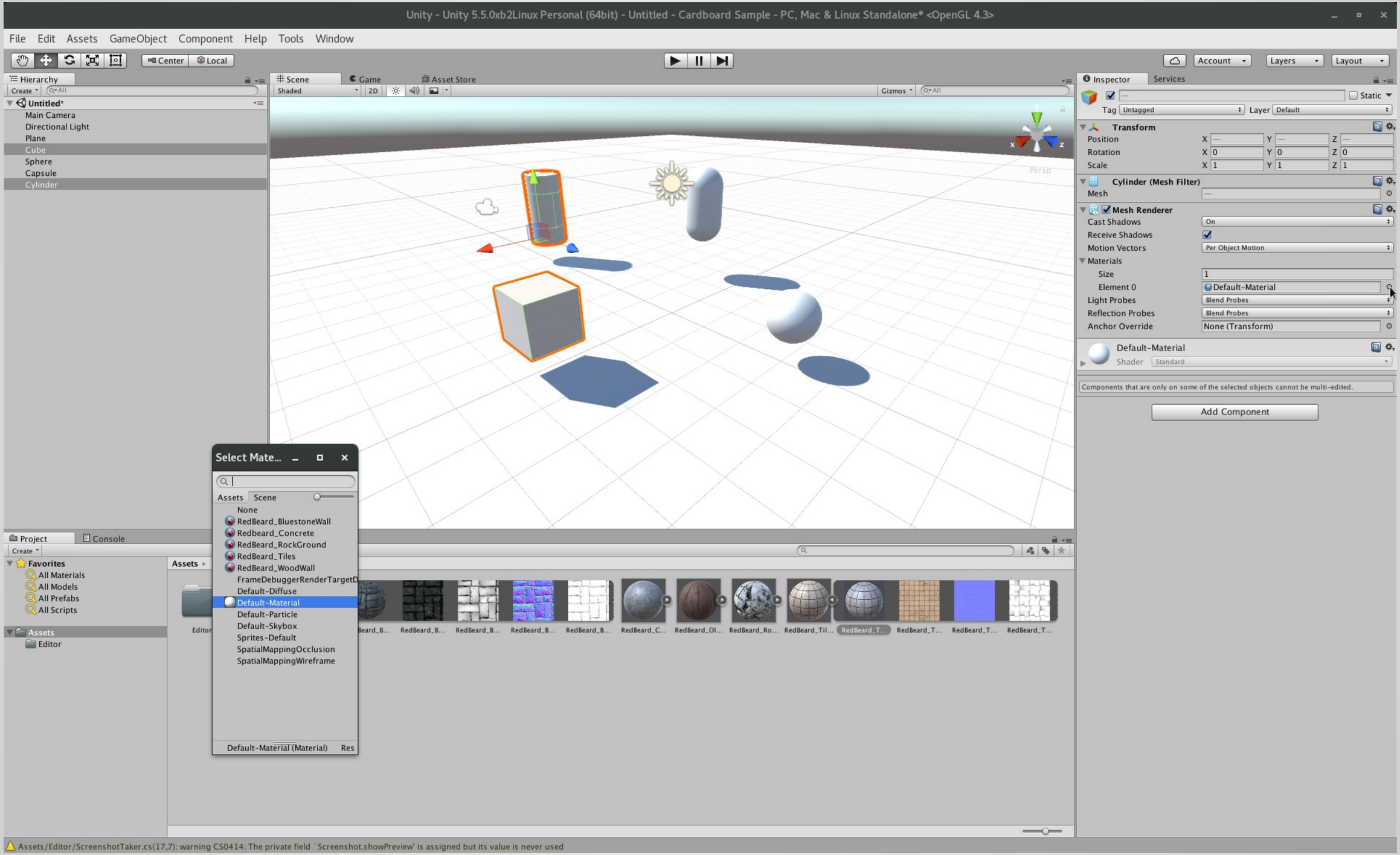

Import Unity Package
Red Beard Design
Free Material 5 Pack
Editor
ScreenshotTaker.cs
RedBeard Substance Pack.unity
RedBeard_Bluestone WallV2.sbsar
RedBeard_ConcreteV2.sbsar
RedBeard_OldWoodV2.sbsar
RedBeard_RockGroundV2.sbsar
RedBeard_TilesV2.sbsar
NEW
All
None
Cancel
Import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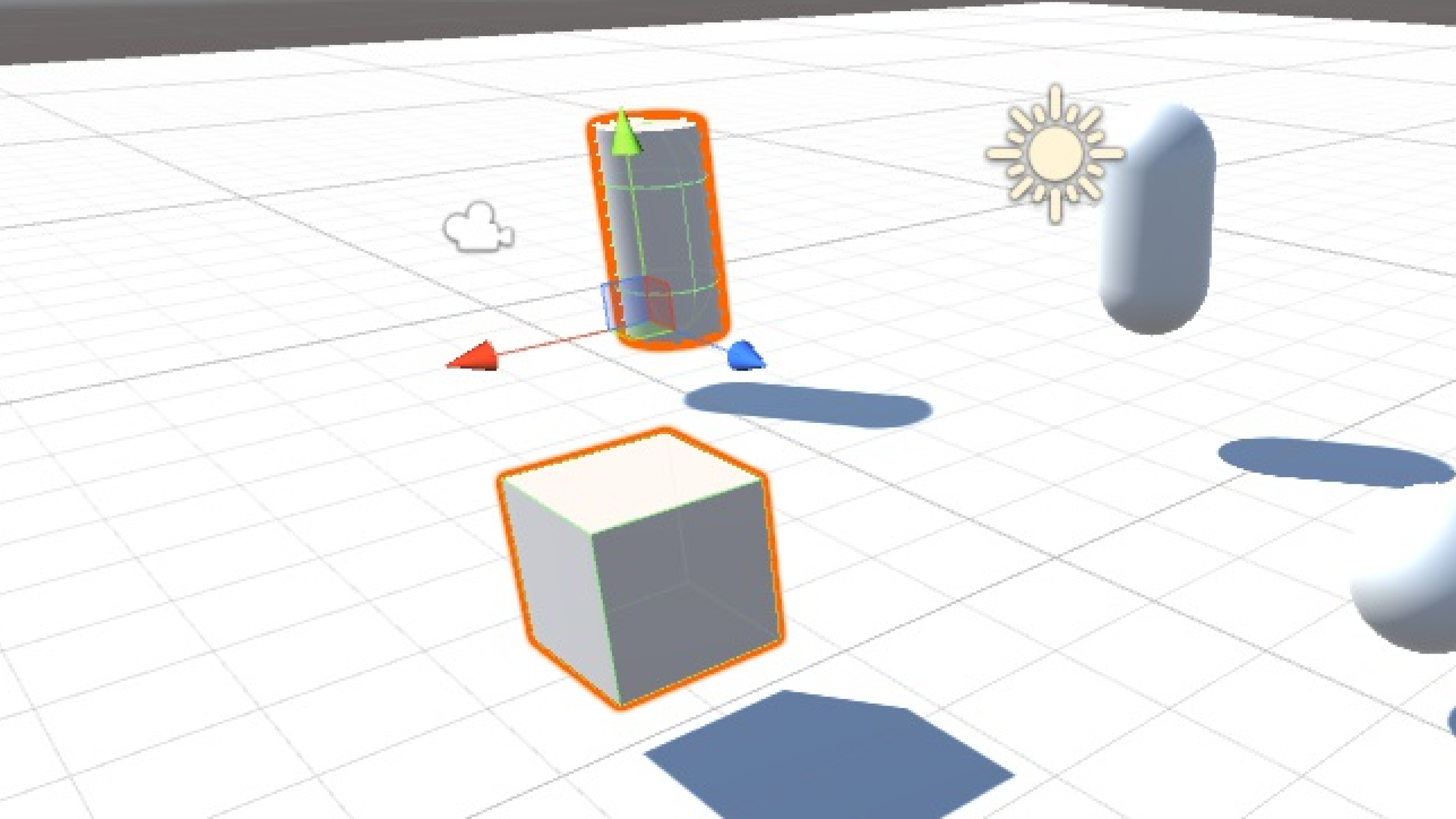
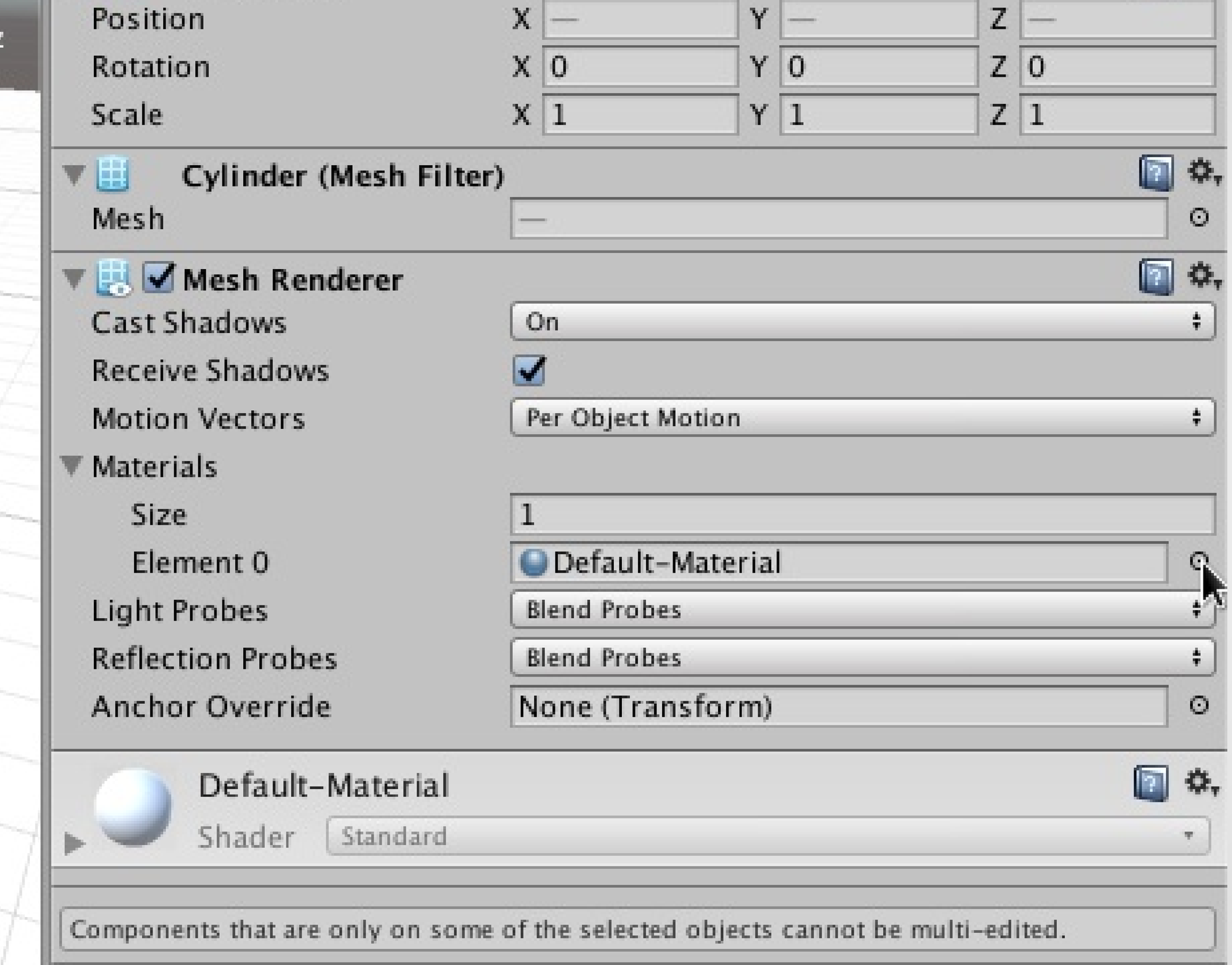
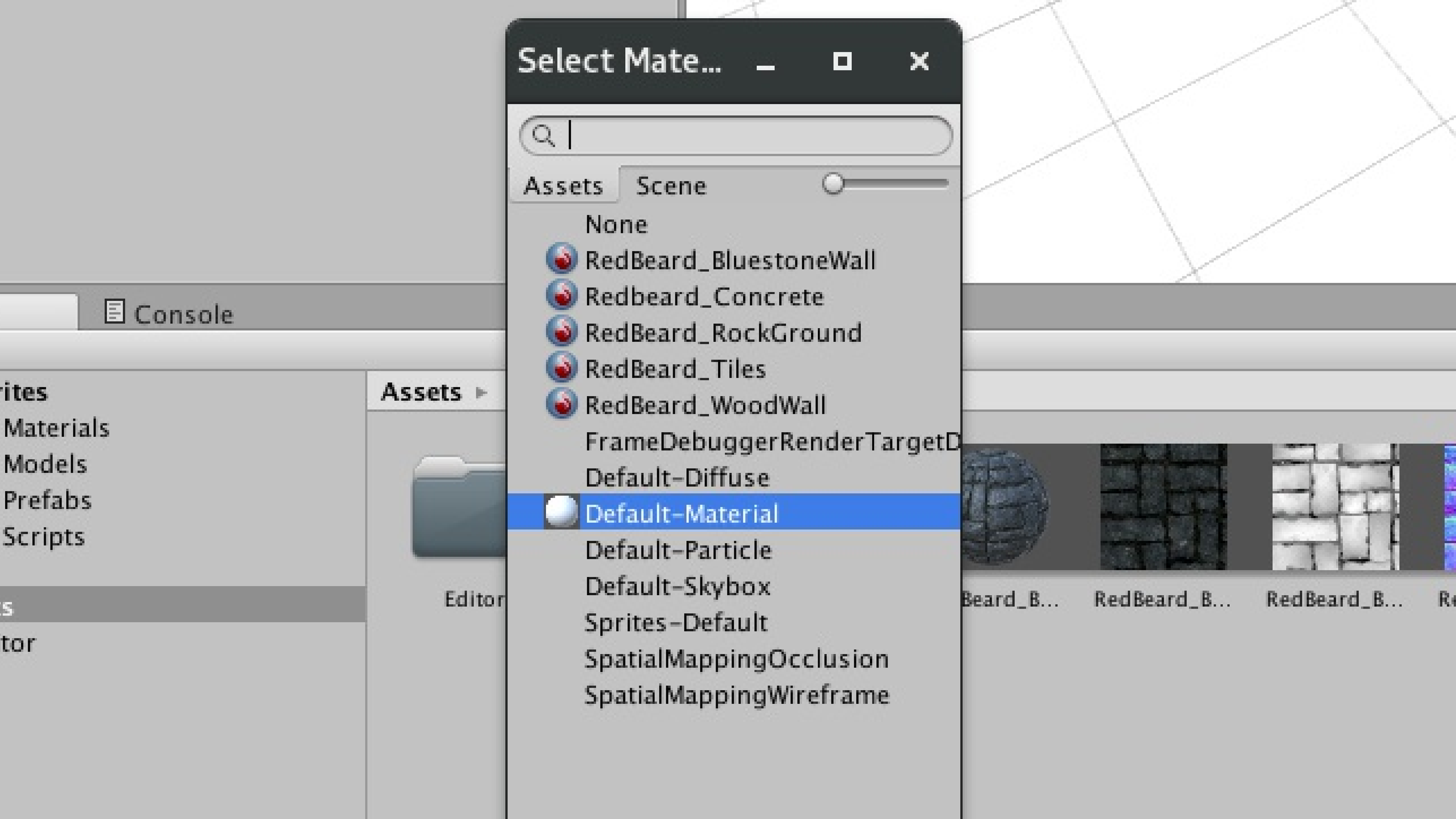
Materials
Size 1
Element 0 Default-Material
Light Probes Blend Probes
Reflection Probes Blend Probes
Anchor Override None (Transform)
Default-Material
Shader Standard
Components that are only on some of the selected objects cannot be multi-edited.
Add Component
Select Mate...
Assets Scene
None
RedBeard_BluestoneWall
Redbeard_Concrete
RedBeard_RockGround
RedBeard_Tiles
RedBeard_WoodWall
FrameDebuggerRenderTargetD
Default-Diffuse
Default-Material
Default-Particle
Default-Skybox
Sprites-Default
SpatialMappingOcclusion
SpatialMappingWireframe
Default-Material (Material) Res
Project Console
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Editor
Assets/Editor/ScreenshotTaker.cs(17,7): warning CS0414: The private field `Screenshot.showPreview' is assigned but its value is never used




Position
X —
Y —
Z —
Rotation
X 0
Y 0
Z 0
Scale
X 1
Y 1
Z 1
Cylinder (Mesh Filter)
Mesh
Mesh Renderer
Cast Shadows
On
Receive Shadows
Motion Vectors
Per Object Motion
Materials
Size
1
Element 0
Default-Material
Light Probes
Blend Probes
Reflection Probes
Blend Probes
Anchor Override
None (Transform)
Default-Material
Shader
Standard
Components that are only on some of the selected objects cannot be multi-edited.


Select Mate...
Assets
Scene
None
RedBeard_BluestoneWall
Redbeard_Concrete
RedBeard_RockGround
RedBeard_Tiles
RedBeard_WoodWall
FrameDebuggerRenderTargetD
Default-Diffuse
Default-Material
Default-Particle
Default-Skybox
Sprites-Default
SpatialMappingOcclusion
SpatialMappingWireframe
Console
Materials
Models
Prefabs
Scripts
Assets
Editor
Beard_B...
RedBeard_B...
RedBeard_B...

Unity - Unity 5.5.0xb2Linux Personal (64bit) - Untitled - Cardboard Sample - PC, Mac & Linux Standalone* <OpenGL 4.3>

File Edit Assets GameObject Component Help Tools Window

Center Local

Account Layers Layout

Hierarchy

Create All

Untitled*

- Main Camera
- Directional Light
- Plane
- Cube
- Sphere
- Capsule
- Cylinder

Scene Game Asset Store

Shaded 2D Gizmos All

Persp

Inspector Services

Plane Static

Tag Untagged Layer Default

Transform

Position	X 0	Y 0	Z 0
Rotation	X 0	Y 0	Z 0
Scale	X 10	Y 1	Z 10

Plane (Mesh Filter)

Mesh: Plane

Mesh Collider

Convex
Inflate Mesh
Skin Width: 0.01
Is Trigger
Material: None (Physic Material)
Mesh: Plane

Mesh Renderer

Cast Shadows: On
Receive Shadows
Motion Vectors: Per Object Motion
Materials
Size: 1
Element 0: RedBeard_WoodWall
Light Probes: Blend Probes
Reflection Probes: Blend Probes
Anchor Override: None (Transform)

RedBeard_WoodWall

Shader: Standard

Rendering Mode: Opaque

Main Maps

Albedo
Metallic
Smoothness: 1
Source: Metallic Alpha
Normal Map: 1
Height Map: 0.0476
Occlusion
Emission: 0
Global Illumination: Realtime
Detail Mask
Tiling X 10 Y 10
Offset X 0 Y 0

Secondary Maps

Detail Albedo x2
Normal Map: 1
Tiling X 1 Y 1
Offset X 0 Y 0
UV Set: UV0

Forward Rendering Options

Specular Highlights
Reflections

Procedural Properties

Generate all outputs

Project Console

Create

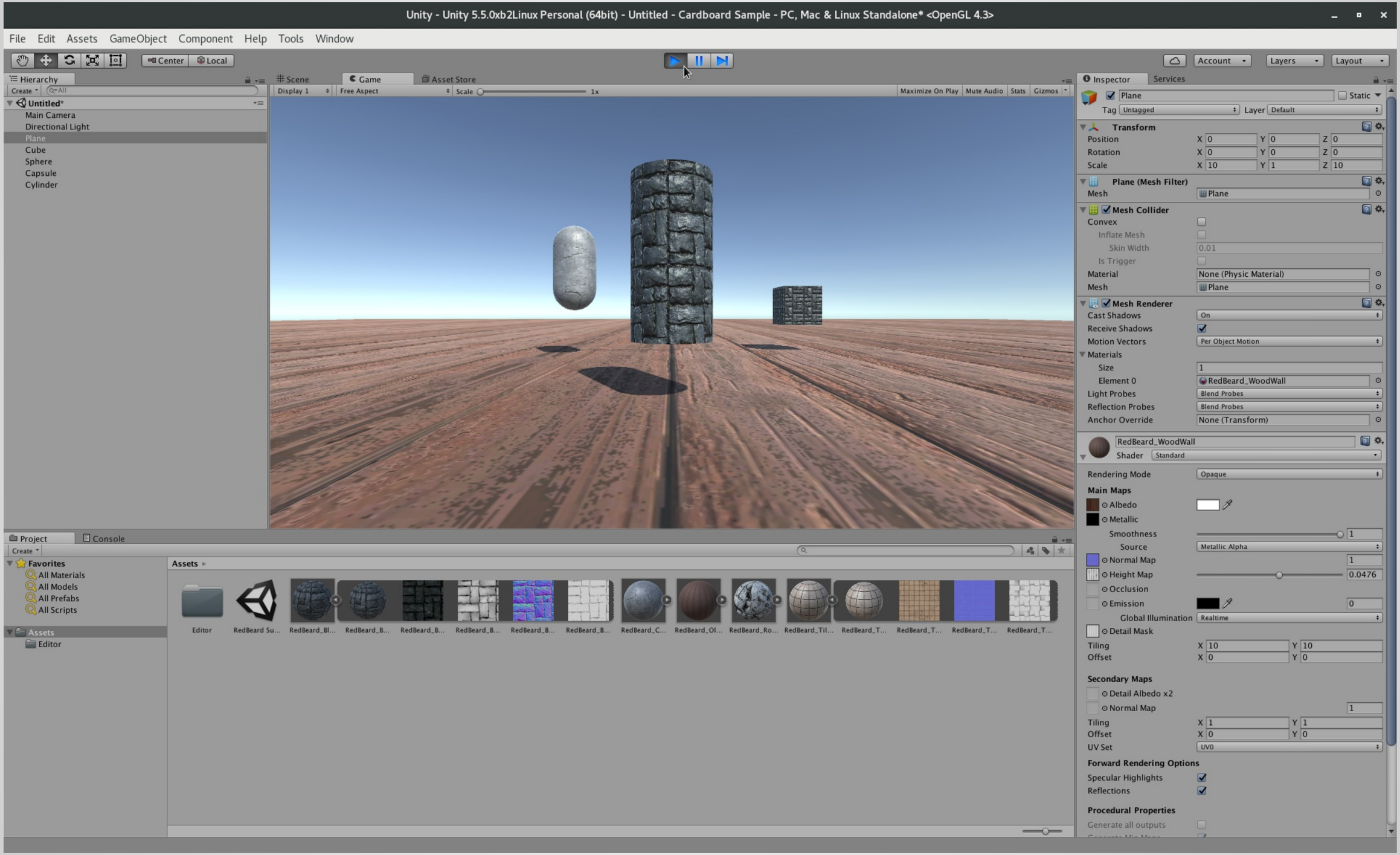
Favorites
- All Materials
- All Models
- All Prefabs
- All Scripts

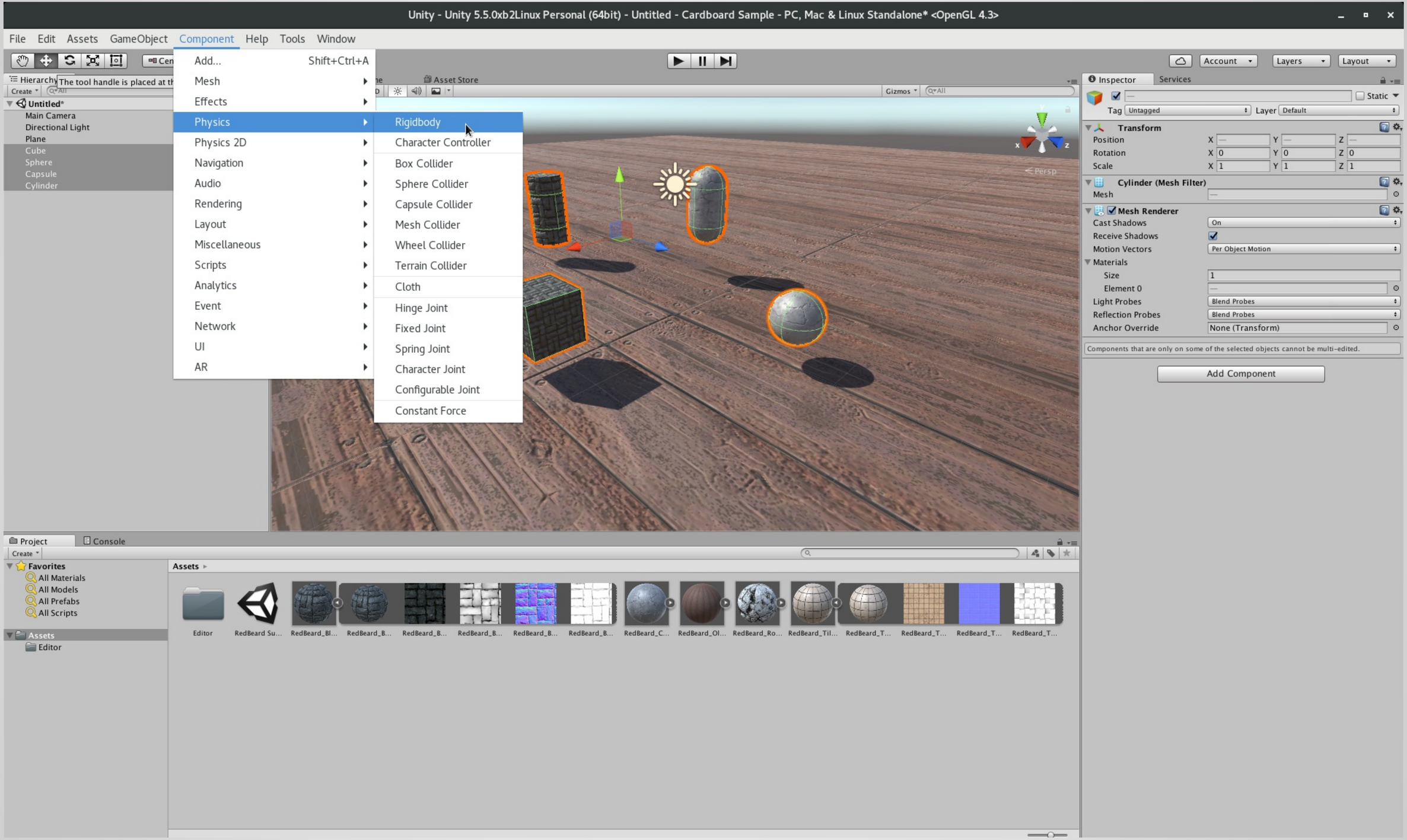
Assets
- Editor

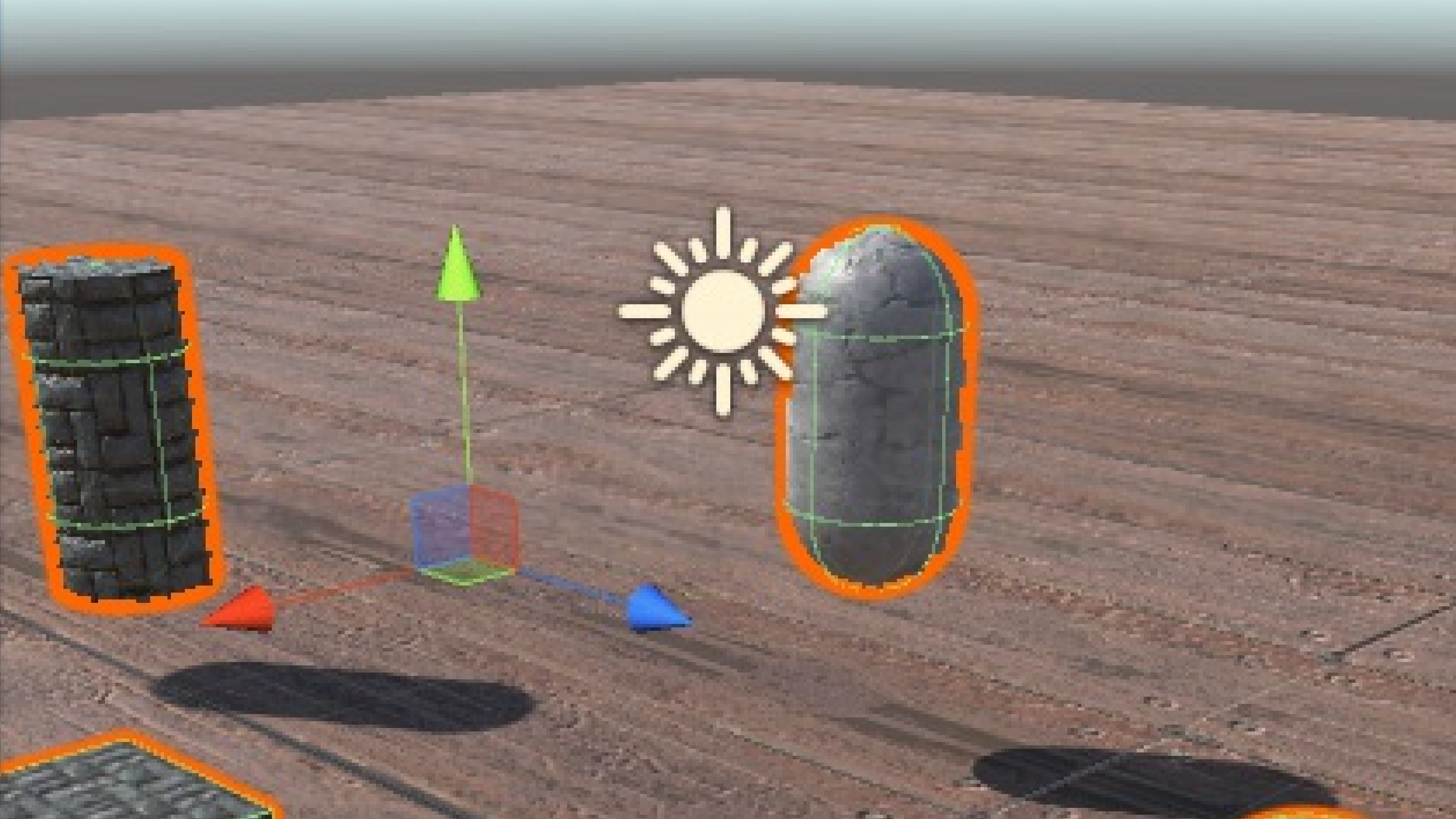
Assets

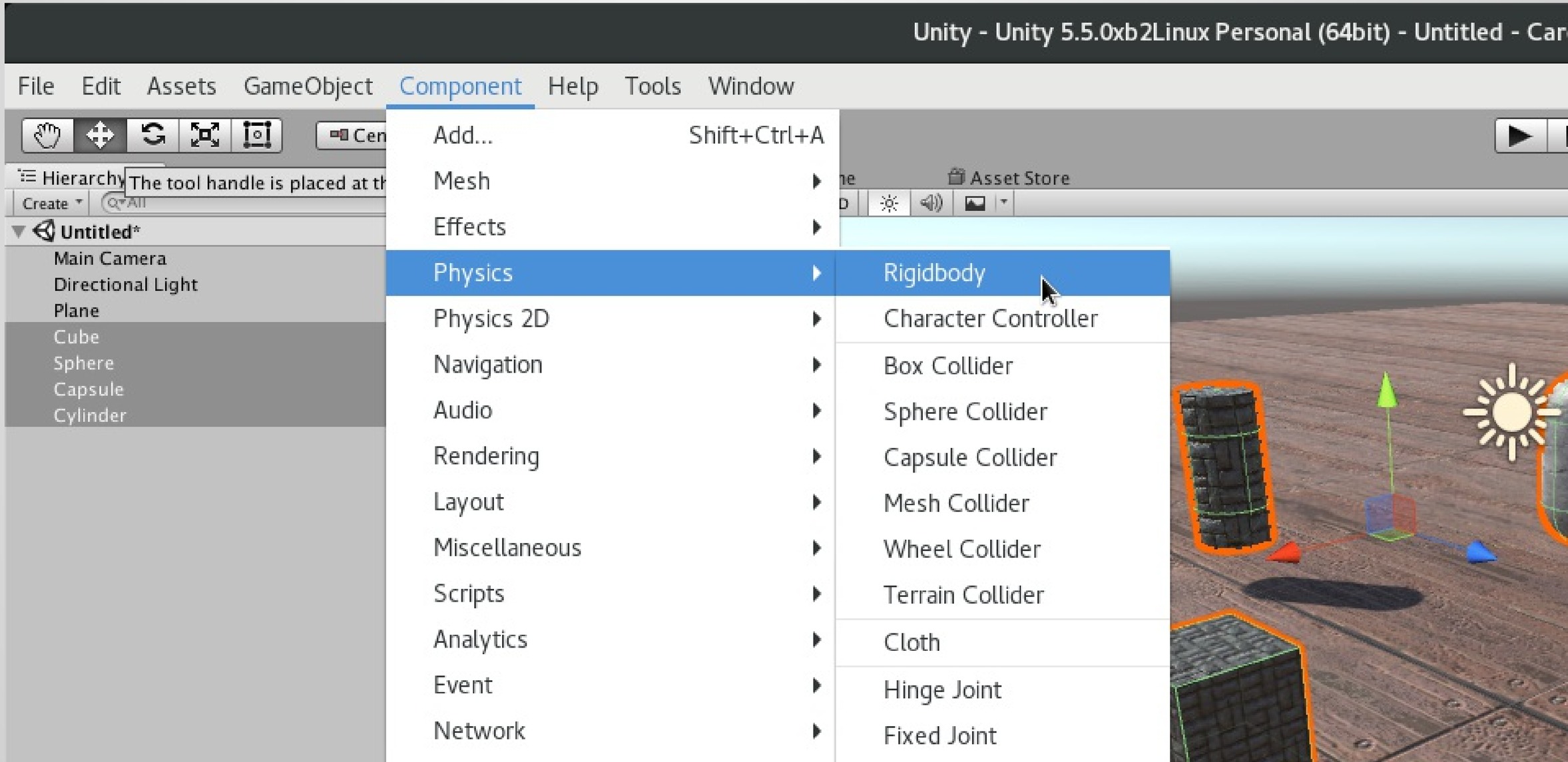
Editor, RedBeard Su..., RedBeard_Bl..., RedBeard_B..., RedBeard_B..., RedBeard_B..., RedBeard_B..., RedBeard_B..., RedBeard_C..., RedBeard_Ol..., RedBeard_Ro..., RedBeard_Til..., RedBeard_T..., RedBeard_T..., RedBeard_T..., RedBeard_T...

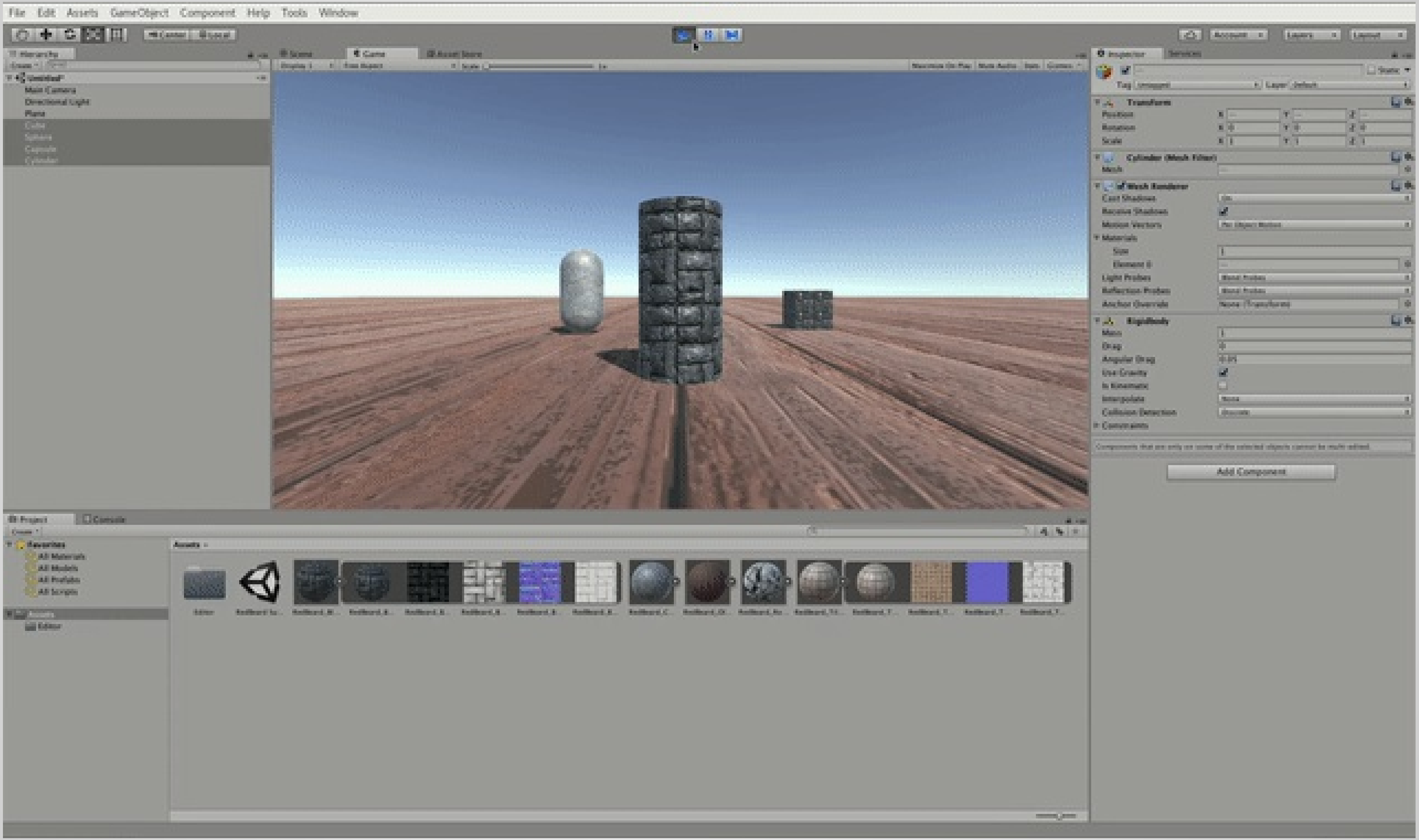
x Personal (64bit) - Untitled - Cardboard Sample - PC, Mac & Li
1x

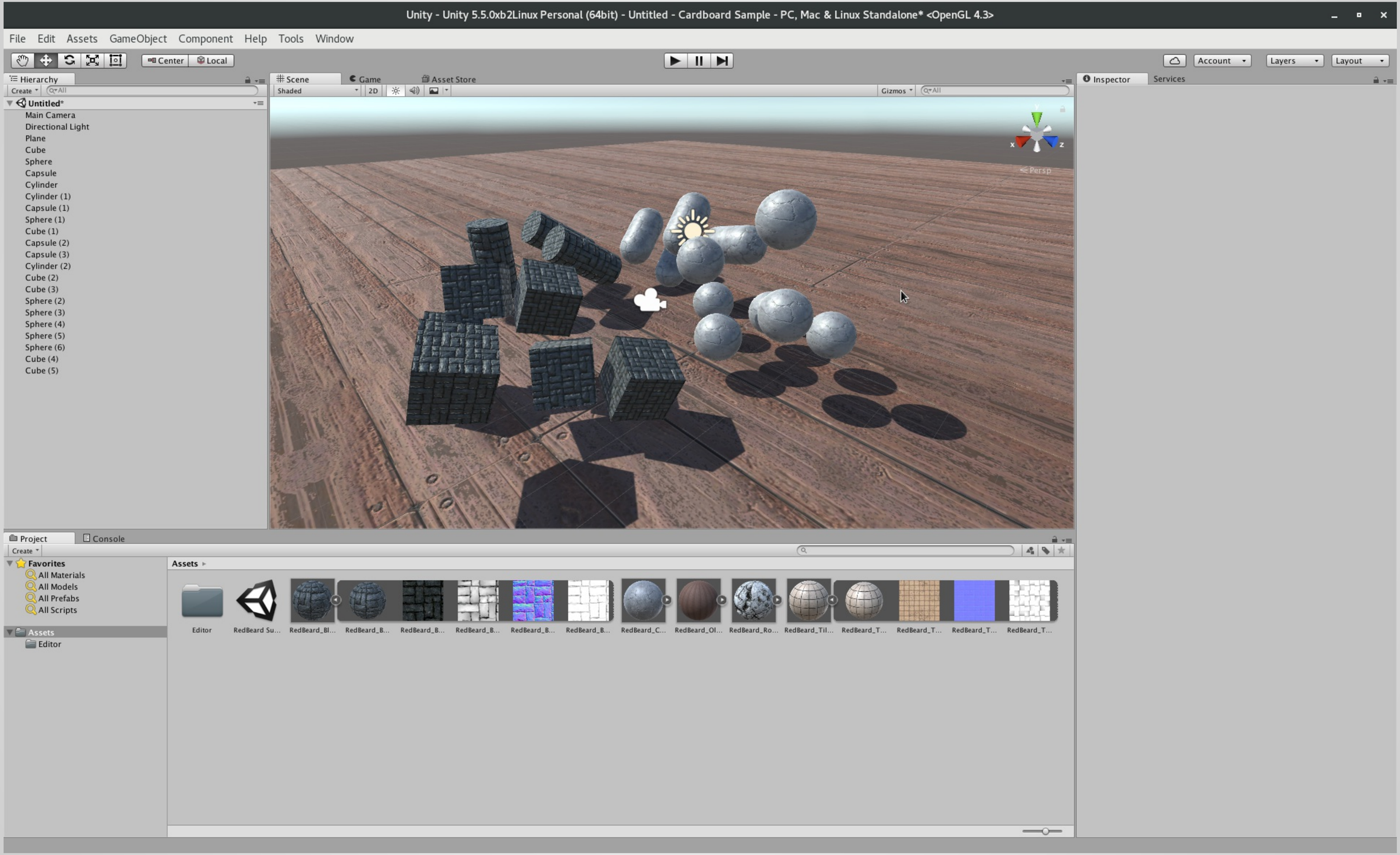

Unity - Unity 5.5.0xb2Linux Personal (64bit) - Untitled - Cardboard Sample - PC, Mac & Linux Standalone* <OpenGL 4.3>
File Edit Assets GameObject Component Help Tools Window
Center Local
Account Layers Layout
Hierarchy
Create
Untitled*
Main Camera
Directional Light
Plane
Cube
Sphere
Capsule
Cylinder
Scene Game Asset Store
Display 1 Free Aspect Scale 1x
Maximize On Play Mute Audio Stats Gizmos
Inspector Services
Plane Static
Tag Untagged Layer Default
Transform
Position X 0 Y 0 Z 0
Rotation X 0 Y 0 Z 0
Scale X 10 Y 1 Z 10
Plane (Mesh Filter)
Mesh Plane
Mesh Collider
Convex
Inflate Mesh
Skin Width 0.01
Is Trigger
Material None (Physic Material)
Mesh Plane
Mesh Renderer
Cast Shadows On
Receive Shadows
Motion Vectors Per Object Motion
Materials
Size 1
Element 0 RedBeard_WoodWall
Light Probes Blend Probes
Reflection Probes Blend Probes
Anchor Override None (Transform)
RedBeard_WoodWall
Shader Standard
Rendering Mode Opaque
Main Maps
Albedo
Metallic
Smoothness 1
Source Metallic Alpha
Normal Map 1
Height Map 0.0476
Occlusion
Emission 0
Global Illumination Realtime
Detail Mask
Tiling X 10 Y 10
Offset X 0 Y 0
Secondary Maps
Detail Albedo x2
Normal Map 1
Tiling X 1 Y 1
Offset X 0 Y 0
UV Set UV0
Forward Rendering Options
Specular Highlights
Reflections
Procedural Properties
Generate all outputs
Project Console
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Editor
Assets
Editor
RedBeard Su...
RedBeard_Bl...
RedBeard_B...
RedBeard_C...
RedBeard_Ol...
RedBeard_Ro...
RedBeard_Til...
RedBeard_T...

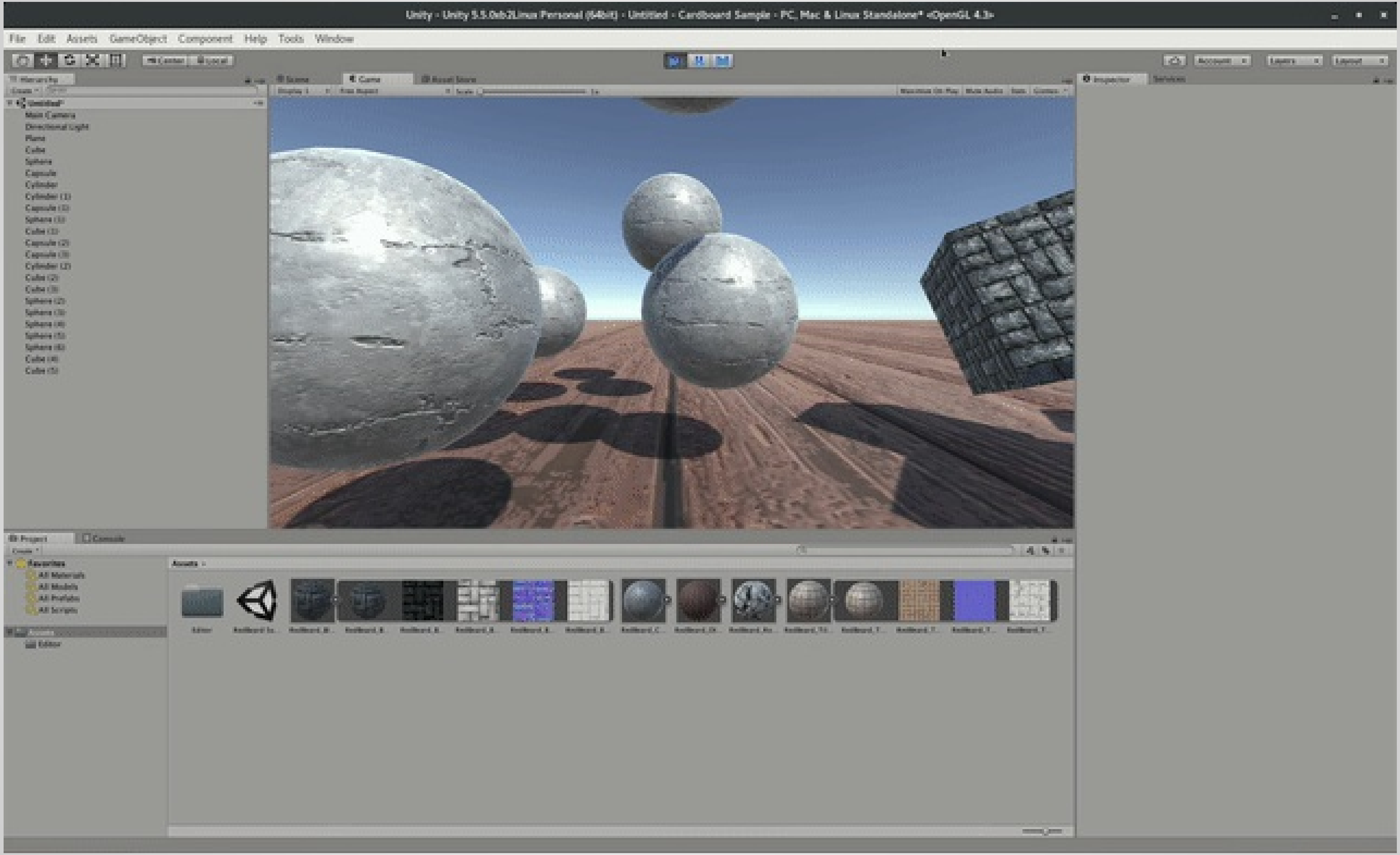

Unity - Unity 5.5.0xb2Linux Personal (64bit) - Untitled - Cardboard Sample - PC, Mac & Linux Standalone* <OpenGL 4.3>
File
Edit
Assets
GameObject
Component
Help
Tools
Window
Add... Shift+Ctrl+A
Mesh
Effects
Physics
Physics 2D
Navigation
Audio
Rendering
Layout
Miscellaneous
Scripts
Analytics
Event
Network
UI
AR
Rigidbody
Character Controller
Box Collider
Sphere Collider
Capsule Collider
Mesh Collider
Wheel Collider
Terrain Collider
Cloth
Hinge Joint
Fixed Joint
Spring Joint
Character Joint
Configurable Joint
Constant Force
Hierarchy
The tool handle is placed at th
Untitled*
Main Camera
Directional Light
Plane
Cube
Sphere
Capsule
Cylinder
Asset Store
Gizmos
Persp
Inspector
Services
Static
Tag Untagged
Layer Default
Transform
Position
Rotation
Scale
Cylinder (Mesh Filter)
Mesh
Mesh Renderer
Cast Shadows On
Receive Shadows
Motion Vectors Per Object Motion
Materials
Size 1
Element 0
Light Probes Blend Probes
Reflection Probes Blend Probes
Anchor Override None (Transform)
Components that are only on some of the selected objects cannot be multi-edited.
Add Component
Account
Layers
Layout
Project
Console
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Editor

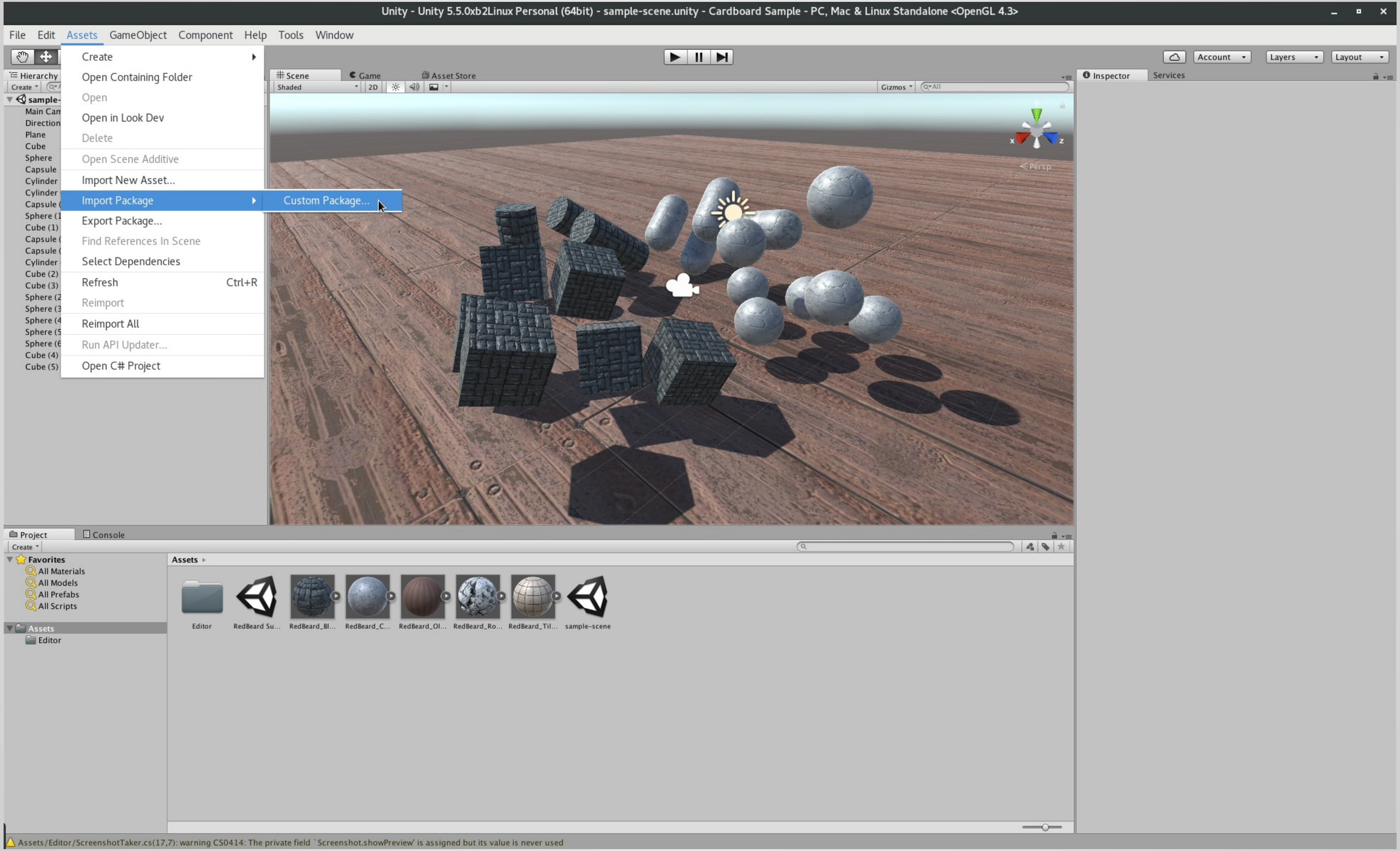


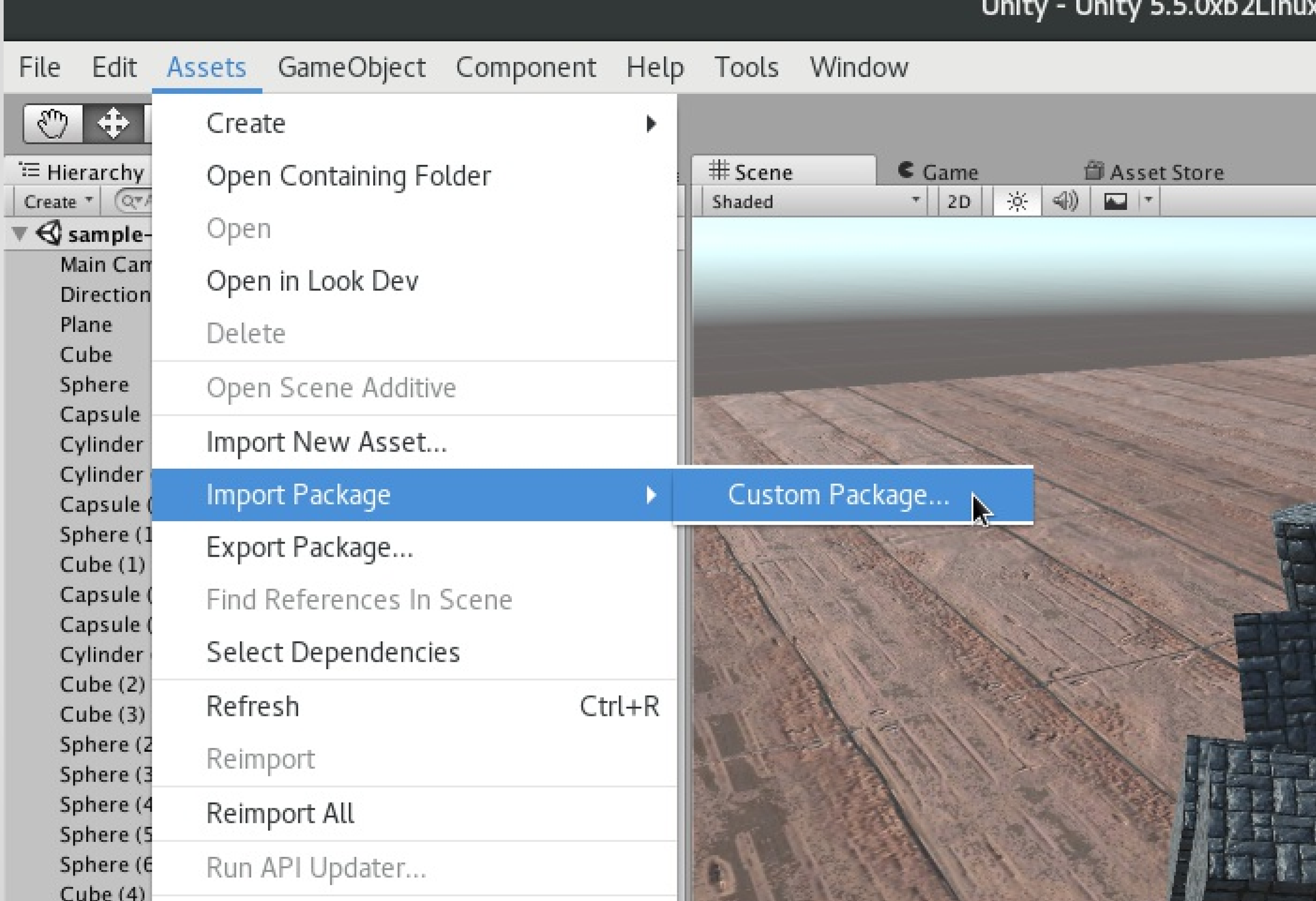

Unity - Unity 5.5.0xb2Linux Personal (64bit) - Untitled - Car
File
Edit
Assets
GameObject
Component
Help
Tools
Window
Hierarchy
The tool handle is placed at th
Create
Untitled*
Main Camera
Directional Light
Plane
Cube
Sphere
Capsule
Cylinder
Asset Store
Add...
Shift+Ctrl+A
Mesh
Effects
Physics
Physics 2D
Navigation
Audio
Rendering
Layout
Miscellaneous
Scripts
Analytics
Event
Network
Rigidbody
Character Controller
Box Collider
Sphere Collider
Capsule Collider
Mesh Collider
Wheel Collider
Terrain Collider
Cloth
Hinge Joint
Fixed Joint

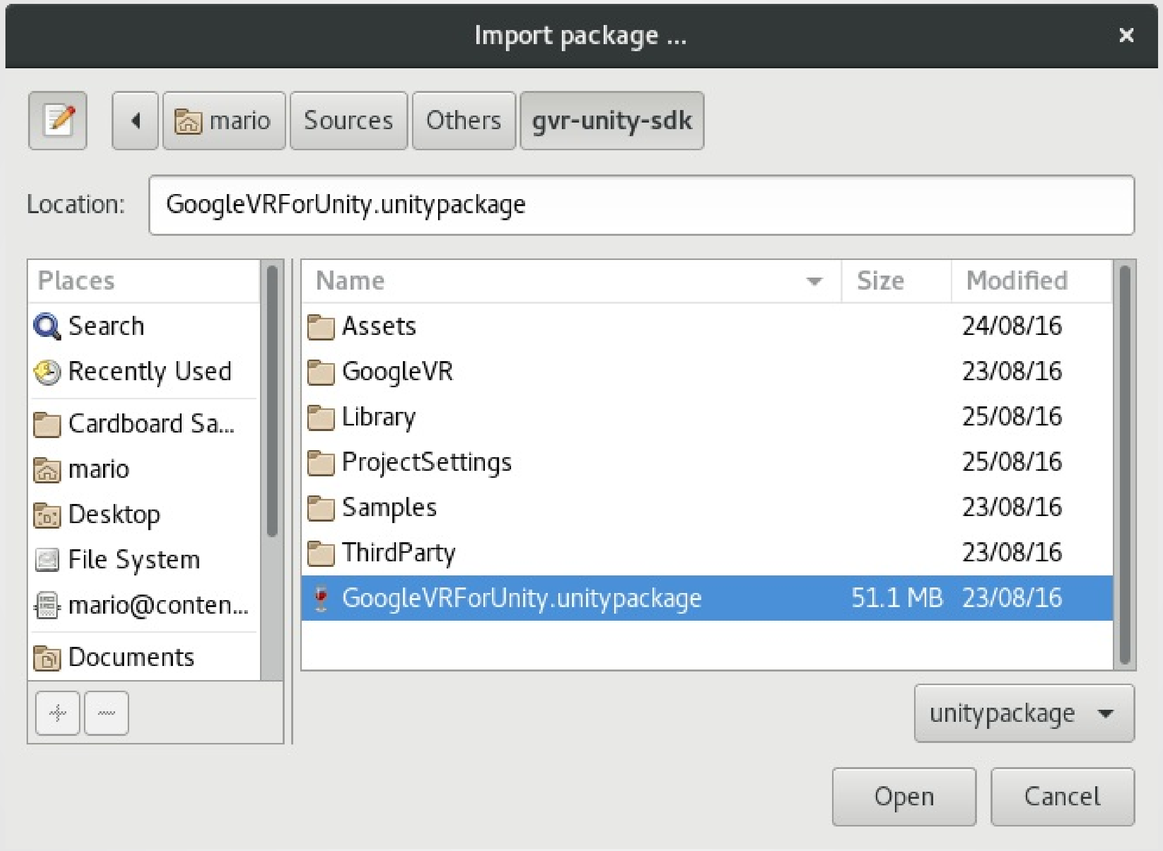

File Edit Assets GameObject Component Help Tools Window
Hierarchy
Untitled*
Main Camera
Directional Light
Plane
Cube
Sphere
Capsule
Cylinder
Scene
Game
Asset Store
Inspector
Services
Static
Tag Untagged
Layer Default
Transform
Position
Rotation
Scale
Cylinder (Mesh Filter)
Mesh
Mesh Renderer
Cast Shadows
Receive Shadows
Motion Vectors
Per Object Motion
Materials
Size
Element 0
Light Probes
Blend Probes
Reflection Probes
Blend Probes
Anchor Override
None (Transform)
Rigidbody
Mass
Drag
Angular Drag
Use Gravity
Is Kinematic
Interpolate
None
Collision Detection
Discrete
Constraints
Components that are only on some of the selected objects cannot be multi-edited.
Add Component
Project
Console
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Editor
Assets

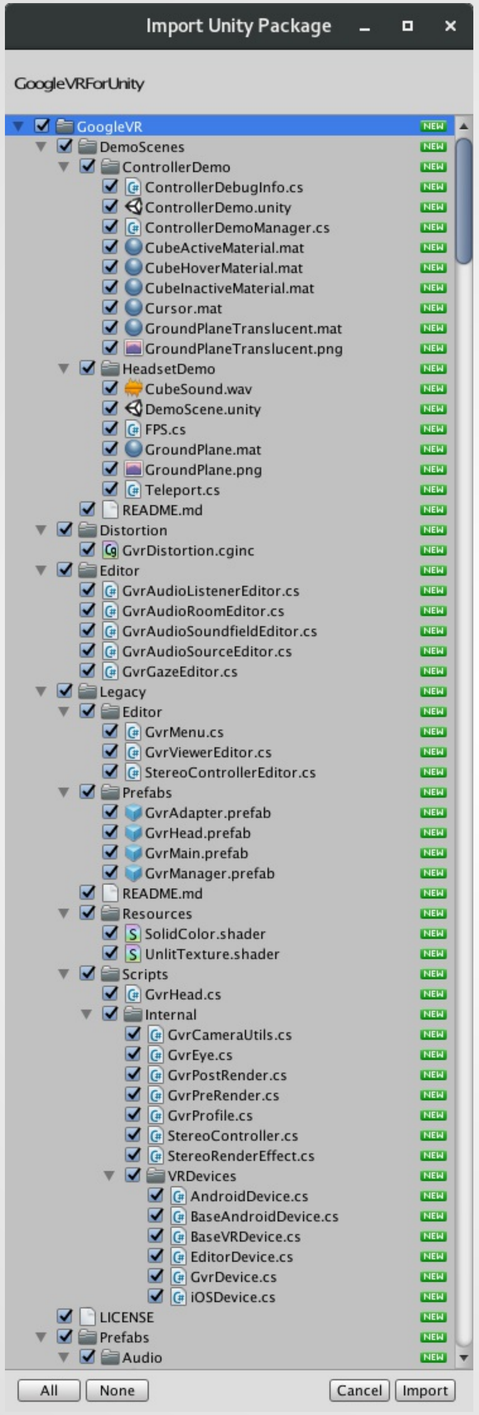

Unity - Unity 5.5.0xb2Linux Personal (64bit) - Untitled - Cardboard Sample - PC, Mac & Linux Standalone* <OpenGL 4.3>
File Edit Assets GameObject Component Help Tools Window
Center Local
Account Layers Layout
Hierarchy
Create
Untitled*
Main Camera
Directional Light
Plane
Cube
Sphere
Capsule
Cylinder
Cylinder (1)
Capsule (1)
Sphere (1)
Cube (1)
Capsule (2)
Capsule (3)
Cylinder (2)
Cube (2)
Cube (3)
Sphere (2)
Sphere (3)
Sphere (4)
Sphere (5)
Sphere (6)
Cube (4)
Cube (5)
Scene
Game
Asset Store
Shaded
2D
Gizmos
Persp
Inspector
Services
Project
Console
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Editor
Editor
RedBeard Su...
RedBeard_Bl...
RedBeard_B...
RedBeard_B...
RedBeard_B...
RedBeard_B...
RedBeard_B...
RedBeard_C...
RedBeard_Ol...
RedBeard_Ro...
RedBeard_Til...
RedBeard_T...
RedBeard_T...
RedBeard_T...
RedBeard_T...

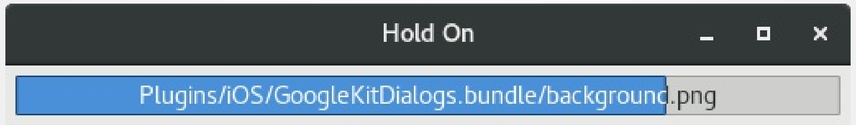

Unity - Unity 5.5.0eb3Linux Personal (64bit) - Untitled - Cardboard Sample - PC, Mac & Linux Standalone* <OpenGL 4.3>
File Edit Assets GameObject Component Help Tools Window
Main Camera
Directional Light
Plane
Cube
Sphere
Capsule
Cylinder
Project
Console
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Editor

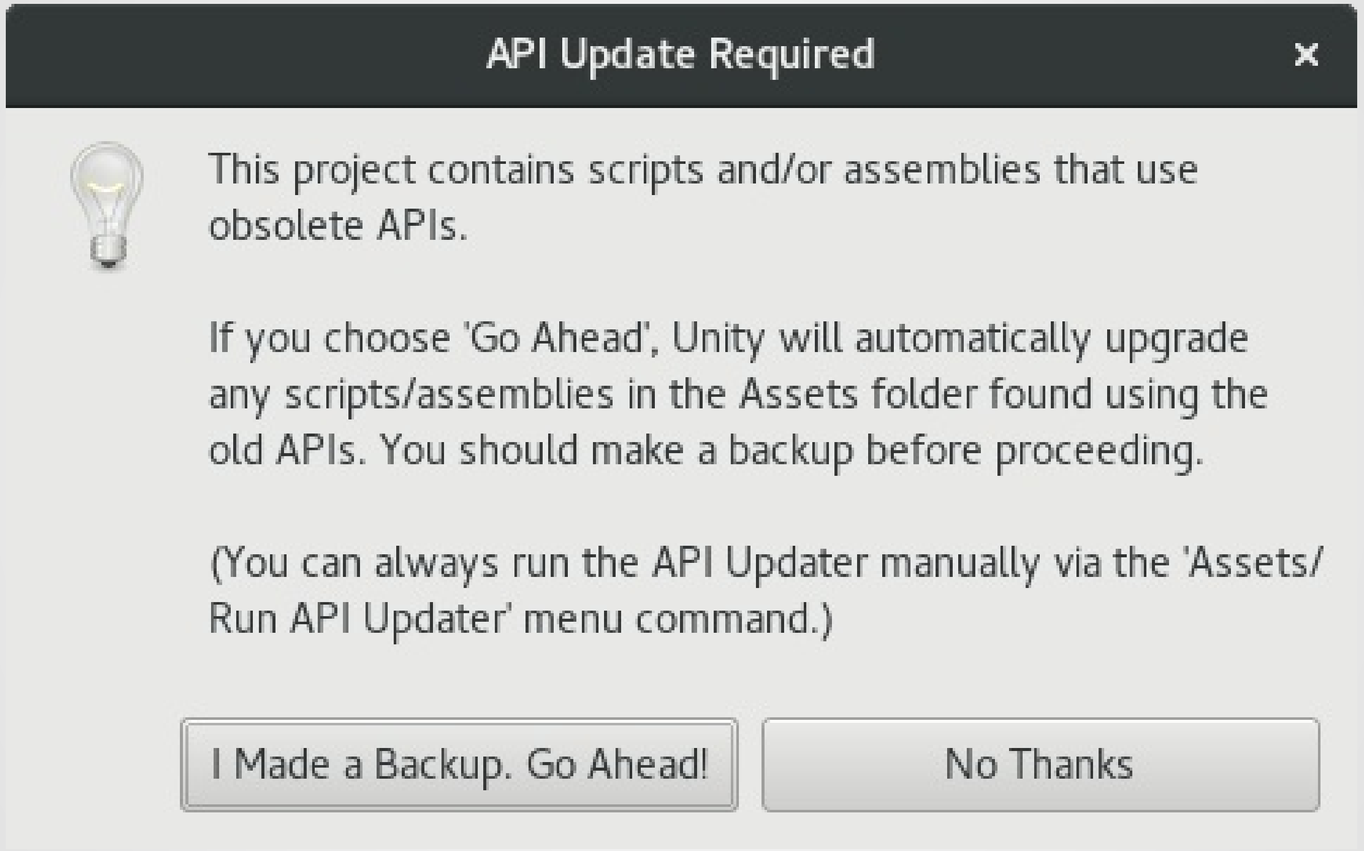

Unity - Unity 5.5.0xb2Linux Personal (64bit) - sample-scene.unity - Cardboard Sample - PC, Mac & Linux Standalone <OpenGL 4.3>
File
Edit
Assets
GameObject
Component
Help
Tools
Window
Create
Open Containing Folder
Open
Open in Look Dev
Delete
Open Scene Additive
Import New Asset...
Import Package
Custom Package...
Export Package...
Find References In Scene
Select Dependencies
Refresh Ctrl+R
Reimport
Reimport All
Run API Updater...
Open C# Project
Hierarchy
Scene
Game
Asset Store
Inspector
Services
Account
Layers
Layout
Shaded
2D
Gizmos
Persp
Project
Console
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Editor
RedBeard Su...
RedBeard_Bl...
RedBeard_C...
RedBeard_Ol...
RedBeard_Ro...
RedBeard_Til...
sample-scene
Assets/Editor/ScreenshotTaker.cs(17,7): warning CS0414: The private field `Screenshot.showPreview' is assigned but its value is never used


Unity - Unity 5.5.0xb2Linux
File
Edit
Assets
GameObject
Component
Help
Tools
Window
Create
Open Containing Folder
Open
Open in Look Dev
Delete
Open Scene Additive
Import New Asset...
Import Package
Custom Package...
Export Package...
Find References In Scene
Select Dependencies
Refresh
Ctrl+R
Reimport
Reimport All
Run API Updater...
Hierarchy
Create
sample-
Main Cam
Direction
Plane
Cube
Sphere
Capsule
Cylinder
Cylinder
Capsule (
Sphere (1
Cube (1)
Capsule (
Capsule (
Cylinder
Cube (2)
Cube (3)
Sphere (2
Sphere (3
Sphere (4
Sphere (5
Sphere (6
Cube (4)
Scene
Game
Asset Store
Shaded
2D


Import package ...
mario
Sources
Others
gvr-unity-sdk
Location:
GoogleVRForUnity.unitypackage
Places
Search
Recently Used
Cardboard Sa...
mario
Desktop
File System
mario@conten...
Documents
Name
Size
Modified
Assets
24/08/16
GoogleVR
23/08/16
Library
25/08/16
ProjectSettings
25/08/16
Samples
23/08/16
ThirdParty
23/08/16
GoogleVRForUnity.unitypackage
51.1 MB
23/08/16
unitypackage
Open
Cancel


Import Unity Package
GoogleVRForUnity
GoogleVR
DemoScenes
ControllerDemo
ControllerDebugInfo.cs
ControllerDemo.unity
ControllerDemoManager.cs
CubeActiveMaterial.mat
CubeHoverMaterial.mat
CubeInactiveMaterial.mat
Cursor.mat
GroundPlaneTranslucent.mat
GroundPlaneTranslucent.png
HeadsetDemo
CubeSound.wav
DemoScene.unity
FPS.cs
GroundPlane.mat
GroundPlane.png
Teleport.cs
README.md
Distortion
GvrDistortion.cginc
Editor
GvrAudioListenerEditor.cs
GvrAudioRoomEditor.cs
GvrAudioSoundfieldEditor.cs
GvrAudioSourceEditor.cs
GvrGazeEditor.cs
Legacy
Editor
GvrMenu.cs
GvrViewerEditor.cs
StereoControllerEditor.cs
Prefabs
GvrAdapter.prefab
GvrHead.prefab
GvrMain.prefab
GvrManager.prefab
README.md
Resources
SolidColor.shader
UnlitTexture.shader
Scripts
GvrHead.cs
Internal
GvrCameraUtils.cs
GvrEye.cs
GvrPostRender.cs
GvrPreRender.cs
GvrProfile.cs
StereoController.cs
StereoRenderEffect.cs
VRDevices
AndroidDevice.cs
BaseAndroidDevice.cs
BaseVRDevice.cs
EditorDevice.cs
GvrDevice.cs
iOSDevice.cs
LICENSE
Prefabs
Audio
NEW
All
None
Cancel
Import


Hold On
Plugins/iOS/GoogleKitDialogs.bundle/background.png


API Update Required
This project contains scripts and/or assemblies that use obsolete APIs.
If you choose 'Go Ahead', Unity will automatically upgrade any scripts/assemblies in the Assets folder found using the old APIs. You should make a backup before proceeding.
(You can always run the API Updater manually via the 'Assets/Run API Updater' menu command.)
I Made a Backup. Go Ahead!
No Thanks

Unity - Unity 5.5.0xb2Linux Personal (64bit) - sample-scene.unity - Cardboard Sample - PC, Mac & Linux Standalone <OpenGL 4.3>

File Edit Assets GameObject Component Help GoogleVR Tools Window

Center Local

Account Layers Layout

Hierarchy

Create

sample-scene

- Main Camera
- Directional Light
- Plane
- Cube
- Sphere
- Capsule
- Cylinder
- Cylinder (1)
- Capsule (1)
- Sphere (1)
- Cube (1)
- Capsule (2)
- Capsule (3)
- Cylinder (2)
- Cube (2)
- Cube (3)
- Sphere (2)
- Sphere (3)
- Sphere (4)
- Sphere (5)
- Sphere (6)
- Cube (4)
- Cube (5)

Scene Game Asset Store

Shaded 2D Gizmos

Persp

Inspector Services

GvrViewerMain Static

Tag Untagged Layer Default

Transform

Position	X 0	Y 0	Z 0
Rotation	X 0	Y 0	Z 0
Scale	X 1	Y 1	Z 1

Gvr Viewer (Script)

General Settings

- VR Mode Enabled ☑
- Distortion Correction: Unity
- Stereo Screen Scale: 1
- Neck Model Scale: 1

Unity Editor Emulation Settings

- Auto Untilt Head ☑
- Screen Size: Nexus 5
- Viewer Type: Cardboard May 2015

Add Component

Project Console

Create

Favorites

- All Materials
- All Models
- All Prefabs
- All Scripts

Assets

- Editor
- GoogleVR
  - DemoScenes
  - Distortion
  - Editor
  - Legacy
  - Prefabs
  - Resources
  - Scripts
- Plugins

Assets ▸ GoogleVR ▸ Prefabs ▸

Audio Controller UI GvrViewerMa...

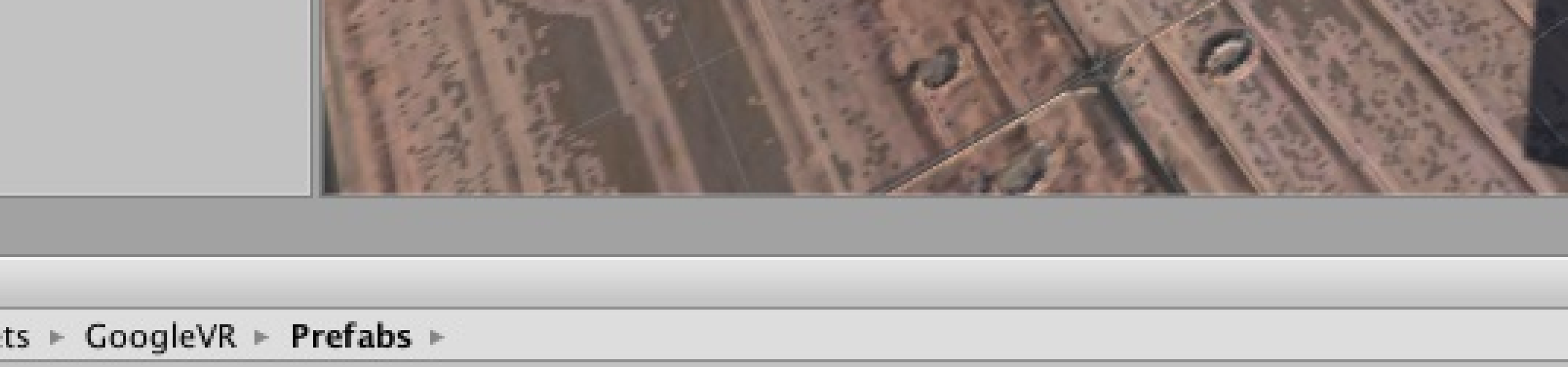
GvrViewerMain.prefab

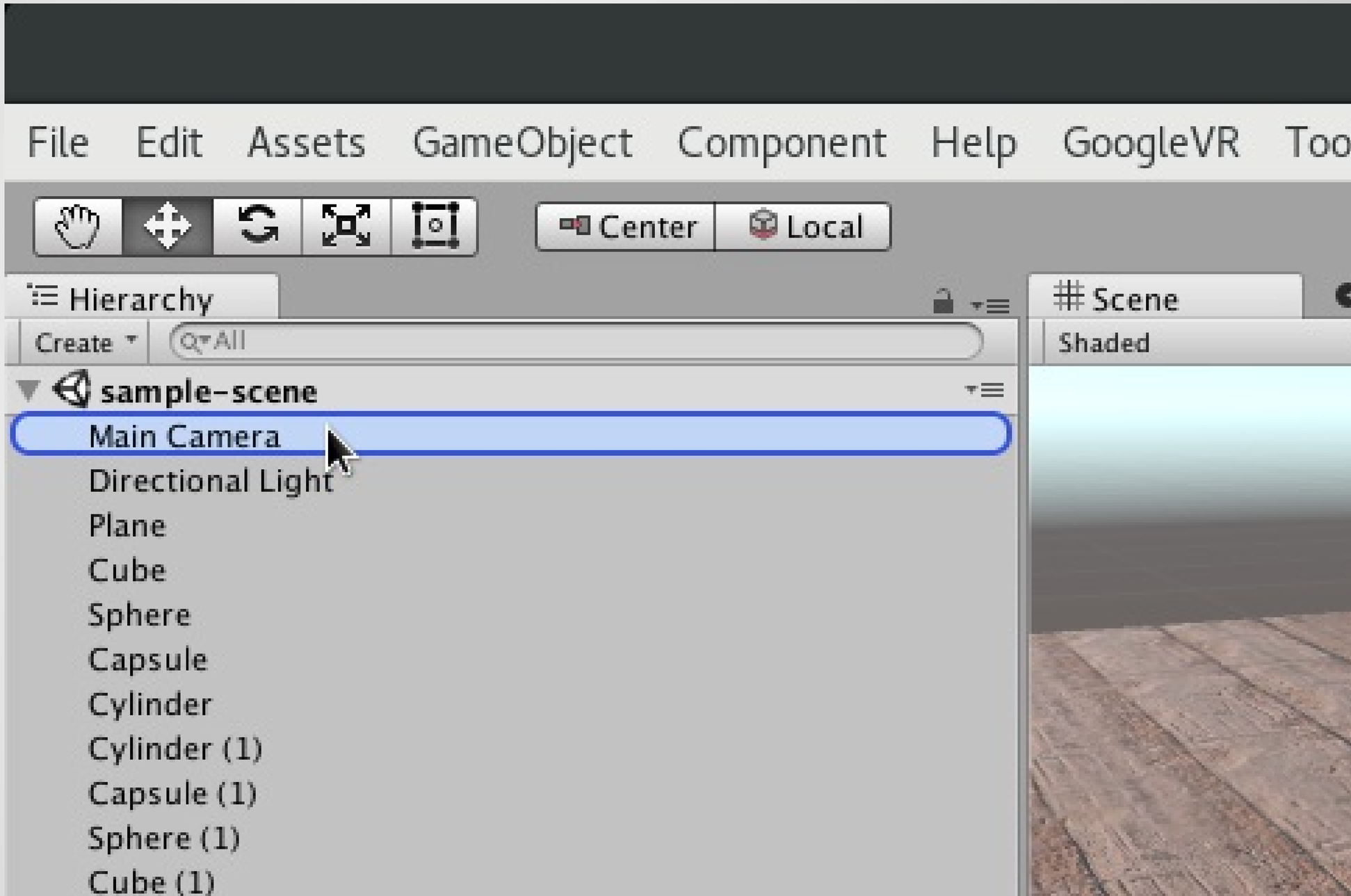
Asset Labels

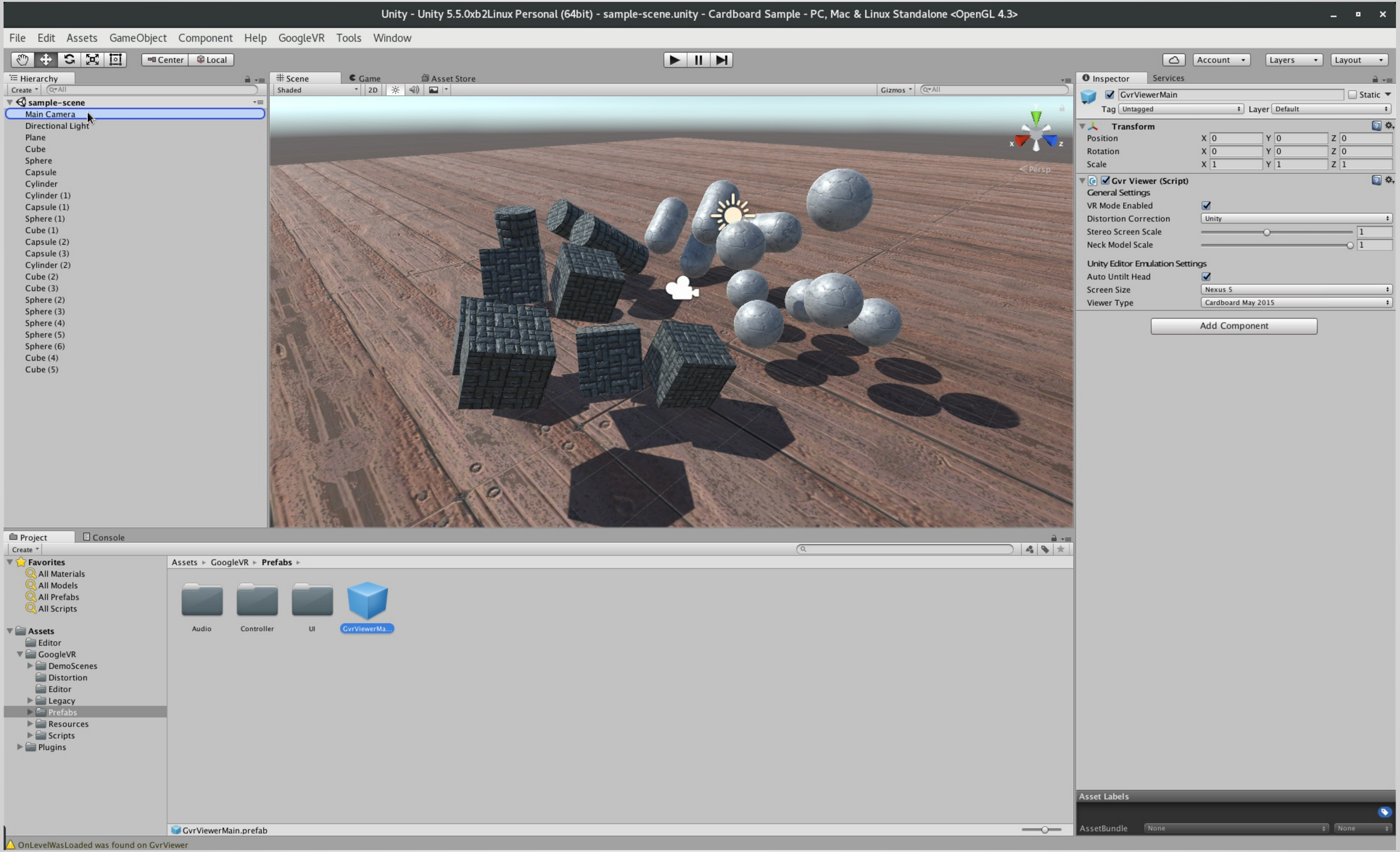
AssetBundle None None

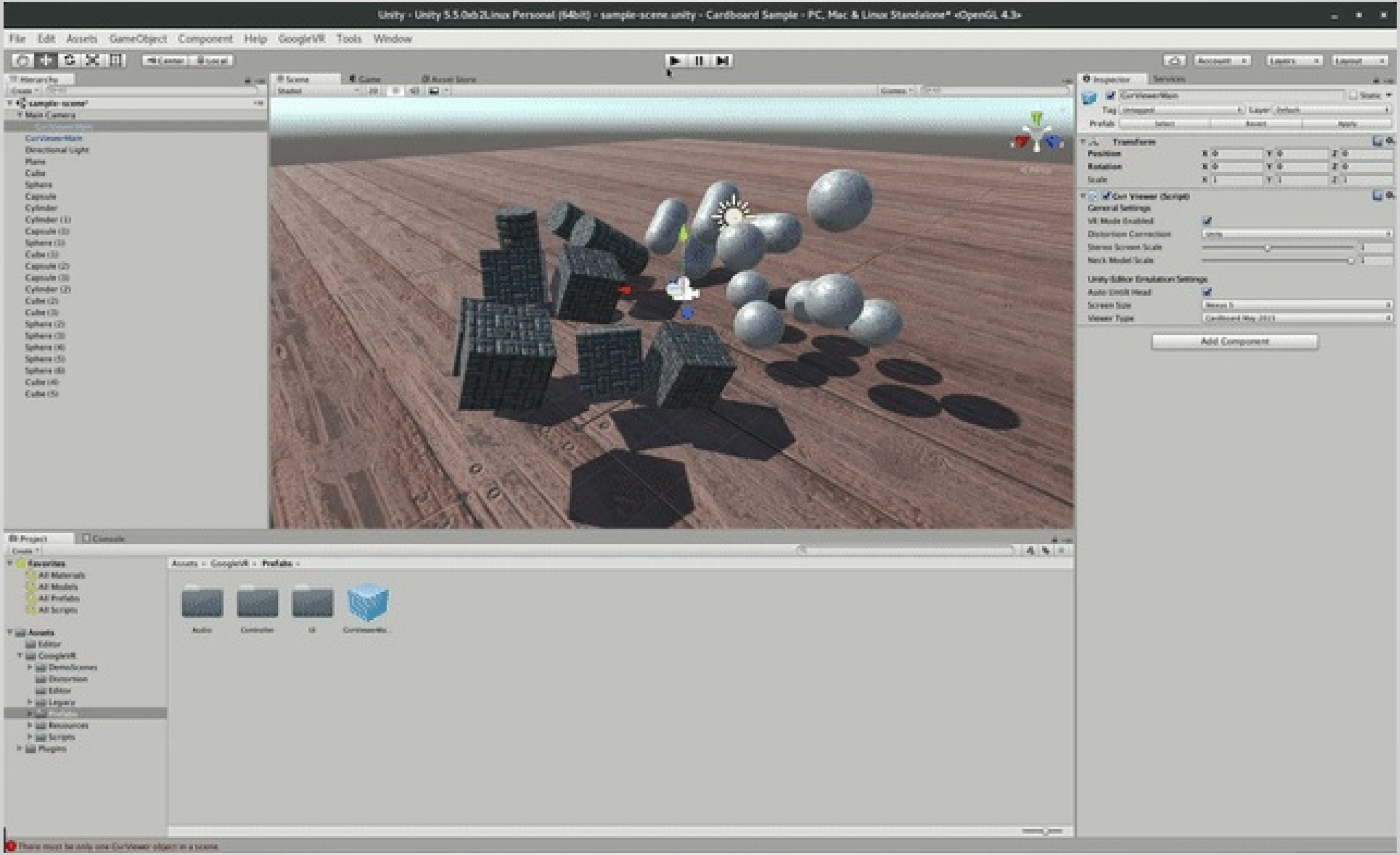
OnLevelWasLoaded was found on GvrViewer

Project
Console
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Editor
GoogleVR
DemoScenes
Distortion
Editor
Legacy
Prefabs
Resources
Scripts
Plugins
Assets ▸ GoogleVR ▸ Prefabs
Audio
Controller


ts ▸ GoogleVR ▸ Prefabs ▸
Audio
Controller
UI
GvrViewerMa...


File
Edit
Assets
GameObject
Component
Help
GoogleVR
Center
Local
Hierarchy
Create
All
sample-scene
Main Camera
Directional Light
Plane
Cube
Sphere
Capsule
Cylinder
Cylinder (1)
Capsule (1)
Sphere (1)
Cube (1)
Scene
Shaded


Unity - Unity 5.5.0xb2Linux Personal (64bit) - sample-scene.unity - Cardboard Sample - PC, Mac & Linux Standalone <OpenGL 4.3>
File Edit Assets GameObject Component Help GoogleVR Tools Window
Center Local
Account Layers Layout
Hierarchy
Create
sample-scene
Main Camera
Directional Light
Plane
Cube
Sphere
Capsule
Cylinder
Cylinder (1)
Capsule (1)
Sphere (1)
Cube (1)
Capsule (2)
Capsule (3)
Cylinder (2)
Cube (2)
Cube (3)
Sphere (2)
Sphere (3)
Sphere (4)
Sphere (5)
Sphere (6)
Cube (4)
Cube (5)
Scene
Game
Asset Store
Shaded
2D
Gizmos
Persp
Inspector
Services
GvrViewerMain
Static
Tag Untagged
Layer Default
Transform
Position X 0 Y 0 Z 0
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1
Gvr Viewer (Script)
General Settings
VR Mode Enabled
Distortion Correction Unity
Stereo Screen Scale 1
Neck Model Scale 1
Unity Editor Emulation Settings
Auto Untilt Head
Screen Size Nexus 5
Viewer Type Cardboard May 2015
Add Component
Project
Console
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Editor
GoogleVR
DemoScenes
Distortion
Editor
Legacy
Prefabs
Resources
Scripts
Plugins
Assets ▸ GoogleVR ▸ Prefabs ▸
Audio
Controller
UI
GvrViewerMa...
GvrViewerMain.prefab
Asset Labels
AssetBundle None None
OnLevelWasLoaded was found on GvrViewer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sample-scene*
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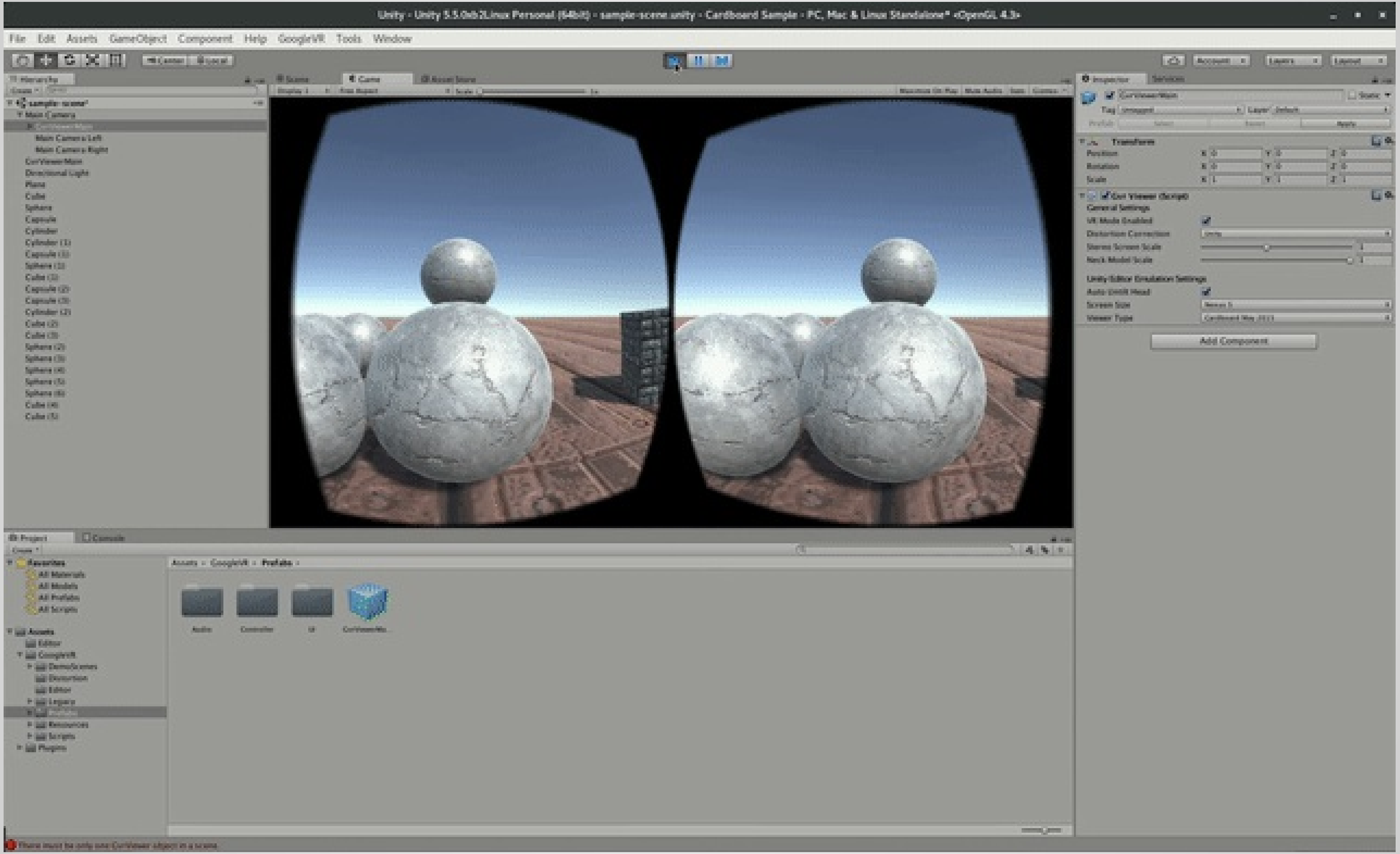
Console
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Editor
GoogleVR
Resources
Scripts
Plugins
Assets ▸ GoogleVR ▸ Prefabs ▸
Audio
Controller
UI
There must be only one CardViewer object in a scene.


Unity - Unity 5.5.0b2Linux Personal (64bit) - sample-scene.unity - Cardboard Sample - PC, Mac & Linux Standalone* <OpenGL 4.3>
File Edit Assets GameObject Component Help GoogleVR Tools Window
Add Component

Summary of Unity Demo

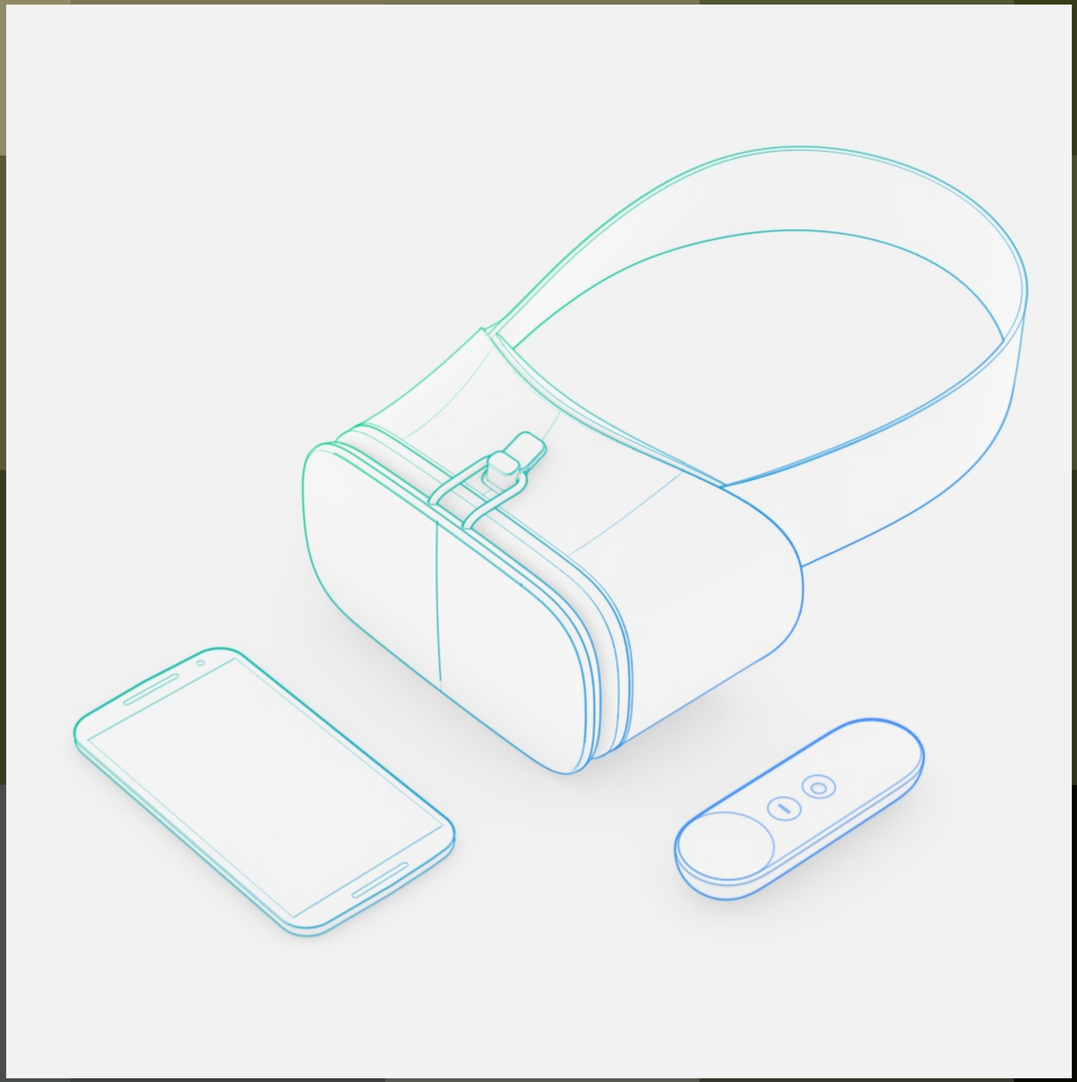
- Using Unity is fast
- Using Cardboard SDK is easy
- Using internal renderer for simulating

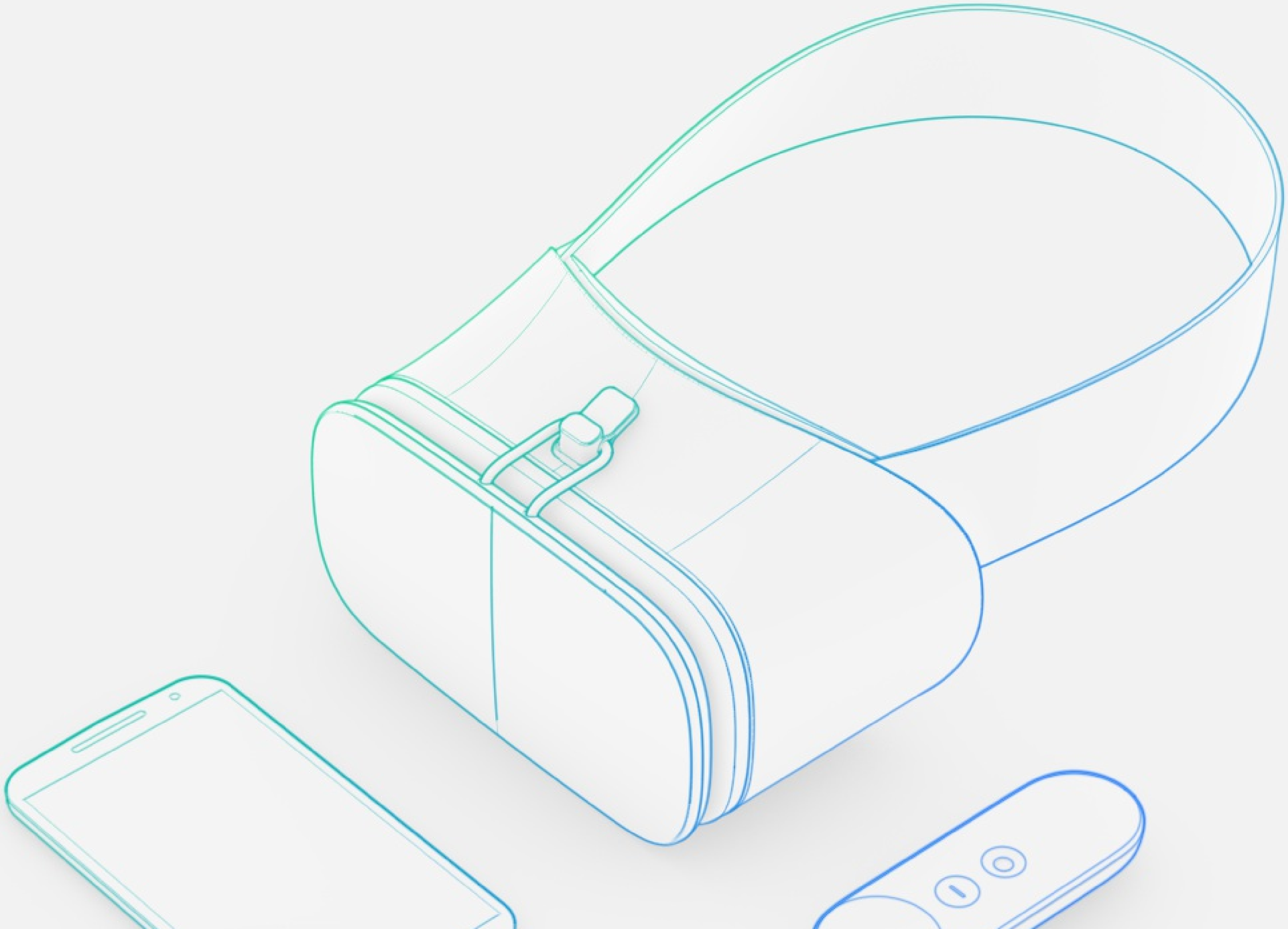
📄 Project 📱 APK

Difficulties in using Unity

- Cost for non free version exists.
- Integration with other (Java) libraries difficult at best.
- Sending of Intents (aka interacting with Android OS / apps) is rather hard.

Daydream

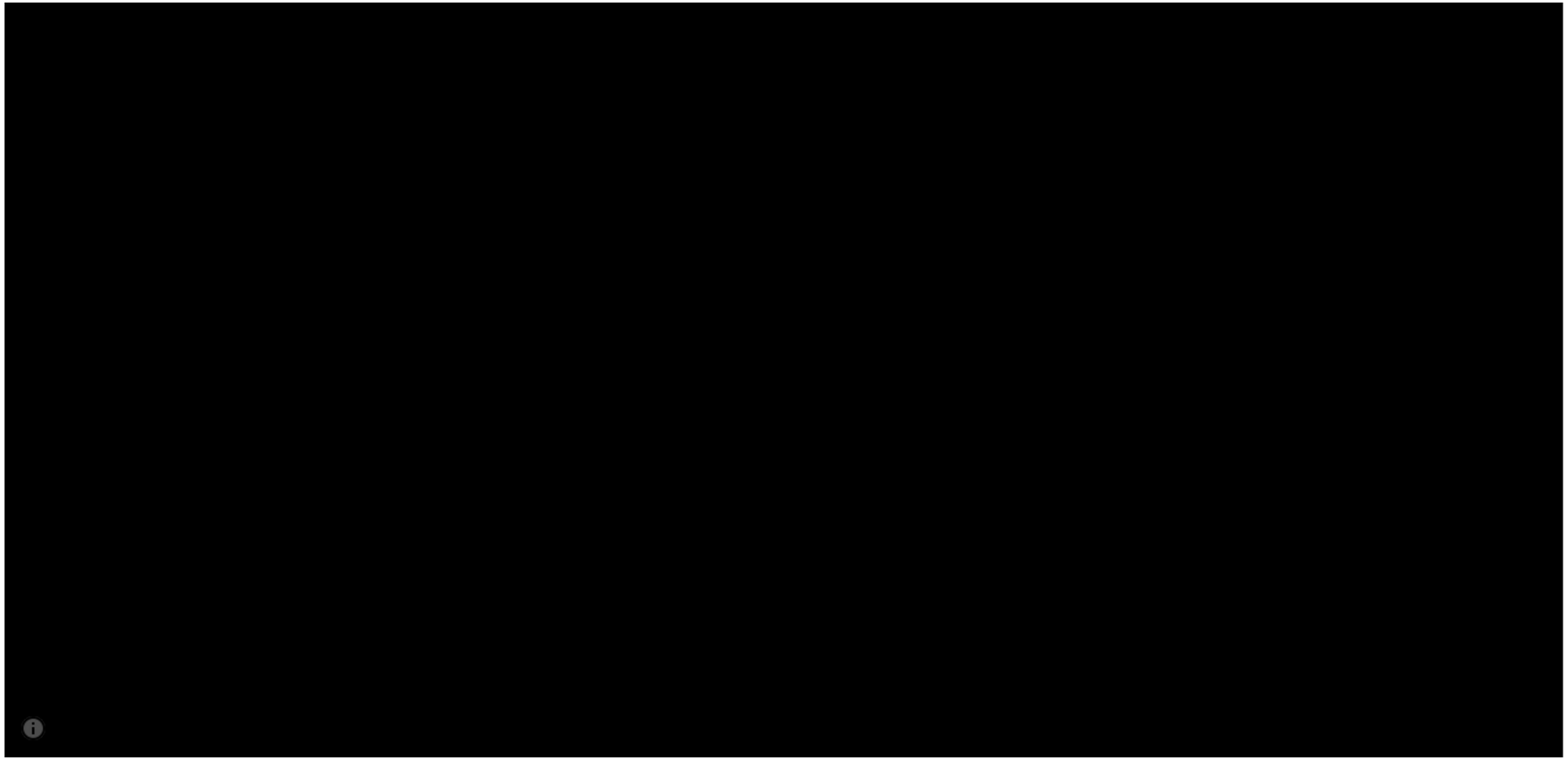




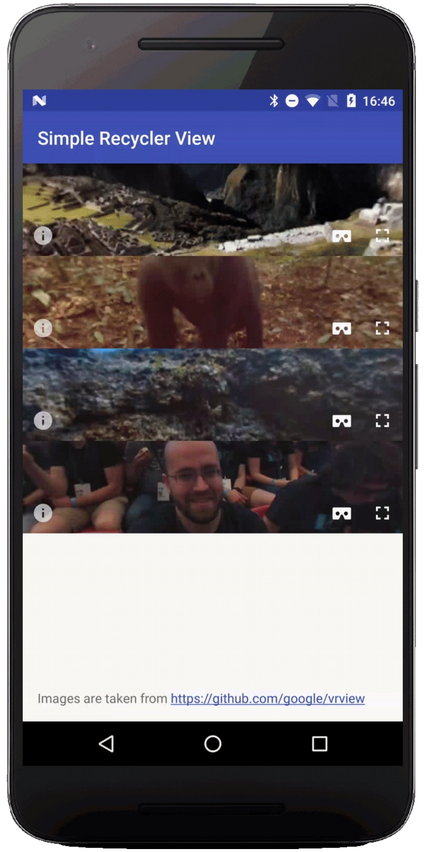
Daydream SDK features

- Same as Cardboard SDK
- Controlling the controller
  - orientation/acceleration
  - input (Clickpad: x,y, clicked, App Button, Vol+/-)
- spatial audio engine

VrView on Web/ios/Android



Simple RecyclerView with 4 VrViews 🎥 Images from Google



Sample Recycler View Project

Source Code

Project Layout

```
MainActivity.java
ConstantResourceAdapter.java

activity_main.xml
resource_layout.xml
```

MainActivity.java

```
ButterKnife.bind(this);

recyclerView.setLayoutManager(
  new LinearLayoutManager(this,
    LinearLayoutManager.VERTICAL, false));

RecyclerView.Adapter adapter =
  new ConstantResourceAdapter();

recyclerView.setAdapter(adapter);
```

MainActivity.java

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ButterKnife.bind(this);

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RecyclerView.Adapter adapter =
  new ConstantResourceAdapter();

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```

ConstantResourceAdapter.java

```
private static final List<Integer> elements =
  new ArrayList<>();

static {
  elements.add(R.drawable.andes);
  elements.add(R.drawable.congo);
  elements.add(R.drawable.coral);
  elements.add(R.drawable.io2016);
}
```

ConstantResourceAdapter.java

```
static class ResourceItemViewHolder
  extends RecyclerView.ViewHolder {
  private final TextView textView;

  public ResourceItemViewHolder(View itemView) {
    super(itemView);
    textView = (TextView) itemView;
  }
}
```

ConstantResourceAdapter.java

```
public
RecyclerView.ViewHolder onCreateViewHolder(…) {

  final LayoutInflater layoutInflater =
    LayoutInflater.from(parent.getContext());

  final View inflate =
    layoutInflater.inflate(R.layout.resource_layout,…

  return new ResourceItemViewHolder(inflate);
}
```

ConstantResourceAdapter.java

```
public
RecyclerView.ViewHolder onCreateViewHolder(…) //{

final LayoutInflater layoutInflater =
  LayoutInflater.from(parent.getContext());

final View inflate =
  layoutInflater.inflate(R.layout.resource_layout,…

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  final LayoutInflater layoutInflater =
    LayoutInflater.from(parent.getContext());

  final View inflate =
    layoutInflater.inflate(R.layout.resource_layout,…)

  return new ResourceItemViewHolder(inflate);
}
```

ConstantResourceAdapter.java

```
public void onBindViewHolder(
  RecyclerView.ViewHolder baseHolder,
  int position) {

  final ResourceItemViewHolder viewHolder =
    (ResourceItemViewHolder) baseHolder;

  viewHolder.textView.setText(
    elements.get(position));
}
```

resource_layout.xml

```
<TextView
    […]
    android:layout_height="100dp"
    android:textSize="32sp"
 />
```

Result

15:29
Simple Recycler View
res/drawable/andes.jpg
res/drawable/congo.jpg
res/drawable/coral.jpg
res/drawable/io2016.jpg
Images are taken from https://github.com/google/vrview

Making the change

Add *.aar dependencies to app

- common.aar
- commonwidget.aar and
- panowidget.aar

from Google VR Android Github

Change in resource_layout.xml

```
<TextView
   […]
```

to

```
<com.google.vr.sdk.widgets.pano.VrPanoramaView
    […]
```

Change in ConstantResourceAdapter.java

```
  class ResourceItemViewHolder
    extends RecyclerView.ViewHolder {

  private final VrPanoramaView vrPanoramaView;

  public ResourceItemViewHolder(View itemView) {
    super(itemView);
    vrPanoramaView = (VrPanoramaView) itemView;
  }
}
```

```
@Override public void onBindViewHolder(…) //{

final ResourceItemViewHolder viewHolder =
  (ResourceItemViewHolder) baseHolder;
final Resources resources =
  viewHolder.vrPanoramaView.getResources();
final Bitmap bitmap =
  BitmapFactory.decodeResource(resources,
    elements.get(position));
viewHolder.vrPanoramaView
  .loadImageFromBitmap(bitmap, null);

}
```

```
@Override public void onBindViewHolder(…) //{

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  viewHolder.vrPanoramaView
    .loadImageFromBitmap(bitmap, null);
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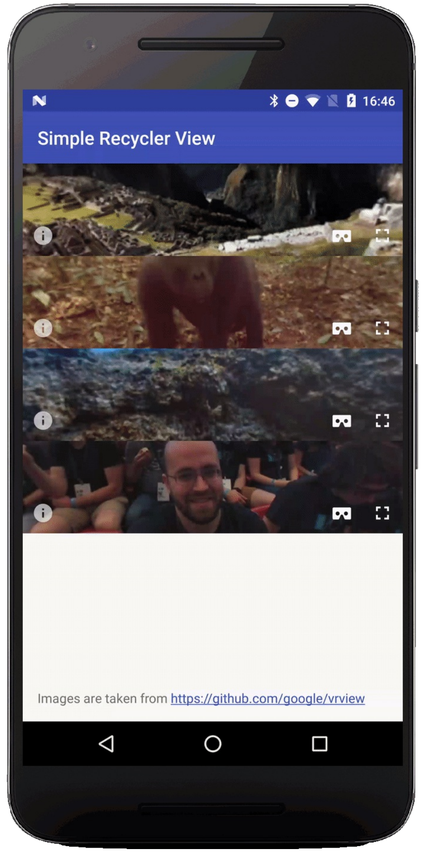
Result

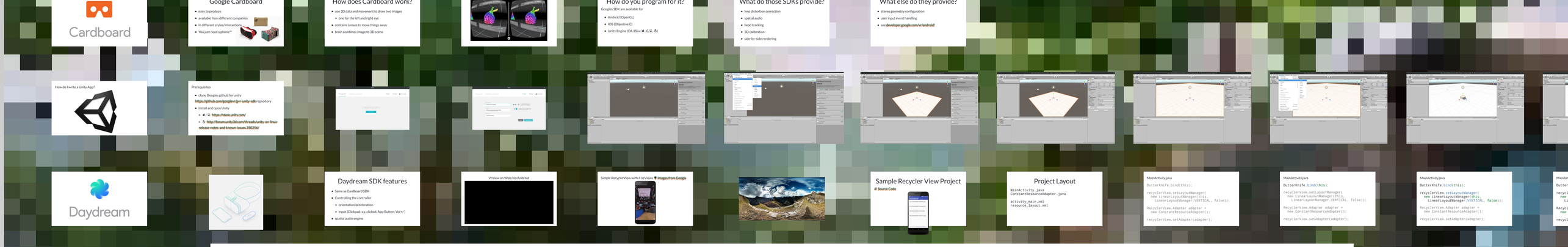

16:46
Simple Recycler View
Images are taken from https://github.com/google/vrview

What did we do?

- Loaded a equirectangular image into a bitmap
- Let it be displayed by a VrPanoramaView
- Use Daydream SDK to display it

Limitations of Daydream for Android SDK

- using 3D models has to be done by
  - either low level OpenGL or
  - 3rd party 3d engine



What will you build?

🎥 General 🎥 Controller 🎥 Designing

📄 Google VR Github

🐦@MarioBodemann