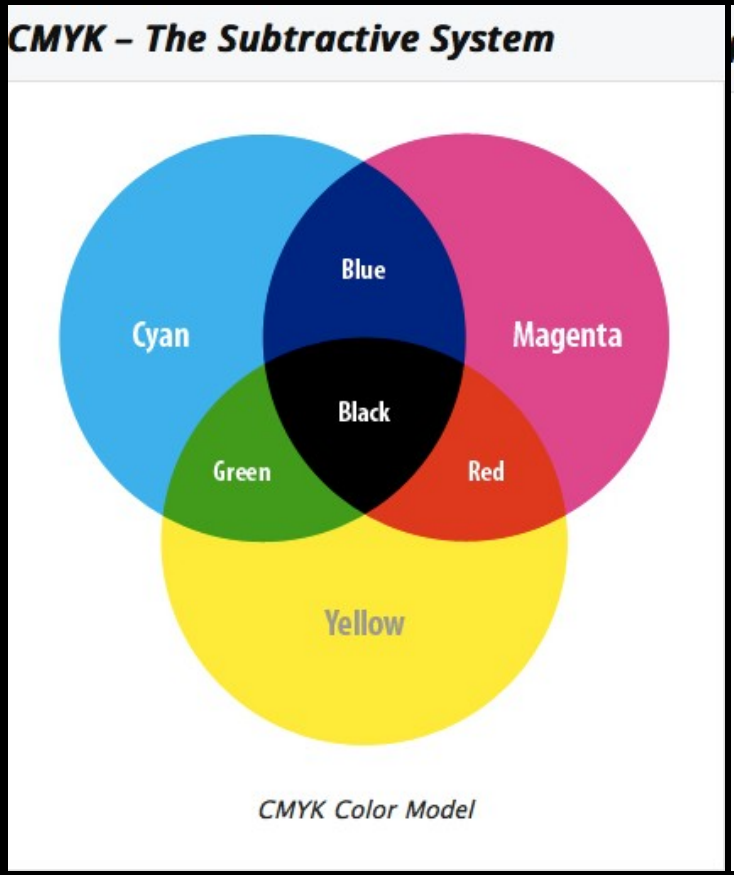
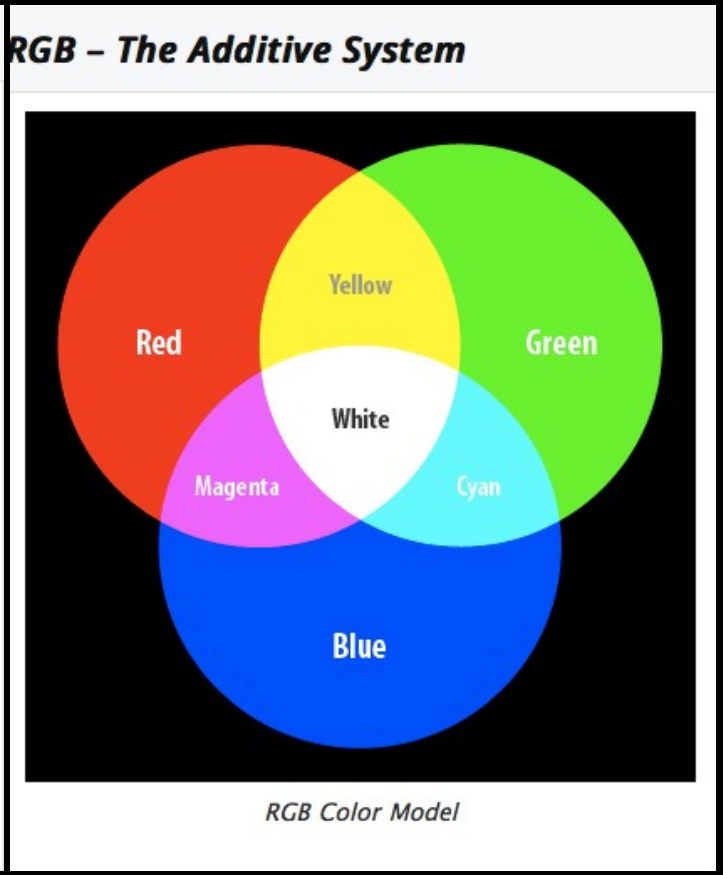
Colors, Materials, Interaction

Project 1 concept discussion and review

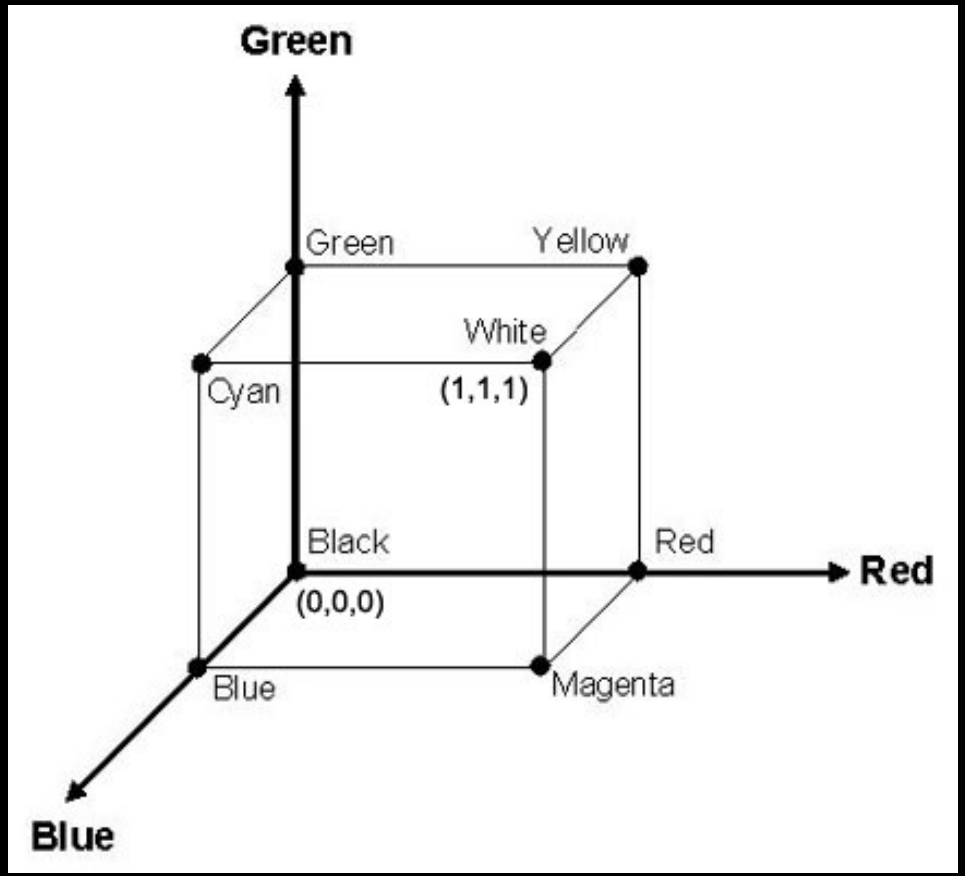
Colors
Materals
Interaction
- -mouse Button input
- -key input

Color Systems





Color Cube


Green
Green
Yellow
White
Cyan
(1,1,1)
Black
Red
Red
(0,0,0)
Blue
Magenta
Blue

RGBA Color

Representation of RGBA colors

Values for red, green, blue and alpha are floating point values with a range from 0 to 1

Alpha component (a) defines transparency

alpha of 1 is completely opaque, alpha of zero is completely transparent

Black RGBA is (0, 0, 0, 1)

Blue RGBA is (0, 0, 1, 1)

Gray RGBA is (0.5, 0.5, 0.5, 1)

Clear Completely transparent. RGBA is (0, 0, 0, 0)

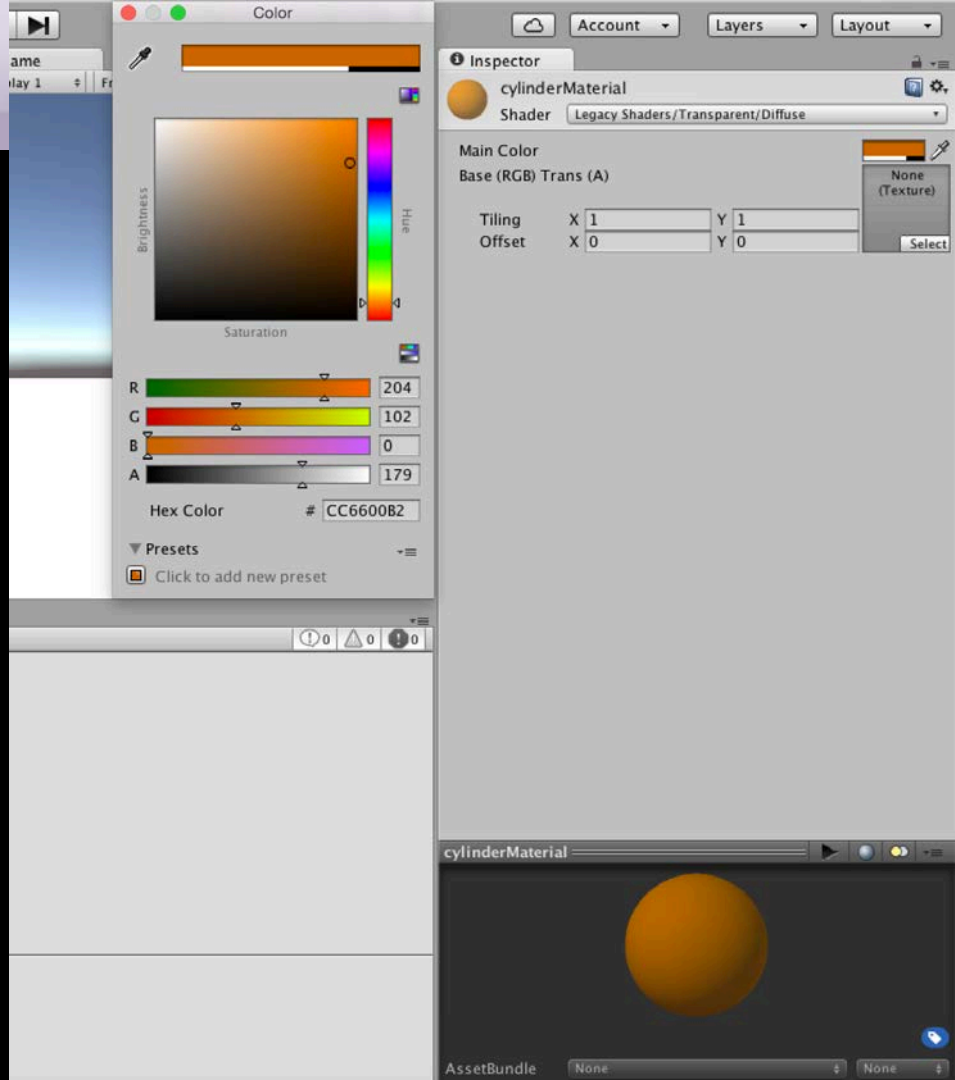
RGBA Color

Black RGBA is (0, 0, 0, 1)
Blue RGBA is (0, 0, 1, 1)
Gray RGBA is (0.5, 0.5, 0.5, 1)
Clear Completely transparent. RGBA is (0, 0, 0, 0)

Magenta?
Yellow?
cyan?

RGBA Color

Unity Color Window



Colors

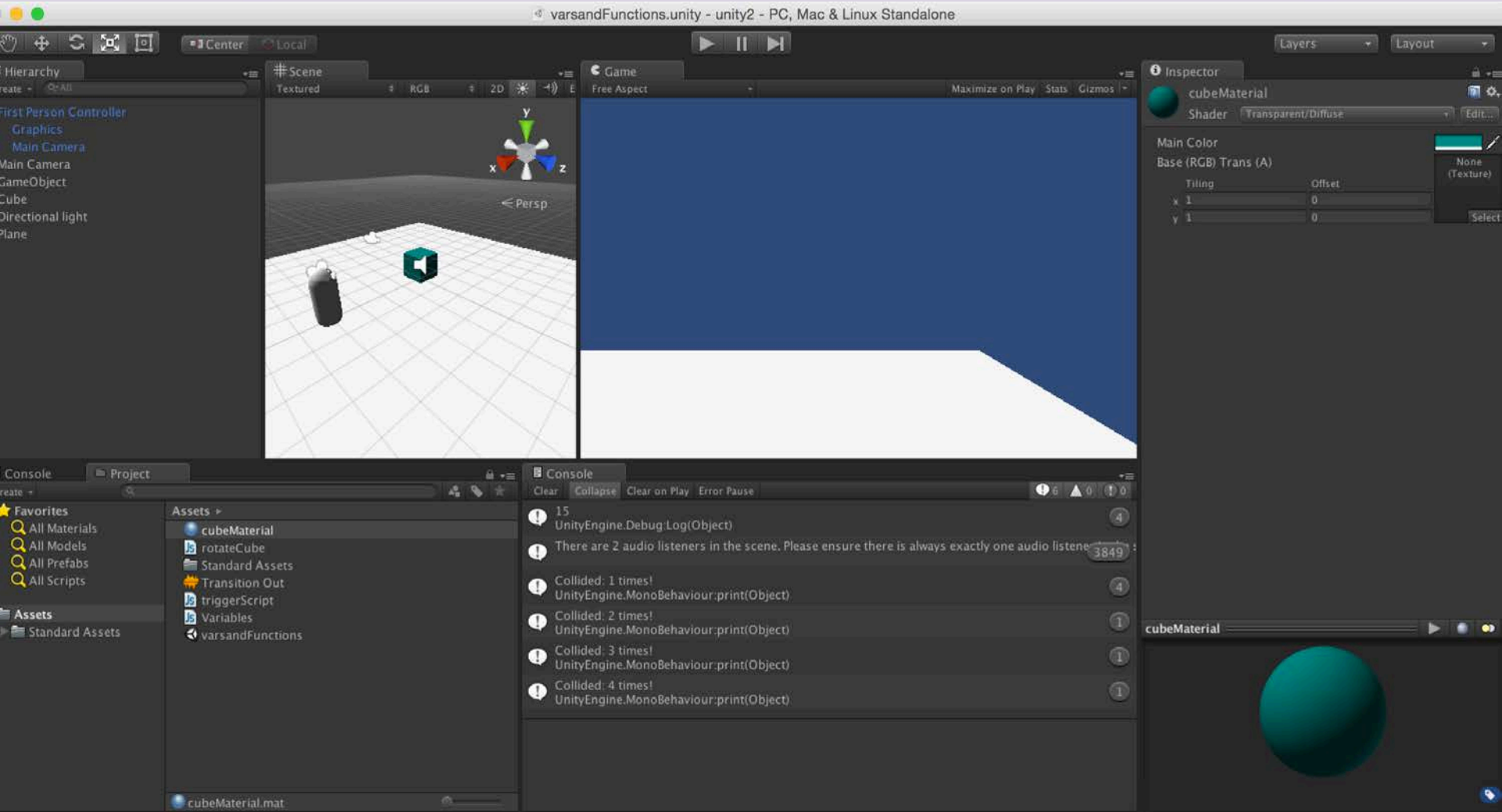
Create a scene (or use the scene from lab2) with the following components:

- 3D Plane
- 3D Cube
- 3D Cylinder

Create 2 new materials and add trasnparent/diffuse shader

Assign materials to the cube and the cylinder (drag and drop)

Assets> Create > Material


varsandFunctions.unity - unity2 - PC, Mac & Linux Standalone
Center
Local
Layers
Layout
Hierarchy
First Person Controller
Graphics
Main Camera
Main Camera
GameObject
Cube
Directional light
Plane
Scene
Textured
RGB
2D
Persp
Game
Free Aspect
Maximize on Play
Stats
Gizmos
Inspector
cubeMaterial
Shader
Transparent/Diffuse
Edit...
Main Color
Base (RGB) Trans (A)
None (Texture)
Tiling
Offset
Select
Console
Project
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Standard Assets
Assets
cubeMaterial
rotateCube
Standard Assets
Transition Out
triggerScript
Variables
varsandFunctions
cubeMaterial.mat
Console
Clear
Collapse
Clear on Play
Error Pause
15
UnityEngine.Debug:Log(Object)
There are 2 audio listeners in the scene. Please ensure there is always exactly one audio listene
3849
Collided: 1 times!
UnityEngine.MonoBehaviour:print(Object)
Collided: 2 times!
UnityEngine.MonoBehaviour:print(Object)
Collided: 3 times!
UnityEngine.MonoBehaviour:print(Object)
Collided: 4 times!
UnityEngine.MonoBehaviour:print(Object)
cubeMaterial

materialsScript

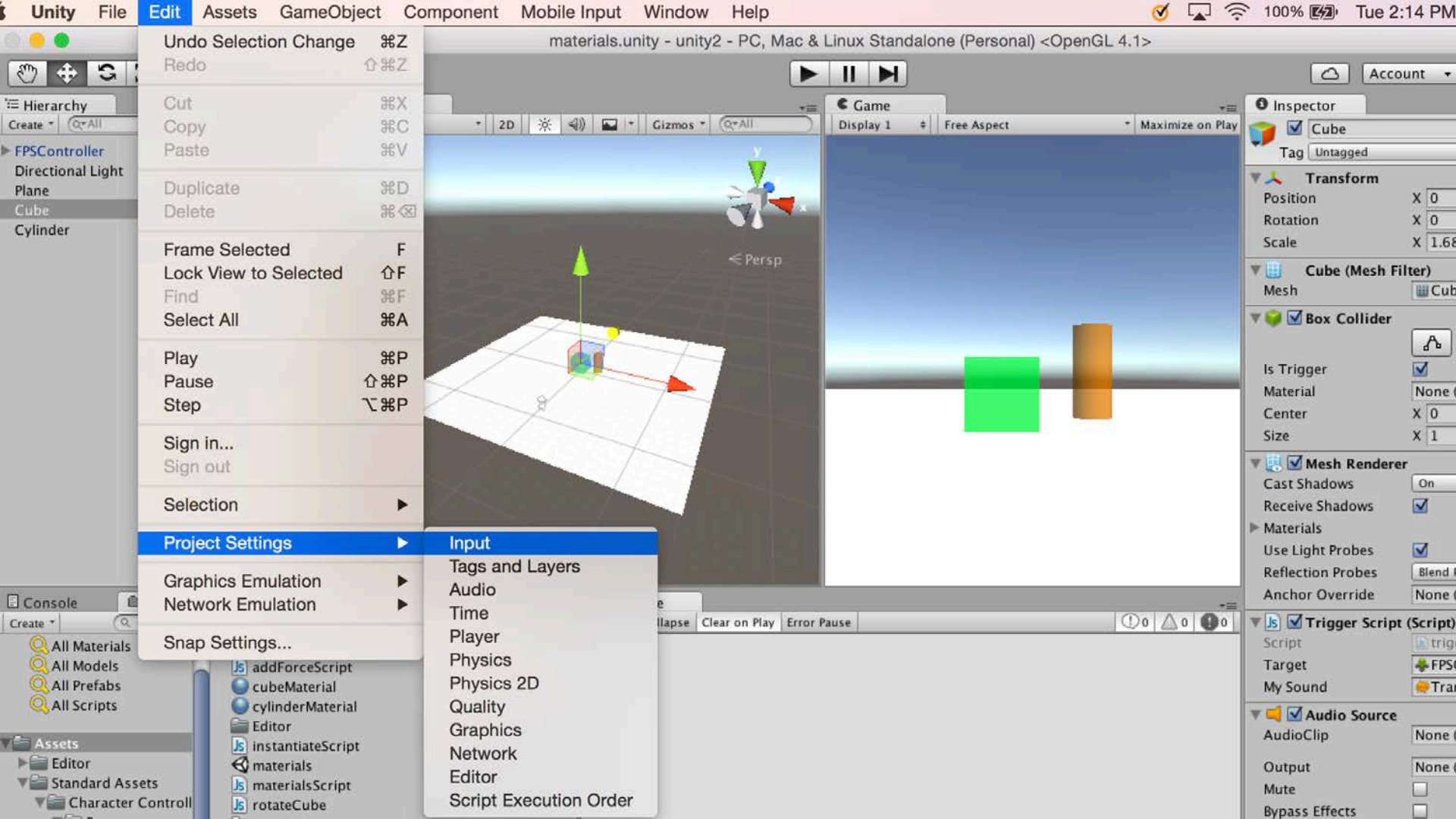
```
#pragma strict
private var orange : Color = Color(0.8, 0.4, 0.0, 0.7);
var newMaterial : Material;
function Start () { }

function Update()
{
if (Input.GetButtonDown("Fire1"))
{
GetComponent.<Renderer>().material.color = orange;
newMaterial.color = orange;
}}
}
```

Interaction – Key and Button input

The input manager allows to name an input and specify a key or button for it.

You can access keys on the keyboard and mouse buttons through scripting interface.

Edit > Project Settings >Input

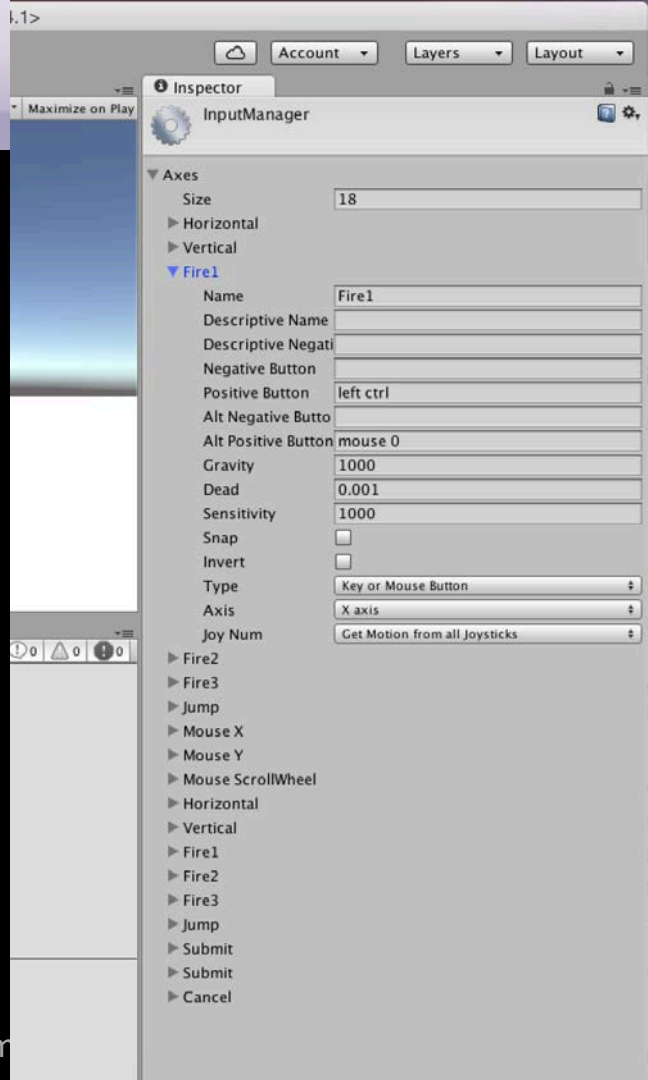

Unity File Edit Assets GameObject Component Mobile Input Window Help
100% Tue 2:14 PM
materials.unity - unity2 - PC, Mac & Linux Standalone (Personal) <OpenGL 4.1>
Undo Selection Change ⌘Z
Redo ⇧⌘Z
Cut ⌘X
Copy ⌘C
Paste ⌘V
Duplicate ⌘D
Delete ⌘⌫
Frame Selected F
Lock View to Selected ⇧F
Find ⌘F
Select All ⌘A
Play ⌘P
Pause ⇧⌘P
Step ⌥⌘P
Sign in...
Sign out
Selection
Project Settings
Graphics Emulation
Network Emulation
Snap Settings...
Input
Tags and Layers
Audio
Time
Player
Physics
Physics 2D
Quality
Graphics
Network
Editor
Script Execution Order
Hierarchy
FPSController
Directional Light
Plane
Cube
Cylinder
Persp
Game
Display 1
Free Aspect
Maximize on Play
Inspector
Transform
Position
Rotation
Scale
Cube (Mesh Filter)
Box Collider
Is Trigger
Material
Center
Size
Mesh Renderer
Cast Shadows
Receive Shadows
Materials
Use Light Probes
Reflection Probes
Anchor Override
Trigger Script (Script)
Audio Source
AudioClip
Output
Mute
Bypass Effects
Console
Clear on Play
Error Pause
All Materials
All Models
All Prefabs
All Scripts
addForceScript
cubeMaterial
cylinderMaterial
Editor
instantiateScript
materials
materialsScript
rotateCube
Assets
Editor
Standard Assets
Character Controll

Interaction – Key and Button input

Input.GetButtonDown("Fire1"))
Mouse button left mouse 0

Input.GetButtonDown("Fire1"))
Mouse button right mouse 1

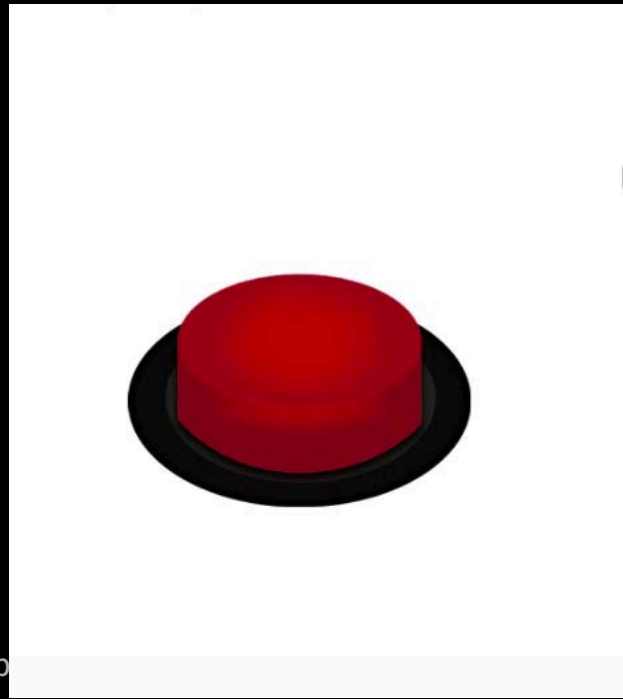
Input.GetKeyDown("Jump"))
space key space



Interaction – Key and Button input

GetButtonDown/Up – before any interaction

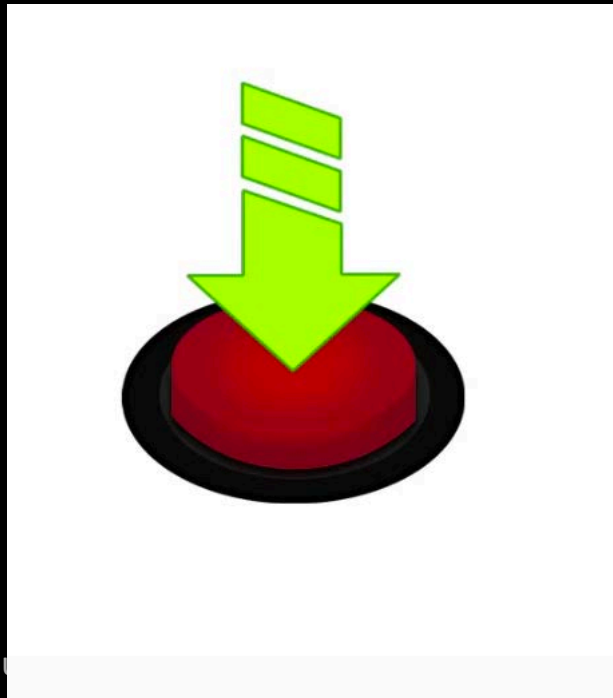
GetButtonDown: false
GetButton: false
GetButtonUp: false



Interaction – Key and Button input

GetButtonDown/Up – on the first frame / on press

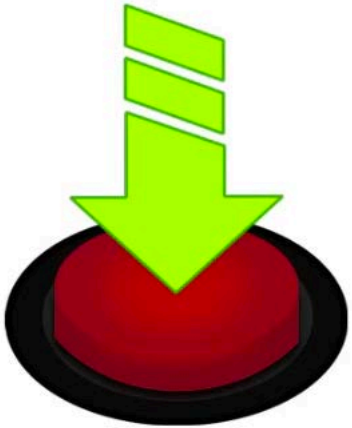
GetButtonDown: true
GetButton: true
GetButtonUp: false



Interaction – Key and Button input

GetButtonDown/Up – after the first frame / holding button down

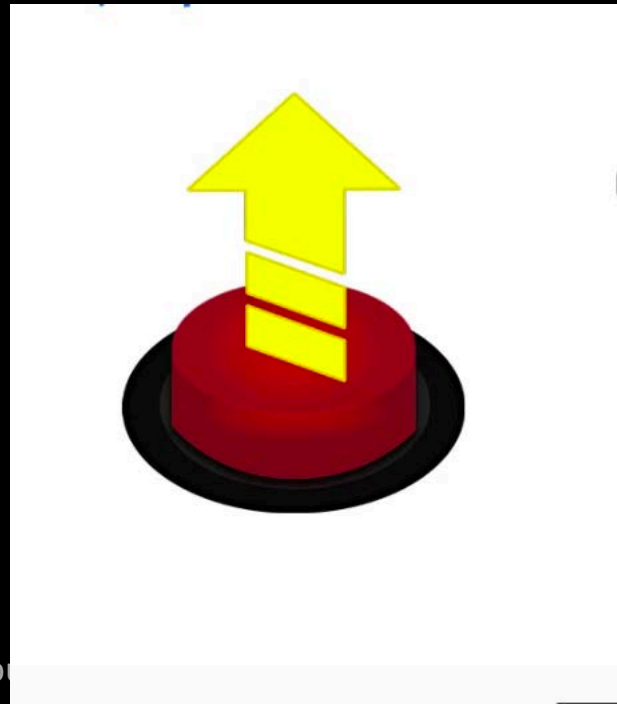
GetButtonDown: false
GetButton: true
GetButtonUp: false



Interaction – Key and Button input

GetButtonDown/Up – on the first frame / on release

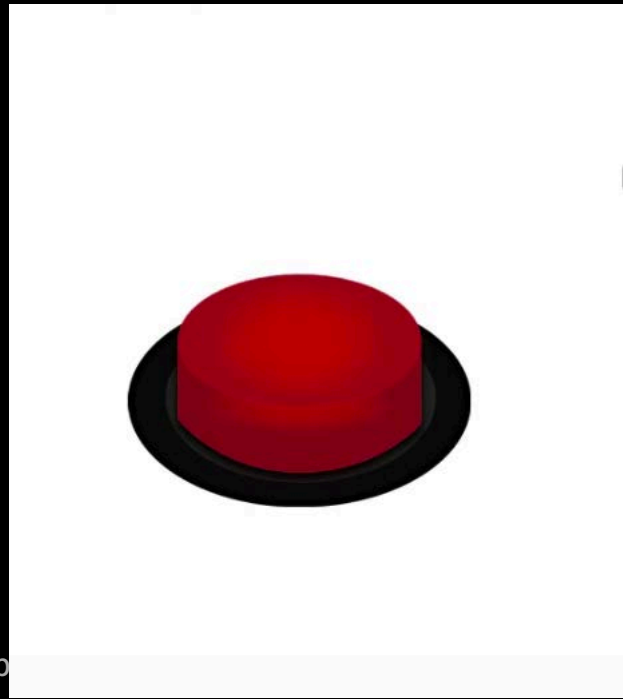
GetButtonDown: false
GetButton: false
GetButtonUp: true



Interaction – Key and Button input

GetButtonDown/Up – after the first frame / on release

GetButtonDown: false
GetButton: false
GetButtonUp: false



Interaction – Key and Button input

Create new object Sphere, add rigidbody component
Create new Script KeyInput.js
Assign script to the sphere

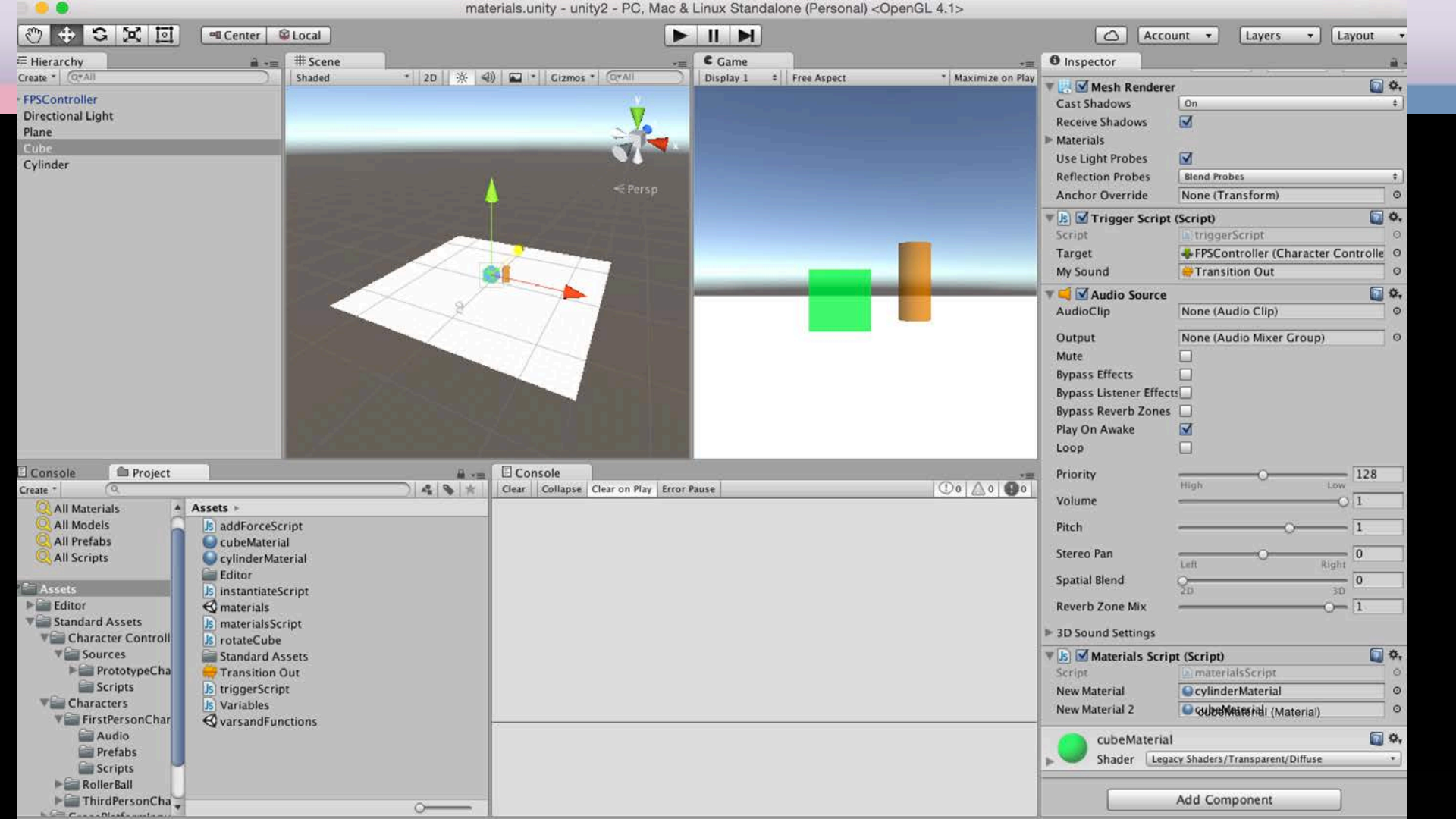
Interaction – Key and Button input

```
#pragma strict
function Update ()
{
    if (Input.GetKey ("up"))
        print ("up arrow key is held down");

    if (Input.GetKey ("down"))
        print ("down arrow key is held down");

    if (Input.GetKeyDown(KeyCode.Space))
    GetComponent.<Rigidbody>().AddForce(transform.forward * 200f);
}
```

Interaction – Key and Button input

Modify the script to create a new var and assign the second material to the same Cube or Cylinder using mouse button input

Make sure you drag the second material to assign it to the var in the inspector


materials.unity - unity2 - PC, Mac & Linux Standalone (Personal) <OpenGL 4.1>
Center
Local
Account
Layers
Layout
Hierarchy
Create
FPSController
Directional Light
Plane
Cube
Cylinder
Scene
Shaded
2D
Gizmos
Persp
Game
Display 1
Free Aspect
Maximize on Play
Inspector
Mesh Renderer
Cast Shadows
On
Receive Shadows
Materials
Use Light Probes
Reflection Probes
Blend Probes
Anchor Override
None (Transform)
Trigger Script (Script)
Script
triggerScript
Target
FPSController (Character Controlle
My Sound
Transition Out
Audio Source
AudioClip
None (Audio Clip)
Output
None (Audio Mixer Group)
Mute
Bypass Effects
Bypass Listener Effects
Bypass Reverb Zones
Play On Awake
Loop
Priority
128
High
Low
Volume
1
Pitch
1
Stereo Pan
0
Left
Right
Spatial Blend
0
2D
3D
Reverb Zone Mix
1
3D Sound Settings
Materials Script (Script)
Script
materialsScript
New Material
cylinderMaterial
New Material 2
cubeMaterial (Material)
cubeMaterial
Shader
Legacy Shaders/Transparent/Diffuse
Add Component
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FirstPersonChar
Audio
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RollerBall
ThirdPersonCha
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rotateCube
Standard Assets
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triggerScript
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varsandFunctions
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Collapse
Clear on Play
Error Pause

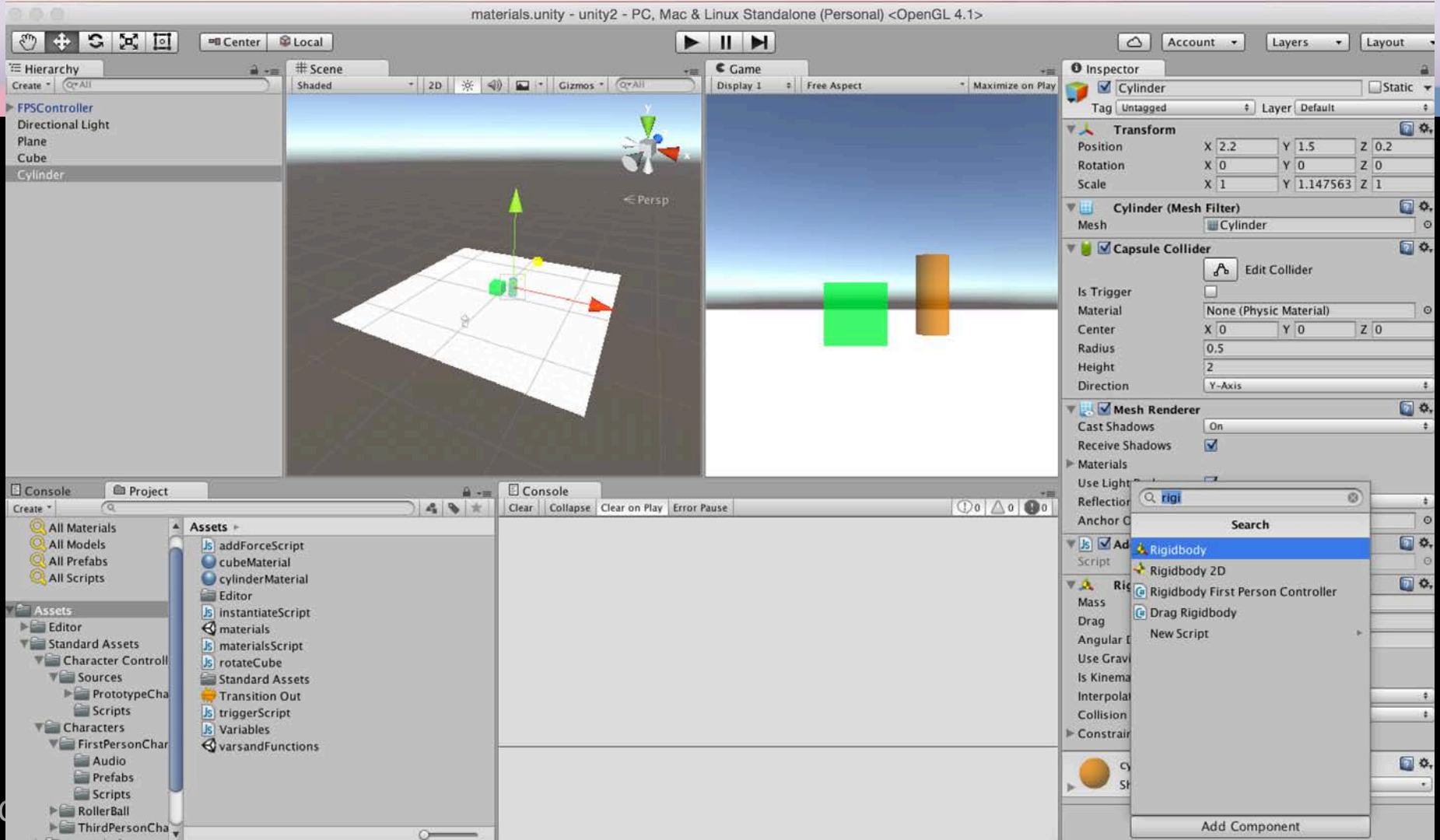
Interaction – Key and Button input

```
private var orange : Color = Color(0.8, 0.4, 0.0, 0.7);
private var green : Color = Color(0.0, 0.9, 0.2, 0.7);
var newMaterial : Material;
var newMaterial2 : Material;
function Update()
{
if (Input.GetButtonDown("Fire1"))
{
GetComponent.<Renderer>().material.color = orange;
newMaterial.color = orange;
}
if (Input.GetButtonDown("Fire2"))
{
GetComponent.<Renderer>().material.color = green;
newMaterial2.color = green;
}}
```

Interaction – Key and Button input

Add RigidBody component to the Cylinder
In the Inspector

Uncheck Use Gravity


materials.unity - unity2 - PC, Mac & Linux Standalone (Personal) <OpenGL 4.1>
Center
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Gizmos
Persp
Game
Display 1
Free Aspect
Maximize on Play
Inspector
Cylinder
Static
Tag
Untagged
Layer
Default
Transform
Position
X 2.2
Y 1.5
Z 0.2
Rotation
X 0
Y 0
Z 0
Scale
X 1
Y 1.147563
Z 1
Cylinder (Mesh Filter)
Mesh
Cylinder
Capsule Collider
Edit Collider
Is Trigger
Material
None (Physic Material)
Center
X 0
Y 0
Z 0
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2
Direction
Y-Axis
Mesh Renderer
Cast Shadows
On
Receive Shadows
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Clear on Play
Error Pause
rigi
Search
Rigidbody
Rigidbody 2D
Rigidbody First Person Controller
Drag Rigidbody
New Script
Add Component

Interaction – Key and Button input

Create addForceScript and assign it to the Cylinder

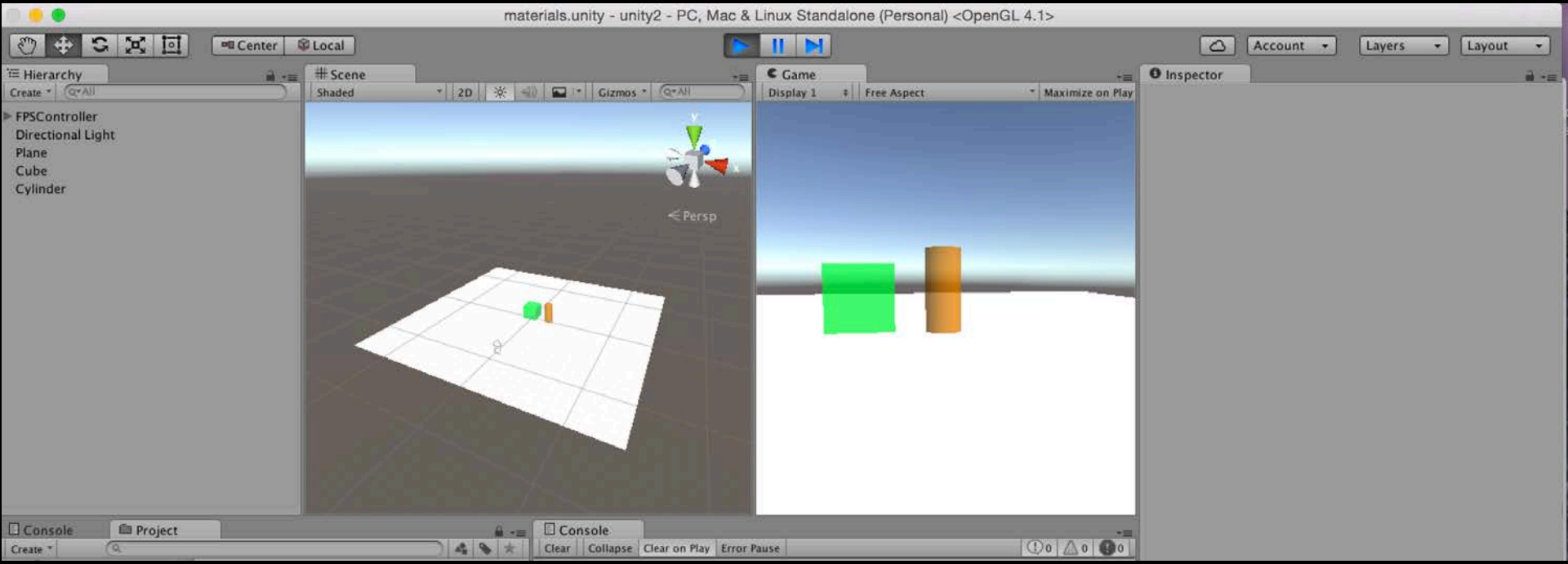
Detects mouse clicks on an element

```
#pragma strict

function OnMouseDown ()
{
    GetComponent.<Rigidbody>().AddForce(transform.forward * 500f);

    GetComponent.<Rigidbody>().useGravity = true;
}
```

Interaction – Key and Button input

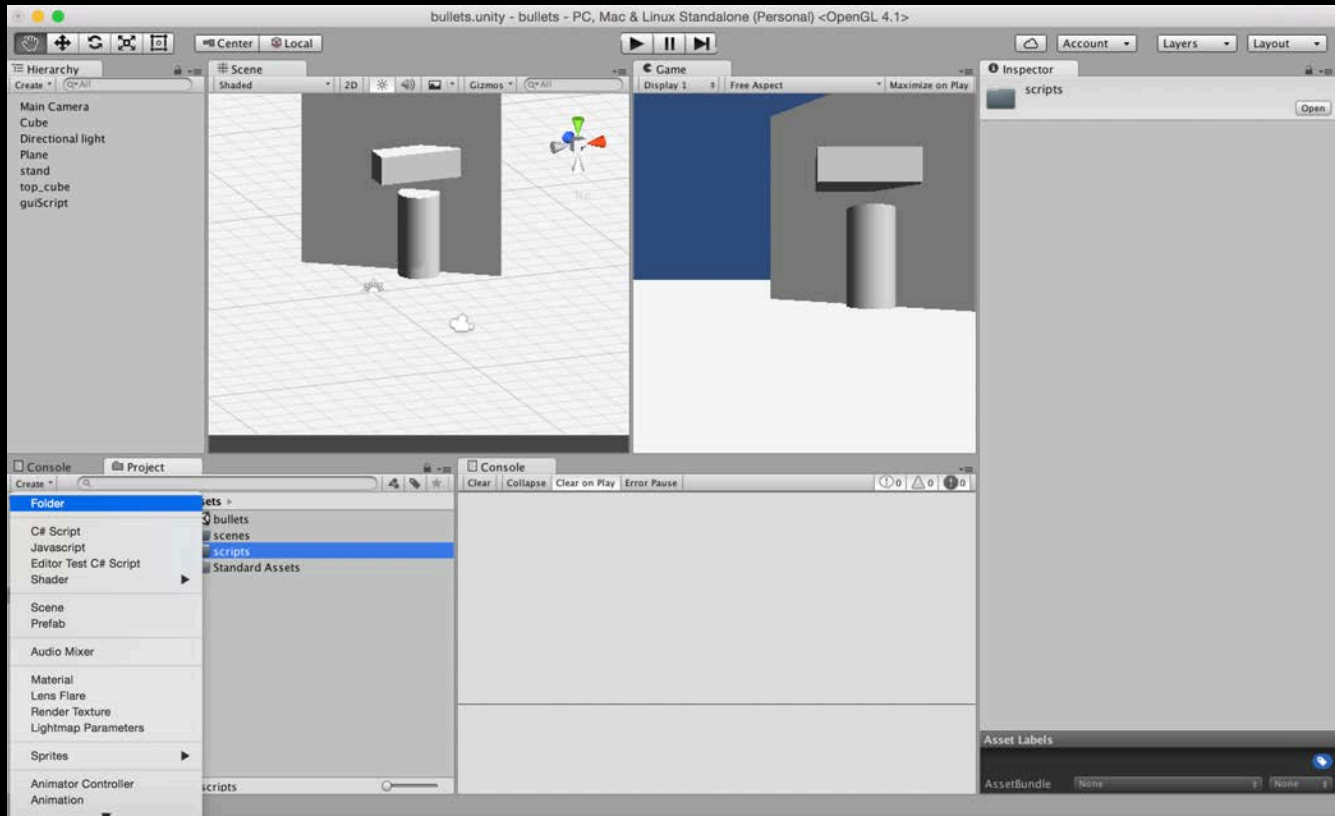
Use mouse button to test mouse input and the Add Force function

Interaction – Key and Button input



Project Organization

Project > Create >Folder

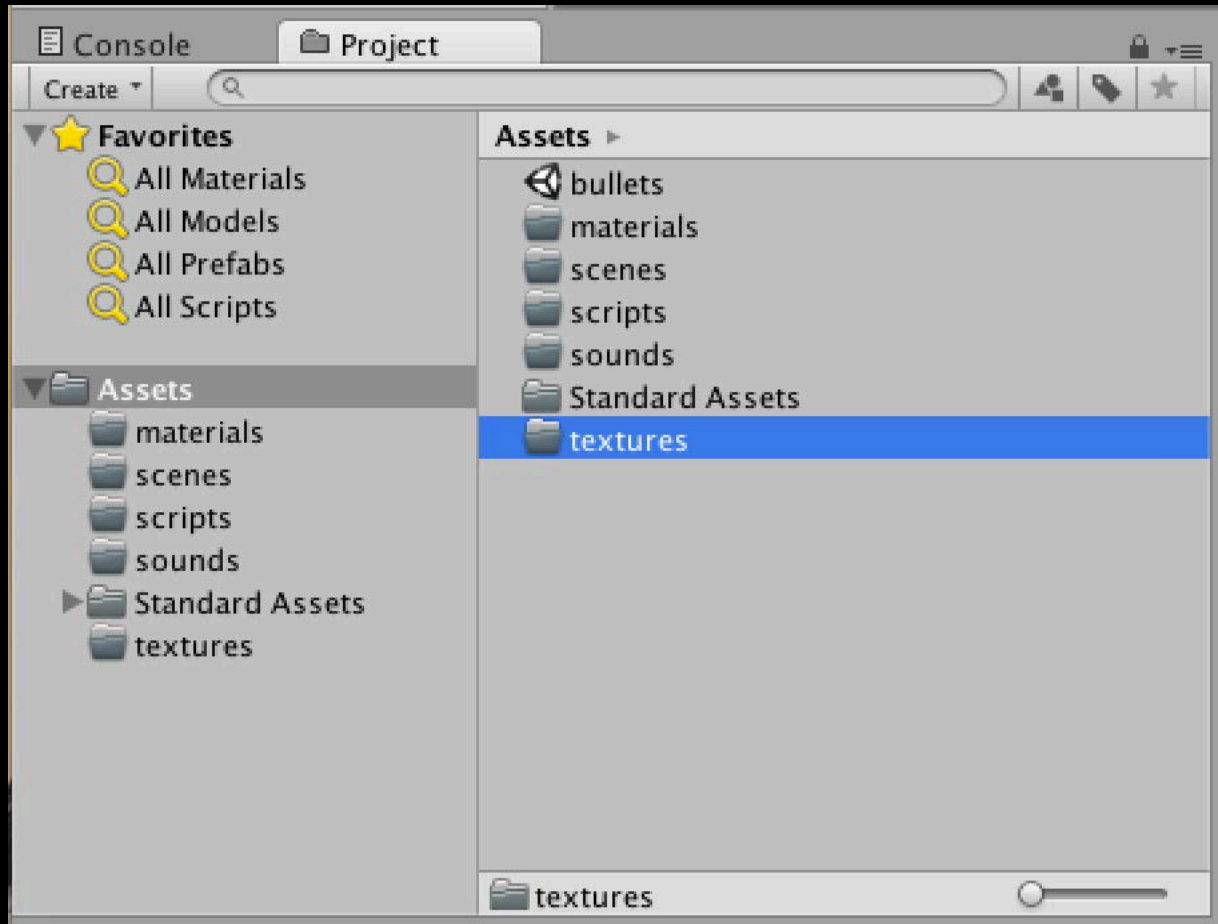


Project Organization

Assets > Folder >

Rename

- Materials
- Scripts
- Scenes
- Prefabs
- Textures
- Sounds



Project Organization

- Keep your assets organized
- Be consistent with naming. If you decide to use camel case for directory names and low letters for assets, stick to that convention.

- Use lowercase folder names

- Use camelCase naming convention if needed

- Sort all the assets in the corresponding folders

Project Organization

- Do not store any asset files in the root directory. Use subdirectories whenever possible.
- Do not create any additional directories in the root directory, unless you really need to.
- Use 3rd-Party to store assets imported from the Asset Store. They usually have their own structure that shouldn't be altered.

Project Organization

- 3rd-Party
- Animations
- Audio
  - Music
  - SFX
- Materials
- Models
- Plugins
- Prefabs
- Resources
- Textures
- Sandbox
- Scenes
  - Levels
  - Other
- Scripts
  - Editor
- Shaders