Unity Scripting 4

Unity Components overview
Particle components
Interaction – Key and Button input
Parenting
Project Organization
Prefabs
Instantiate

Unity Components

Animation components
Asset components
Audio components
Physics components
The GameObject
Image effect scripts
Settings managers
Mesh components
Network group
Particle components
Rendering components
Transform component
UnityGUI group
Wizards

Unity Components

Audio components

Implement sound in Unity

- Audio Listener

  Add this to a Camera to get 3D positional sound.

- Audio Source

  Add this Component to a GameObject to make it play a sound

- Audio Effects

Unity Components

Physics components
Physic Material
Rigidbody
Box Collider
Capsule Collider
Character Controller
Character Joint
Configurable Joint
Constant Force
Fixed Joint
Hinge Joint
Spring Joint
Interactive Cloth
Skinned Cloth…

Unity Components

The Game Object

GameObjects are containers for all other Components

All objects in your scene are inherently GameObjects

They are containers that hold Components, which implement actual functionality. Ex. a Light is a Component which is attached to a GameObject.

Unity Components

Mesh components

3D Meshes are the main graphics primitive of Unity

Various components exist in Unity to render regular or skinned meshes, trails or 3D lines

Mesh Filter

Mesh Renderer

Skinned Mesh Renderer

Text Mesh

Unity Components

Particle components

Particle Systems are used to make effects

Smoke

Steam

Fire

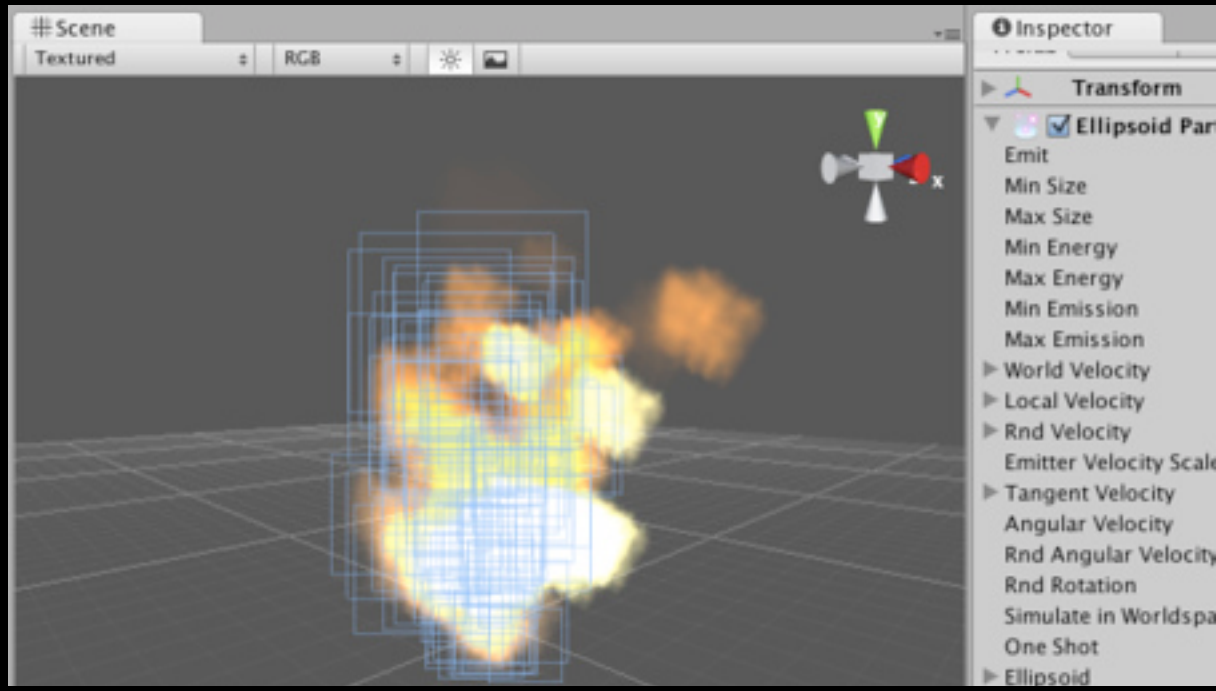
Atmospheric effects

Particle systems in Unity work by using one or two textures (2D), and drawing them many times, creating a chaotic random effect

Unity Components

Particle components

Ellipsoid Particle Emitter
Line Renderer
Mesh Particle Emitter
Particle Animator
Particle Renderer
Trail Renderer
Particle Collider



Unity Components

Particle components

Ellipsoid Particle Emitter

- spawns particles inside a sphere
- Use the Ellipsoid property to scale & stretch the sphere

Unity Components

Particle components

Line Renderer

draws a straight line between two or more points in 3D space

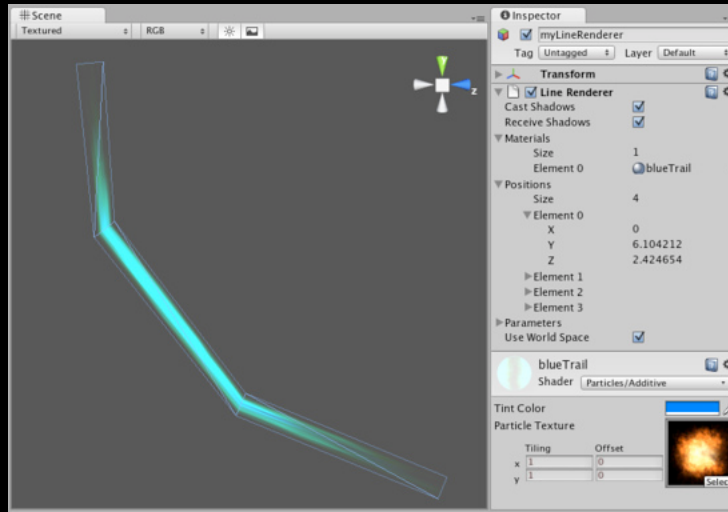
can be used to draw anything from a simple straight line, to a complex spiral

renders billboard lines that have width

and can be textured

uses the same algorithm for line rendering

as the Trail Renderer

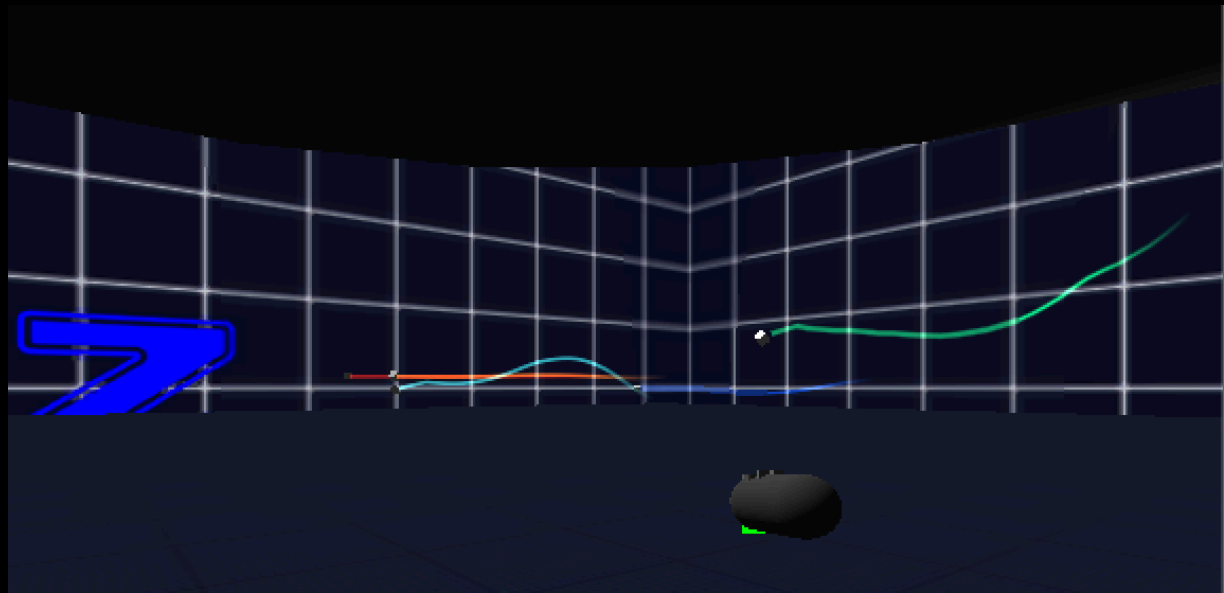


Unity Components

Particle components

Trail Renderer

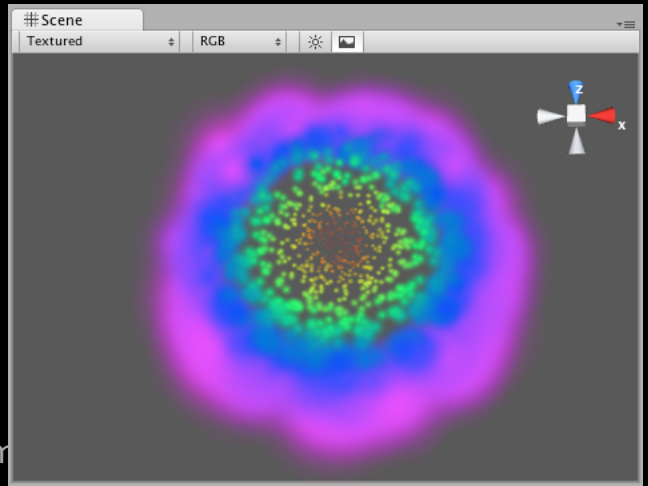
makes trails behind moving objects in the scene



Unity Components

Particle components
Particle animator

Move particles over time
Used to apply wind, drag and color cycling to particle systems



Unity Components

Particle components

Mesh particle emitter

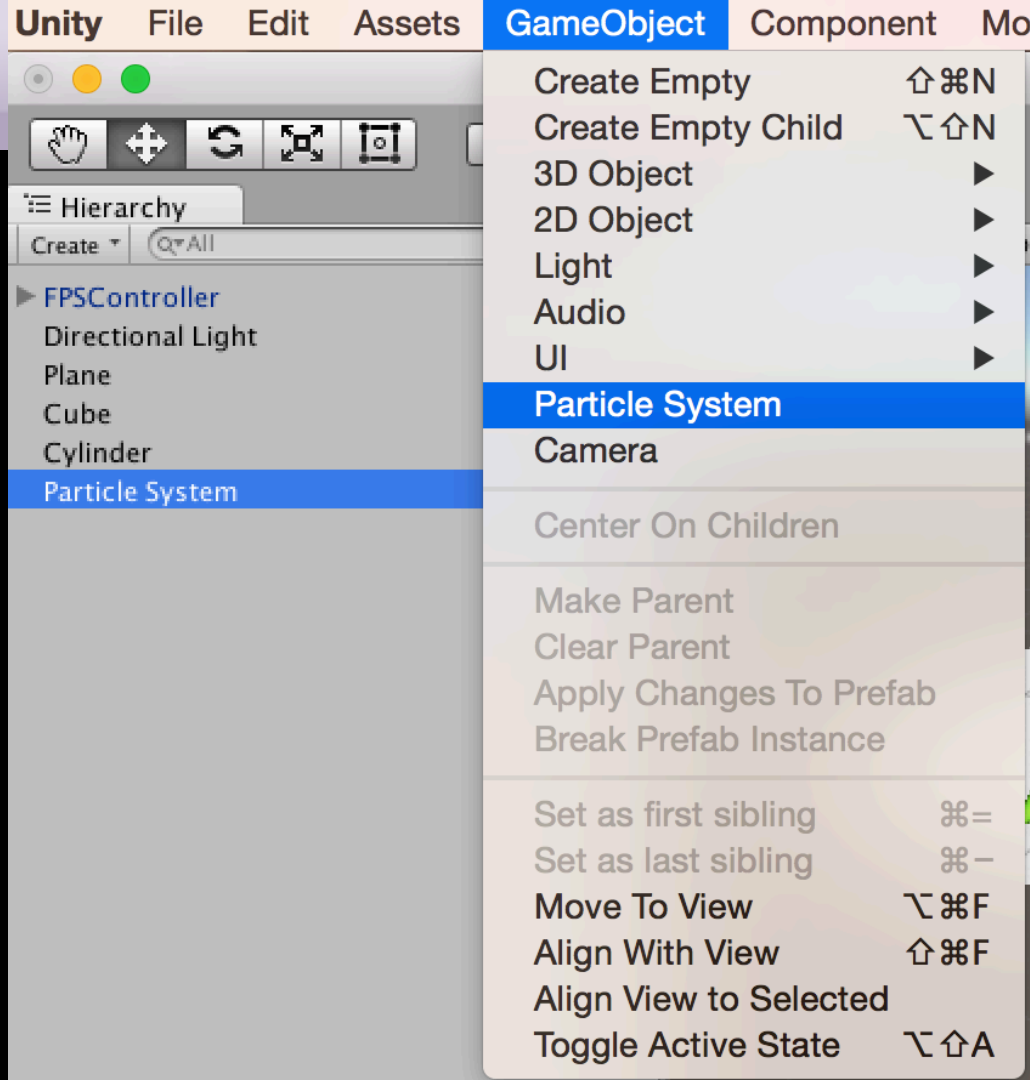
emits particles around a mesh

particles are spawned from the surface of the mesh

Particle component

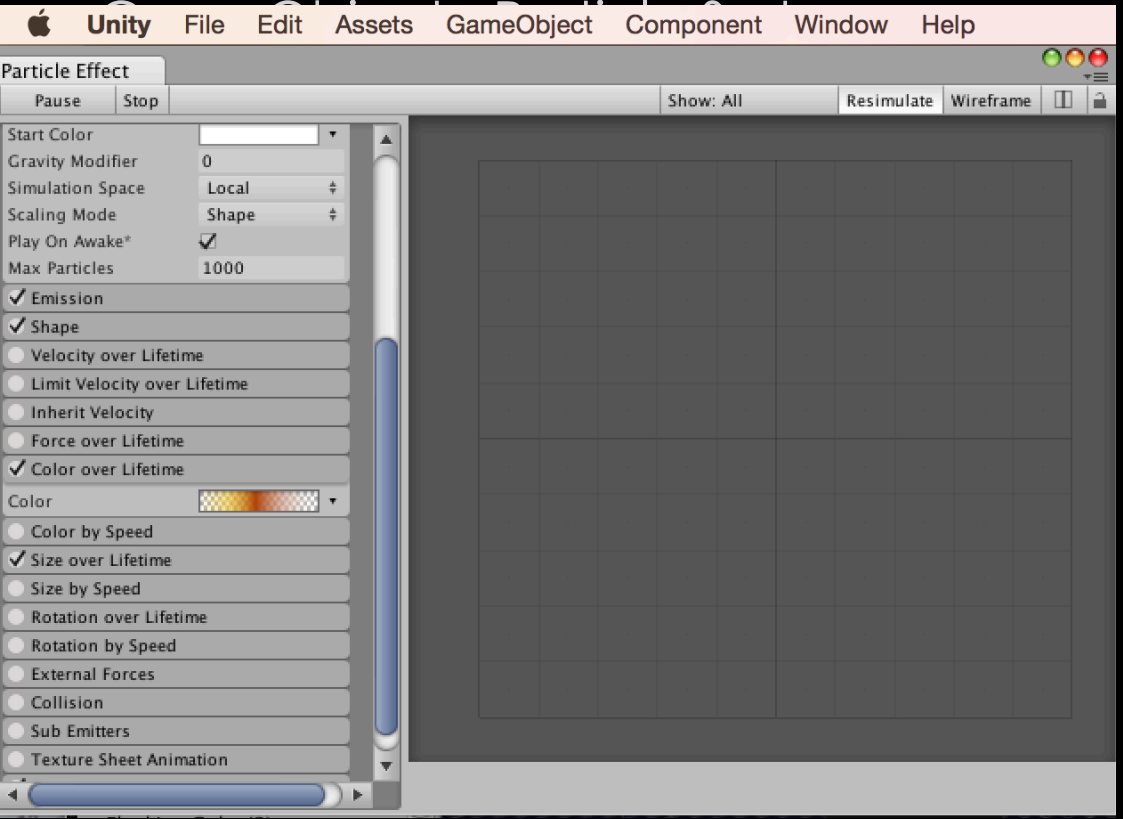
Open your Unity scene
GameObject >Particle System

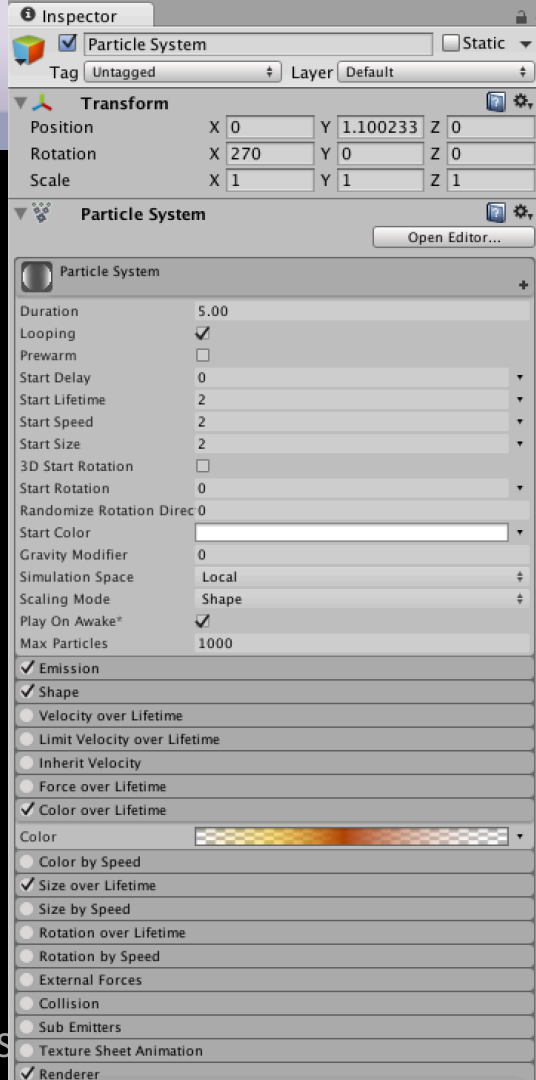
Rename it “Confetti”



Particle component

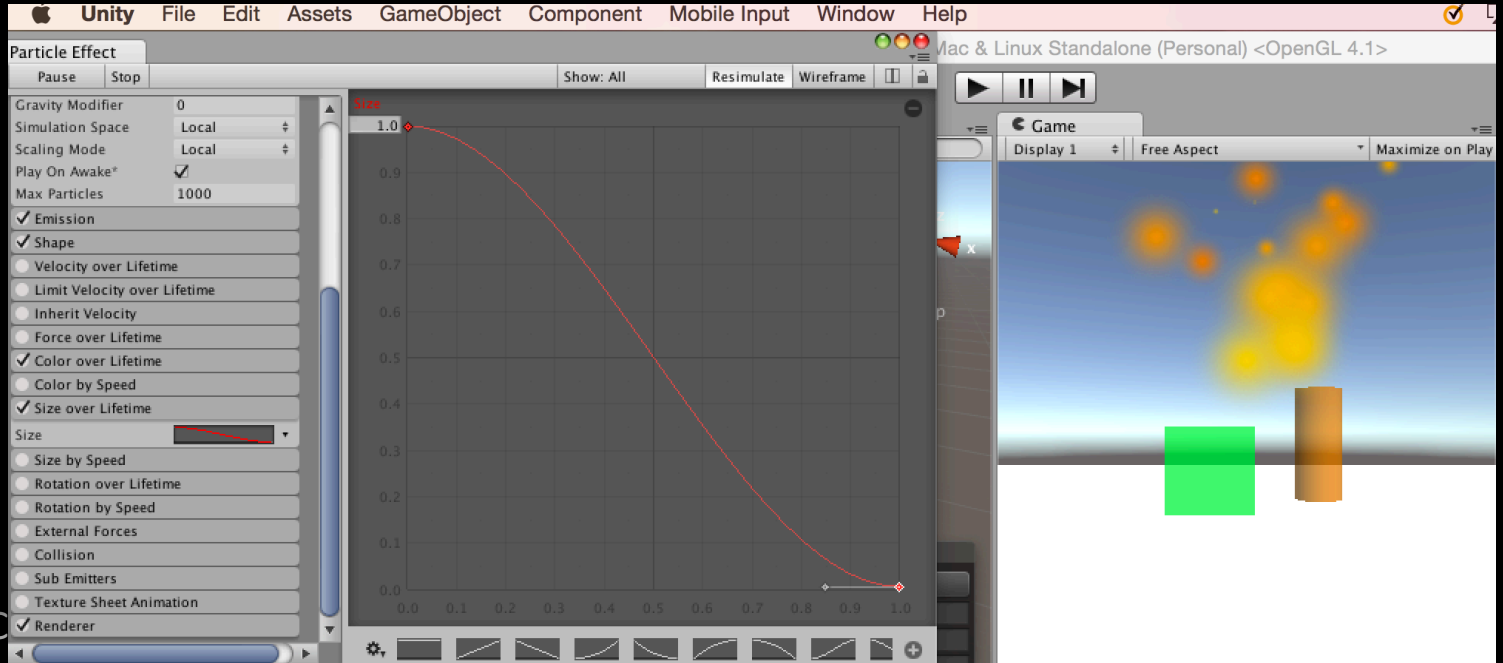
Particle Effect window / Inspector





Particle component

Open Particle Editor
Adjust Size over Lifetime parameter in the graph view
Adjust Color over Lifetime in the Editor



Particle component

Create a script “ParticleScript”

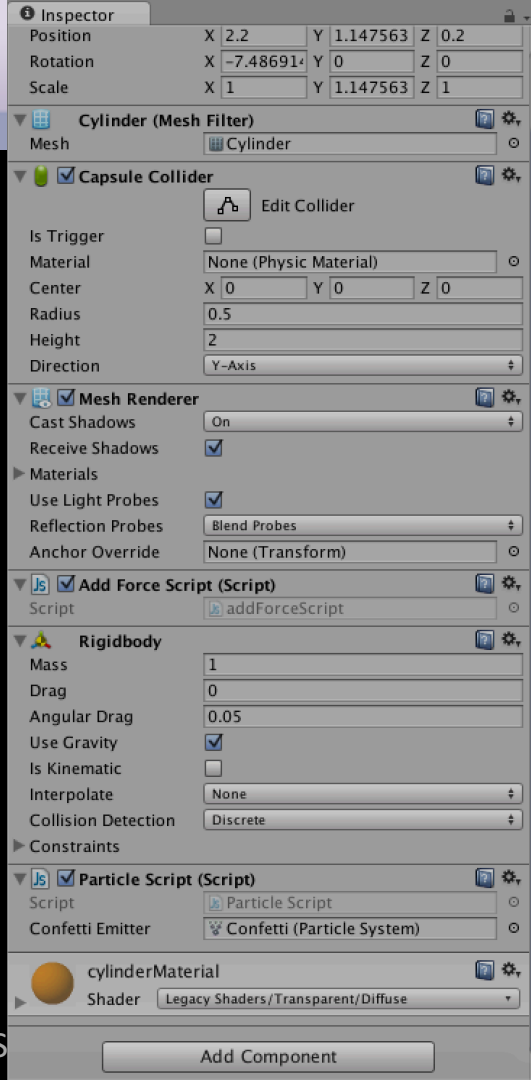
```
public var confettiEmitter : ParticleSystem;

function Start() {
confettiEmitter = GameObject.Find("Confetti").GetComponent(ParticleSystem);
    }
function Update()
{
    if (Input.GetButtonDown("Fire1"))
        {
          confettiEmitter.Emit(30); //emits 30 particles
        }
    }
```

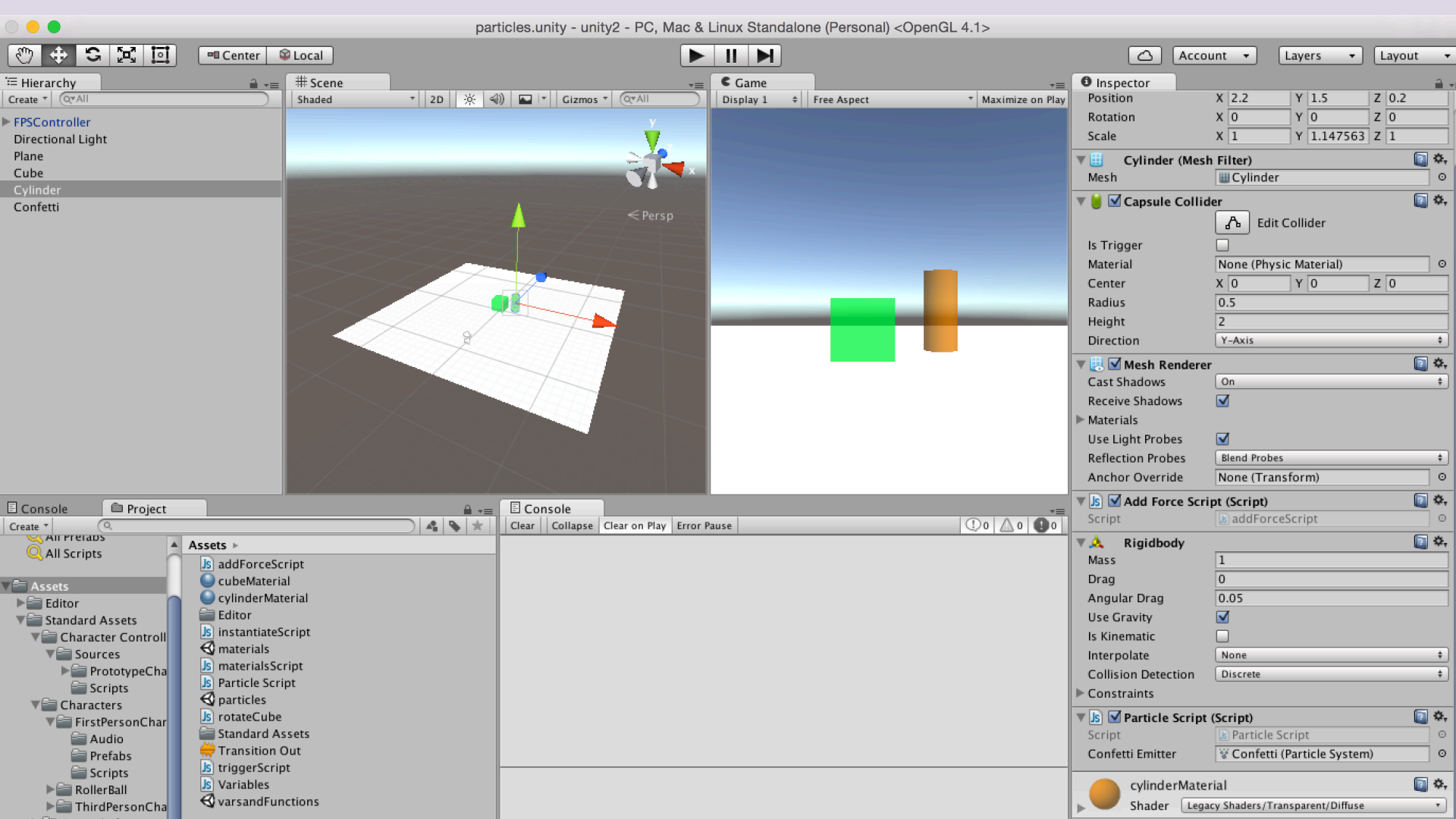
Particle component

Assign “ParticleScript” to a cylinder
(drag and drop)

Assign Confetti Particles to
Confetti Emitter Var in the Inspector
(drag and drop from Hierarchy)

Uncheck “Play on Awake” box in the Inspector
Uncheck “Looping” box
With selected Confetti object in Hierarchy

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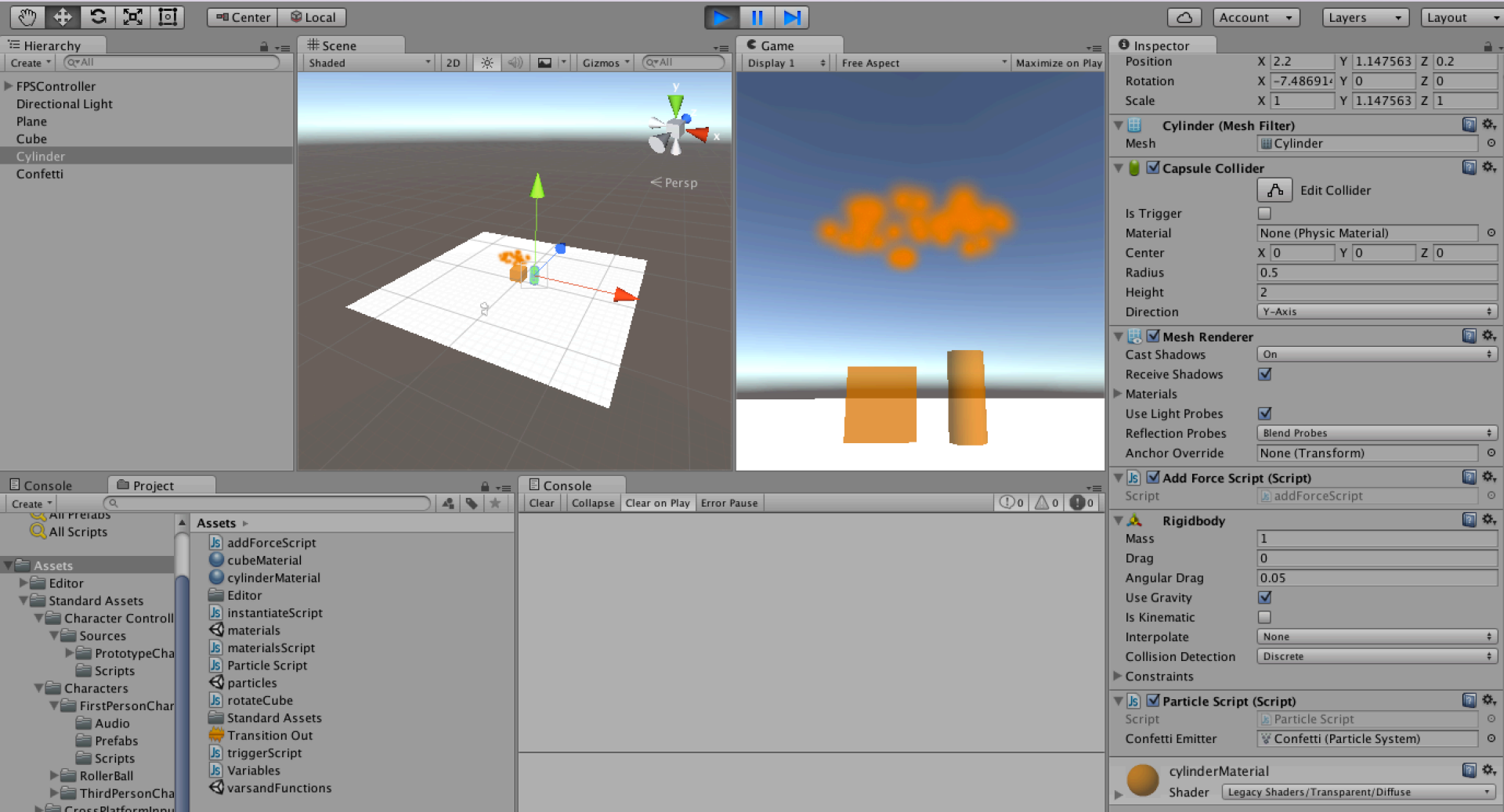
Center
Local
Account
Layers
Layout
Hierarchy
Create
FPSController
Directional Light
Plane
Cube
Cylinder
Confetti
Scene
Shaded
2D
Gizmos
Persp
Game
Display 1
Free Aspect
Maximize on Play
Inspector
Position
Rotation
Scale
Cylinder (Mesh Filter)
Mesh
Cylinder
Capsule Collider
Edit Collider
Is Trigger
Material
None (Physic Material)
Center
Radius
Height
Direction
Y-Axis
Mesh Renderer
Cast Shadows
On
Receive Shadows
Materials
Use Light Probes
Reflection Probes
Blend Probes
Anchor Override
None (Transform)
Add Force Script (Script)
Script
addForceScript
Rigidbody
Mass
Drag
Angular Drag
Use Gravity
Is Kinematic
Interpolate
None
Collision Detection
Discrete
Constraints
Particle Script (Script)
Particle Script
Confetti Emitter
Confetti (Particle System)
cylinderMaterial
Shader
Legacy Shaders/Transparent/Diffuse
Console
Project
Create
All Scripts
Assets
Editor
Standard Assets
Character Controll
Sources
PrototypeCha
Scripts
Characters
FirstPersonChar
Audio
Prefabs
Scripts
RollerBall
ThirdPersonCha
addForceScript
cubeMaterial
cylinderMaterial
Editor
instantiateScript
materials
materialsScript
Particle Script
particles
rotateCube
Standard Assets
Transition Out
triggerScript
Variables
varsandFunctions
Console
Clear
Collapse
Clear on Play
Error Pause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Layers
Layout
Hierarchy
Create
FPSController
Directional Light
Plane
Cube
Cylinder
Confetti
Scene
Shaded
2D
Gizmos
Persp
Game
Display 1
Free Aspect
Maximize on Play
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Particle Script (Script)
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Confetti Emitter Confetti (Particle System)
cylinderMaterial
Shader Legacy Shaders/Transparent/Diffuse
Console
Project
Create
All Prefabs
All Scripts
Assets
Editor
Standard Assets
Character Controll
Sources
PrototypeCha
Scripts
Characters
FirstPersonChar
Audio
Prefabs
Scripts
RollerBall
ThirdPersonCha
addForceScript
cubeMaterial
cylinderMaterial
Editor
instantiateScript
materials
materialsScript
Particle Script
particles
rotateCube
Standard Assets
Transition Out
triggerScript
Variables
varsandFunctions
Console
Clear
Collapse
Clear on Play
Error Pause

Particle component

Test the mouse button input and interaction

The particle should emit 30 particles on mouse click

Parenting

Parent-Child Relationship in Unity

The Child Game Object will inherit the behaviour of its parent

It will move, rotate, scale exactly as its Parent does.

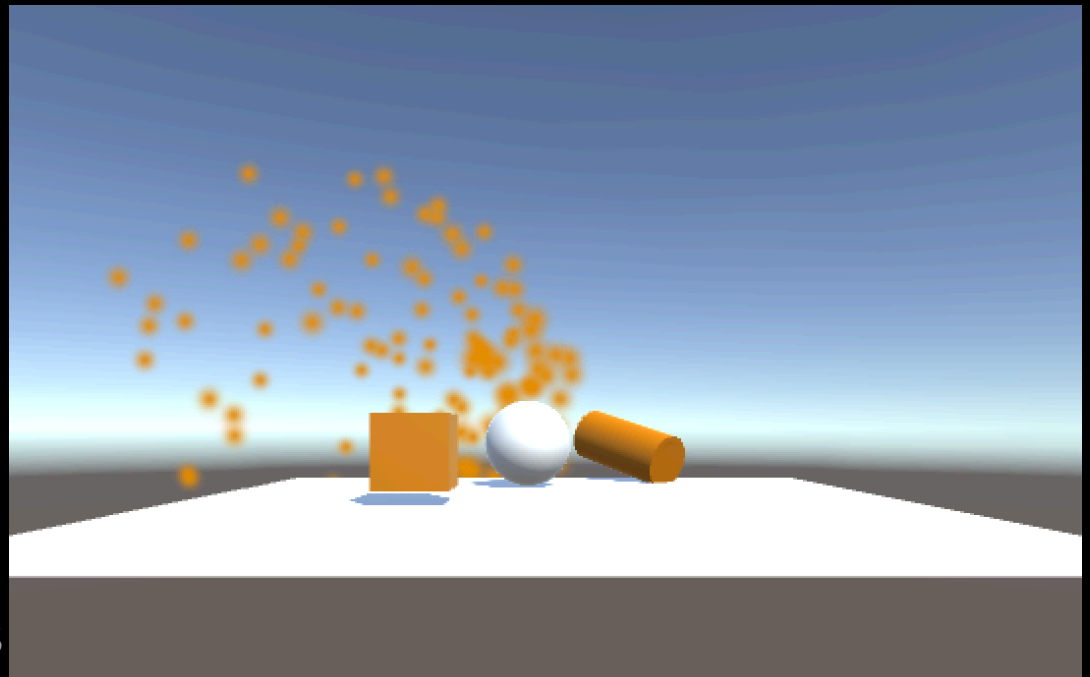
Similar to Arm/Body rleationship- whenever your body moves, your arm moves along with it

- This is a way of grouping objects together
- Children can have their own children and etc.
- Complex parent-child structore
- Represented in the Hierarchy window

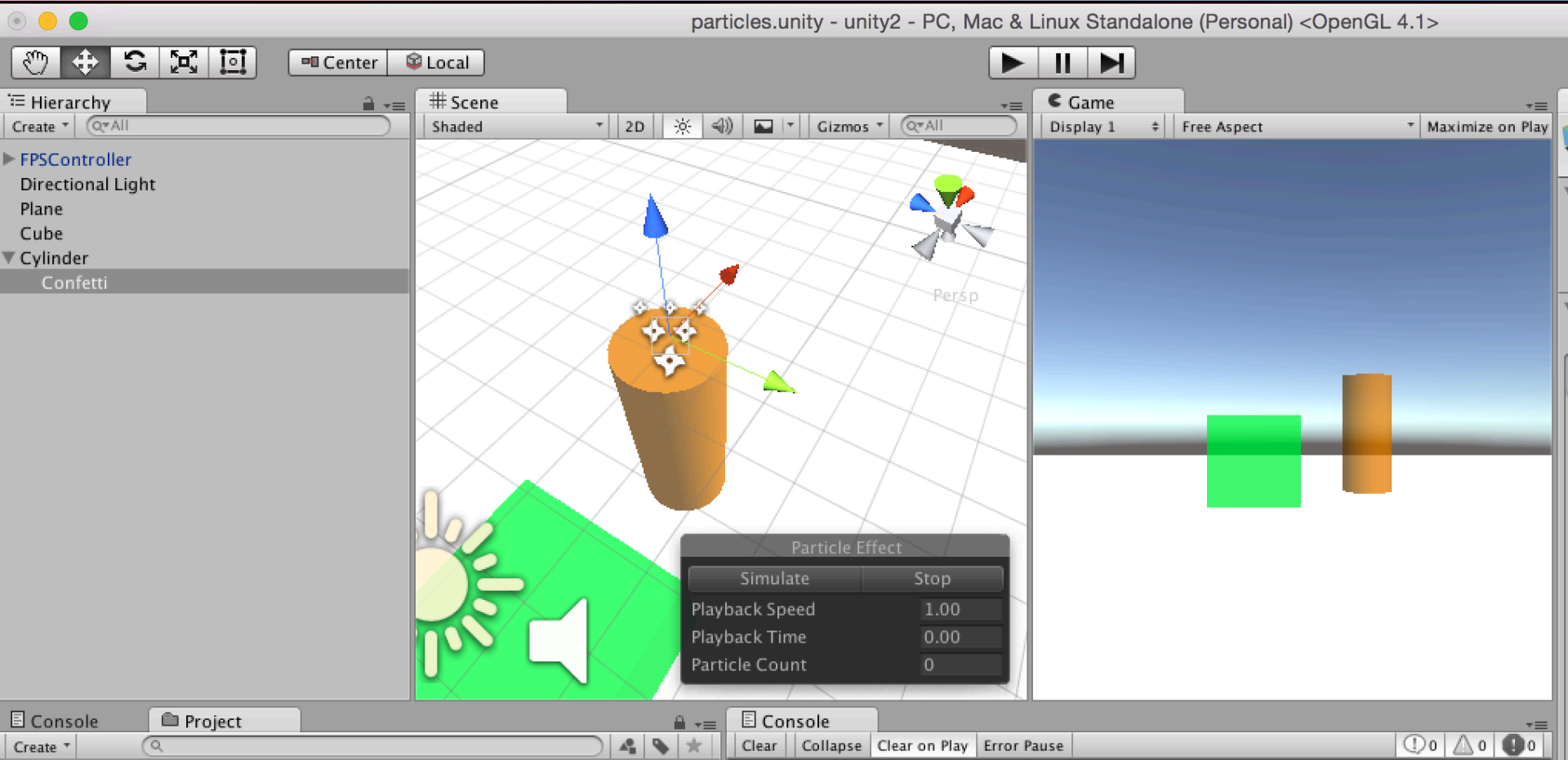
Parenting

Drag and drop Confetti particles inside the Cylinder object in the Hierarchy window

Test the game



Parenting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Center
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Hierarchy
Create
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FPSController
Directional Light
Plane
Cube
Cylinder
Confetti
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Shaded
2D
Gizmos
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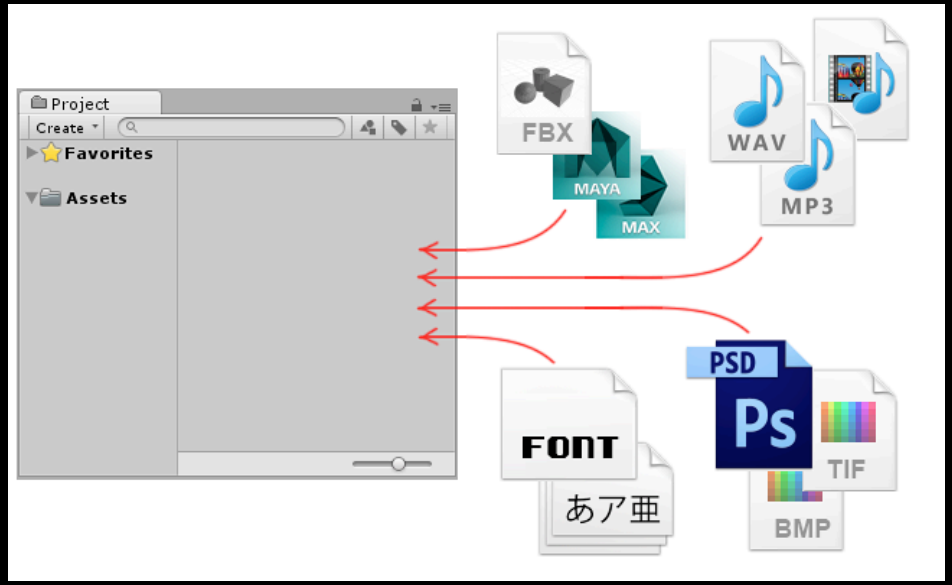
Project Assets

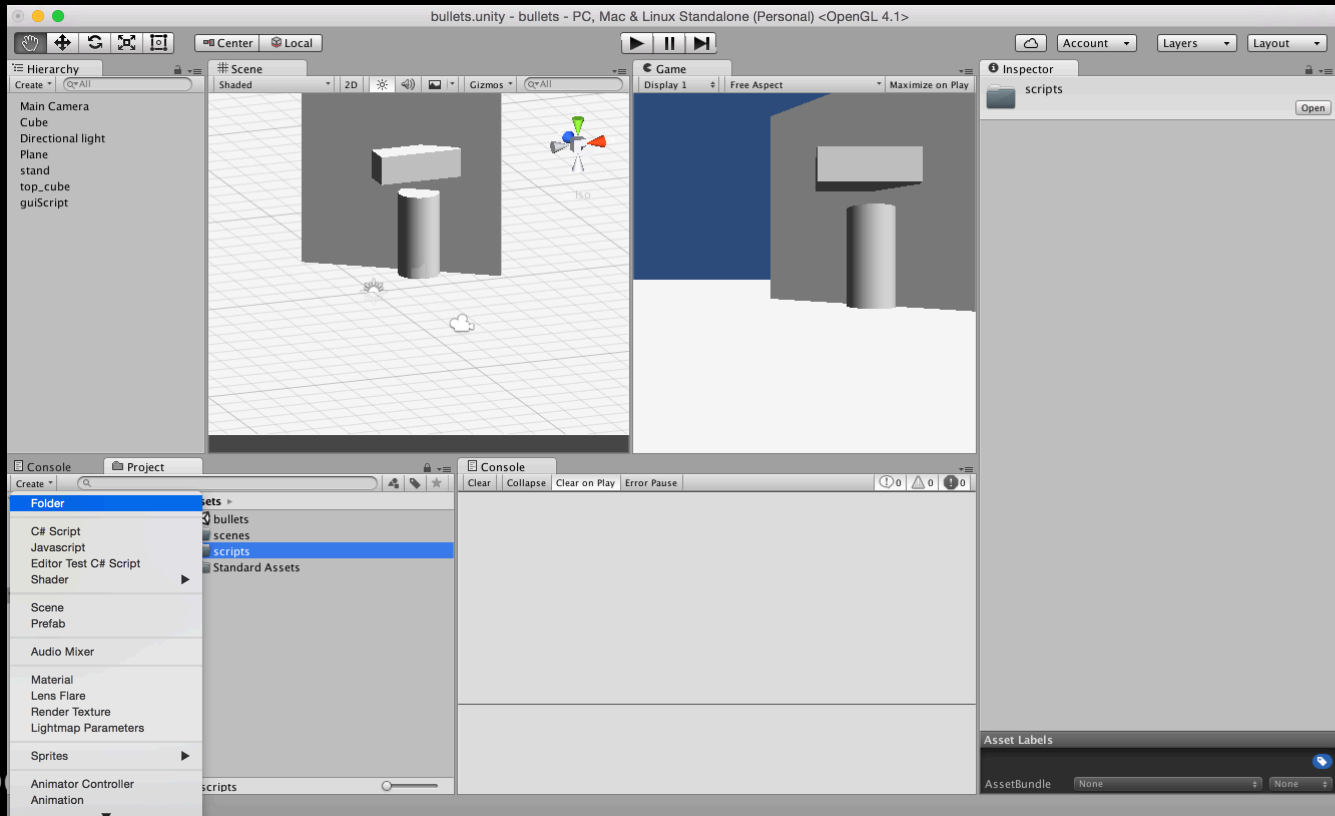
Assets are the models, textures, sounds and all other media files from which you make your 3D project

- Audio Files
- Materials
- Meshes
- Textures
- Prefabs
- Scripts
- Prefabs



Project Organization

Project > Create >Folder

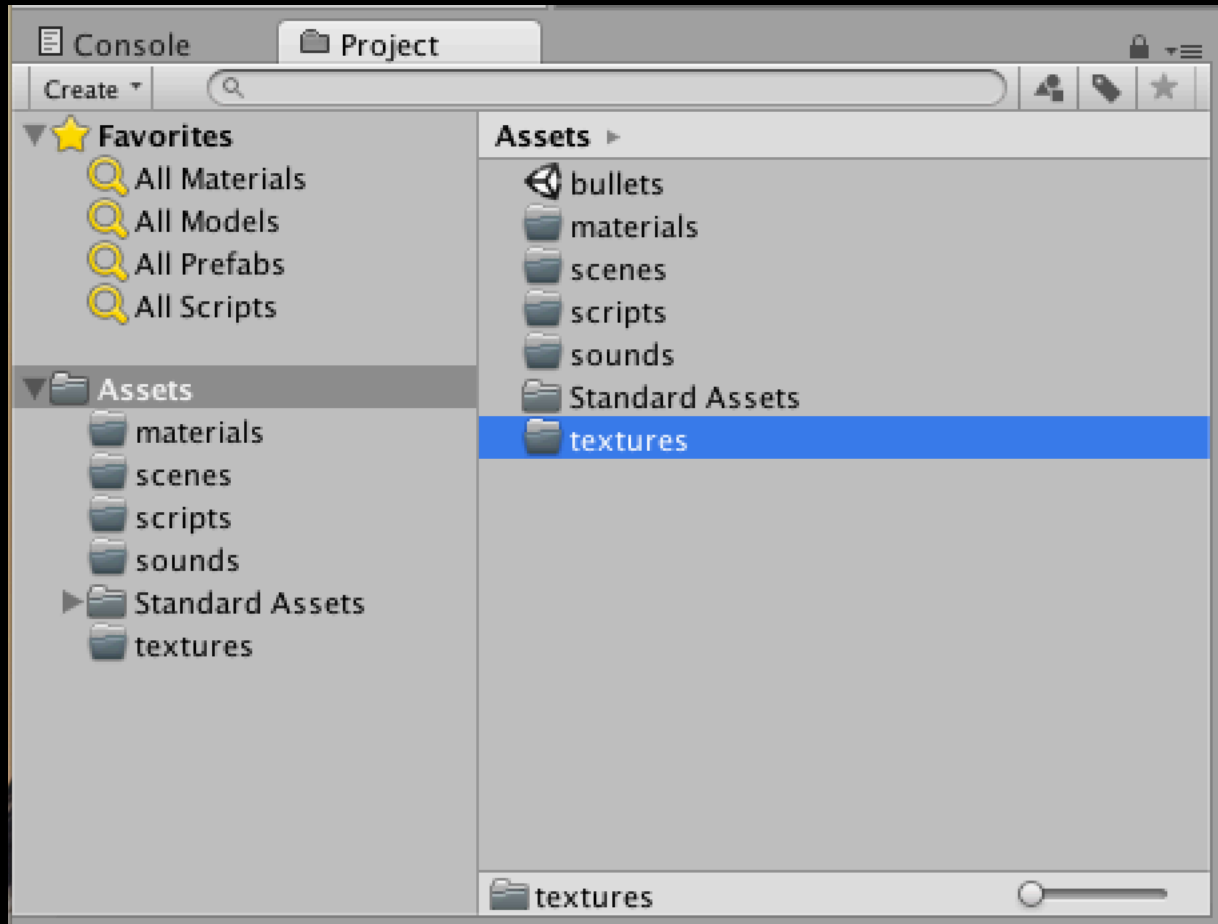


Project Organization

Assets > Folder >

Rename

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



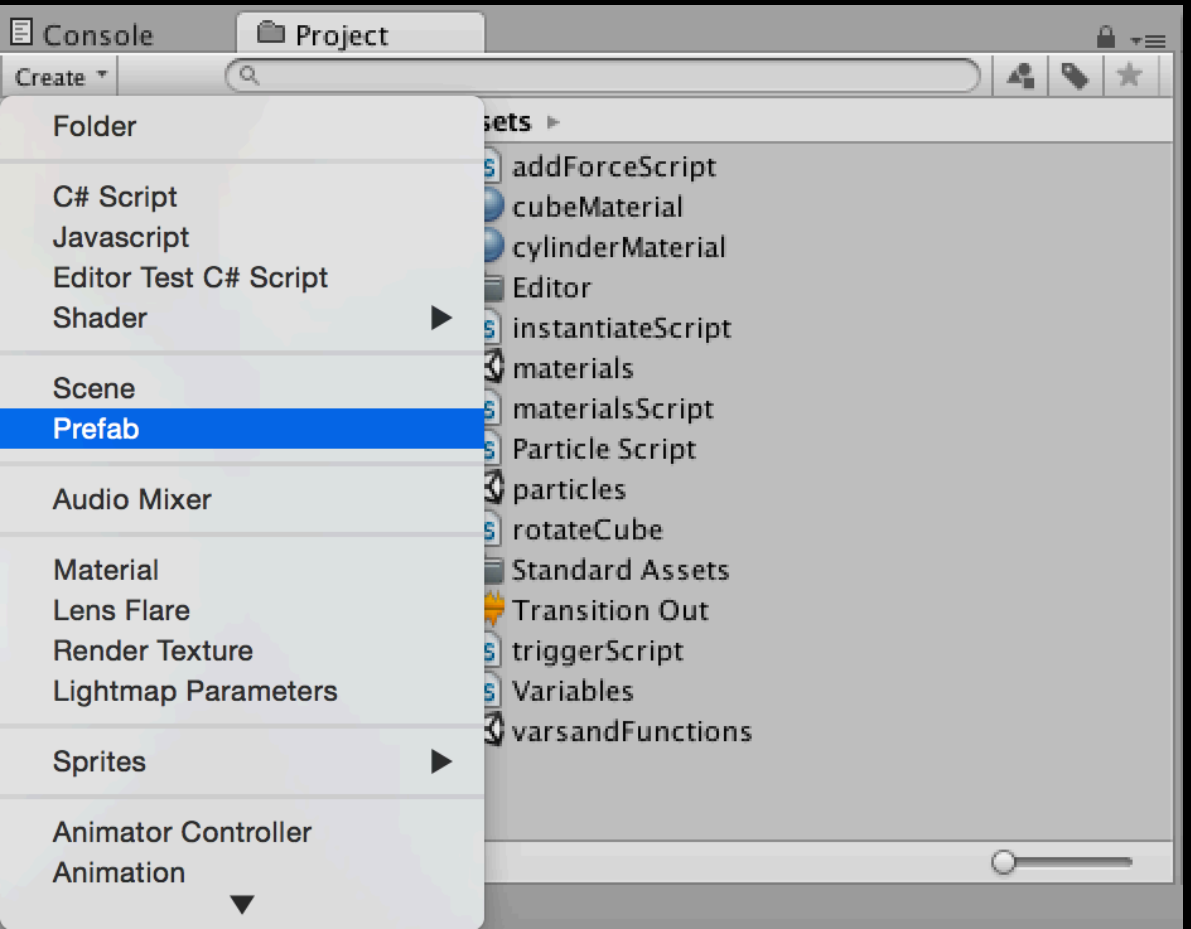
Prefabs

Prefabs and reusable assets

Create Prefab:

- Project > Create > Prefab
- Rename it “PrefabSphere”
- Game Object > 3D > Sphere
- Inspector : Add RigidBody Component
- Drag and drop sphere into PrefabSphere
- Delete Sphere in the Hierarchy window / scene

Prefabs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Prefab
Audio Mixer
Material
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Sprites
Animator Controller
Animation
addForceScript
cubeMaterial
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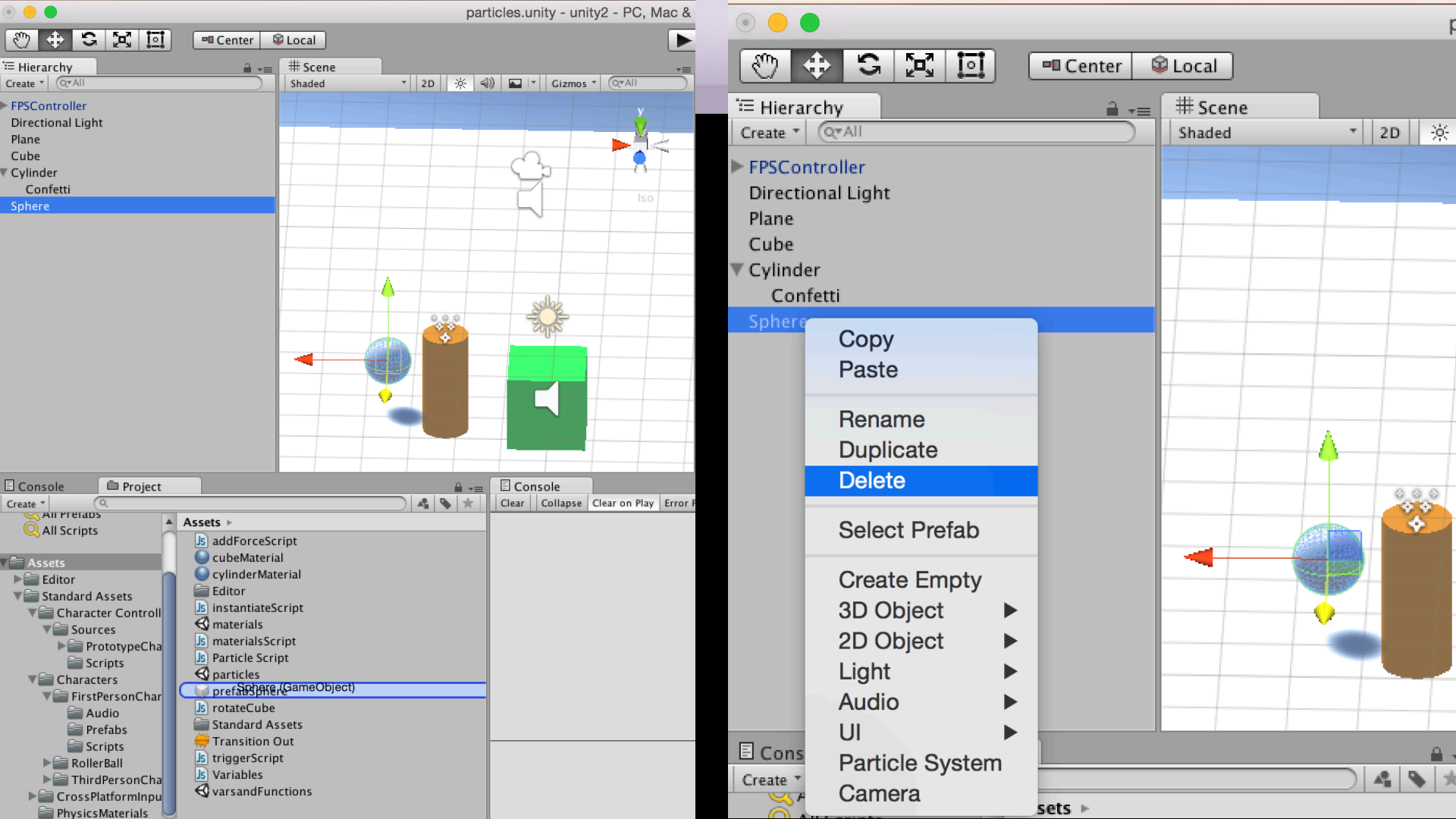
materials
materialsScript
Particle Script
particles
rotateCube
Standard Assets
Transition Out
triggerScript
Variables
varsandFunctions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Hierarchy
Create
FPSController
Directional Light
Plane
Cube
Cylinder
Confetti
Sphere
Scene
Shaded
2D
Gizmos
Console
Project
Clear
Collapse
Clear on Play
All Prefabs
All Scripts
Assets
Editor
Standard Assets
Character Controll
Sources
PrototypeCha
Scripts
Characters
FirstPersonChar
Audio
Prefabs
Scripts
RollerBall
ThirdPersonCha
CrossPlatformInpu
PhysicsMaterials
addForceScript
cubeMaterial
cylinderMaterial
Editor
instantiateScript
materials
materialsScript
Particle Script
particles
prefabSphere
Sphere (GameObject)
rotateCube
Standard Assets
Transition Out
triggerScript
Variables
varsandFunctions
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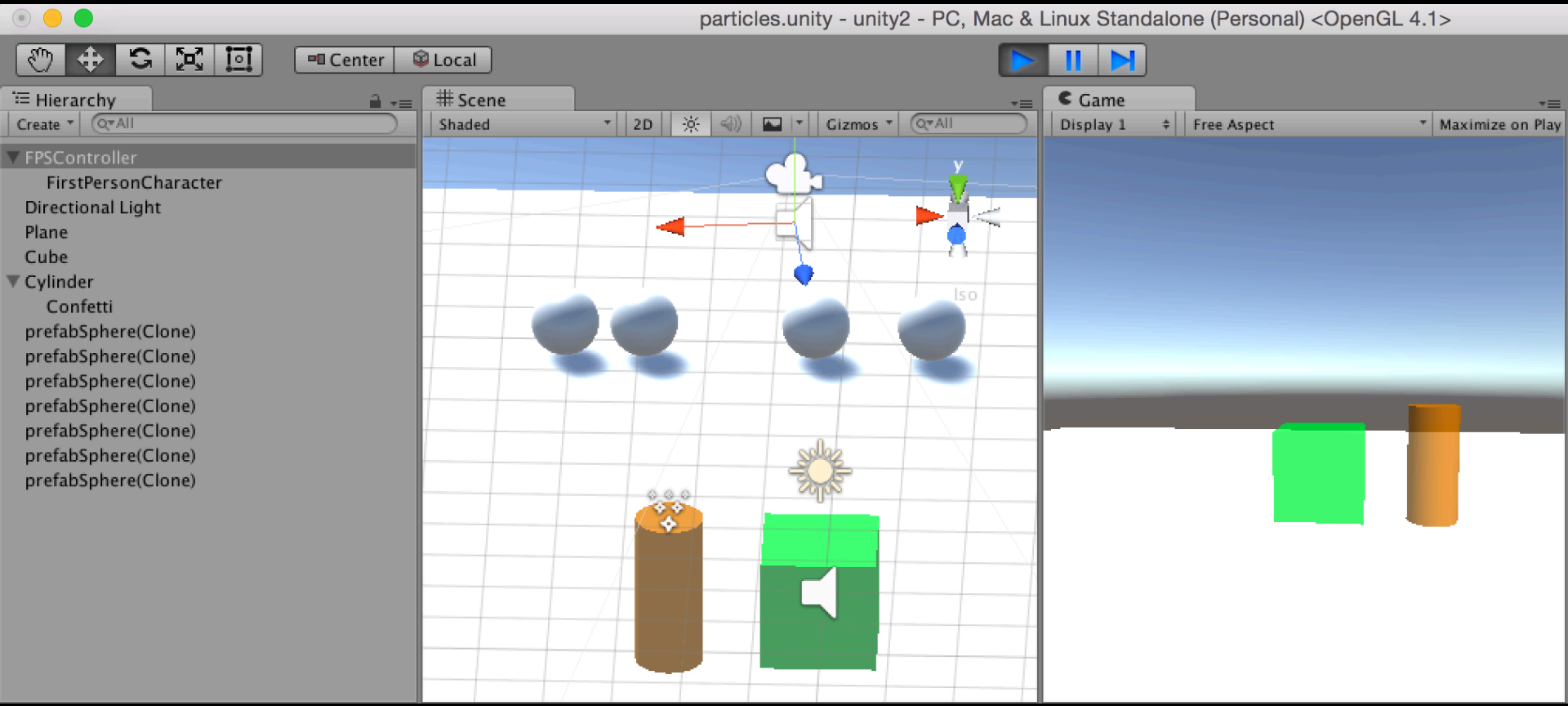
2D Object
Light
Audio
UI
Particle System
Camera

Prefabs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Hierarchy
Create
All
FPSController
FirstPersonCharacter
Directional Light
Plane
Cube
Cylinder
Confetti
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Scene
Shaded
2D
Gizmos
All
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Iso
Game
Display 1
Free Aspect
Maximize on Play

Prefabs

Create InstantiateScript

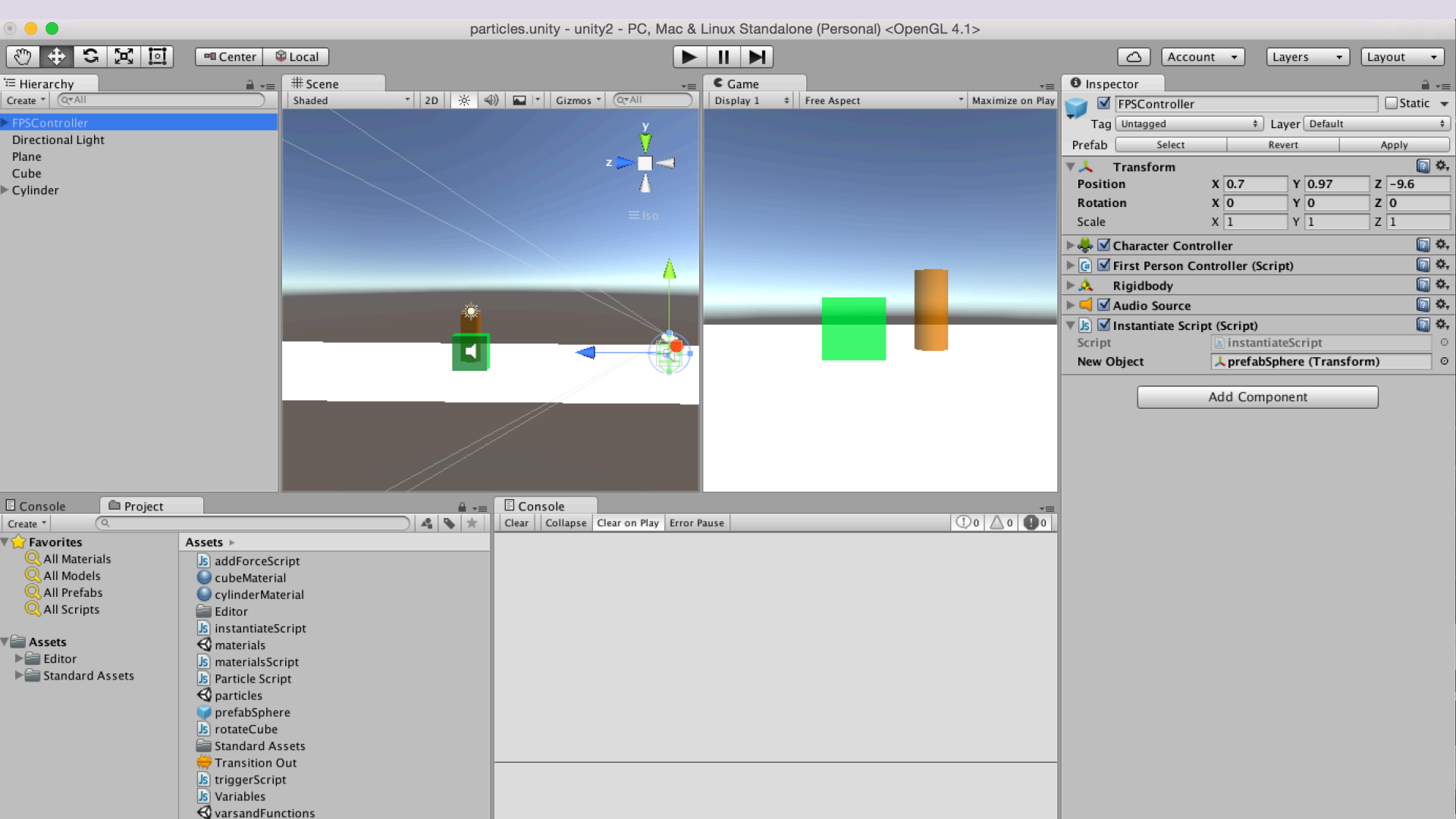
```
var prefabSphere : Transform;

function Update () {

if (Input.GetButtonDown("Jump")) {
var instanceObject = Instantiate(prefabSphere, transform.position,
 transform.rotation);
}
}
```

Prefabs

Assign script to FP character Controller (add one if your scene has no FPC)

Assign prefabShpere to New Object in the Inspector

Test the game ad press Space bar to instantiate spheres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Local
Account
Layers
Layout
Hierarchy
Create
FPSController
Directional Light
Plane
Cube
Cylinder
Scene
Shaded
2D
Gizmos
Iso
Game
Display 1
Free Aspect
Maximize on Play
Inspector
FPSController
Static
Tag
Untagged
Layer
Default
Prefab
Select
Revert
Apply
Transform
Position
X 0.7
Y 0.97
Z -9.6
Rotation
X 0
Y 0
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Scale
X 1
Y 1
Z 1
Character Controller
First Person Controller (Script)
Rigidbody
Audio Source
Instantiate Script (Script)
Script
instantiateScript
New Object
prefabSphere (Transform)
Add Component
Console
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Editor
Standard Assets
Assets
addForceScript
cubeMaterial
cylinderMaterial
Editor
instantiateScript
materials
materialsScript
Particle Script
particles
prefabSphere
rotateCube
Standard Assets
Transition Out
triggerScript
Variables
varsandFunctions
Console
Clear
Collapse
Clear on Play
Error Pause

Instantiate

1. Which object to instantiate?

the best way is to expose a variable

We can state which object to instantiate by using drag and drop to assign a game object to this variable

prefab

2 Where to instantiate it?

create the new game object wherever the user (FPC) is currently located whenever the Jump button is pressed.

Instantiate

Instantiate is to create objects during run-time (as the game is being played)

Instantiate function takes three parameters;

(1) the object we want to create

(2) the 3D position of the object

(3) the rotation of the object

```
if (Input.GetButtonDown("Jump")) {
var instanceObject = Instantiate(prefabSphere, transform.position, t
ransform.rotation);
}// the transform that the script is attached to (FP Character)
```

Instantiate

To clean generated prefabs from the scene, attach the following script "destroyPrefabs" to the prefabSphere

```
var timeRemaining = 3.0;

function Update()
{
timeRemaining -= Time.deltaTime;
if (timeRemaining <= 0.0)
{
Destroy(gameObject);
}
}
```

Instantiate

To add a direction in which the prefabs are moving,

Add a forward pointing force to the script:

```
var forwardForce = 1000;

 instanceObject.GetComponent.<Rigidbody>().AddForce(transform.forward * forwardForce);
```