# Intro to Scripting part 1, 2, 3

Variables
Functions
Syntax
Arithmetic operators
If statement

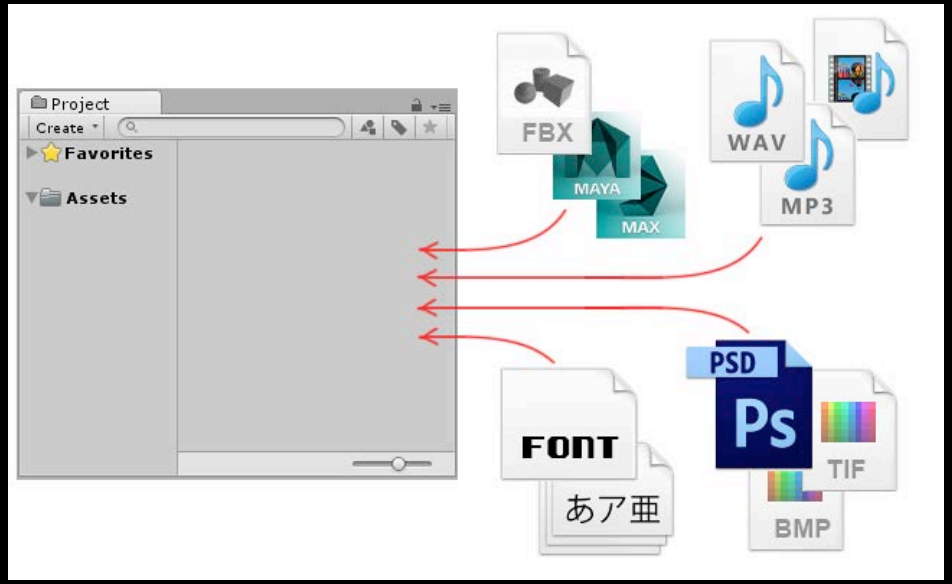
Sounds
Colors
Materials
Interaction
-button input
-key input

Project organization
Unity Components
Particle component
Parenting
KeyCode
Prefabs
Instantiate

# Project Assets

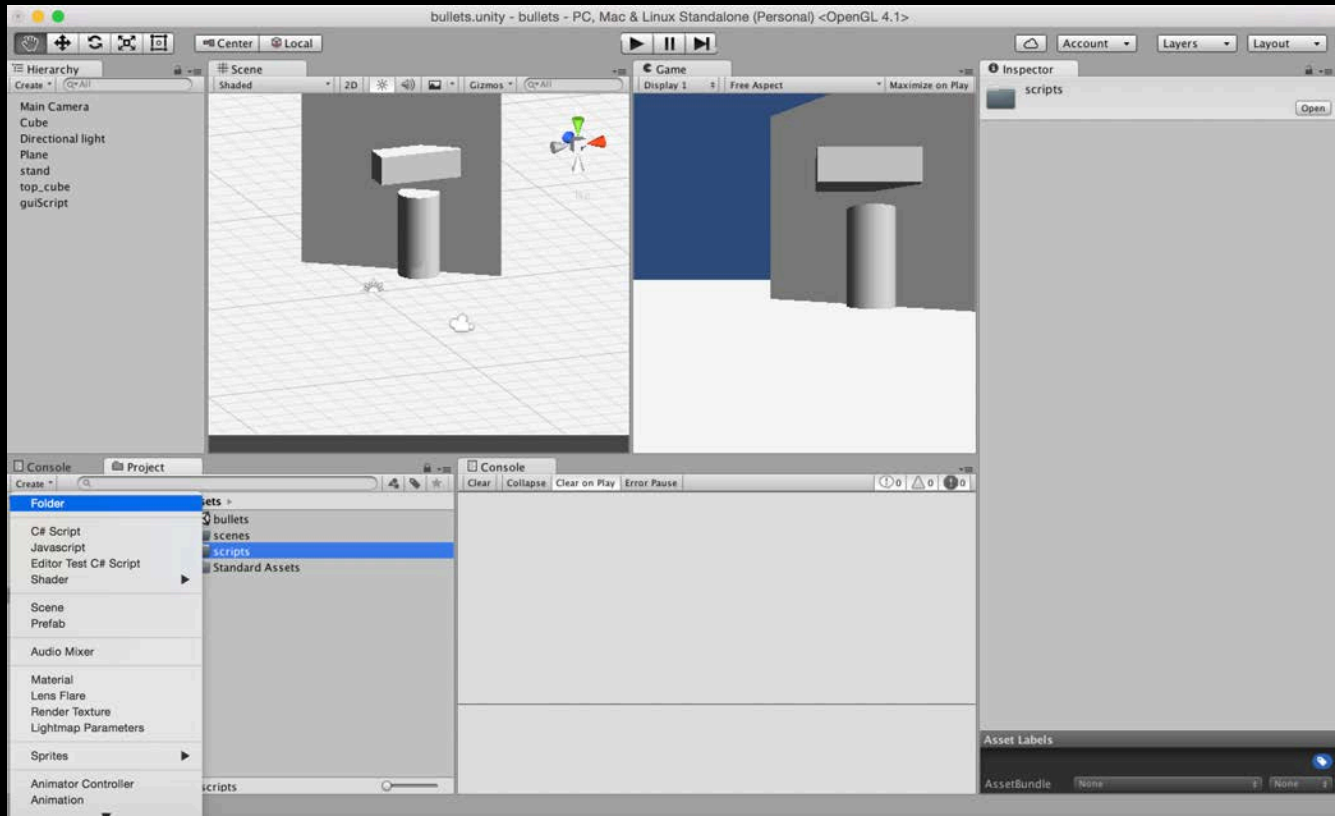
Assets are the models, textures, sounds and all other media files from which you make your 3D project

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



# Project Organization

Project > Create >Folder

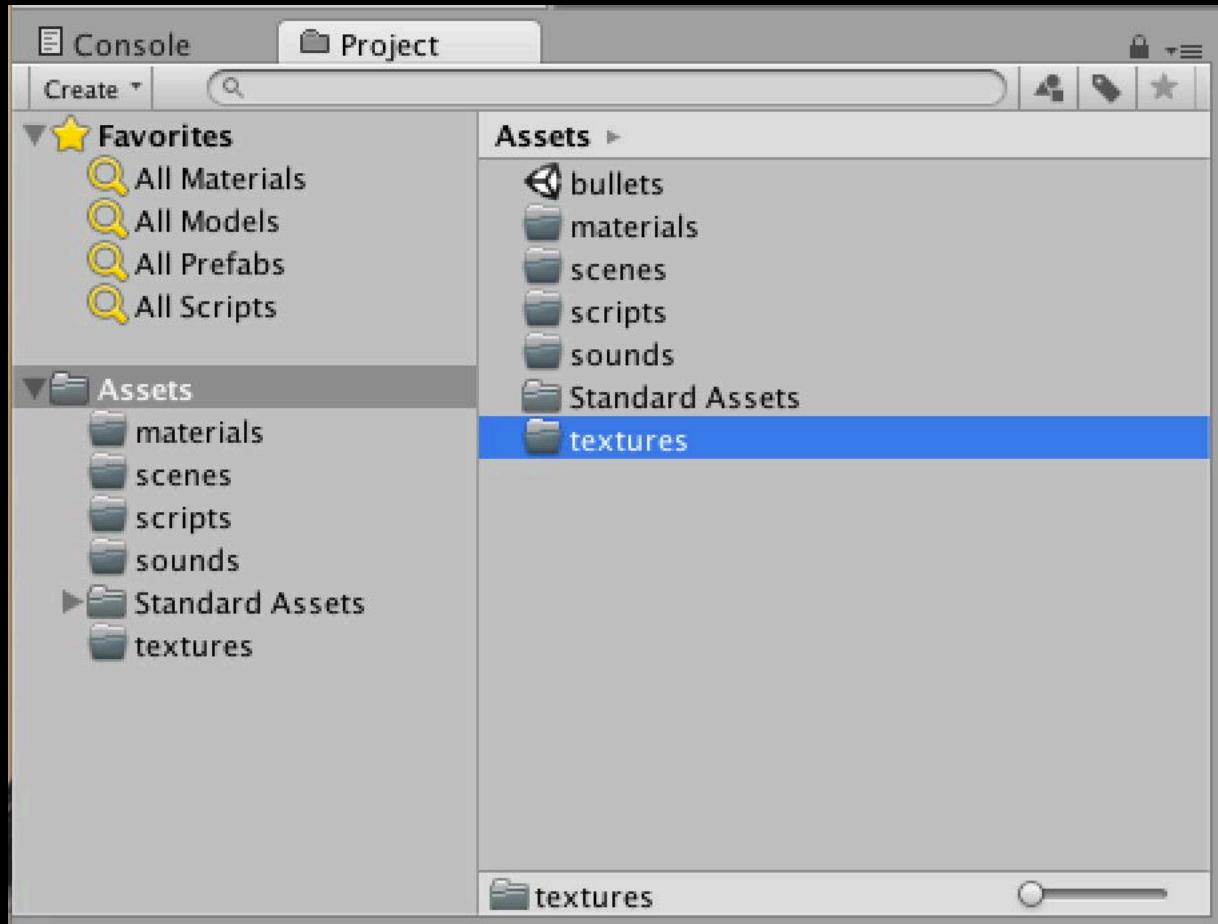


# Project Organization

Assets > Folder >

Rename

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



# 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

# Unity Components

Components are the nuts & bolts of objects and behaviors in a game.

A GameObject is a container for many different Components.

# 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

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

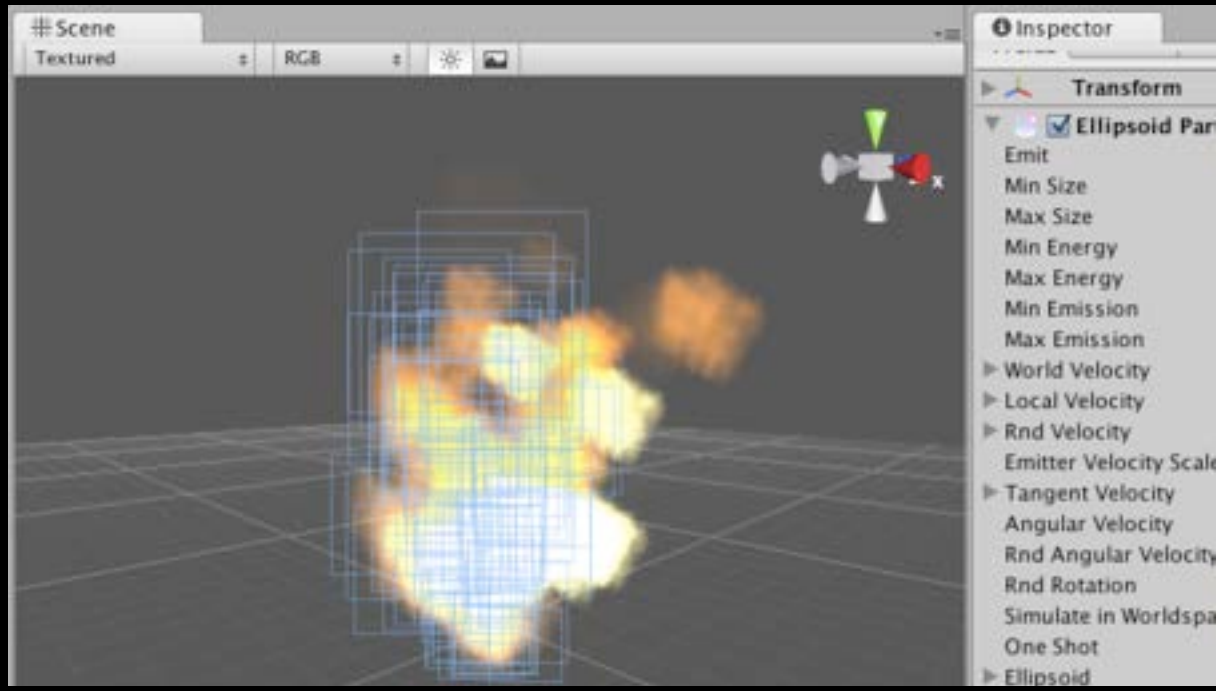
Atmospheric effects

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

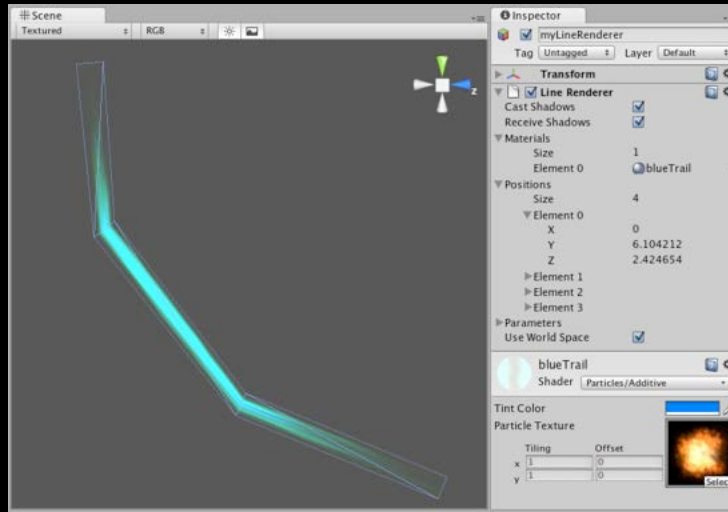
can be used to draw anything from a simple straight line, to a complex spiral

renders billboard lines that have width

and can be textured

uses the same algorithm for line rendering

as the Trail Renderer

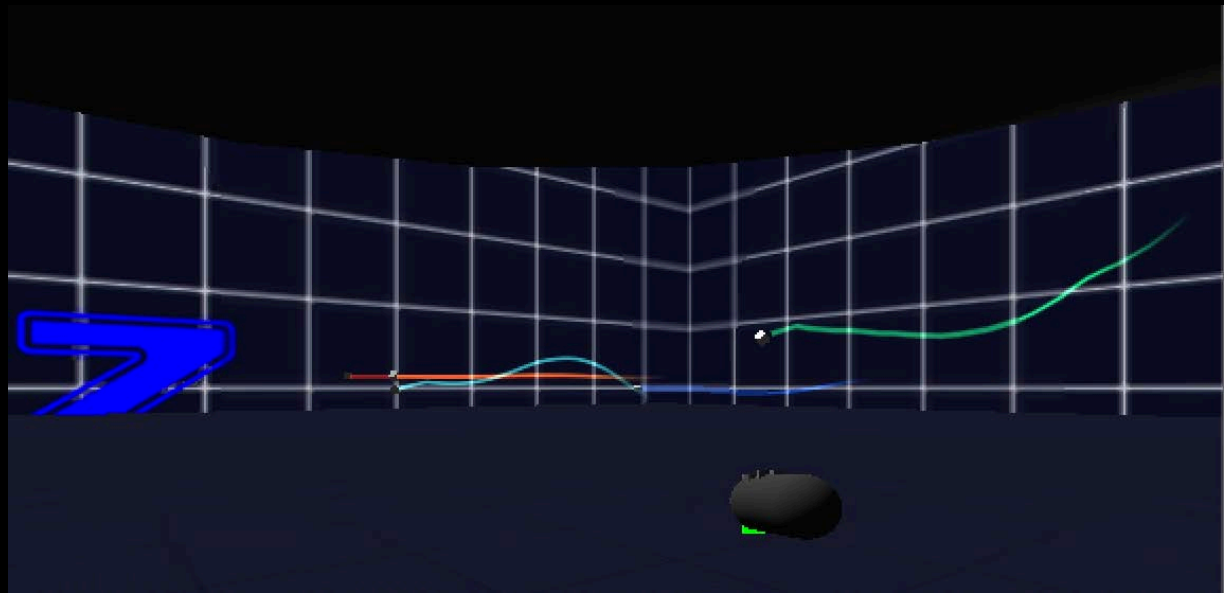


# Unity Components

Particle components

Trail Renderer

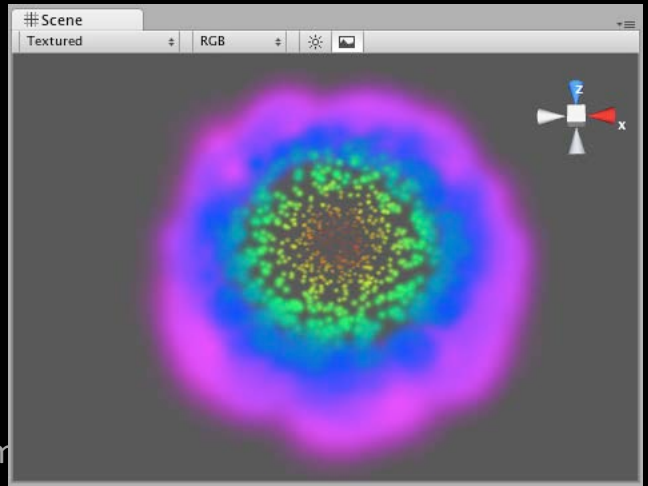
makes trails behind moving objects in the scene



# 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

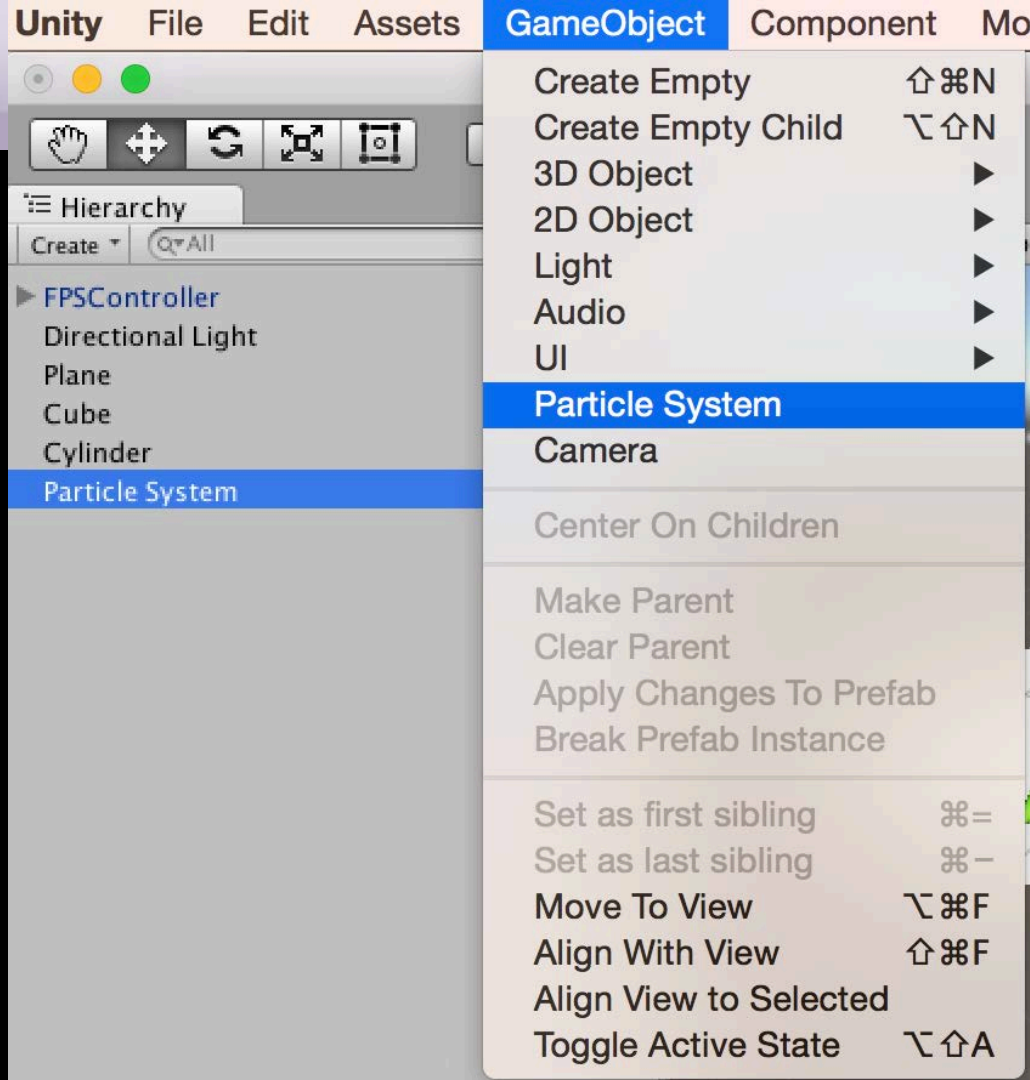
emits particles around a mesh

particles are spawned from the surface of the mesh

# Particle component

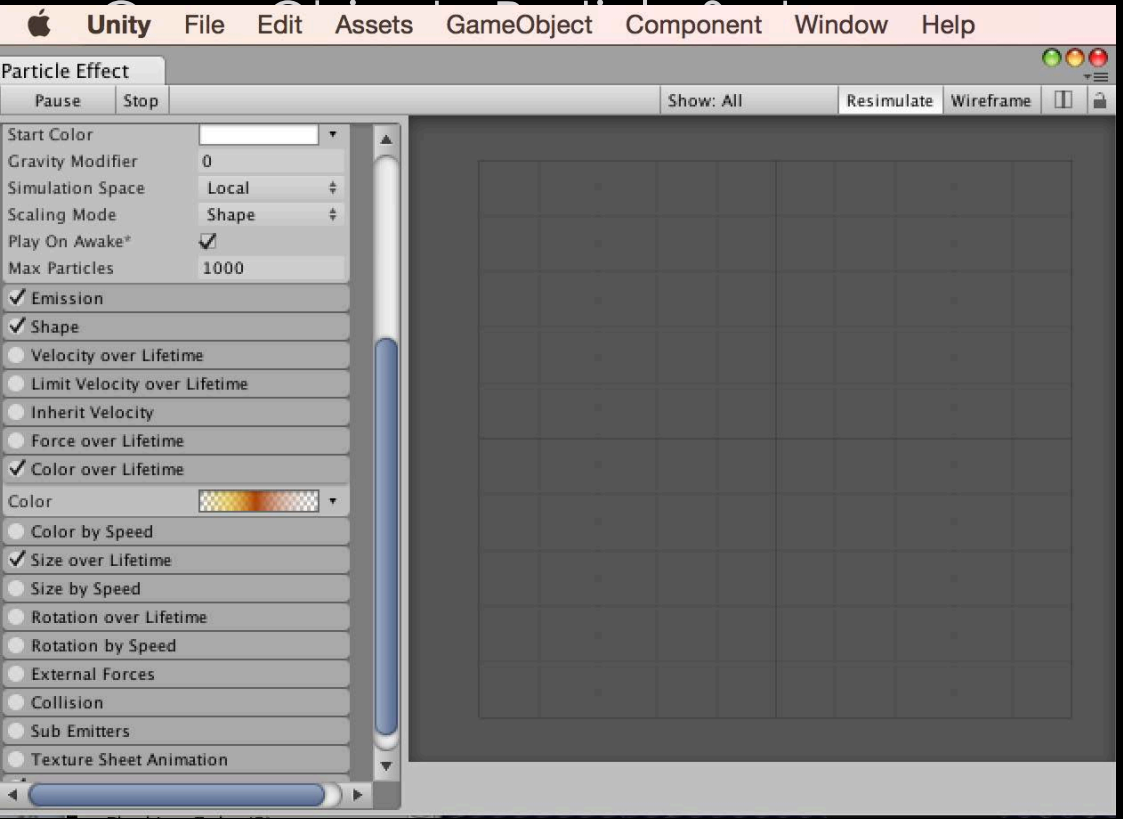
Open your Unity scene
GameObject >Particle System

Rename it “Confetti”



# Particle component

Particle Effect window / Inspector




# Particle Script - confetti

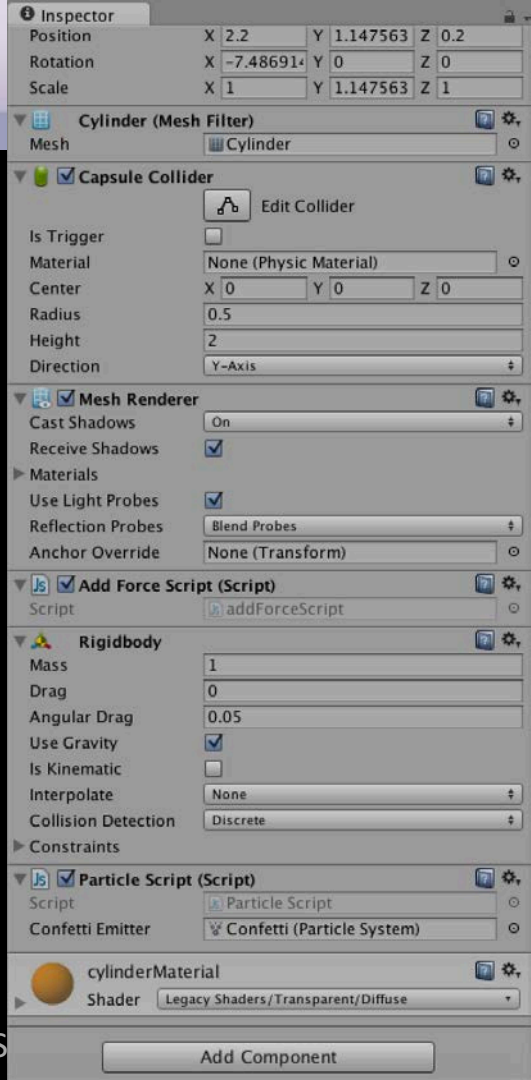
```
public class confetti : MonoBehaviour {

public ParticleSystem confettiEmitter;
   void Start () {
    }

    void Update () {

        if (Input.GetButtonDown("Fire1"))
        {
            confettiEmitter.Emit(30);
        }
    }
}
```

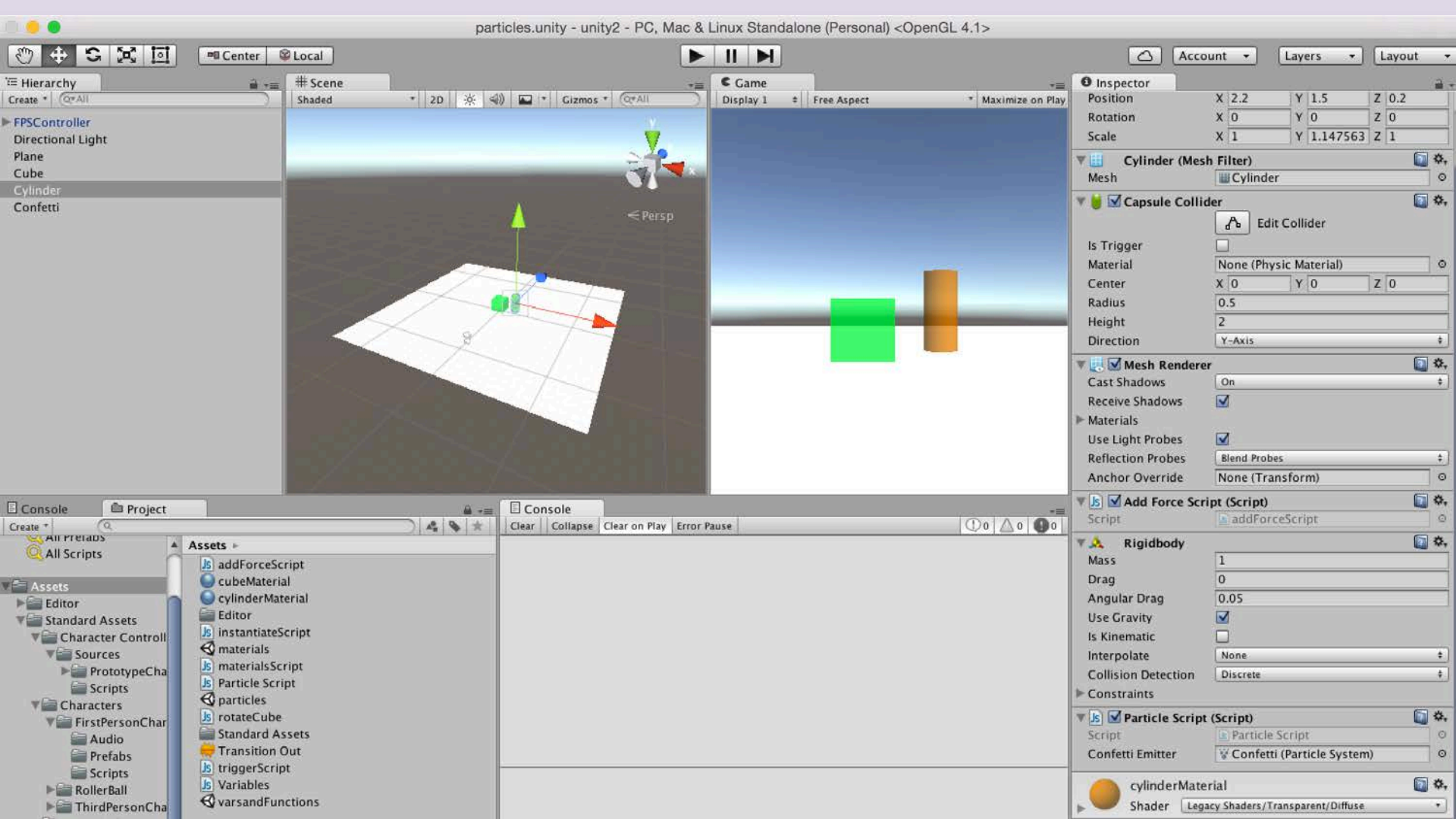
# Particle component

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

Assign Confetti Particles to
Confetti Emitter variable 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




particles.unity - unity2 - PC, Mac & Linux Standalone (Personal) <OpenGL 4.1>
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Layers
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Hierarchy
Create
FPSController
Directional Light
Plane
Cube
Cylinder
Confetti
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Maximize on Play
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Cylinder (Mesh Filter)
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Cylinder
Capsule Collider
Edit Collider
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Y-Axis
Mesh Renderer
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Receive Shadows
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Use Light Probes
Reflection Probes
Blend Probes
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Add Force Script (Script)
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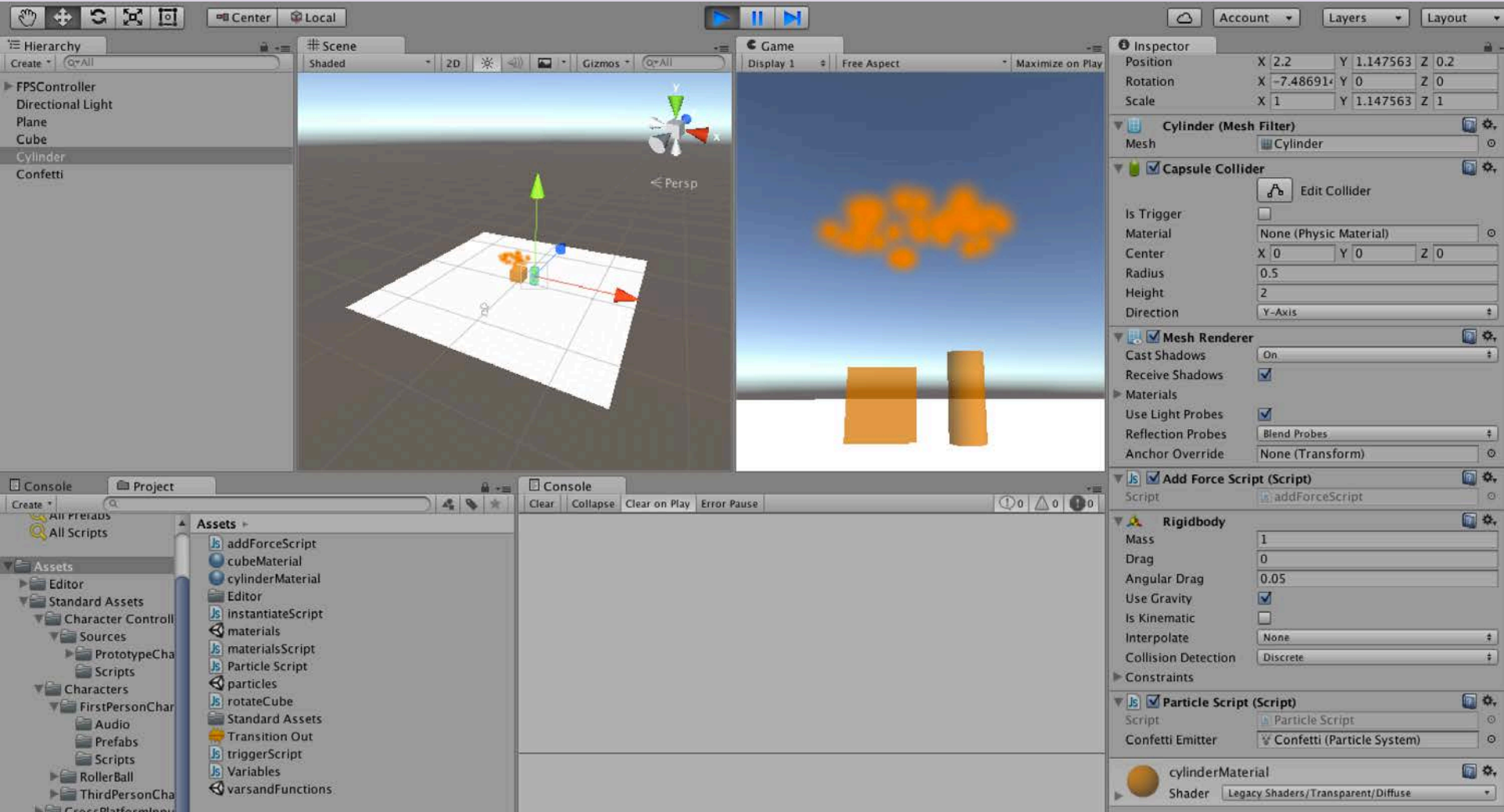
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# Particle component

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

# Particle Script - confetti

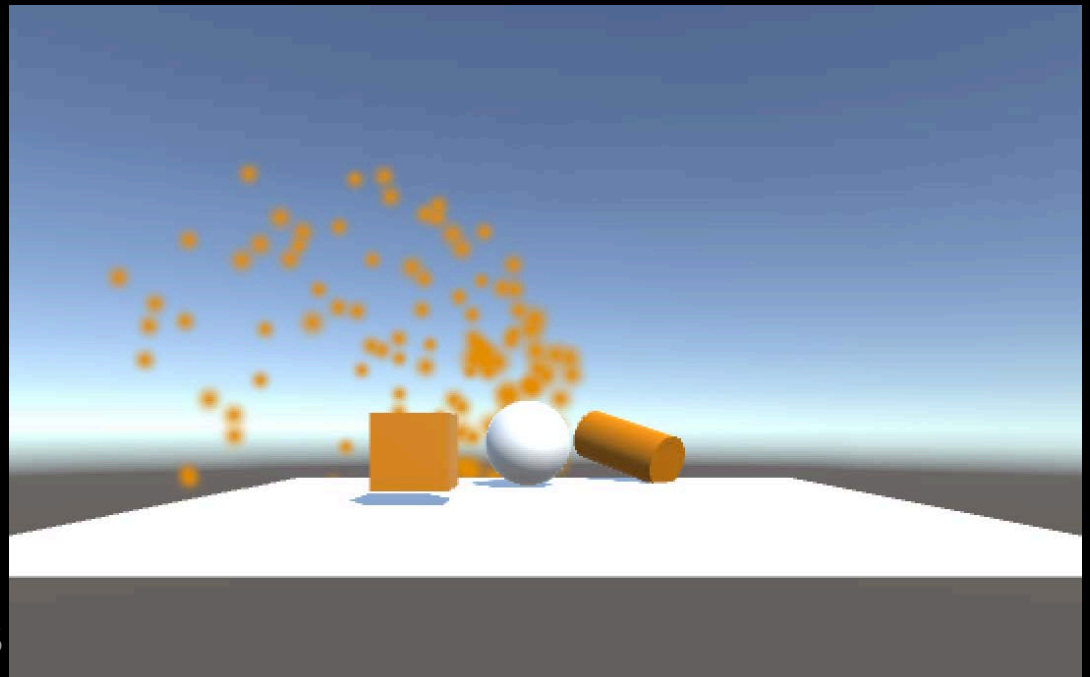
Add another if statement to add force to push cylinder forward:

```
public ParticleSystem confettiEmitter;

    void Update () {

        if (Input.GetButtonDown("Fire1"))
        {
            confettiEmitter.Emit(30);
        }
        if (Input.GetKeyDown(KeyCode.Tab))
        {
            GetComponent<Rigidbody>().AddForce(transform.forward * 200f);
        }
    }
}
```

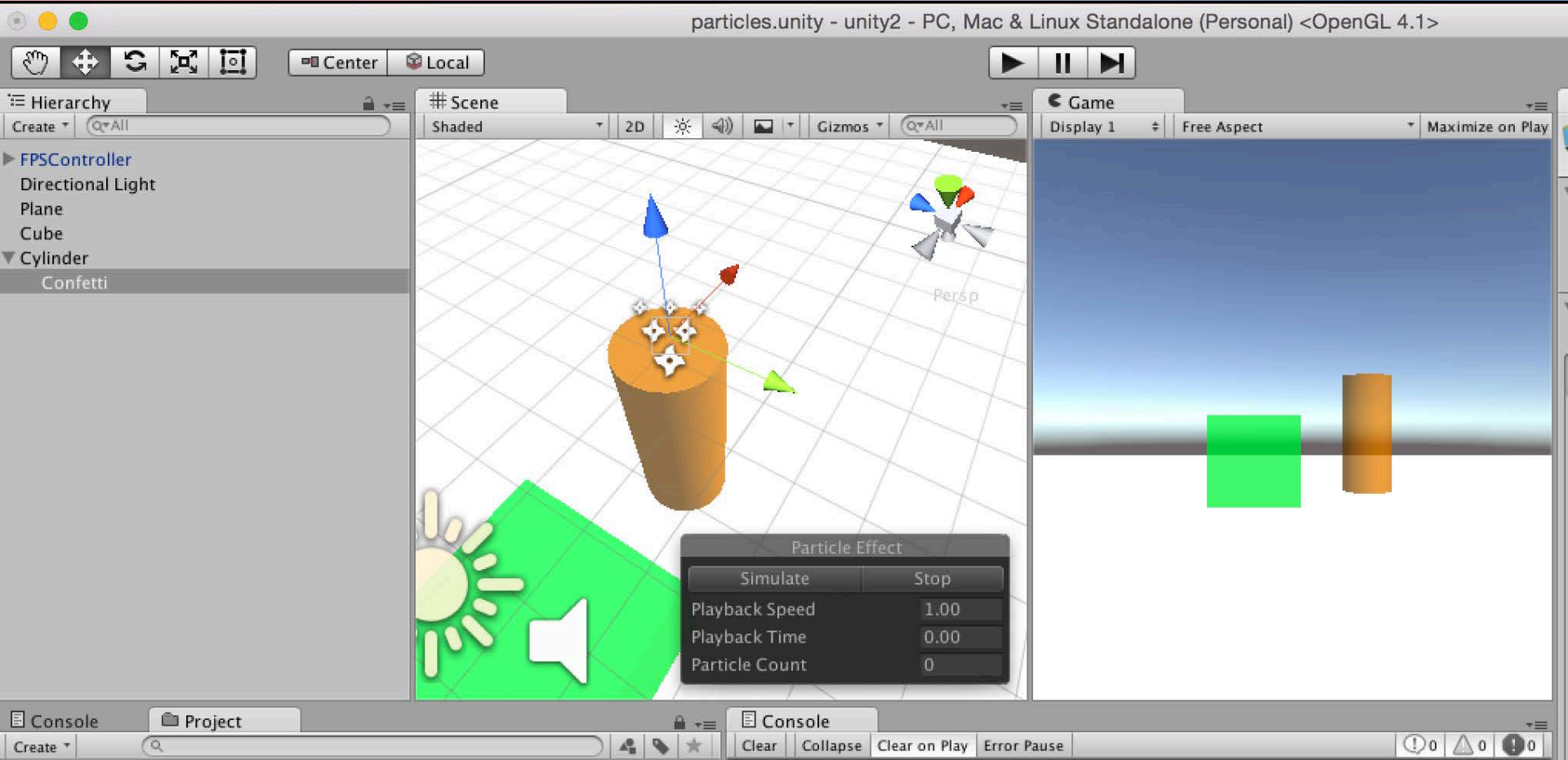
# Parenting

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

Test the game



# Parenting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# Unity Documentation - KeyCode

unity | DOCUMENTATION  Manual  Scripting API  Search scripting...  unity3d.com

Version: **2018.2** (switch to 2018.3b or 2017.4)  C#

- ImagePosition
- IMECompositionMode
- JointDriveMode
- JointLimitState2D
- JointProjectionMode
- **KeyCode**
- LegDof
- LightmapBakeType
- LightmapsMode
- LightmapsModeLegacy
- LightRenderMode
- LightShadowCasterMode
- LightShadows
- LightType
- LineAlignment
- LineTextureMode
- LocationServiceStatus
- LODFadeMode
- LogType

## Properties

| | |
|---|---|
| None | Not assigned (never returned as the result of a keystroke). |
| Backspace | The backspace key. |
| Delete | The forward delete key. |
| Tab | The tab key. |
| Clear | The Clear key. |
| Return | Return key. |
| Pause | Pause on PC machines. |
| Escape | Escape key. |
| Space | Space key. |
| Keypad0 | Numeric keypad 0. |
| Keypad1 | Numeric keypad 1. |
| Keypad2 | Numeric keypad 2. |
| Keypad3 | Numeric keypad 3. |

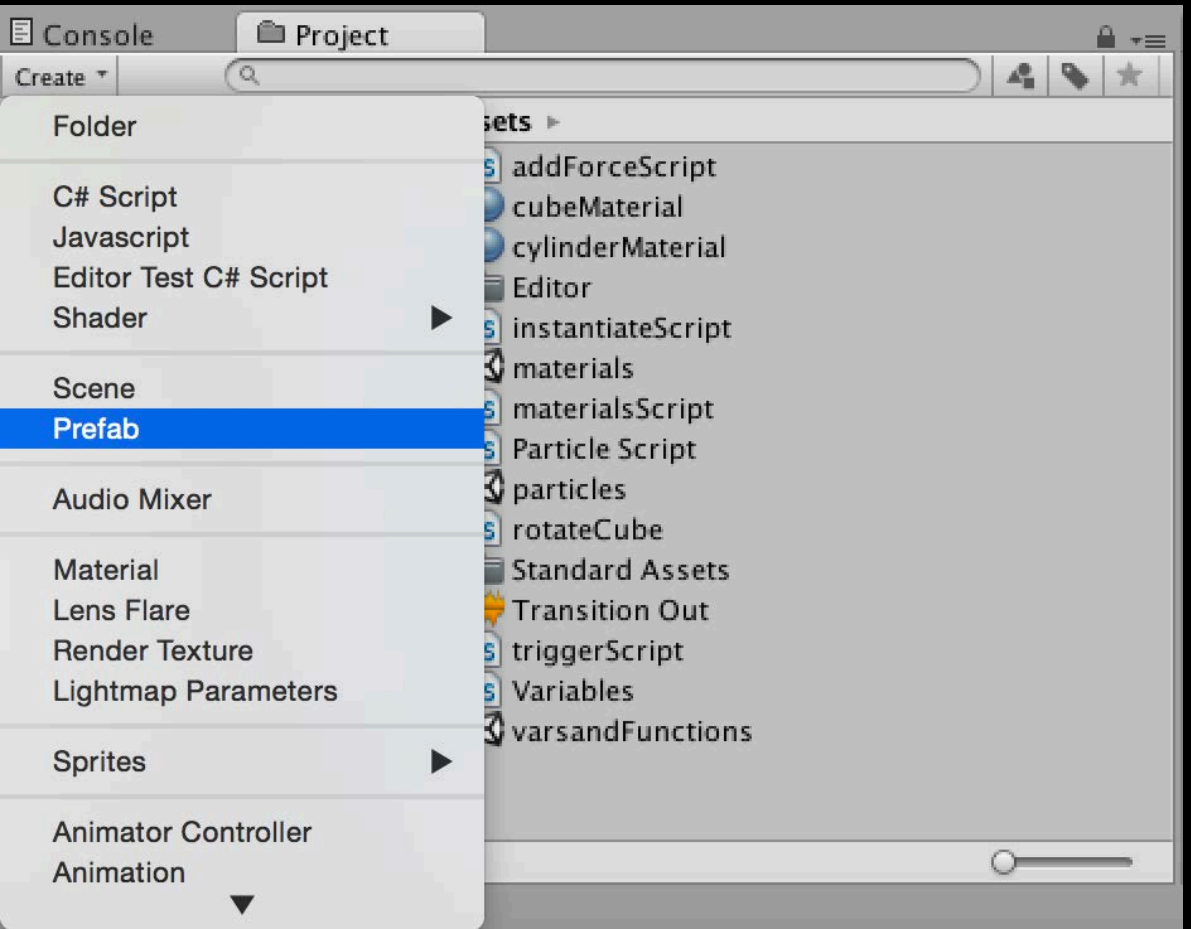
# Prefabs

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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Lightmap Parameters
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Animator Controller
Animation
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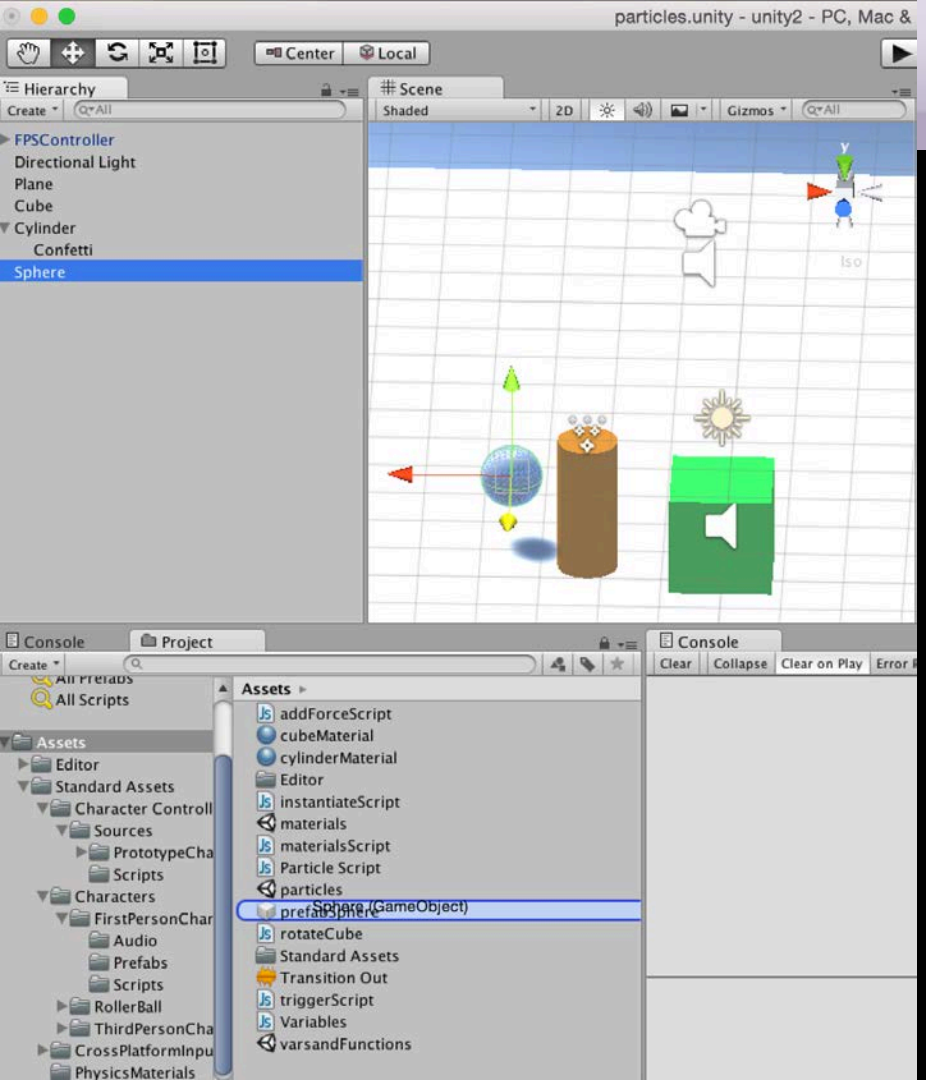
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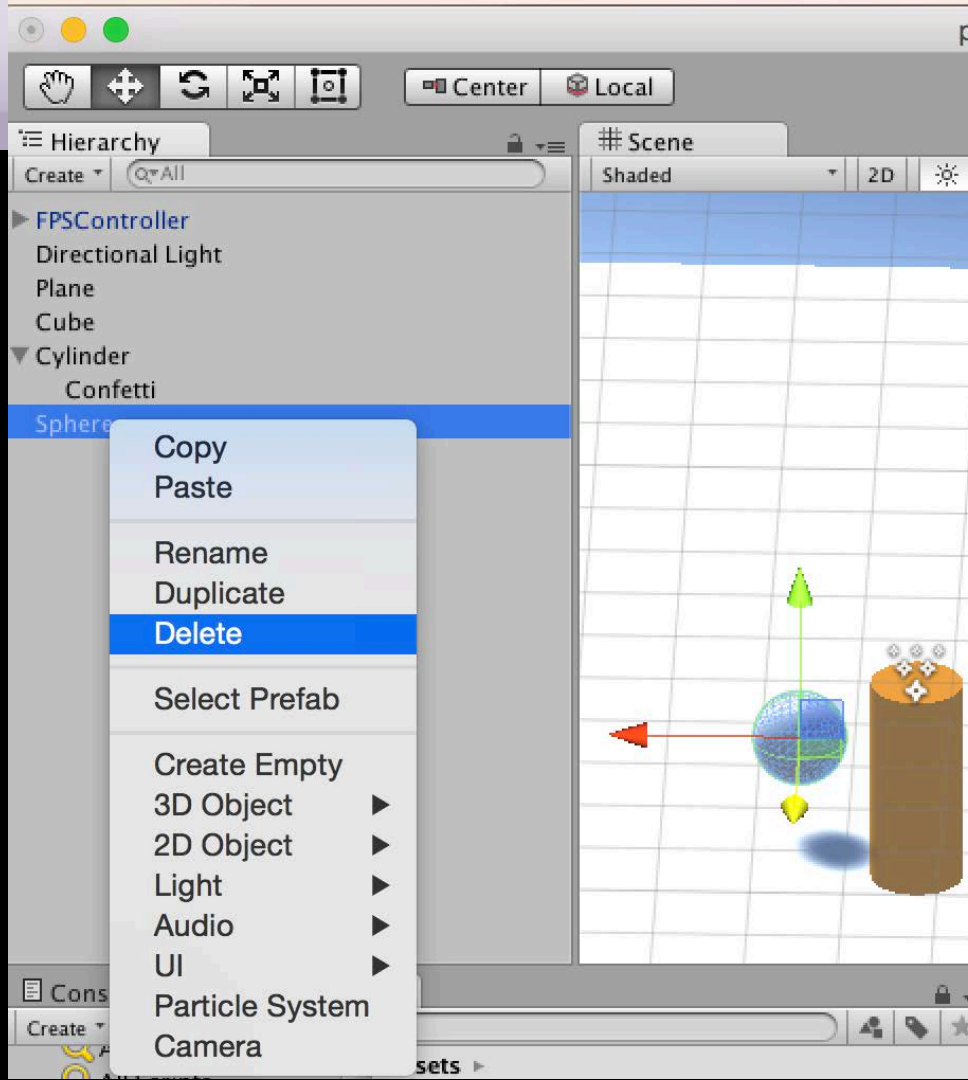
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Copy
Paste
Rename
Duplicate
Delete
Select Prefab
Create Empty
3D Object
2D Object
Light
Audio
UI
Particle System
Camera

# 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

# 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 to locate new prefab whenever the Fire2 button is pressed.

# Prefabs

Create UnisingInstantiate script and assign it to the cilynder:

```
public class UsingInstantiate : MonoBehaviour
{
    public Rigidbody spherePrefab;
    public Transform placetoStart;
```

# Prefabs

```
    void Update ()
    {
        if(Input.GetButtonDown("Fire2"))
        {
            Rigidbody newInstance;

            newInstance = Instantiate (spherePrefab, placetoStart.position,
            placetoStart.rotation);

            newInstance.AddForce(placetoStart.forward * 50);
        }
    }
}
```

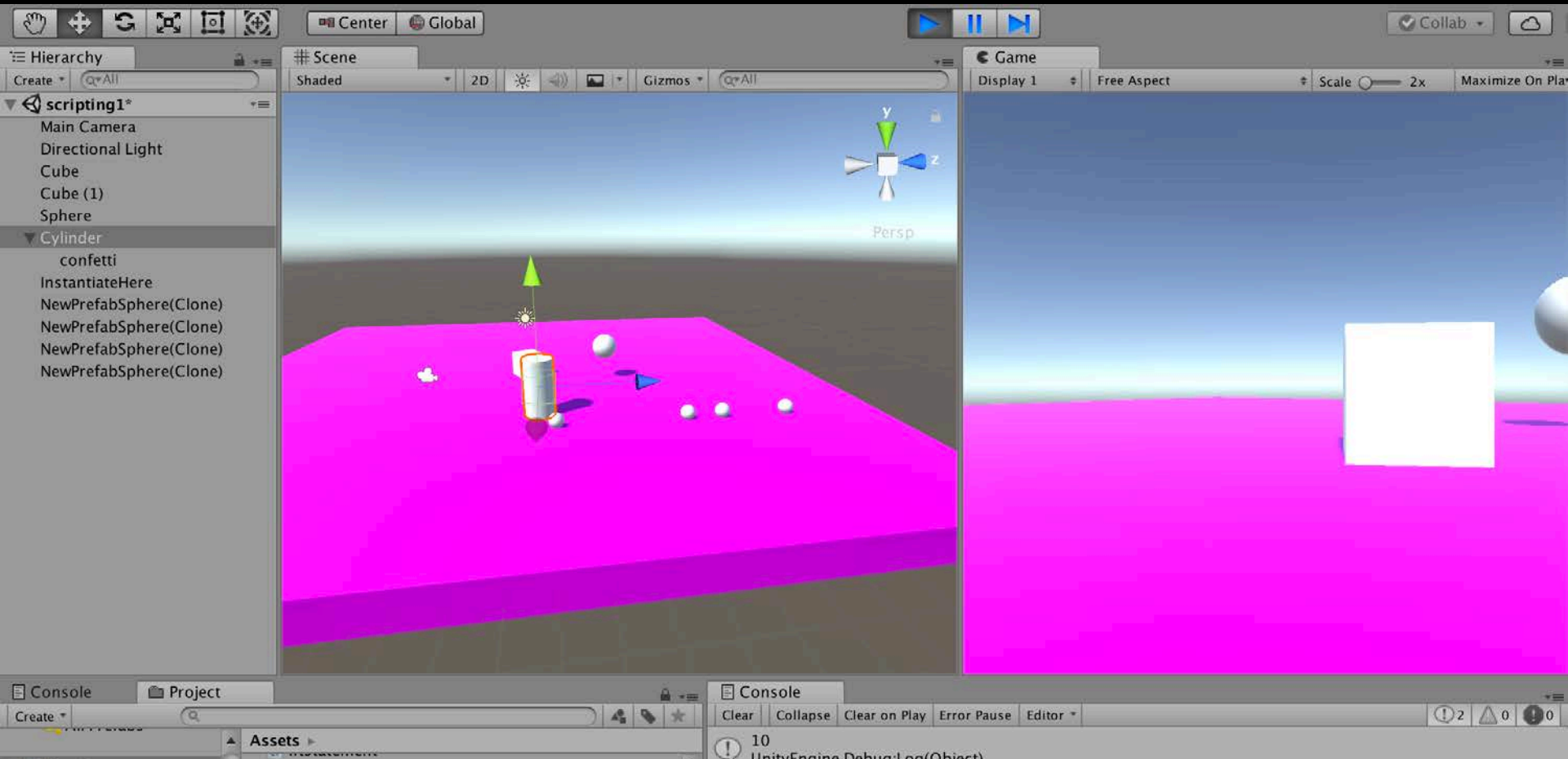
# Prefabs

Create a new GameObject and assign it as a reference to Transform  placetoStart in the inspector

Assign prefabShpere to spherePrefab in the Inspector

Test the game ad press mouse button 2 to instantiate spheres

# Prefabs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InstantiateHere
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NewPrefabSphere(Clone)
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Free Aspect
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10

# Instantiate- Cleaning Instances

To clean generated prefabs from the scene, attach the following script “PrefabDestruction” to the prefabSphere

```
using UnityEngine;
using System.Collections;

public class PrefabDestruction : MonoBehaviour
{
    void Start()
    {
        Destroy (gameObject, 5.5f);
    }
}
```