



Unity

Multimedia Techniques & Applications

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Introduction

- **Game engine**
 - A **software framework** primarily designed for the development of video games, and generally includes **relevant libraries** and **support programs**
- **Top game engines**
 - Unity
 - Unreal Engine (UE)
 - Amazon Lumberyard
 - CryEngine
 - GameMaker: Studio
 - Godot
 - Cocos2d

Unity v.s. Unreal Engine

Blender Classroom Demo



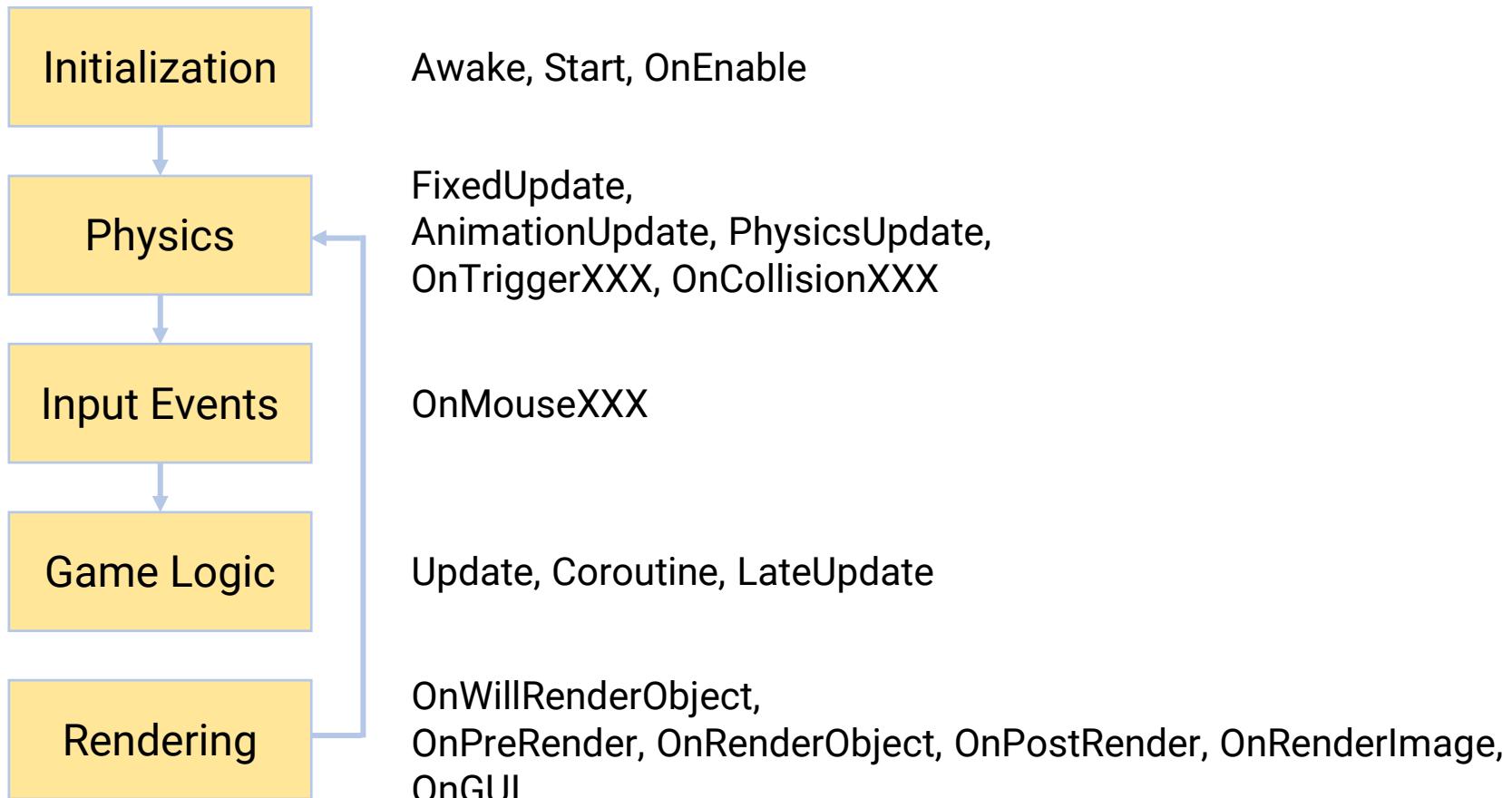
Unity v.s. Unreal Engine (cont.)

	Unreal Engine	Unity
Pros	<ul style="list-style-type: none">• Better rendering quality• Better material editing system• Blueprint for prototype	<ul style="list-style-type: none">• Easier to learn• Easier to deploy to various platform• More online resource
Cons	<ul style="list-style-type: none">• Steeper learning curve• Fewer online assets	<ul style="list-style-type: none">• Lower rendering quality

Unity

Unity Overview

- **Unity event order list (lifecycle flowchart)**

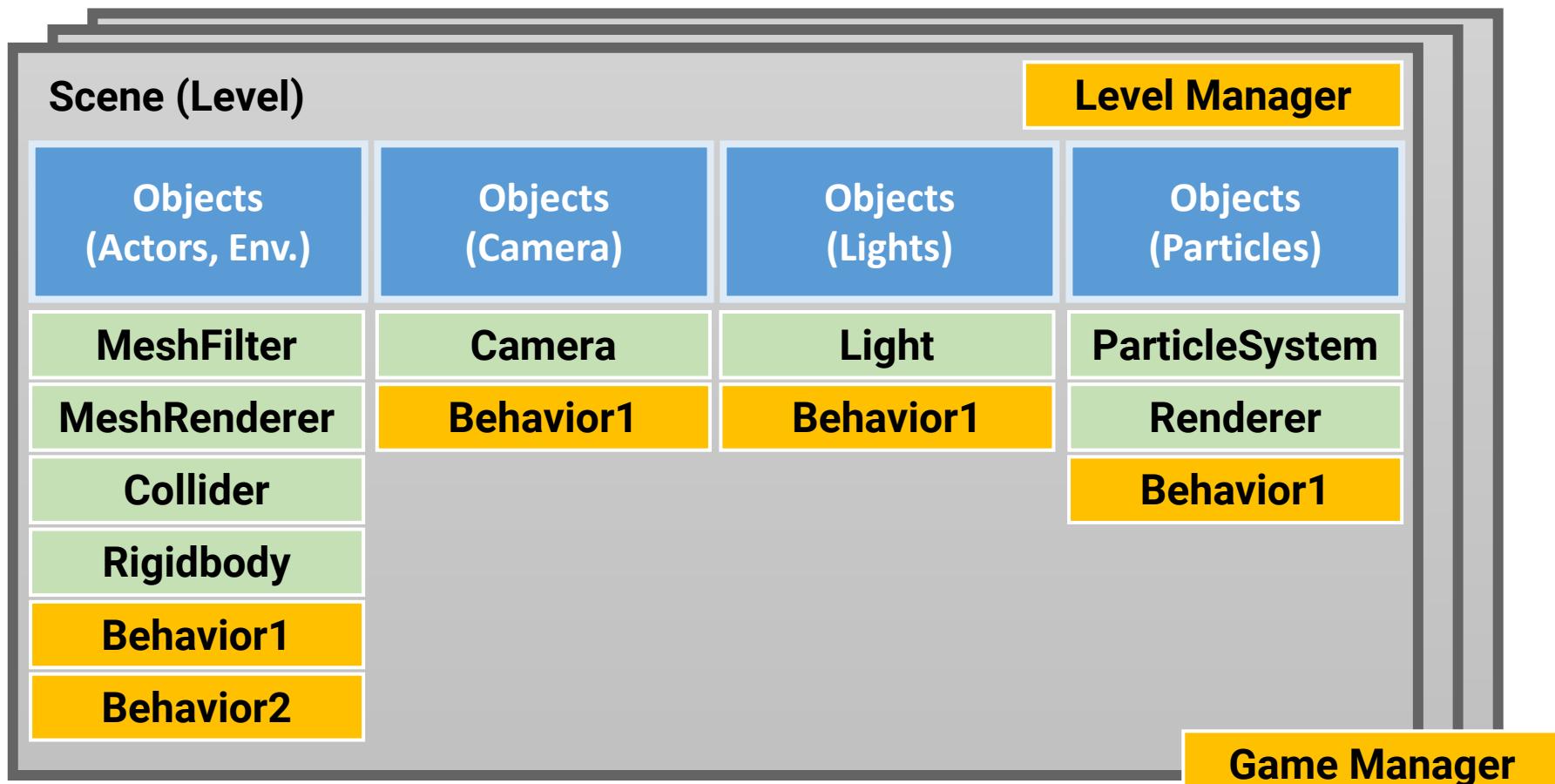


Unity Overview (cont.)

- Component-based (C# scripts)

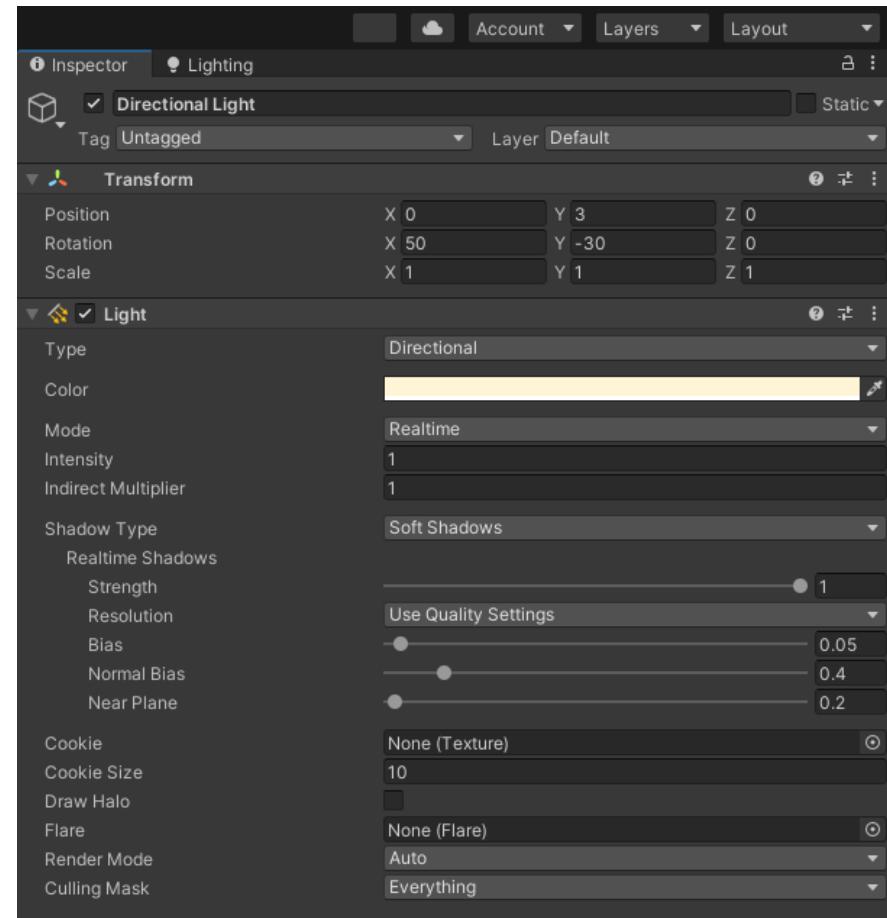
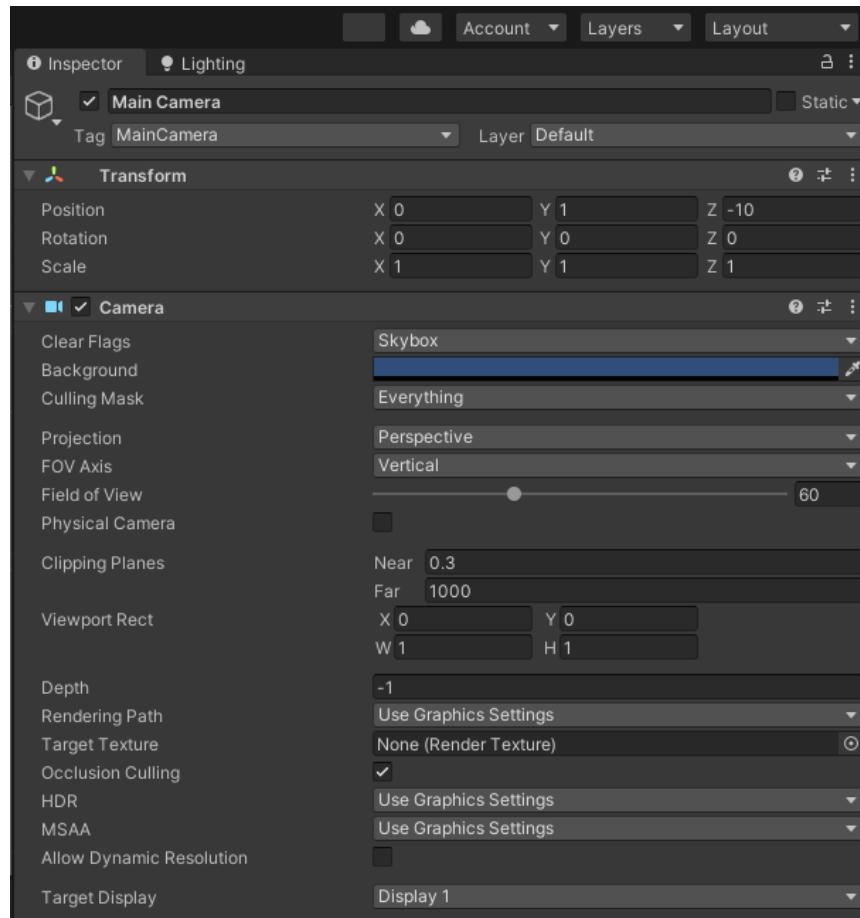
Custom

Built-in



Unity Overview (cont.)

- Component-based (C# scripts)



Download Unity (1)

The screenshot shows the Unity website's main landing page. At the top, there is a navigation bar with links for Unity, Products, Solutions, Learning, Support & Services, Community, Developer tools, and a prominent blue 'Get started' button, which is highlighted with a red rectangular border. Below the navigation bar is a large, atmospheric photograph of a person's hands interacting with a game interface on a screen. The person is holding a gold-colored coin over a screenshot of the Unity Editor showing a game scene titled 'The Heretic - Main Scene - PC'. The text 'Get started on Unity Pro today' is overlaid in large white letters on the left side of the image. Below this, a smaller text block reads: 'Put the power of an entire ecosystem of game creation tools, support, and community in your team's hands to deliver better games faster.' At the bottom left, there is a blue button labeled 'Get Unity Pro'.



Download Unity (2)

The screenshot shows the Unity Store interface on store.unity.com. The top navigation bar includes links for account management and search. Below the navigation is a header with the Unity logo and a search bar.

The main content area features two tabs: "Individual" (selected) and "Teams".

Student
Learn the tools and workflows professionals use on the job
Free
[Sign up](#)

Personal
Start creating with the free version of Unity
Free
[Get started](#) Learn more

Unity Learn
Master Unity with expert-led live sessions and on-demand learning
[Start learning](#)

Eligibility:
Students 16 years and older who are enrolled in an accredited educational institution and can provide consent to the collection and processing of their personal information.

Requirements:

- ✓ Latest version of the core Unity development platform
- ✓ Five seats of Unity Teams Advanced
- ✓ Real-time cloud diagnostics

[Compare plans](#)

Download Unity (3)

The screenshot shows the Unity download page with a large banner at the top. Below the banner, there are two main download buttons: "Download for Windows" (blue background) and "Download other versions" (white background). Underneath these buttons, there are four navigation links: "How to get started", "System requirements", "New users", and "Resources".

Create with Unity in three steps

- 1. Download the Unity Hub**

Follow the instructions onscreen for guidance through the installation process and setup.

[Download for Windows](#)
[Download for Mac](#)
[Instructions for Linux](#)
- 2. Choose your Unity version**

Install the latest version of Unity, an older release, or a beta featuring the latest in-development features.

[Visit the download archive](#)
- 3. Start your project**

Begin creating from scratch, or pick a template to get your first project up and running quickly. Access tutorial videos designed to support creators, from beginners to experts.

Unity Hub (1)

Unity Hub 3.1.2

The screenshot shows the Unity Hub application interface. On the left is a sidebar with icons for Projects, Installs, Learn, Community, and Downloads. The 'Projects' icon is highlighted with a red box. The main area is titled 'Projects' and contains a table with four rows of project information. The columns are labeled NAME, MODIFIED, and EDITOR VERSION. Each row has a star icon, the project name, its last modified time, the editor version it was created with, and two small dropdown arrows. A search bar is at the top right.

★	NAME	MODIFIED	EDITOR VERSION	...
★	UnityTutorial C:\Users\user\UnityTutorial	17 hours ago	2020.3.30f1	▼ ...
★	CourseAssets C:\Users\user\CourseAssets	2 days ago	2020.3.30f1	▼ ...
★	Ambient Occlusion C:\Users\user\Ambient Occlusion	2 months ago	2020.3.30f1	▼ ...
★	My project C:\Users\user\My project	2 months ago	2020.3.30f1	▼ ...

Unity Hub (2)

Unity Hub 3.1.2



2020.3.30f1

LTS

C:\Program Files\Unity\Hub\Editor\2020.3.30f1\Editor\Unity.exe

WebGL

Windows



Unity Hub (3)

Unity Hub 3.1.2



Unity Hub (4)

Unity Hub 3.1.2



Install Unity Editor

Official releases Pre-releases Archive

LONG TERM SUPPORT (LTS)

2021.3.2f1 LTS Recommended version	Install
2020.3.34f1 LTS	Install
2019.4.39f1 LTS	Install

OTHER VERSIONS

[Beta program webpage](#)

Install Editor

Downloads

Unity Hub (5)

Unity Hub 3.1.2



Learn

Featured

Recommended

Downloaded

[Visit Unity Learn](#)

BEGINNER TUTORIAL

INTERMEDIATE TUTORIAL

BEGINNER PROJECT



Creator Kit: FPS

BEGINNER PROJECT



Creator Kit: Beginner Code

BEGINNER PROJECT

Ruby's Adventure: 2D
Beginner

BEGINNER PROJECT



Learn

Community

Downloads

Unity Hub (6)

Unity Hub 3.1.2



Y ▾ Projects Installs Learn Community Downloads

Community

Resources

Unity Blog
Read it all here first. Don't miss the latest features, announcements, creator achievements, tips & tricks and so much more.
blog.unity.com

Answers
Beginners and experts alike contribute, helping each other with Unity. The built-in voting system points you to the best answers fast.
answers.unity.com

Forums
Post questions, find answers, see awesome projects, meet your peers, or even

Create a new project (1)

Unity Hub 3.1.2



Projects

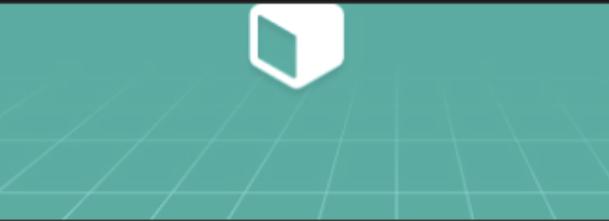
[Open](#)[New project](#) Search...

★	NAME	MODIFIED	EDITOR VERSION	...
★	UnityTutorial C:\Users\user\UnityTutorial	17 hours ago	2020.3.30f1	▼ ...
★	CourseAssets C:\Users\user\CourseAssets	2 days ago	2020.3.30f1	▼ ...
★	Ambient Occlusion C:\Users\user\Ambient Occlusion	2 months ago	2020.3.30f1	▼ ...
★	My project C:\Users\user\My project	2 months ago	2020.3.30f1	▼ ...

[Downloads](#)

Create a new project (2)

Unity Hub 3.1.2



3D

This is an empty 3D project that uses Unity's built-in renderer.

[Read more](#)

PROJECT SETTINGS

Project name

NewProject

Location

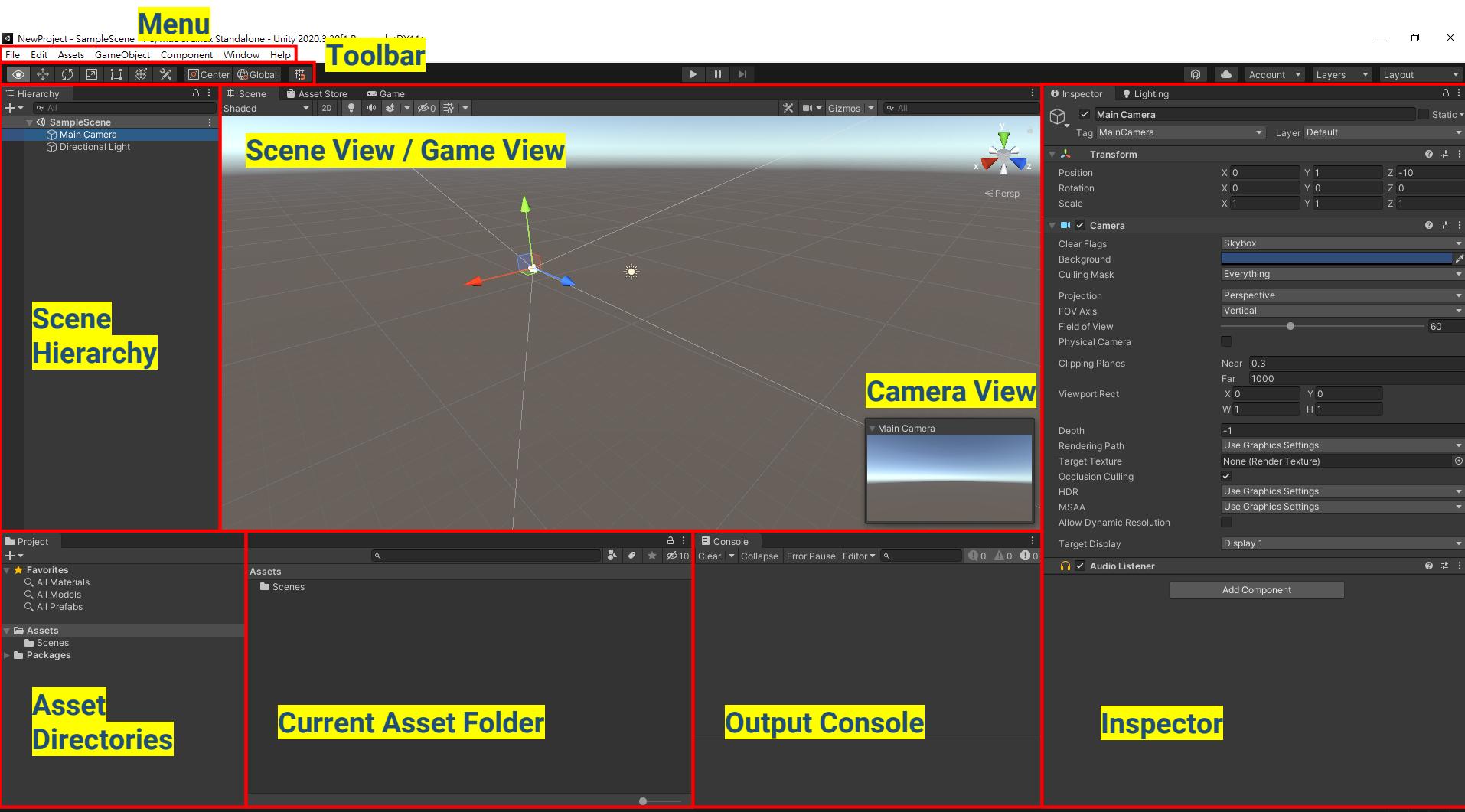
C:\Users\user

Cancel

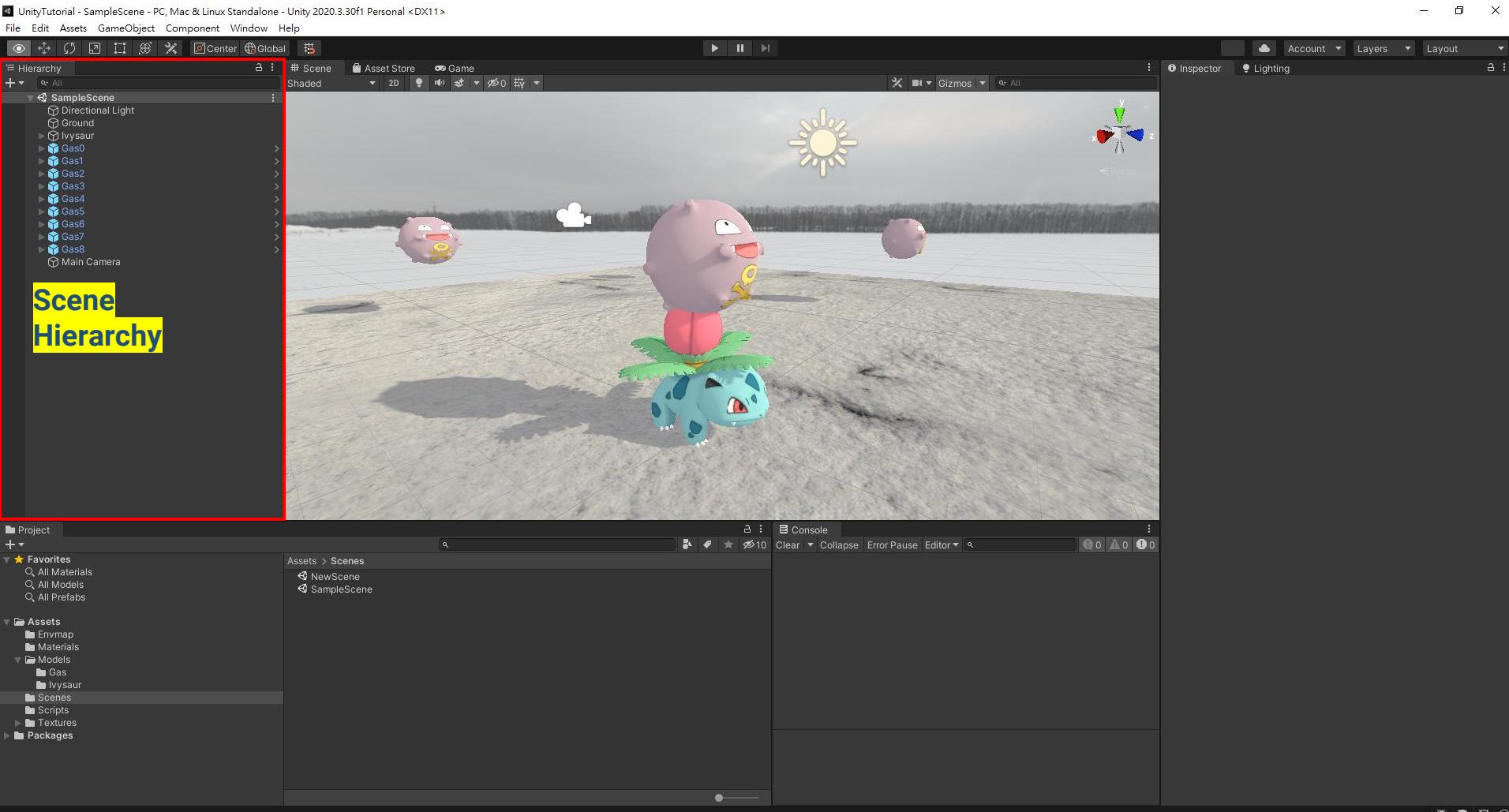
Create project

Unity Editor

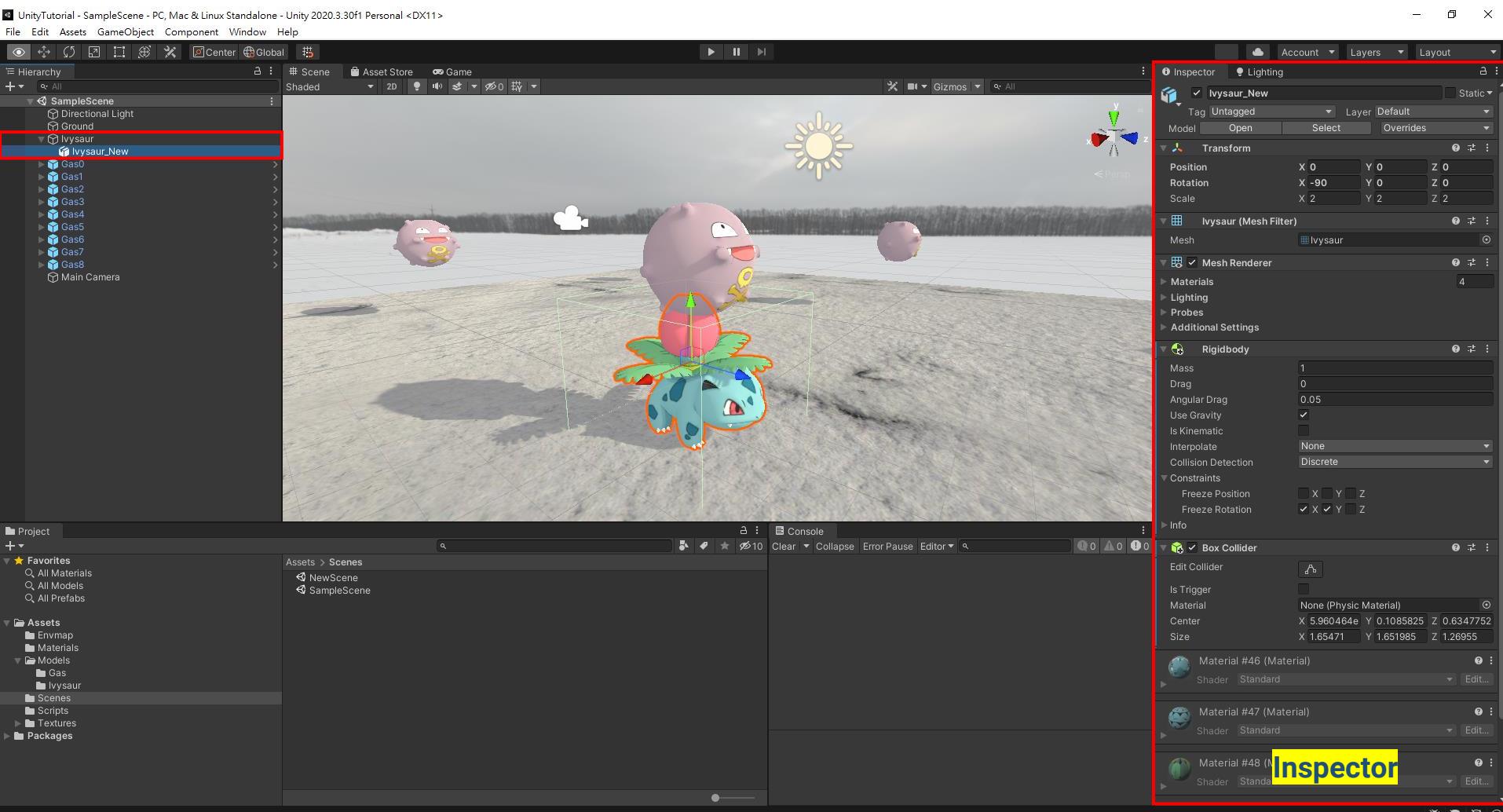
Editor layout



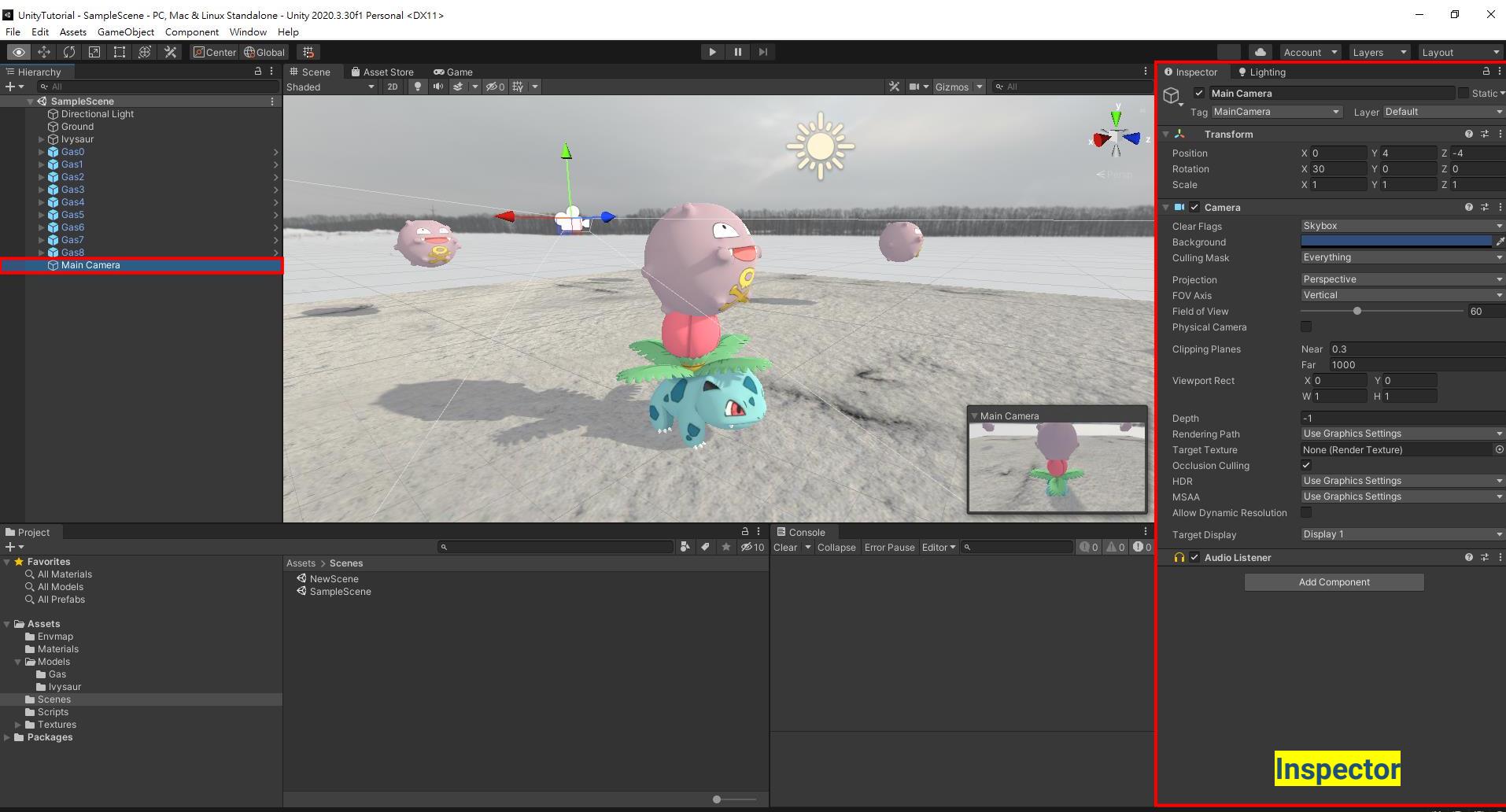
Scene



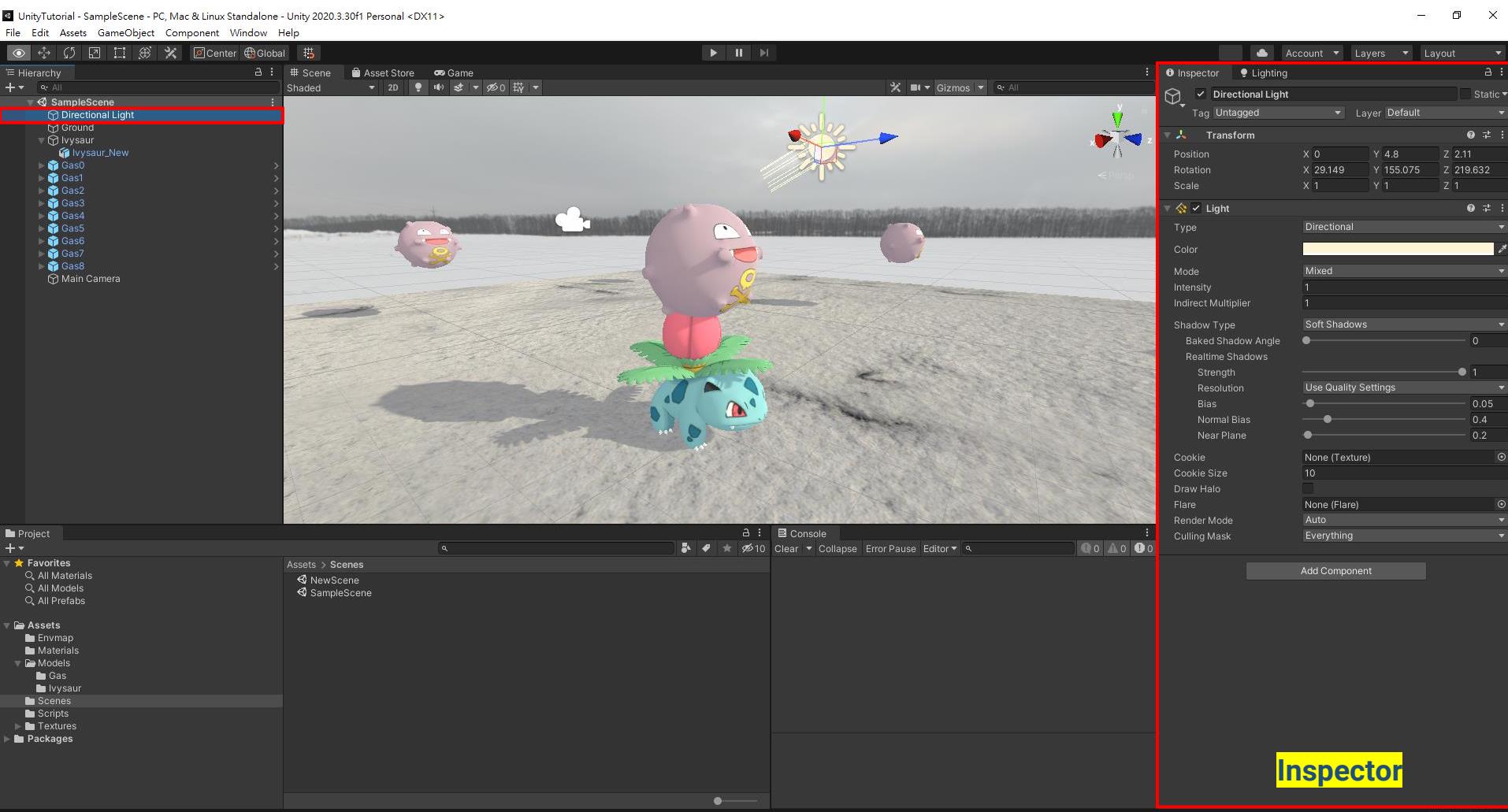
Object



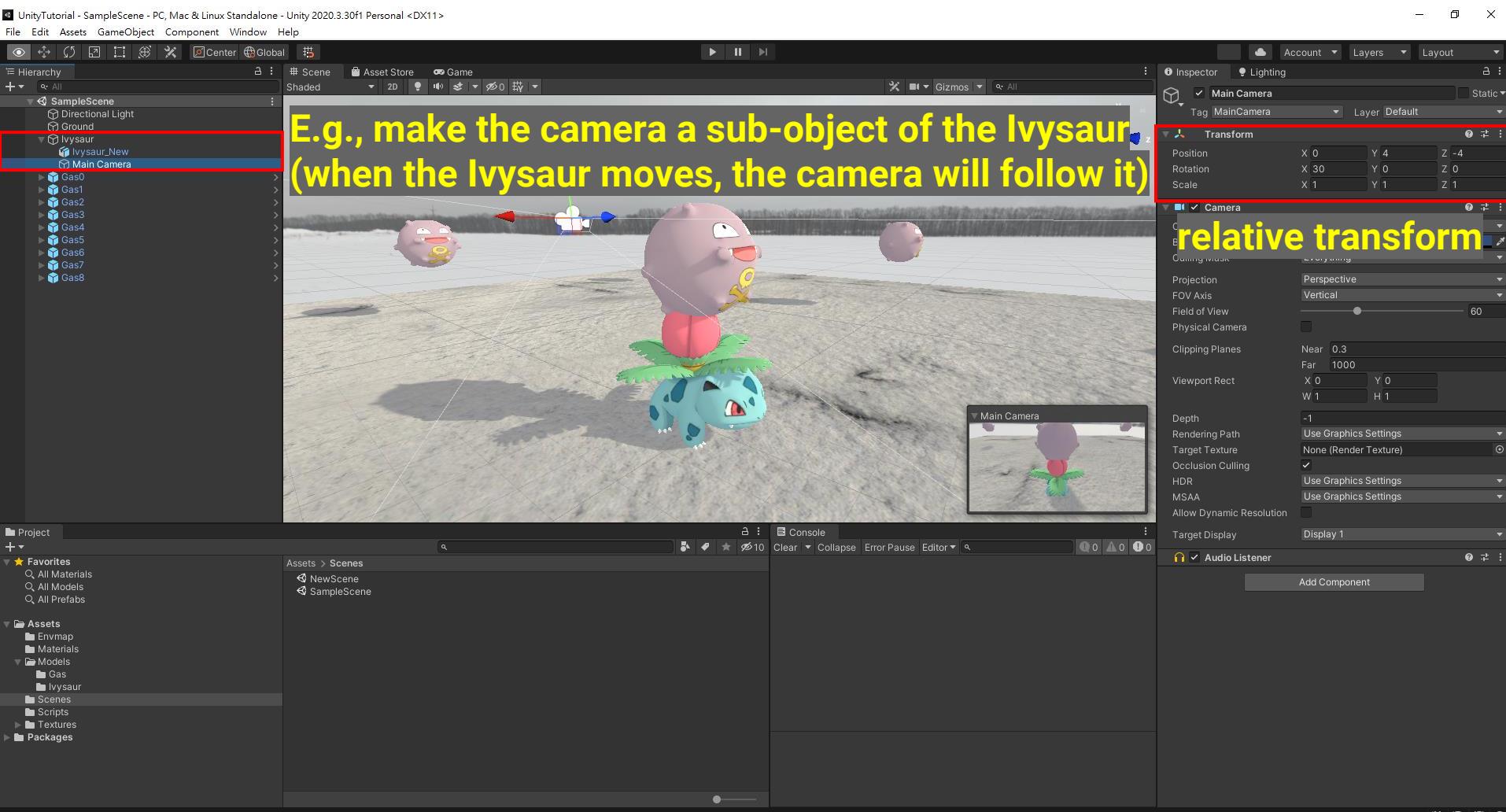
Camera



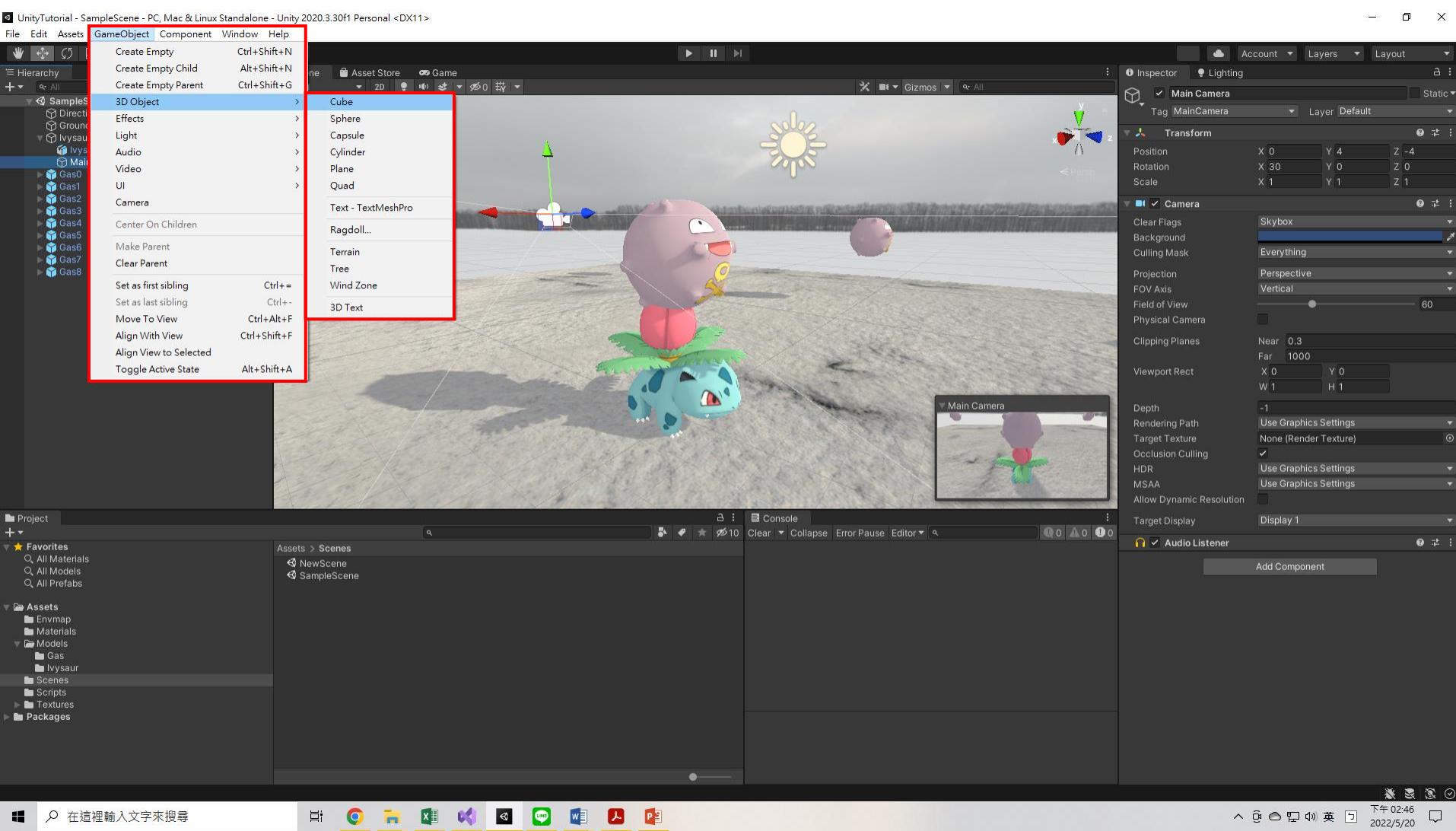
Light



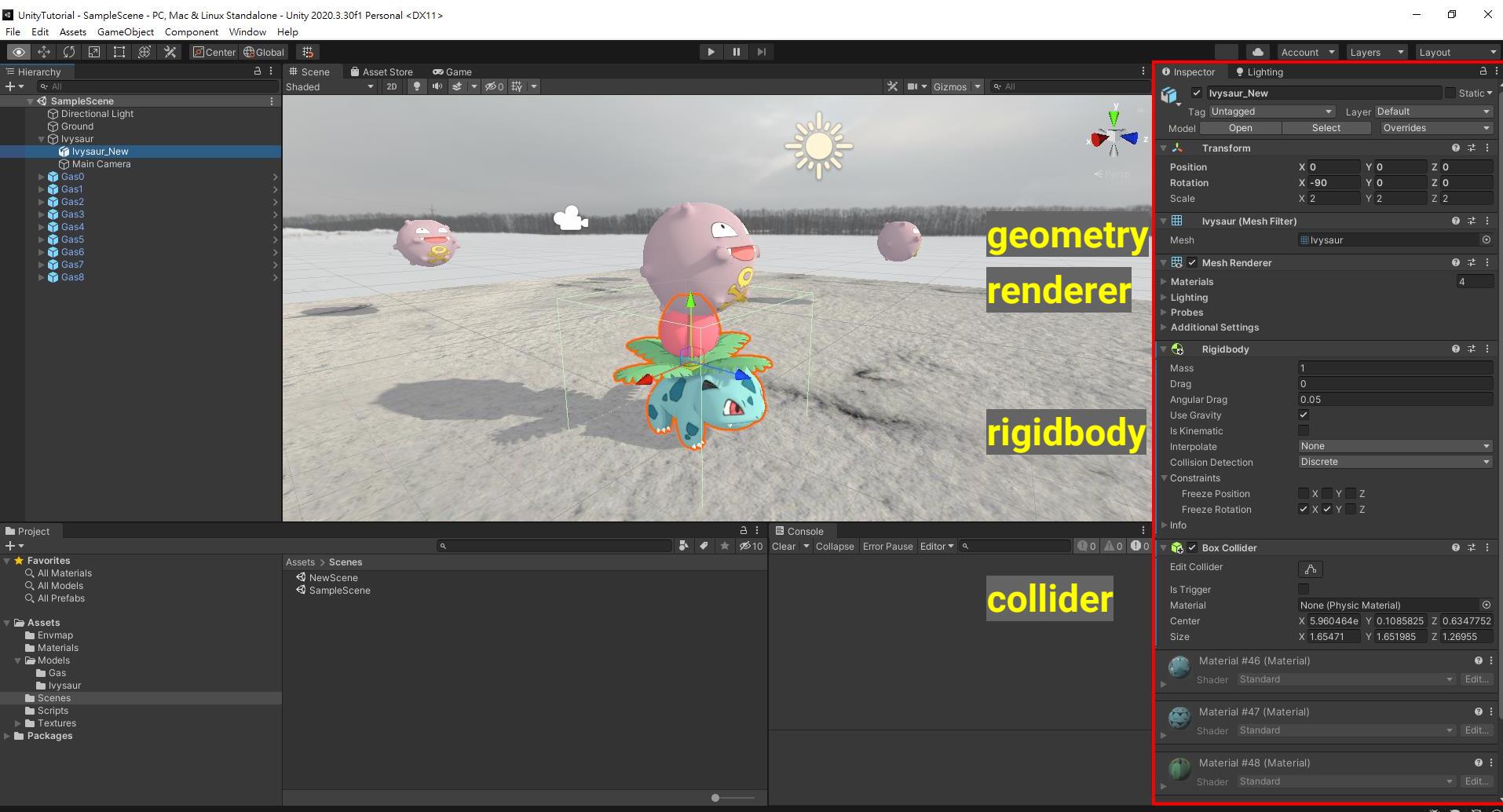
Hierarchy and transform



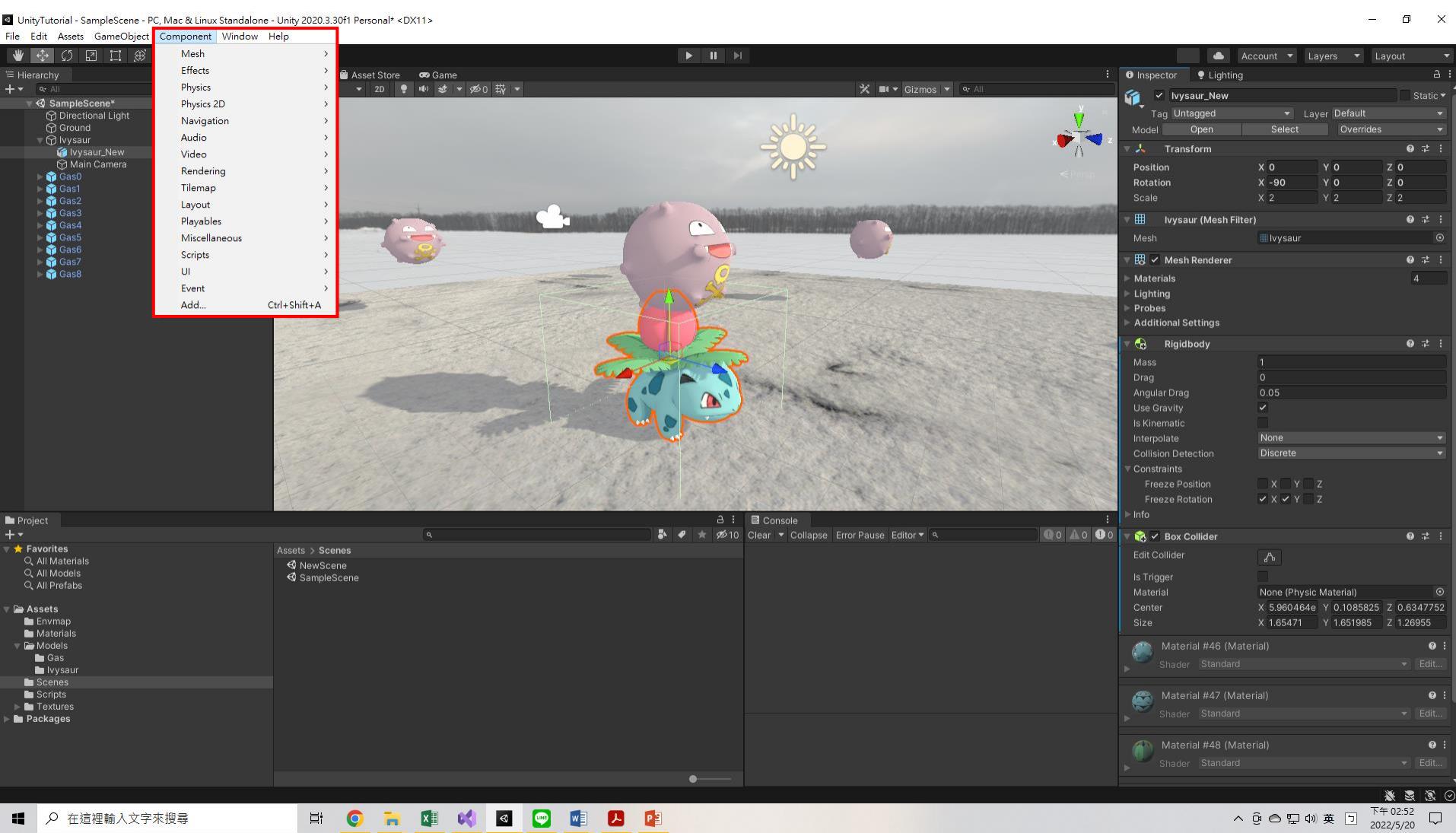
Add new objects



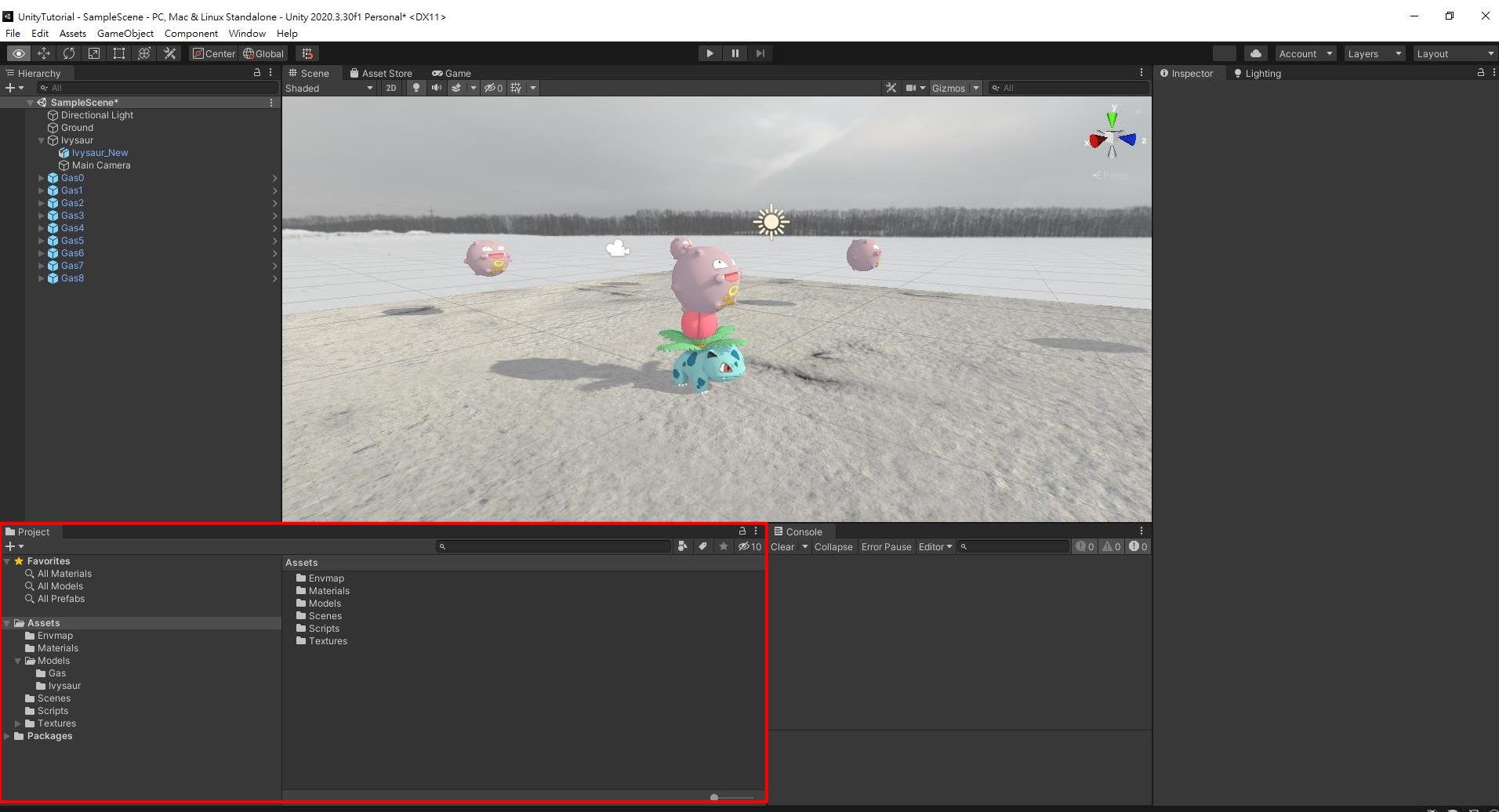
Components



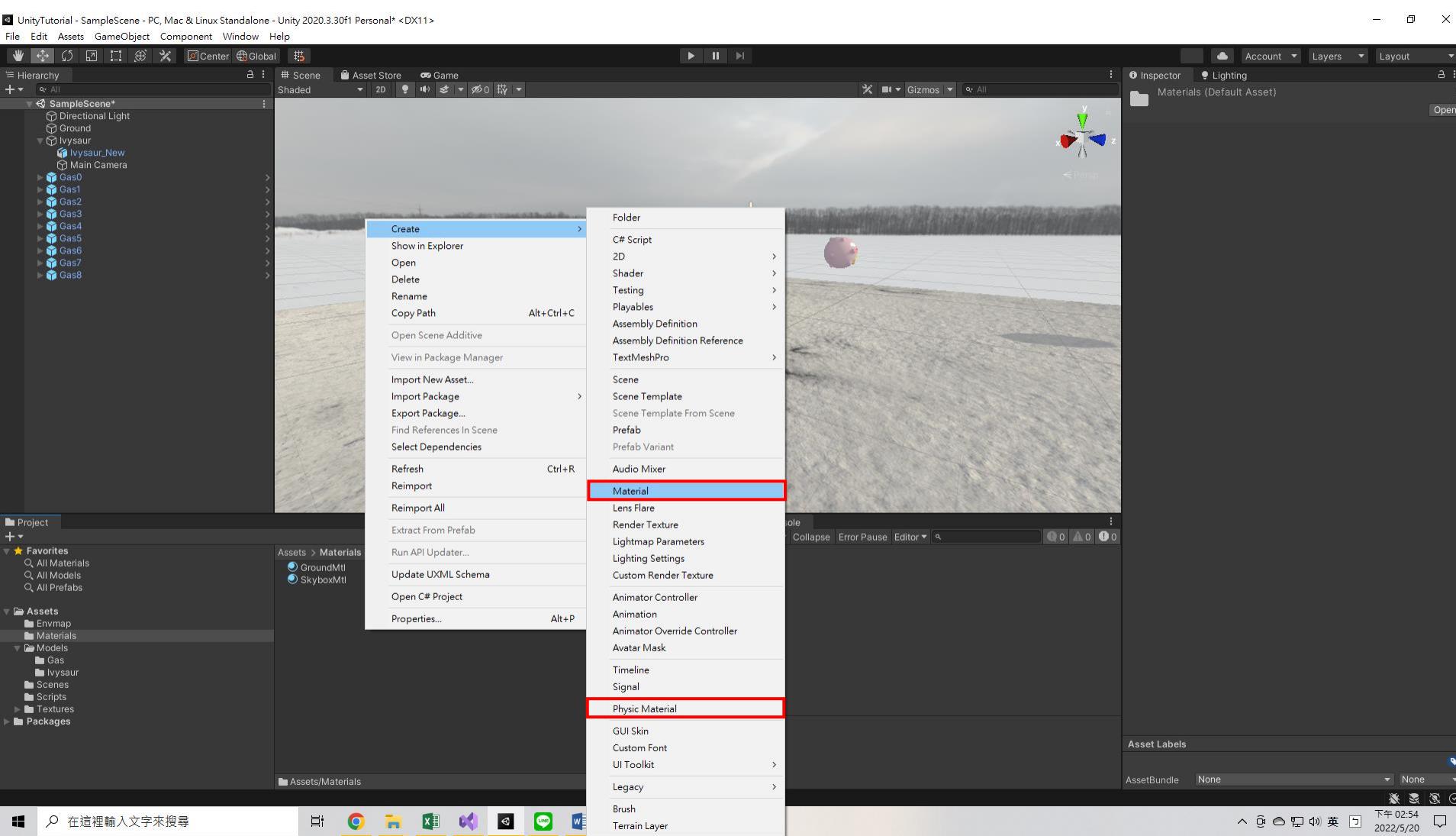
Add new components



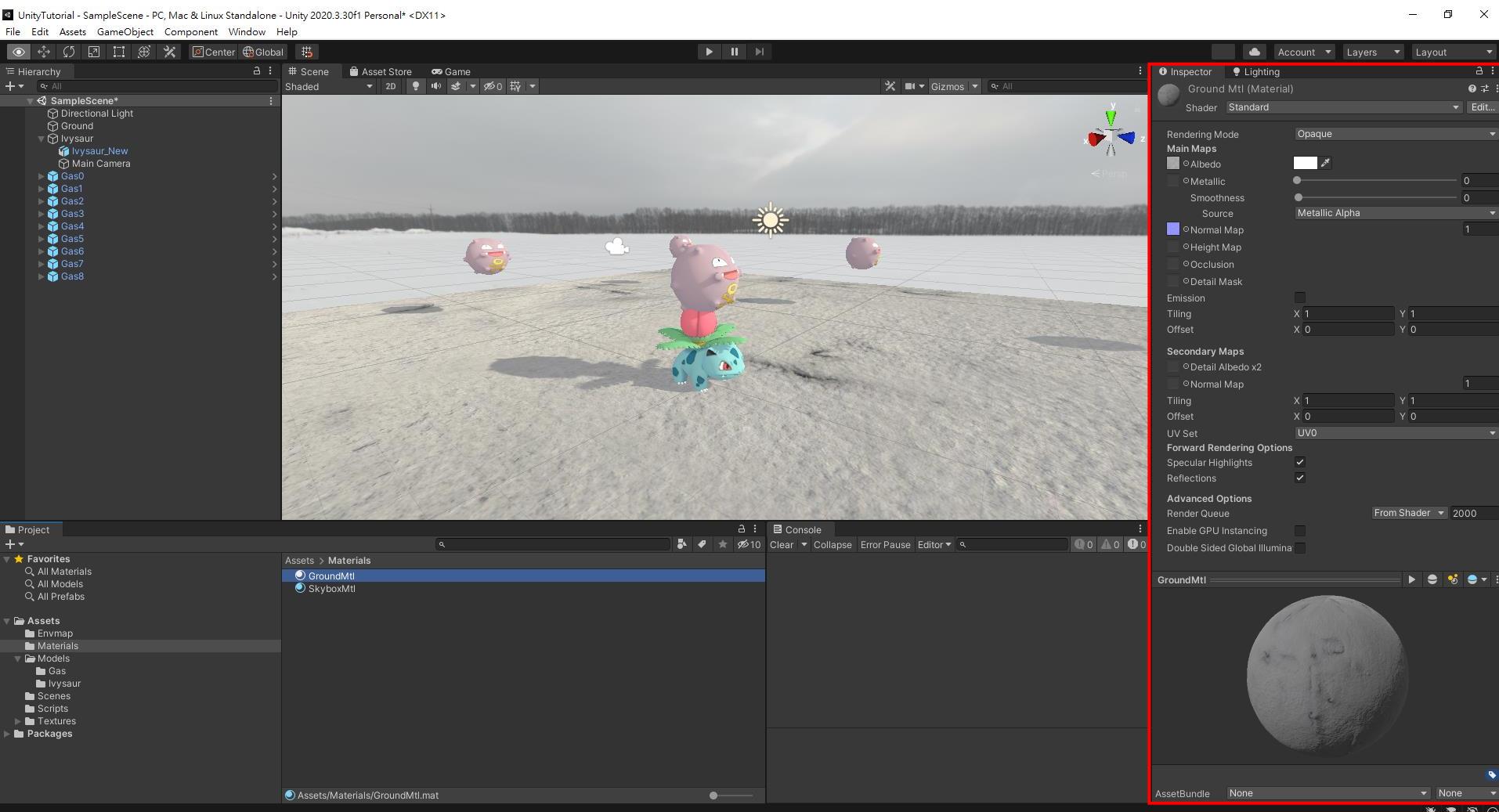
Assets Management



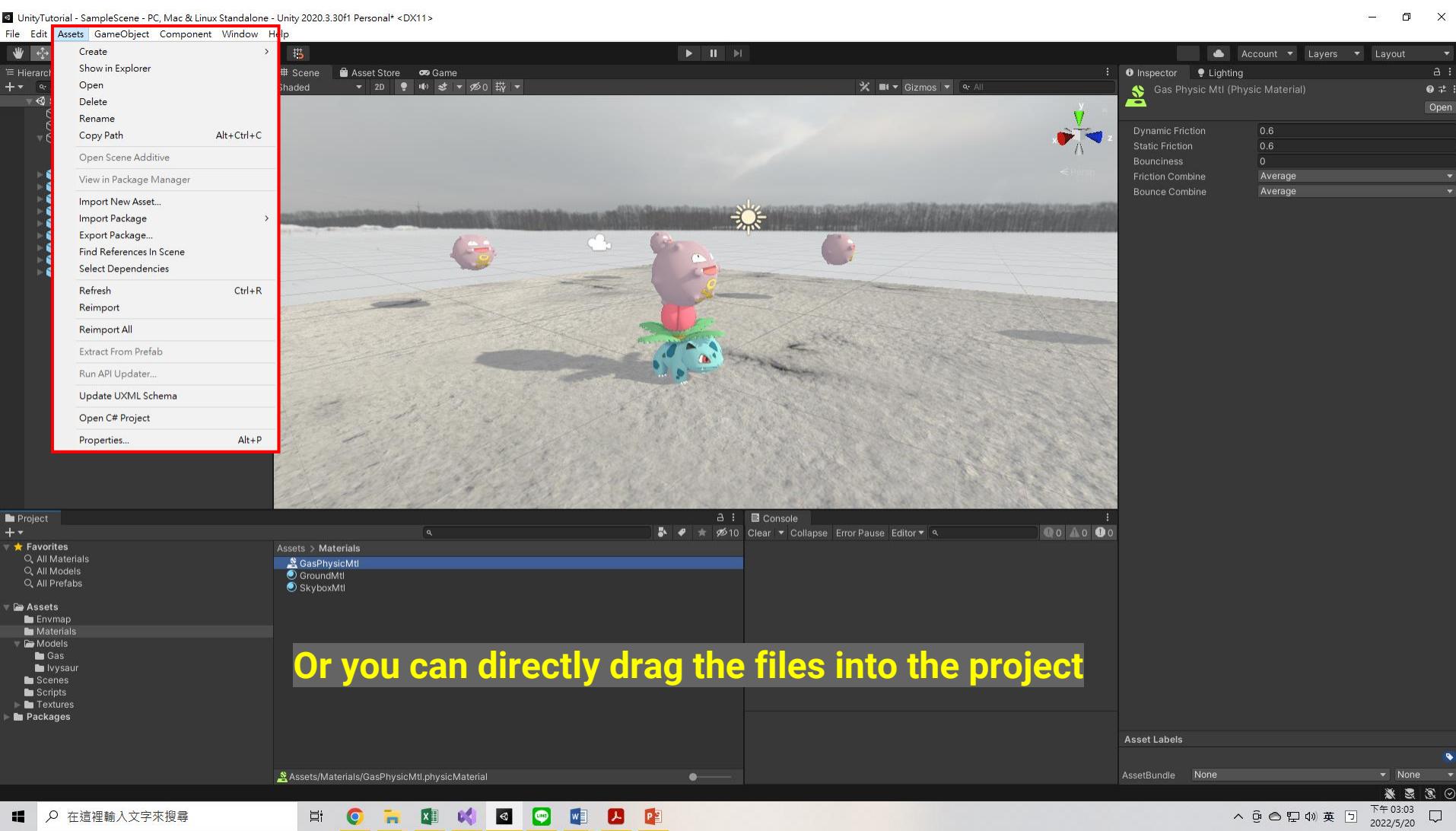
Material (for rendering / physics)



Material (for rendering)



Import new assets



UnityAssetStore

assetstore.unity.com/packages/3d/environments/landscapes/lowpoly-environment-pack-99479#description

應用程式 國立台北大學 Web... 數位學苑 作業系統 (郭大維教... 作業系統 (周志遠教... Rendering Resour... NTPU-教學手冊 感官製造機 : 工程...

Home > 3D > Environments > Landscapes > LowPoly Environment Pack

You purchased this item on May 17, 2022.
Please rate and review this asset. Your honest review and rating will help other users who are deciding whether they should get this asset.

[Write a Review](#)

kOrveen 3 Assets ★★★★★ (Average)

LowPoly Environment Pack
★★★★★ (104) | ❤ (8564)

FREE

🕒 900 views in the past week

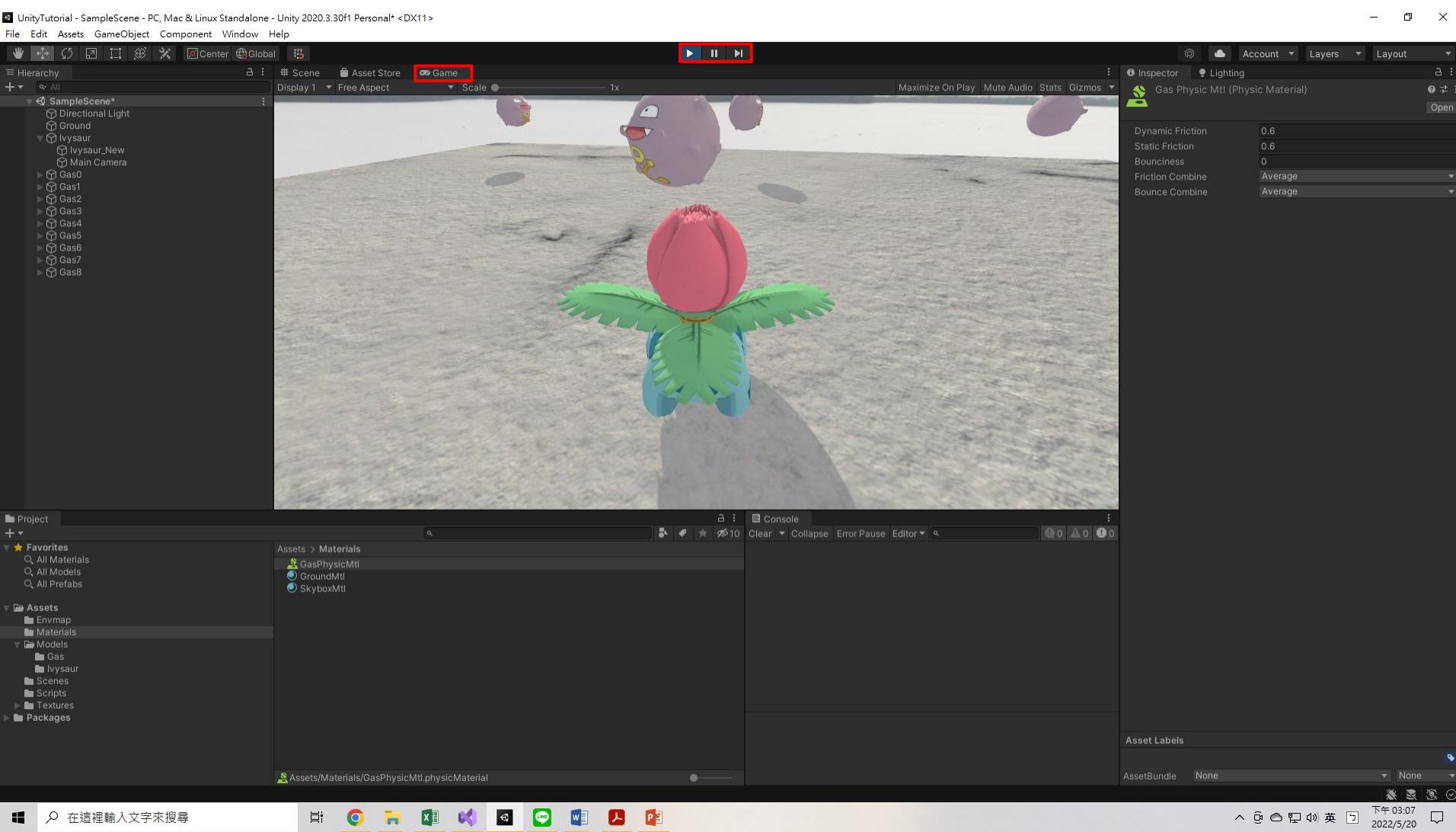
[Open in Unity](#) [Heart](#)

License agreement Standard Unity Asset Store EULA
License type Extension Asset
File size 1.8 MB
Latest version 1.0
Latest release date Oct 7, 2017
Supported Unity versions 2017.1.0 or higher
Support [Visit site](#)

→ Frequently bought together

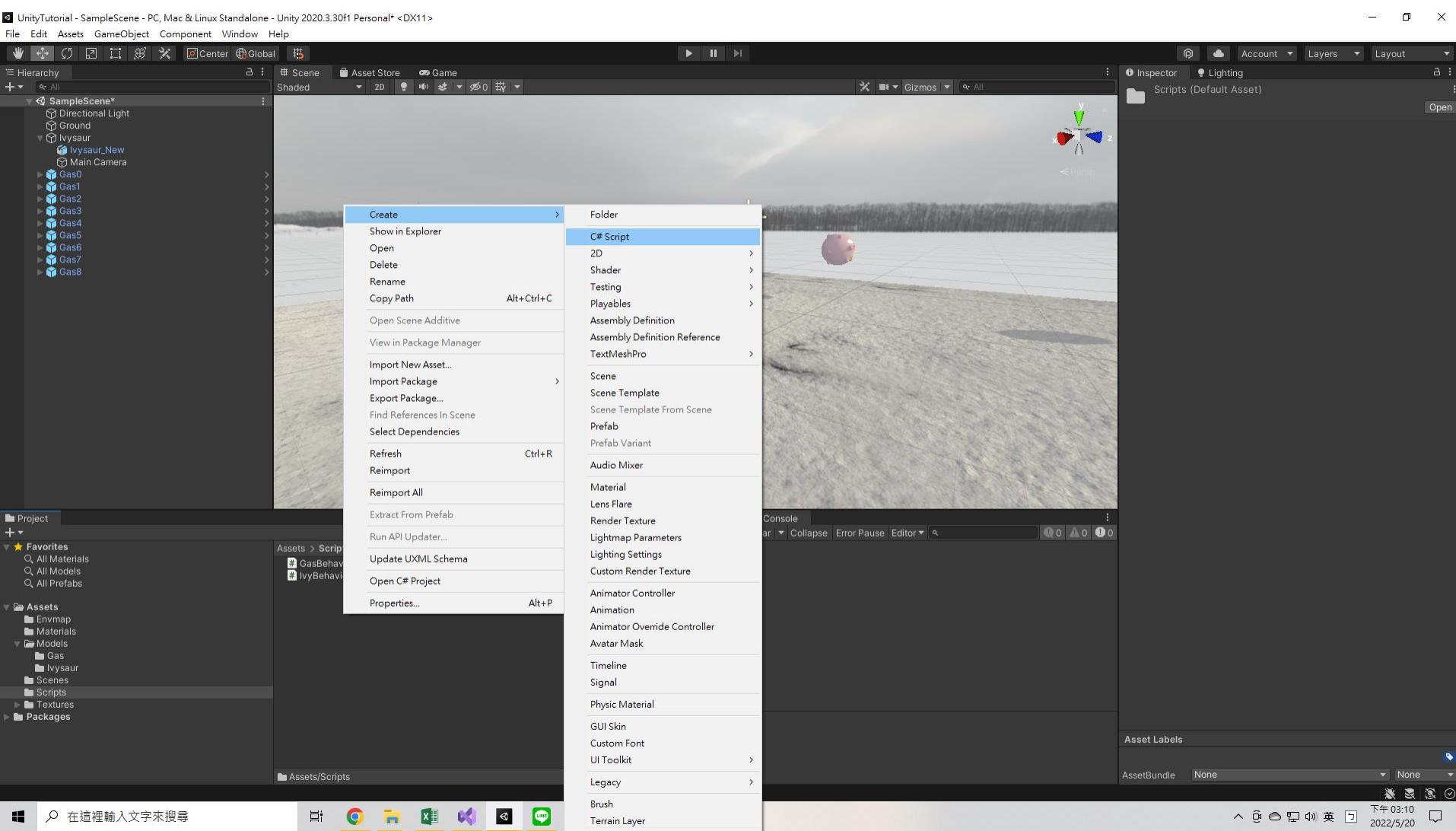
Overview Package Content Releases Reviews Publisher info Asset Quality

Mode



Behavior and Game Control

Add new behavior



Add new behavior

The screenshot shows the Unity Editor's code editor with the file `CollisionBehavior.cs` open. The code defines a `CollisionBehavior` class that inherits from `MonoBehaviour`. It includes `Start()` and `Update()` methods, and two event handlers: `OnTriggerEnter` and `OnTriggerExit`.

A red box highlights the declaration of the `firstHit` boolean variable:

```
public class CollisionBehavior : MonoBehaviour
{
    bool firstHit = true;
```

A yellow box highlights the `OnTriggerEnter` method, which contains logic to play an audio clip and update a score text mesh. The `OnTriggerExit` method is also highlighted with a yellow box.

A large yellow callout box with the text "Put your code in" is positioned over the `OnTriggerEnter` method area.

```
public class CollisionBehavior : MonoBehaviour
{
    bool firstHit = true;

    // Start is called before the first frame update
    void Start()
    {
    }

    // Update is called once per frame
    void Update()
    {
    }

    private void OnTriggerEnter(Collider other)
    {
        if (firstHit)
        {
            GetComponent().Play();
            int score = int.Parse(GetComponentInChildren<TextMesh>().text);
            score++;
            GetComponentInChildren<TextMesh>().text = score.ToString();
            firstHit = false;
        }
    }

    private void OnTriggerExit(Collider other)
    {
        firstHit = true;
    }
}
```

Deploy

Output executable file

