

Part 1: Unity Flappy Bird Tutorial

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Flappy Bird is a mobile game for both android and iOS. It was developed by a Vietnamese indie game developer Dong Nguyen. It was released initially on May 24, 2013 and was suddenly pulled back from PlayStore somewhere around February of 2014.

According to Dong Nguyen, this game was created in 3 days.

- Follow all directions carefully and accurately.
- Think of the directions as minimum requirements.

Unity Hub

1. Double Click **Unity Hub** on your desktop or find it in your start menu. If you don't find it, add it to your Visual Studio installation.
2. Update Unity Hub if there is a prompt.
3. You must create an Account with Unity.
4. Install the latest LTS Version of Unity. 2020.3 (The exact number may change.)
 - a. You do not need to select Visual Studio 2019. We will use Visual Studio 2022 to edit our Unity scripts.

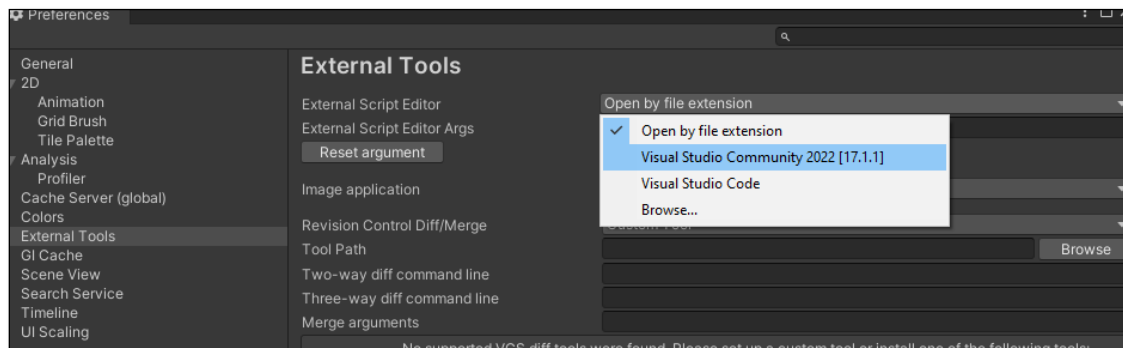
Create Unity Project

We are ready to create a new Unity project and start our game development career!

1. In the **Unity Hub** → **Projects** → Click **New project**
2. Under **All templates** → Select **2D Core**
 - a. Project name: **Flappy Bird**
 - b. Location: **Choose a location on your hard drive.**
NOTE: If you store this project on a USB drive, it may run very slowly.
3. It may take some time to create the project depending on the speed of your computer and disk drive.

Let's setup Visual Studio Community 2022 to work better with Unity. This will enable Intellisense code completion amongst other features.

1. In **Unity Editor** → **Edit** menu → **Preferences**
2. Click **External Tools** → **External Script Editor** → Choose Visual **Studio Community 2022** as shown below. It will take a moment to change.

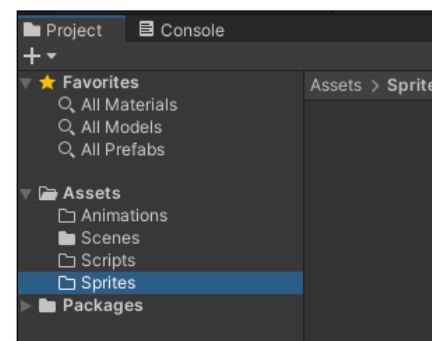


3. Close the **Preferences** window.

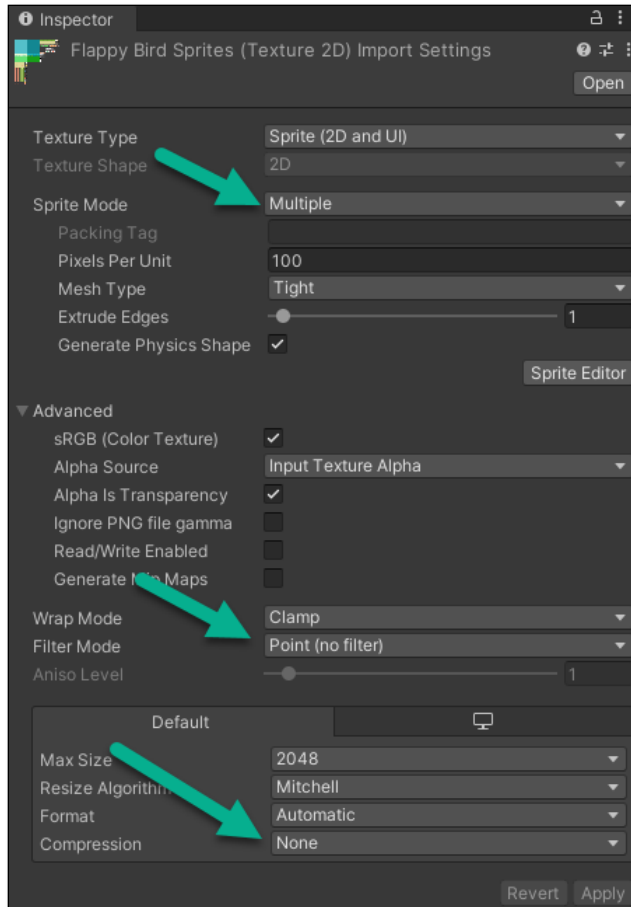
Assets

Let's import some game assets such as the bird, the pipes, the interfaces, etc.

1. **FlappyBirdSprites.png** is attached to this assignment. Download the file somewhere you can find it.
2. Go to the **Unity Editor**.
3. In the lower left-hand corner under the **Project** tab → **Right Click** on **Assets** → **Create** → **Folder**

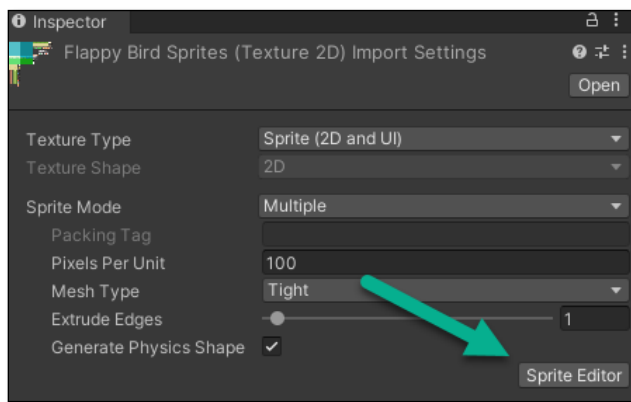


4. Create 3 folders.
 - a. Name: **Animation**
 - b. Name: **Scripts**
 - c. Name: **Sprites**
5. **Right Click** on the **Sprites** folder → **Import New Asset** → **Browse** to **FlappyBirdSprites.png** Click **Import**.
6. Select the imported sprite. Use the **Inspector** to set the following properties as shown below.
 - a. **Sprite Mode:** Multiple
 - b. **Pixels Per Unit:** 25
 - c. **Filter Mode:** Point
 - d. **Compression:** None
 - e. Click **Apply**.

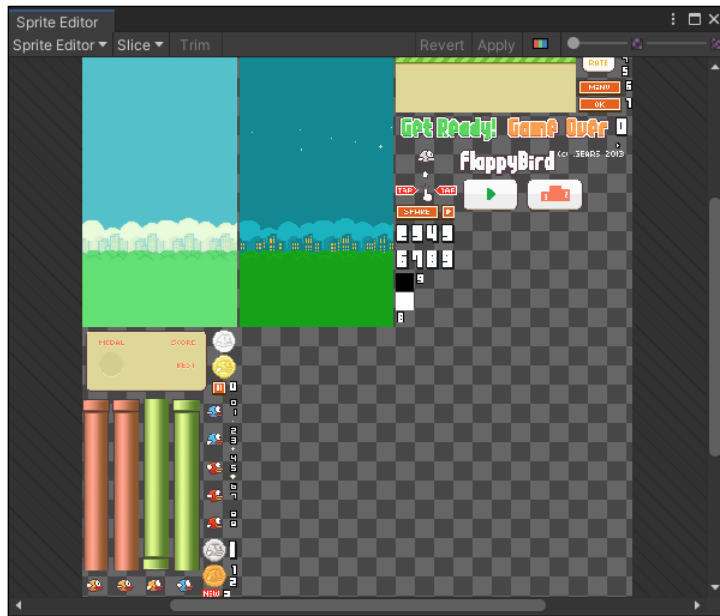


Our assets are in single a PNG file. Let's slice this sprite using Sprite Editor. We can the use the separate objects such as the bird, the pipes.

7. Select the **imported sprite**.
8. In the Inspector → Under the **Generate Physics Shape** checkbox → Click the **Sprite Editor** button as shown below.

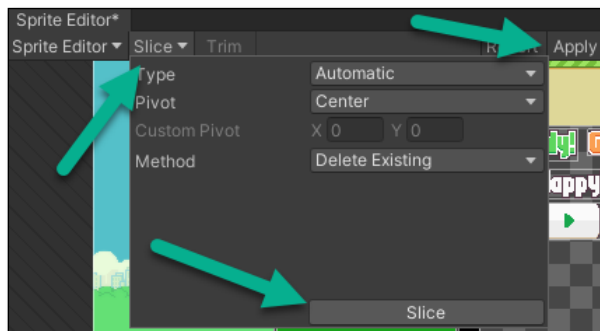


9. This will open the **Sprite Editor** window. You may have to resize the window to see the image.

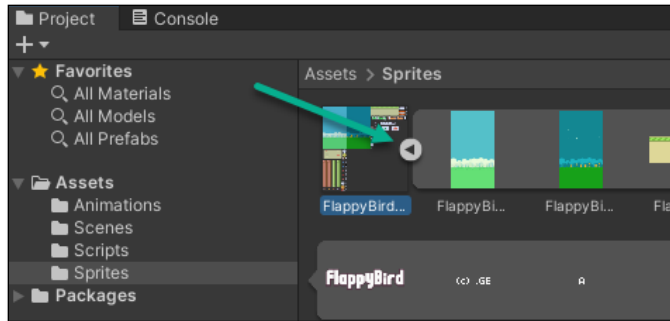


10. Click the **Slice** menu → Click the **Slice** button as shown below. Notice how Unity automatically slices the images apart.

11. Click **Apply**.



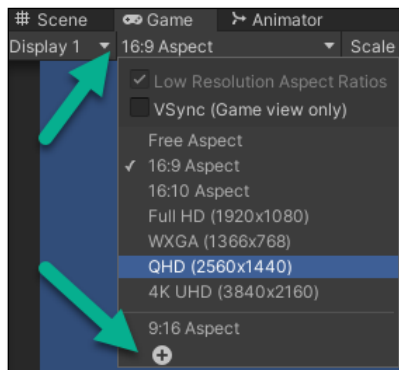
12. Close the **Sprite Editor**.
13. Click the **Play** button on **FlappyBirdImages** sprite as shown. You should see all the sliced sprites appear inside your Sprites folder. The screenshot below is only showing some of the 81 images.



The Game Scene

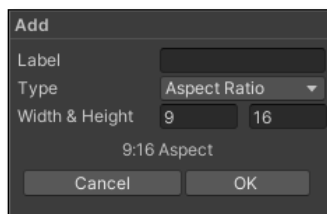
We have our assets ready. Let's set the scene by adjusting our game aspect ratio to 9:16. This is a common mobile phone screen ratio.

1. At the top of the Unity Editor → Click the **Game** tab → Click the **16:9 Aspect** menu → Click the + sign at the bottom of the menu as shown below.

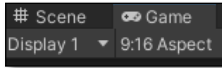


2. Change **Type** to **Aspect Ratio**.

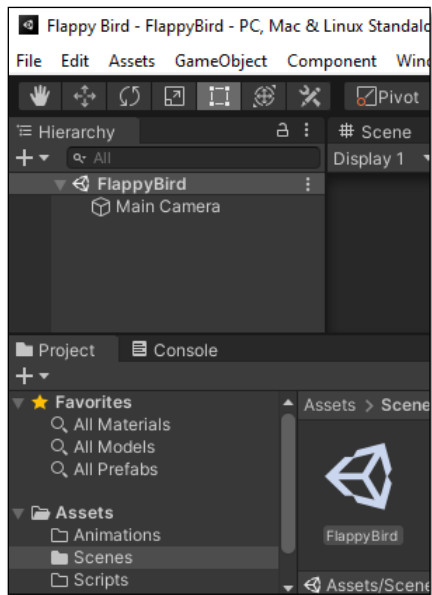
- a. **Width:** 9
- b. **Height:** 16



3. Click **OK**. Under the **Game** tab, you should see **9:16 Aspect**. You should see a vertical rectangle for the game area.



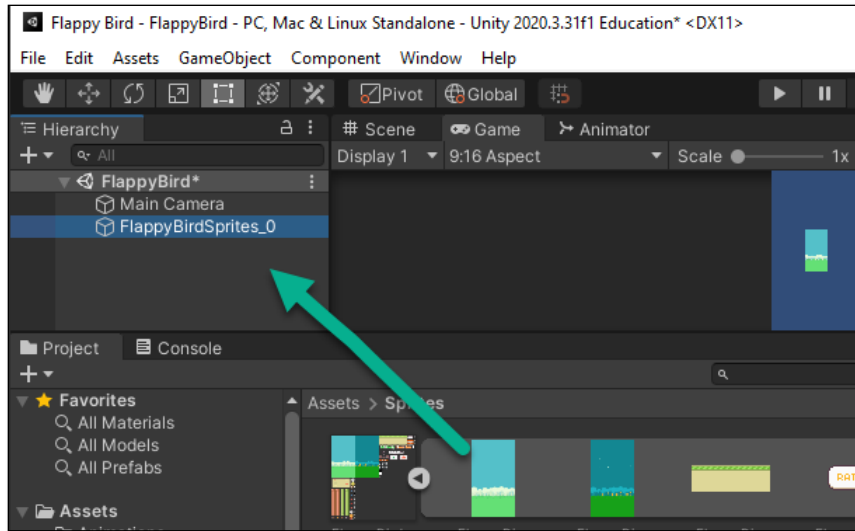
4. Go to **Assets** → **Scenes** → Right Click **SampleScene** → Rename: **FlappyBird** as shown below.
5. Press **Enter**.



The Background

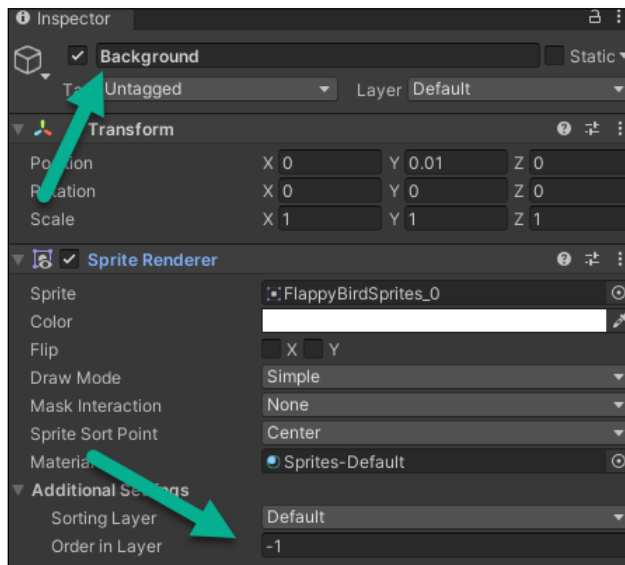
For assets to appear on our game, we must put them in the Hierarchy. This stores everything available to the scene.

1. At the top of the Unity Editor → Click the **Scene** tab.
2. Go to **Assets** → **Sprites** The first individual sprite is the FlappyBird background.
3. Drag it up into the **Hierarchy** below the **Main Camera** as shown below.



4. In the **Inspector** as shown below:

- a. Change the name to **Background**.
- b. To keep the **Background** in the background → change **Order in Layer**: **-1**

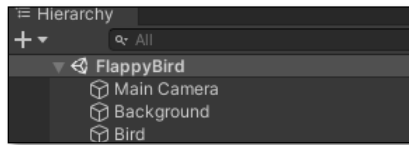


The Bird

Time to get our Bird on deck and flapping.

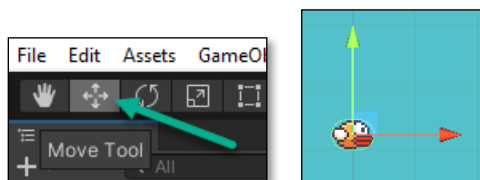
1. **Assets** → **Sprites** → Find the FlappyBird sprite with its wing raised up, it is the 7th from the end.
2. Drag it onto the **Hierarchy**.

3. In the **Inspector** → Change the name to **Bird** as shown below.

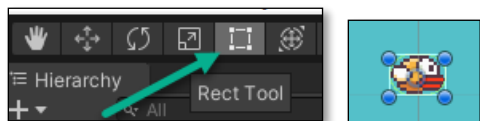


There are 2 main tools that are used for moving Sprites in the scene. Go to the toolbar at the top of the Unity Editor window.

Select the **Move** tool. Grab the vertical arrow and drag up to place the Bird vertically. The horizontal arrow moves the Sprite horizontally. This tool allows constrained vertical and horizontal placement of Sprites.



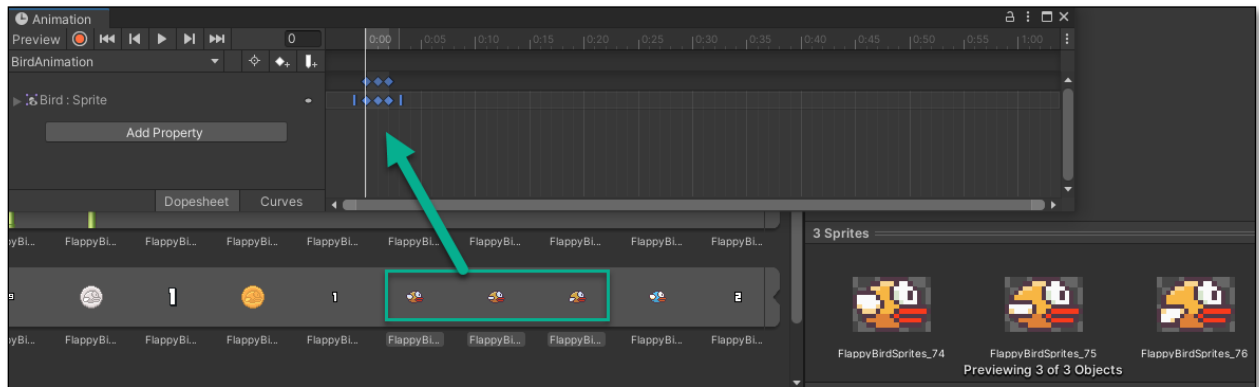
The **Rect** tool is the default tool for manipulating Sprites. If you point in the middle of the Sprite, you can move it around freely. The corners will allow you to resize the Sprite.



Let's animate our Flappy Bird to flap its wings.

4. Go to the **Window menu** → **Animation** → **Animation**
5. Be sure that the **Bird** Game Object and the **Animations** folder is selected. You can change the selection while the Animation window is open.
6. In the **Animation** window → Click **Create**
7. This will open the **Create New Animation** file dialog box.
8. Name the Animation: **BirdAnimation**
9. Be sure you are in the **Animations** folder before saving the animation.
10. Click **Save**.
11. Leave the **Animation** window open. Click the **Sprites** folder.

12. Select the three birds as shown below. Drag them into the **Animation** window.



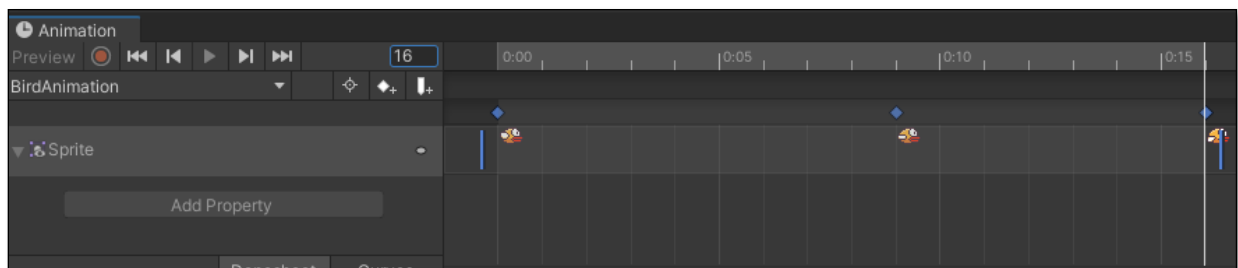
13. Use your mousewheel to zoom out. Expand the Animation window to see all three birds.

14. Click the down triangle by **Sprite** to see the bird images in the timeline.

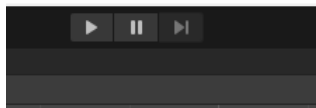
15. To make your animation look better:

- Drag the last keyframe (bird) to 0:16
- Drag the second keyframe (bird) to 0:08
- Leave the first keyframe to its original place as shown below.

16. Adjust the number of keyframes to **16**.



17. Click the **Play** button at the top of the screen. The Bird should flap and fall.



18. Click the **Play** button again to stop the Playback.

Assignment Submission

A Unity project is at least 200 MB. That is too big to be submitted.

Please attach a screenshot of your project to the assignment in Blackboard.