CS Schools Experience

2D Game Making Workshop Handout

Prerequisites

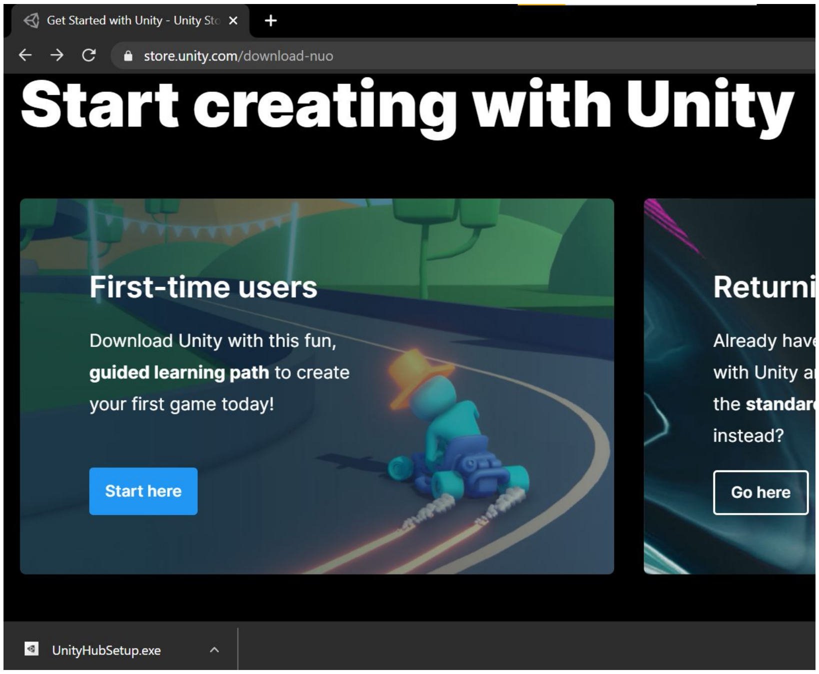
Unity - https://store.unity.com/download-nuo

Prepared by:

Kelly - hfykl4@nottingham.edu.my (Enquiries for guide)

0. Guide on Prerequisites - Creating a new project

Go to this website https://store.unity.com/download-nuo , click “Start here” under First-time users, it will download an .exe file for you.



Start creating with Unity

First-time users

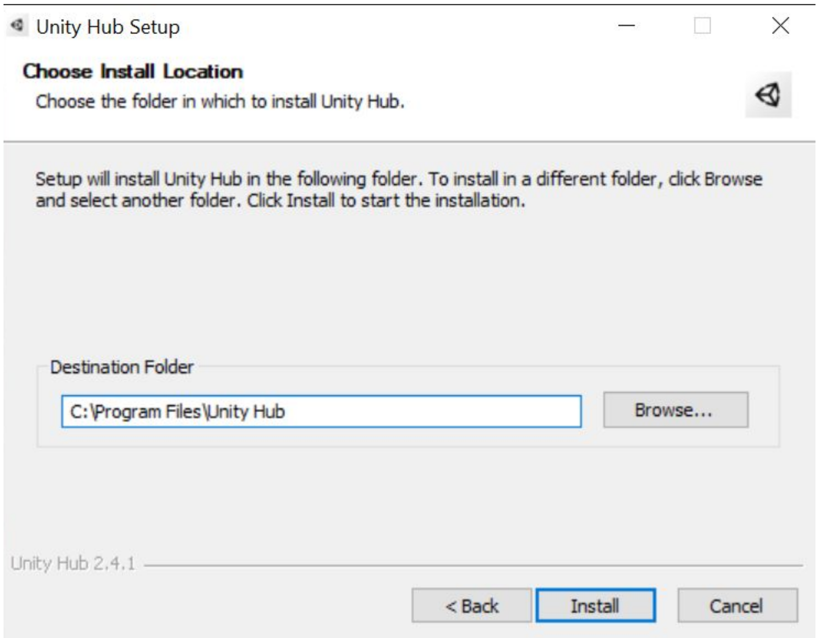
Download Unity with this fun, **guided learning path** to create your first game today!

Returni

Already have with Unity a the **standar** instead?

Get Started with Unity - Unity St
store.unity.com/download-nuo
Start here
Go here
UnityHubSetup.exe

Click on the exe file and it will pop up a window for you to set up. Select the folder path you want to store the folder and click “Install”.



Choose Install Location

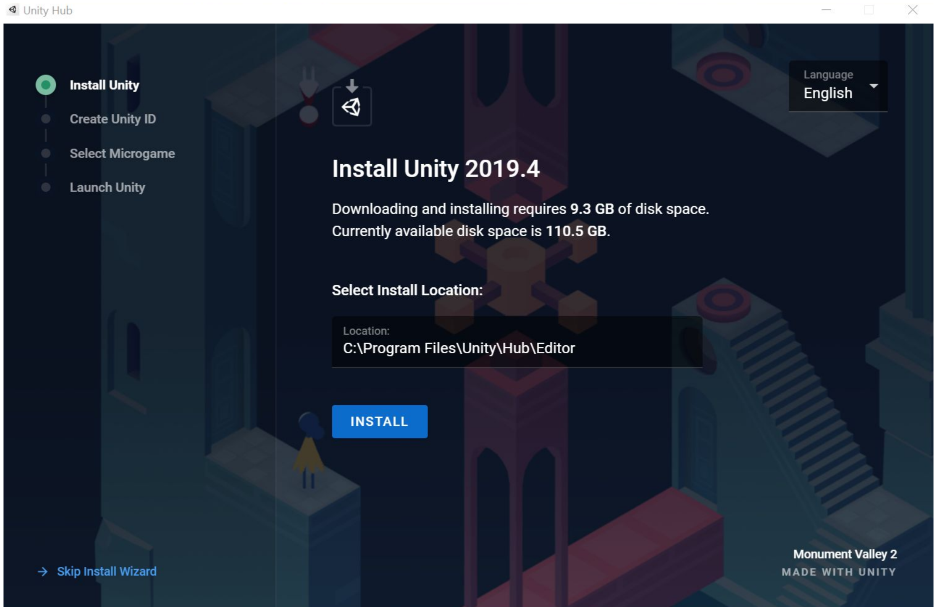
Choose the folder in which to install Unity Hub.

Setup will install Unity Hub in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.

Destination Folder: C:\Program Files\Unity Hub

Then, a desktop icon of Unity Hub will appear on your screen.

Double click the Unity Hub icon to launch the Unity Hub. It will prompt you to install unity engine. Again you will need to select the folder path you want to store. And then click the "Install" button and it will install Unity Game Engine for you. Take note that this installation process will take some time.

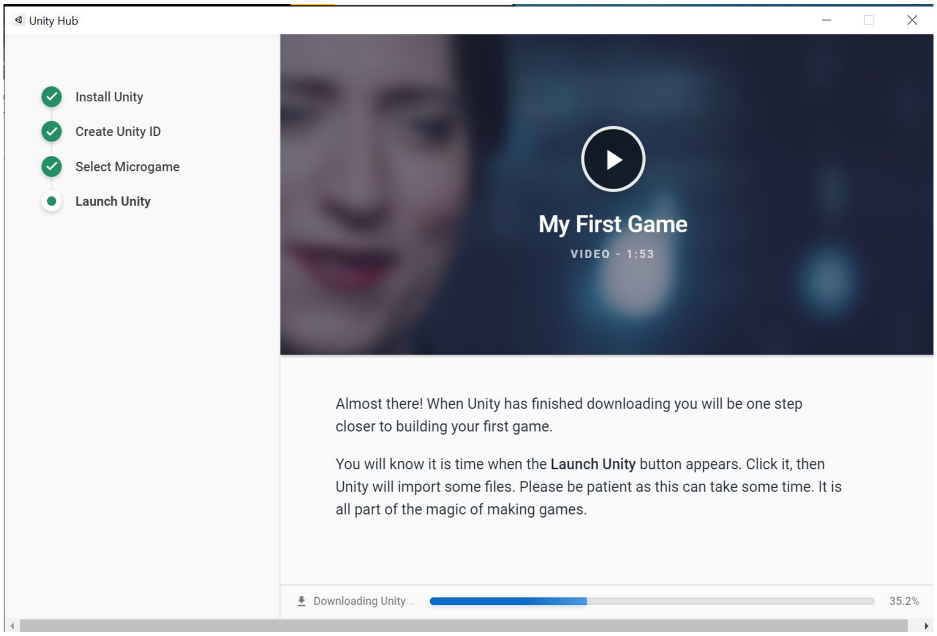


Install Unity 2019.4

Downloading and installing requires **9.3 GB** of disk space.
Currently available disk space is **110.5 GB**.

Select Install Location:

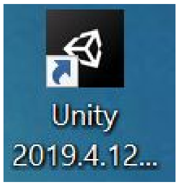
Location:
C:\Program Files\Unity\Hub\Editor



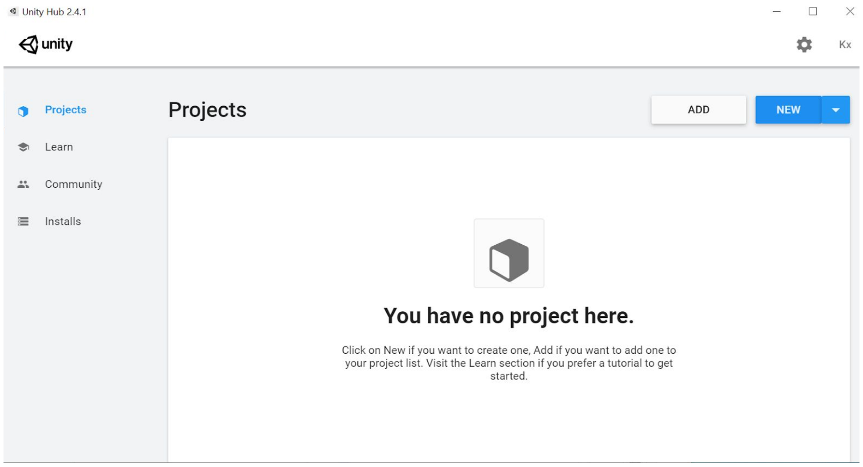
Almost there! When Unity has finished downloading you will be one step closer to building your first game.

You will know it is time when the **Launch Unity** button appears. Click it, then Unity will import some files. Please be patient as this can take some time. It is all part of the magic of making games.

After the installation is done, this black unity icon will appear on your desktop screen. Do not click on this yet as you will need to create a project in unity hub and launch the unity game engine via unity hub.



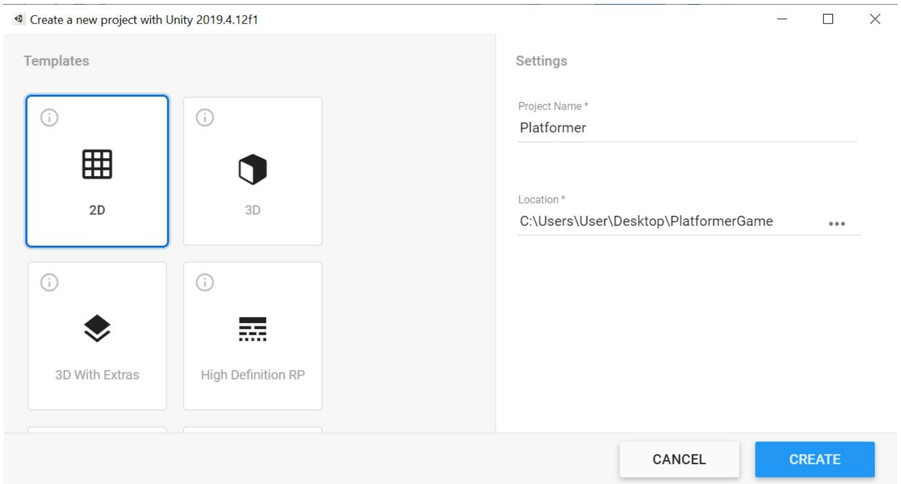
Next, you will launch unity hub, which is the white icon of unity logo. And the screen below will appear. You will need to click on the "New" blue button.



You have no project here.

Click on New if you want to create one, Add if you want to add one to your project list. Visit the Learn section if you prefer a tutorial to get started.

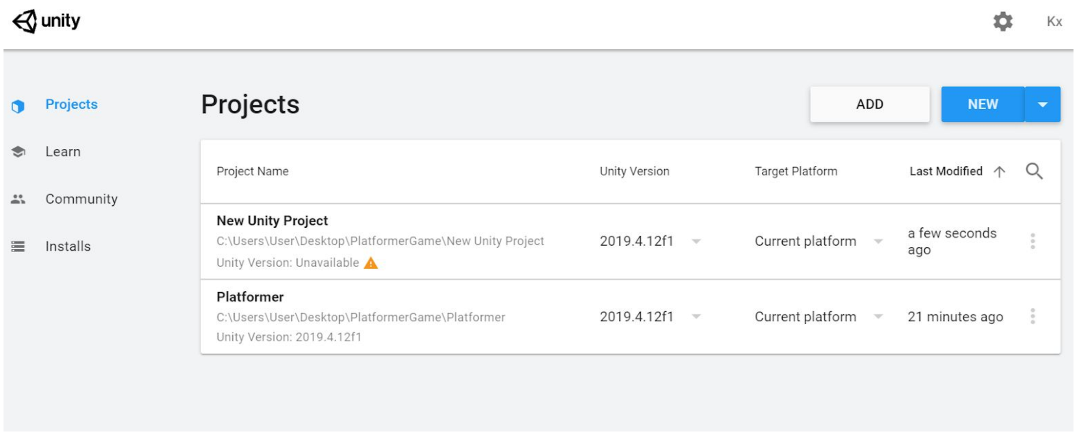
A new window will pop out and this is where you create your project, select **"2D"** at the left hand side and on the right hand form, under the Project Name, name it as "Platformer" .Second input is to select the folder path where you would like to save your folder, at this moment, I would suggest you to save in desktop so it is easy for you to find and access your folder, you can also save it anywhere you would like afterwards. Then, select "Create".



Project Name *
Platformer

Location *
C:\Users\User\Desktop\PlatformerGame

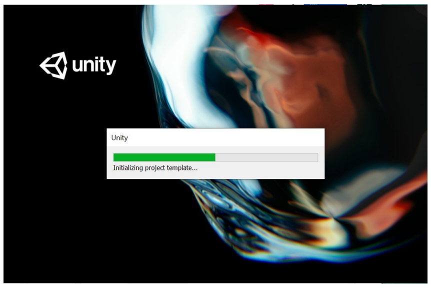
This should create a project named “Platformer” under your Projects in unity hub. You will need to double click the Platformer project and it will launch the unity game engine for you.



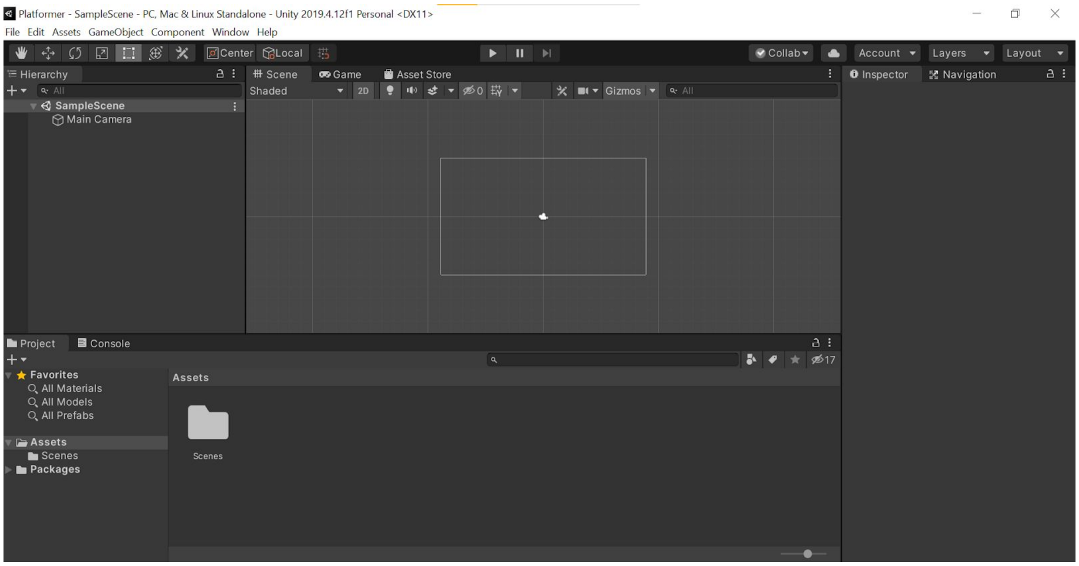
Projects

Project Name	Unity Version	Target Platform	Last Modified
New Unity Project C:\Users\User\Desktop\PlatformerGame\New Unity Project Unity Version: Unavailable ⚠	2019.4.12f1	Current platform	a few seconds ago
Platformer C:\Users\User\Desktop\PlatformerGame\Platformer Unity Version: 2019.4.12f1	2019.4.12f1	Current platform	21 minutes ago

After the launch, a grey theme workspace will pop out in your windows and this is where you will build the game.



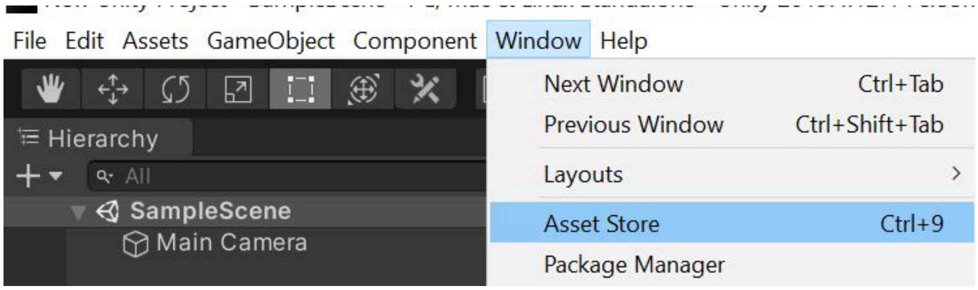
Initializing project template...



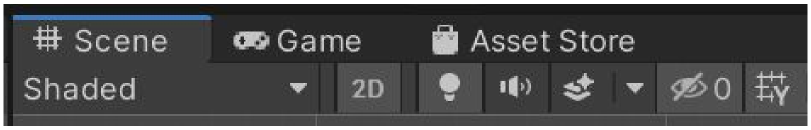
Platformer - SampleScene - PC, Mac & Linux Standalone - Unity 2019.4.12f1 Personal <DX11>

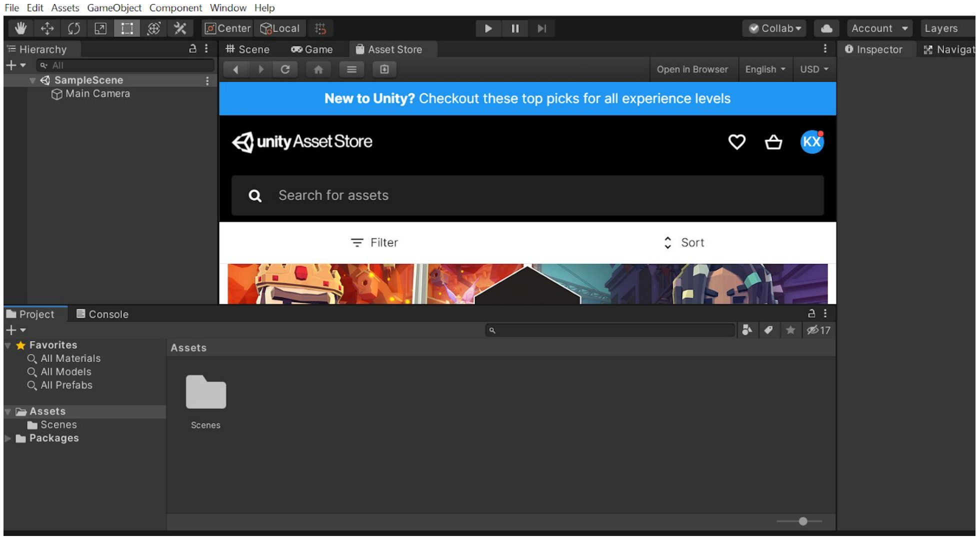
1. Downloading & Importing Assets

In this section, you will be going to utilize free assets prepared by the unity community so that you do not need to design or create the assets from scratch. To do this, navigate to your top bars and look for “Window”, under window select “Asset Store” you can also use ctrl+9 shortcut to open it.

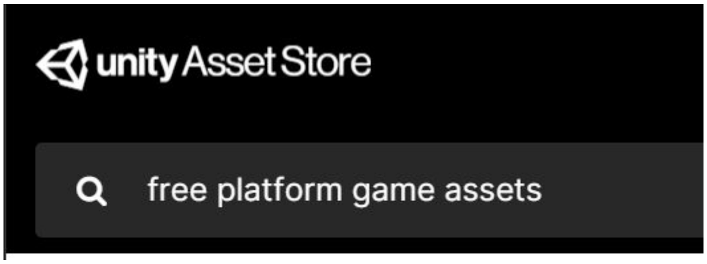


OnClick the “Asset Store”, a new tab name “Asset Store” will be opened in your middle workspace.

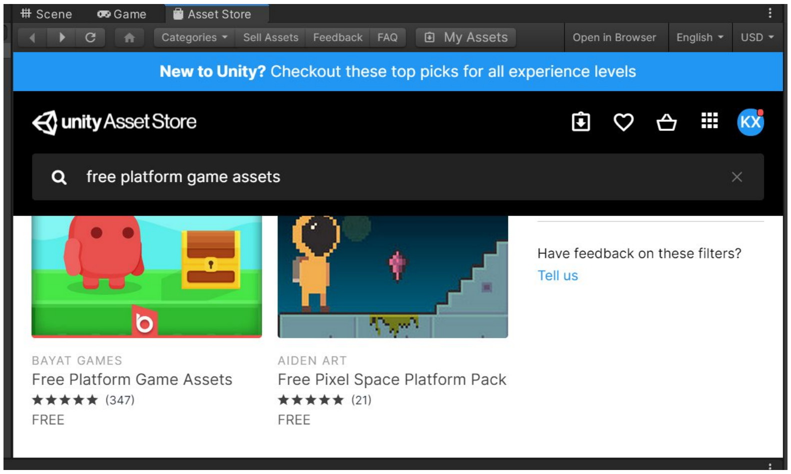




In the search bar, type in “free platform game assets” and enter, it will appear different types of assets that you can use in your project. you will look for the first left assets package (blue background, pink character, chest) and click in. If the Terms of Services window pops out, just click accept.



free platform game assets



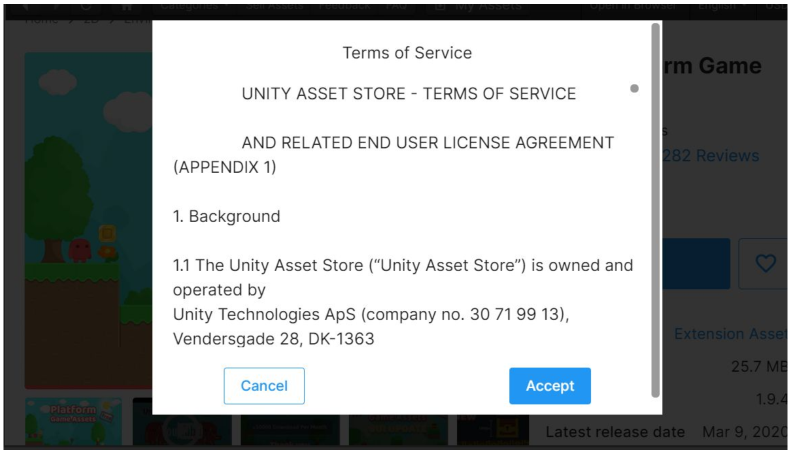
New to Unity? Checkout these top picks for all experience levels

free platform game assets

BAYAT GAMES
Free Platform Game Assets
★★★★★ (347)
FREE

AIDEN ART
Free Pixel Space Platform Pack
★★★★★ (21)
FREE

Have feedback on these filters?
Tell us



Terms of Service

UNITY ASSET STORE - TERMS OF SERVICE

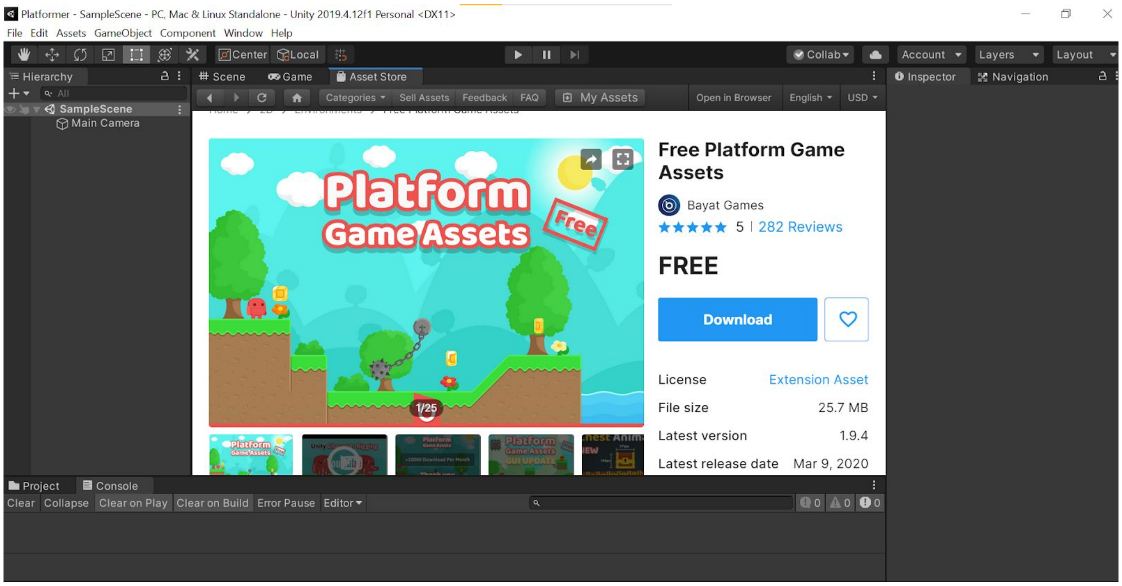
AND RELATED END USER LICENSE AGREEMENT (APPENDIX 1)

1. Background

1.1 The Unity Asset Store (“Unity Asset Store”) is owned and operated by
Unity Technologies ApS (company no. 30 71 99 13),
Vendersgade 28, DK-1363

Cancel Accept

After clicking in you will click the download blue button, this will take some time.


Platformer - SampleScene - PC, Mac & Linux Standalone - Unity 2019.4.12f1 Personal <DX11>

Free Platform Game Assets

Bayat Games

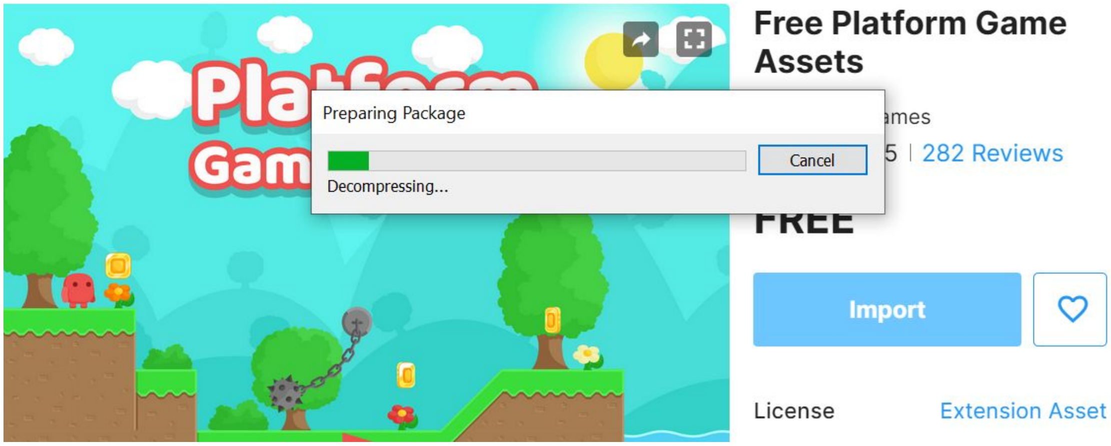
★★★★★ 5 | 282 Reviews

FREE

Download

License	Extension Asset
File size	25.7 MB
Latest version	1.9.4
Latest release date	Mar 9, 2020

After downloading the blue button will become “Import” and you will need to click the import button again. This will take some time as well.


Free Platform Game Assets

ames

5 | 282 Reviews

FREE

Preparing Package

Decompressing...

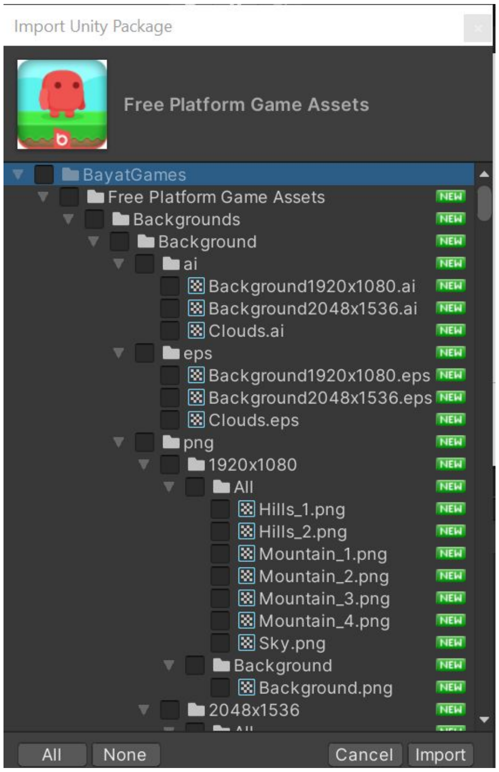
Cancel

Import

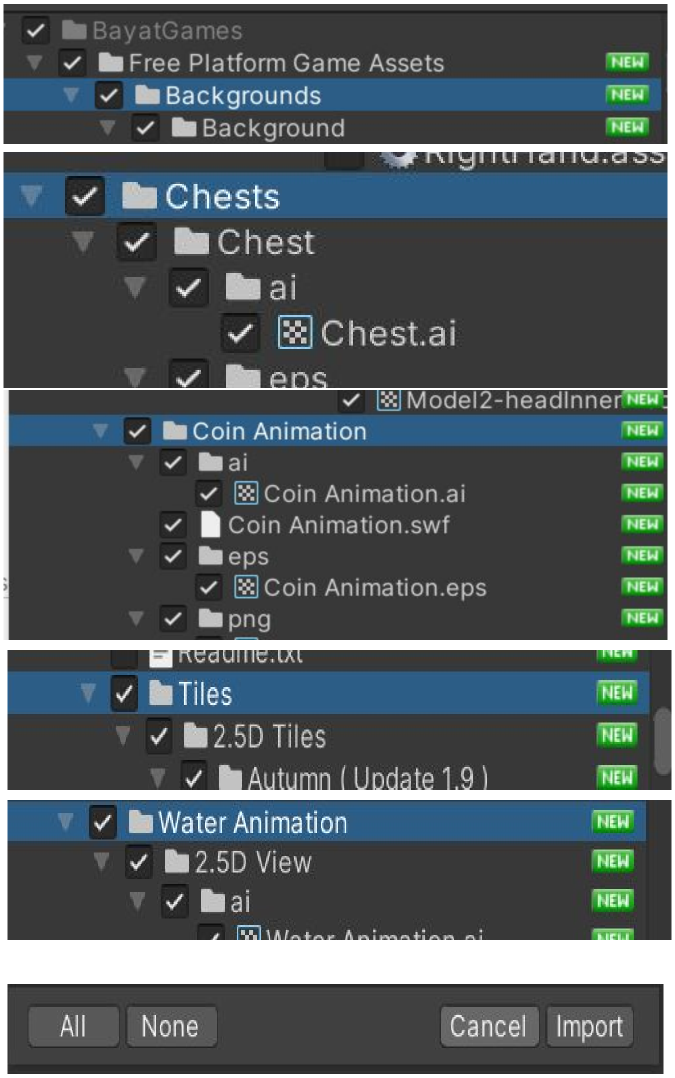
License Extension Asset

A new window will pop out and this is the whole asset package. If you import a full package it will take too much time for this workshop, because import takes time, so you will selectively import the package. **UNTICK** the first box named “BayatGames” to untick all packages at once, and then you selectively tick the package that you want. You will look at boxes named **Backgrounds, Chests, Coin Animation, Tiles, Water Animation** and tick that one box with the naming. After that, click the import button at the most right hand side at the bottom.

[IMPORTANT NOTE]: After you tick the relevant boxes, it will automatically select other boxes for you, ignore them, DO NOT UNTICK the automatically selected boxes.

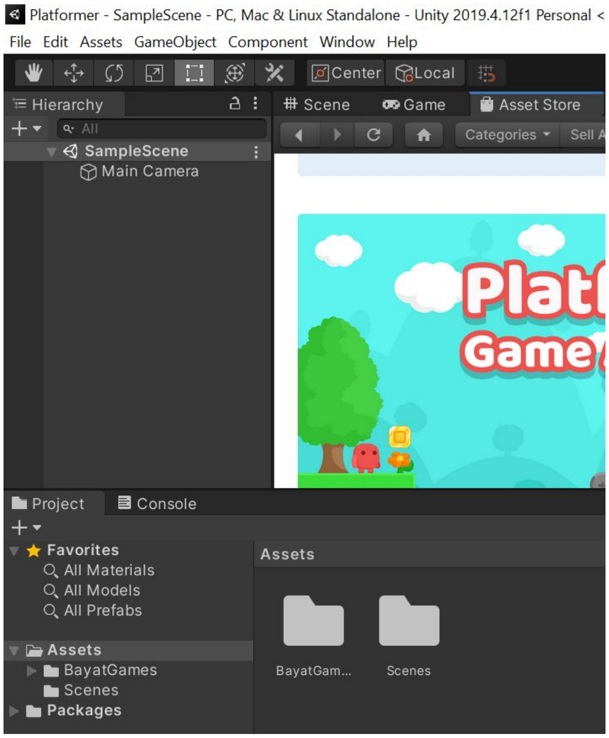


```
Import Unity Package
Free Platform Game Assets

☐ BayatGames
  ☐ Free Platform Game Assets                NEW
    ☐ Backgrounds                            NEW
      ☐ Background                           NEW
        ☐ ai                                 NEW
          ☐ Background1920x1080.ai           NEW
          ☐ Background2048x1536.ai           NEW
          ☐ Clouds.ai                        NEW
        ☐ eps                                NEW
          ☐ Background1920x1080.eps          NEW
          ☐ Background2048x1536.eps          NEW
          ☐ Clouds.eps                       NEW
        ☐ png                                NEW
          ☐ 1920x1080                        NEW
            ☐ All                            NEW
              ☐ Hills_1.png                  NEW
              ☐ Hills_2.png                  NEW
              ☐ Mountain_1.png               NEW
              ☐ Mountain_2.png               NEW
              ☐ Mountain_3.png               NEW
              ☐ Mountain_4.png               NEW
              ☐ Sky.png                      NEW
            ☐ Background                     NEW
              ☐ Background.png               NEW
          ☐ 2048x1536                        NEW

All   None                        Cancel   Import
```

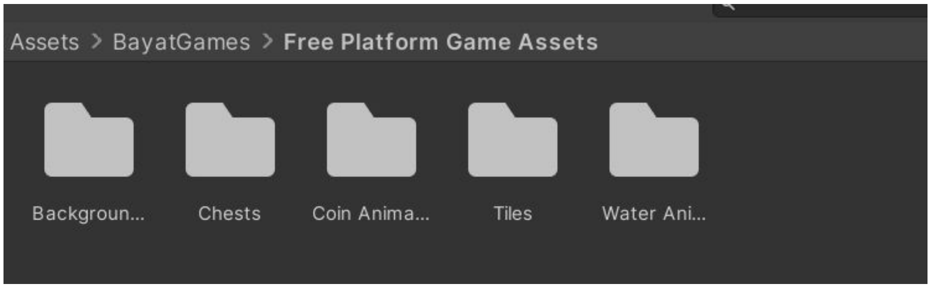


```
☑ BayatGames
  ☑ Free Platform Game Assets                NEW
    ☑ Backgrounds                            NEW
      ☑ Background                           NEW

☑ Chests
  ☑ Chest
    ☑ ai
      ☑ Chest.ai
    ☑ eps

      ☑ Model2-headInner                     NEW
☑ Coin Animation                             NEW
  ☑ ai                                       NEW
    ☑ Coin Animation.ai                      NEW
  ☑ Coin Animation.swf                       NEW
  ☑ eps                                      NEW
    ☑ Coin Animation.eps                     NEW
  ☑ png                                      NEW

  ☐ Readme.txt                               NEW
☑ Tiles                                      NEW
  ☑ 2.5D Tiles                               NEW
    ☑ Autumn ( Update 1.9 )                  NEW

☑ Water Animation                            NEW
  ☑ 2.5D View                                NEW
    ☑ ai                                     NEW
      ☑ Water Animation.ai                   NEW

All   None                        Cancel   Import
```

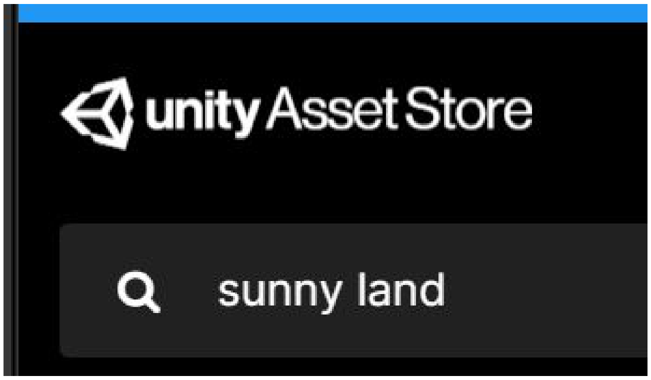
Via finish importing, at the bottom workshop under project, you will observe that a folder named Bayat Games will be installed, this is where you imported all the folders.

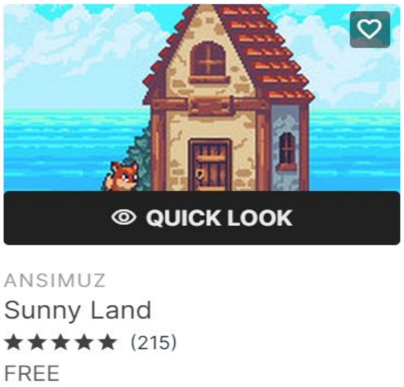


When you click in the folder icon of BayatGame and Free Platform Game Assets, you will see these are the assets being imported.



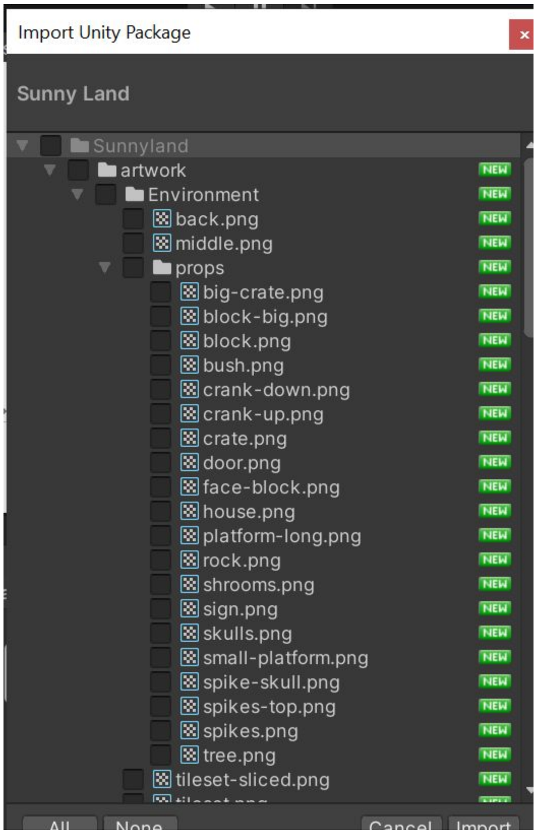
Next, you will again search for another asset called sunny land. You will look for the package that looks like the right hand side picture (fox, house, blue background) and click in. You will then do the same process as the previous one, which is click download and import.




QUICK LOOK

ANSIMUZ
Sunny Land
★★★★★ (215)
FREE

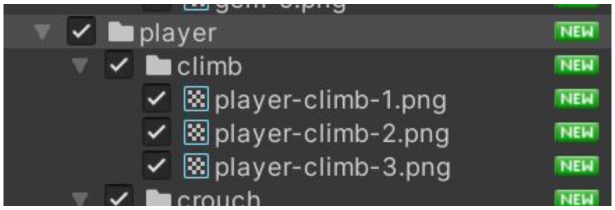
Again you will untick everything by untick the first box, this time you will only need to look for the box named **Player** and tick this one box. Ignore all those default automatically ticked boxes, DO NOT untick the automatically ticked box. And click the "Import" button at the right left bottom.


Import Unity Package

Sunny Land

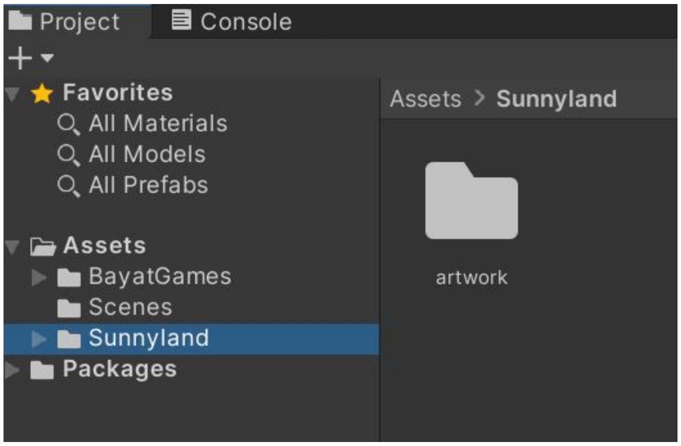
```
▼ □ Sunnyland
  ▼ □ artwork                     NEW
    ▼ □ Environment               NEW
        □ back.png                NEW
        □ middle.png              NEW
      ▼ □ props                   NEW
          □ big-crate.png         NEW
          □ block-big.png         NEW
          □ block.png             NEW
          □ bush.png              NEW
          □ crank-down.png        NEW
          □ crank-up.png          NEW
          □ crate.png             NEW
          □ door.png              NEW
          □ face-block.png        NEW
          □ house.png             NEW
          □ platform-long.png     NEW
          □ rock.png              NEW
          □ shrooms.png           NEW
          □ sign.png              NEW
          □ skulls.png            NEW
          □ small-platform.png    NEW
          □ spike-skull.png       NEW
          □ spikes-top.png        NEW
          □ spikes.png            NEW
          □ tree.png              NEW
        □ tileset-sliced.png      NEW
        □ tileset.png             NEW
```

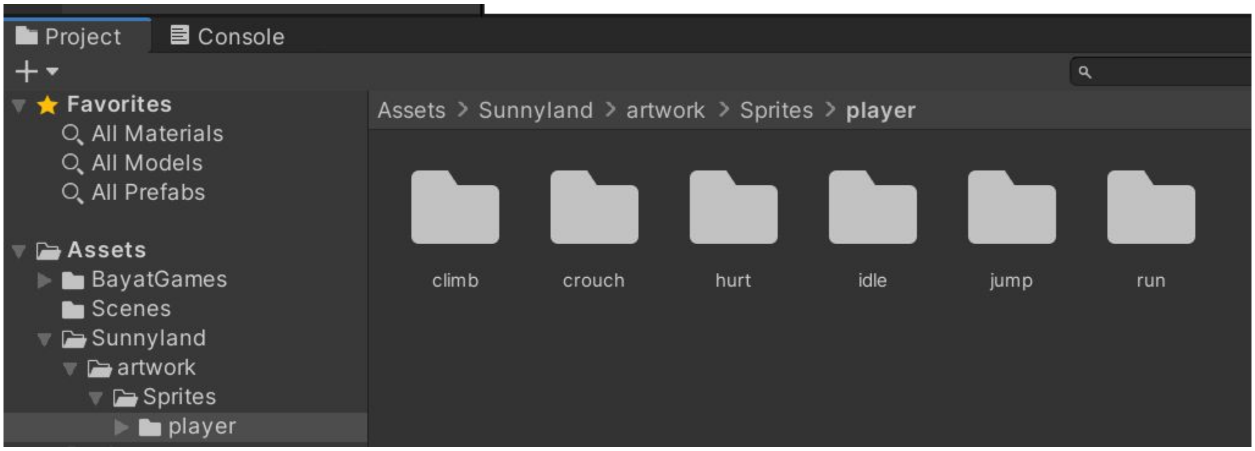
All None Cancel Import



```
▼ ☑ player                        NEW
  ▼ ☑ climb                       NEW
      ☑ player-climb-1.png        NEW
      ☑ player-climb-2.png        NEW
      ☑ player-climb-3.png        NEW
  ▼ ☑ crouch                      NEW
```

Via importing, the below folder will be imported and inside will contain the payer folder assets that you just imported.

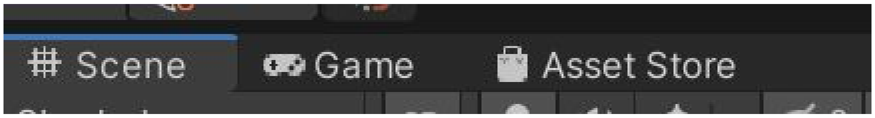


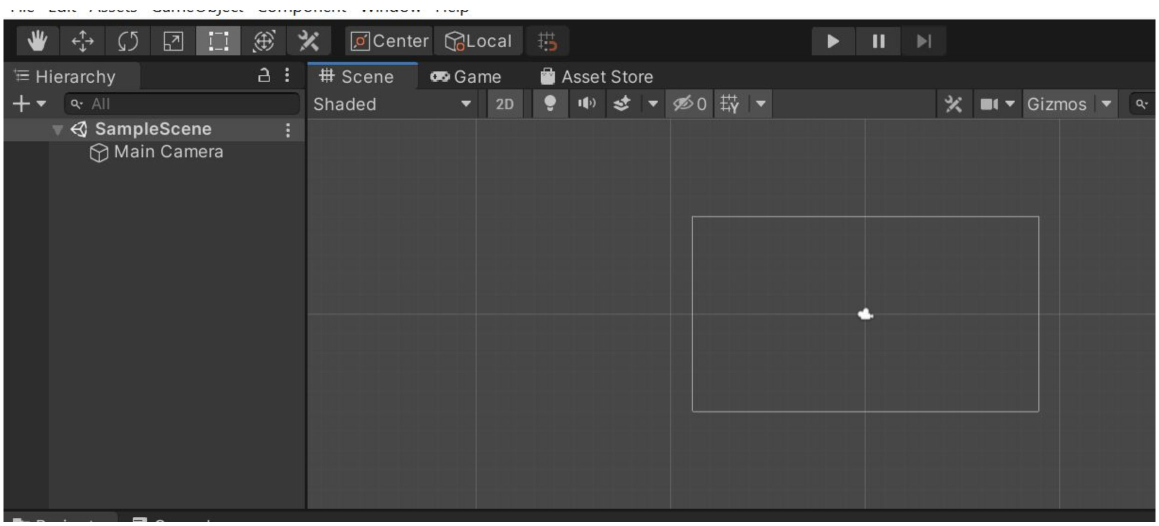


2. Creating your own scene

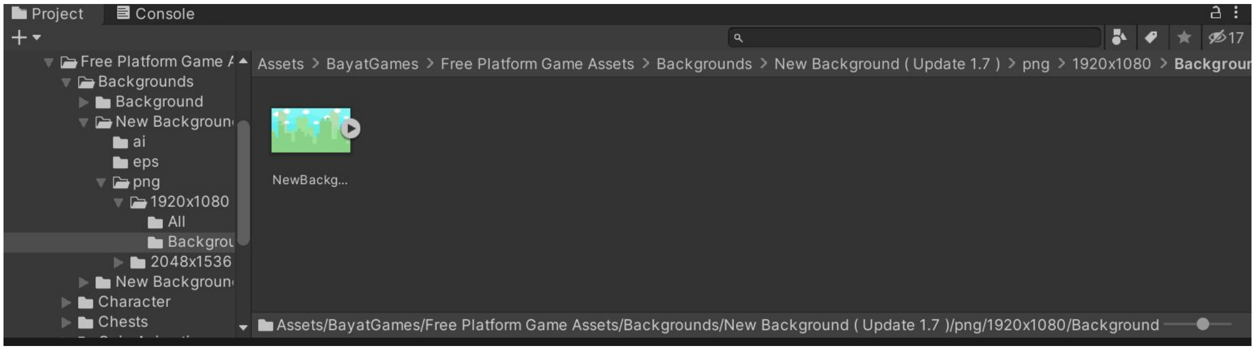
In this section you will start to utilize what you had imported previously. Select the scene tab and you will go back to your original workspace.

[IMPORTANT NOTE]: Pay attention to the camera box, everything placed outside the camera box will not be visible for the player.



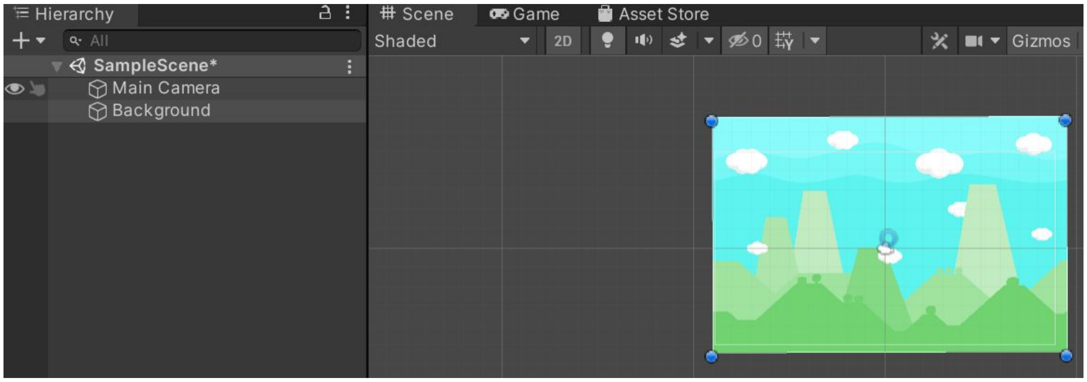


Go into your project panel named assets and select BayatGames -> Free Platform Game Assets -> Backgrounds -> Background -> png -> 2048x1536 -> Background. This will lead you to get the background as the picture below.


Project
Console
17
Free Platform Game A
Backgrounds
Background
New Backgroun
ai
eps
png
1920x1080
All
Backgrou
2048x1536
New Backgroun
Character
Chests
Assets > BayatGames > Free Platform Game Assets > Backgrounds > New Background (Update 1.7) > png > 1920x1080 > Backgrour
NewBackg...
Assets/BayatGames/Free Platform Game Assets/Backgrounds/New Background (Update 1.7)/png/1920x1080/Background

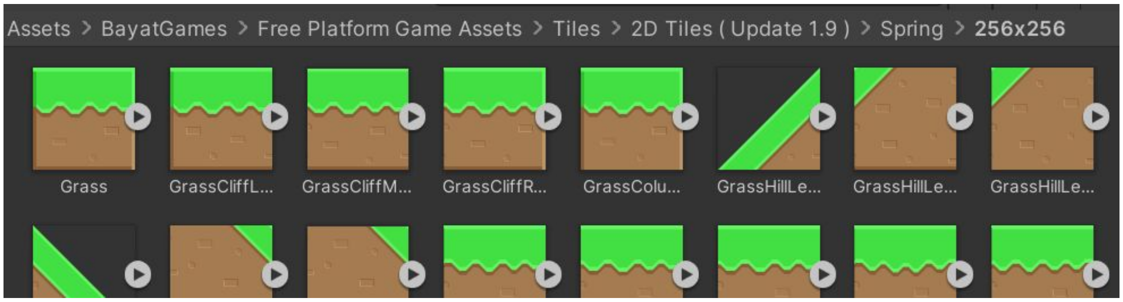
Use your mouse, select it and drag and drop to the scene and you will get a background.

[IMPORTANT NOTE]: It is normal and acceptable to have your background larger than the camera box, as long as the background covers the all the box but shouldn't be smaller than the box.



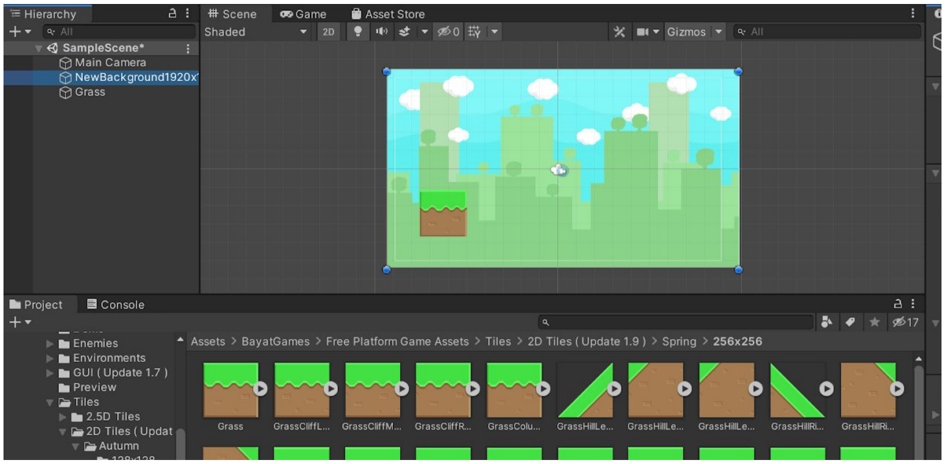
3. Design & create your own level

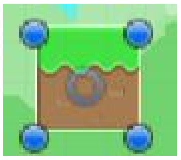
In this section, you will start building your level. Go to the following directories BayatGames -> Free Platform Game Assets -> Tiles -> 2D Tiles -> Spring (you can choose other if you like) -> 256x256 and you will see different tiles that are ready for you to use.



The tiles have the same technique as the background which is drag & drop it into the scene. You can easily resize the tile by clicking the tiles and enlarge or smaller it.

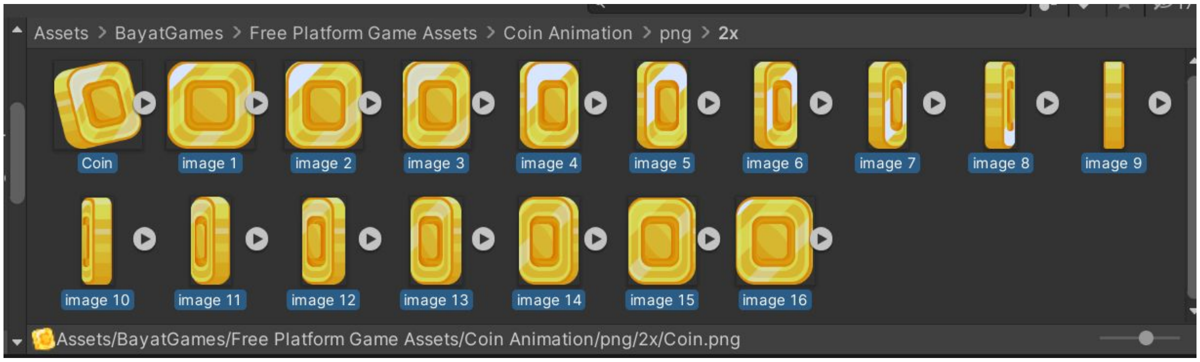
[IMPORTANT NOTE]: Useful shortcut, click the object that you are working with, in this example, the tiles, and press F on your keyboard, your camera will focus on the tiles. Keep in mind that this shortcut is important.



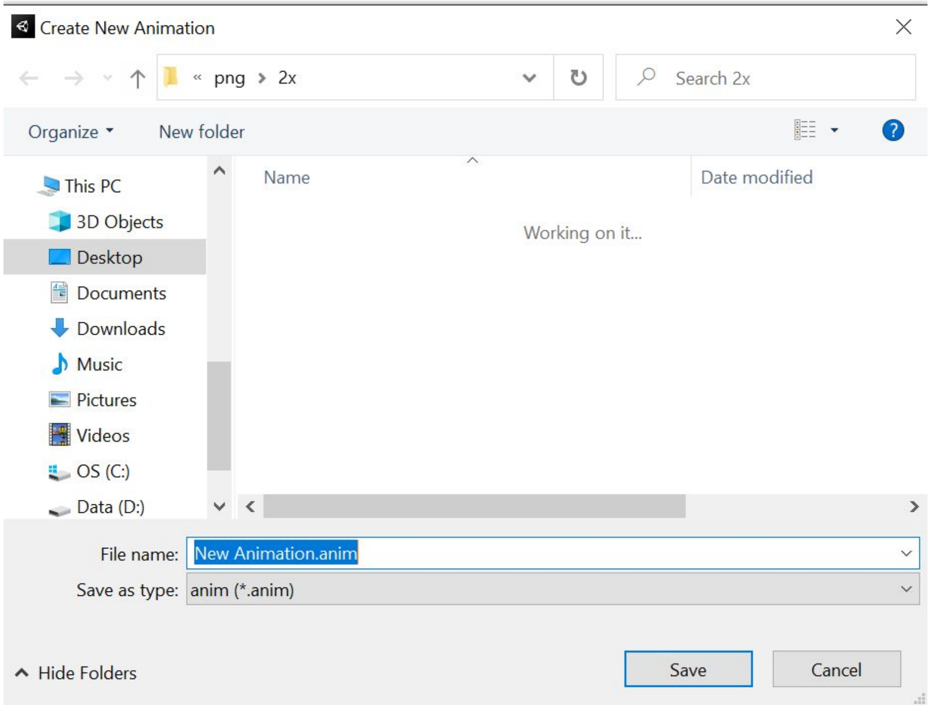


Animation (Coin, Water)

This section will guide you through adding animation objects into your game. Go to the following directories: BayatGames -> Free Platform Game Assets -> Coin Animation -> png -> 2x and click on the first image then press and hold shift on your keyboard and select your last image. You will observe that the whole row will be highlighted blue and then drag your mouse to the scene.

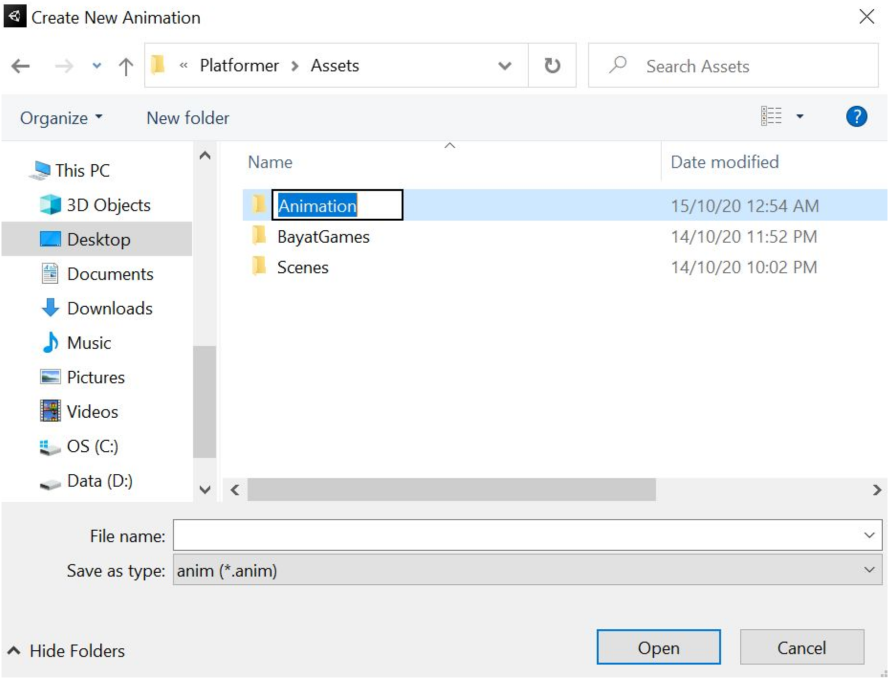

Assets > BayatGames > Free Platform Game Assets > Coin Animation > png > 2x
Coin
image 1
image 2
image 3
image 4
image 5
image 6
image 7
image 8
image 9
image 10
image 11
image 12
image 13
image 14
image 15
image 16
Assets/BayatGames/Free Platform Game Assets/Coin Animation/png/2x/Coin.png

Unity will directly detect/realise that you are creating an animation, and it will pop up windows, in the window will be in the current directory of the coin and it is NOT recommended saving your animation here. Therefore, you will go to your project folder directories: Desktop -> Platformer -> Assets, open a new folder there named Animation (Refer second picture below). Then, go inside the Animation folder you created, you will save your file named CoinAnimation with the extension of .anim, in full CoinAnimation.anim (Refer third picture below).



File name: New Animation.anim

Save as type: anim (*.anim)



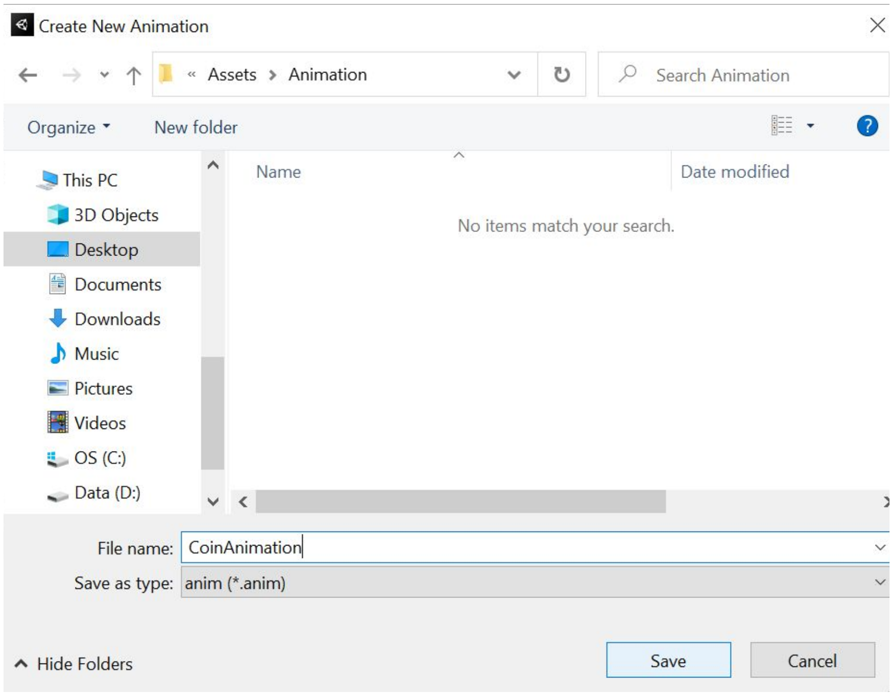
Create New Animation

Platformer > Assets

Name	Date modified
Animation	15/10/20 12:54 AM
BayatGames	14/10/20 11:52 PM
Scenes	14/10/20 10:02 PM

File name:

Save as type: anim (*.anim)



Create New Animation

Assets > Animation

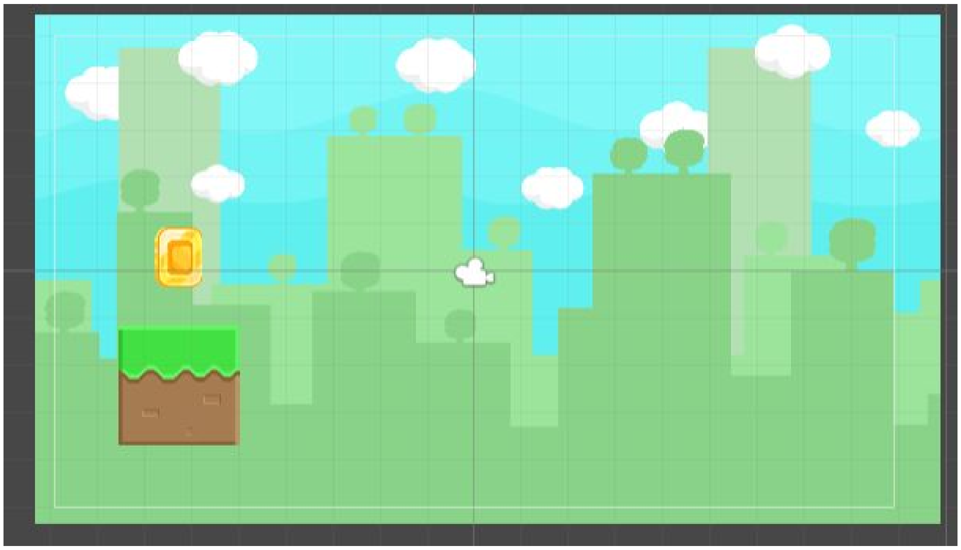
Name	Date modified

No items match your search.

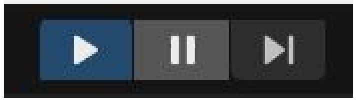
File name: CoinAnimation

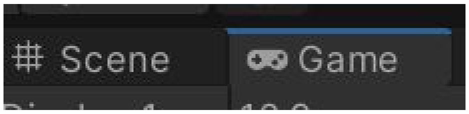
Save as type: anim (*.anim)

After you save, you will see the coin appear but it does not move and being idle although you had applied it to be animated.

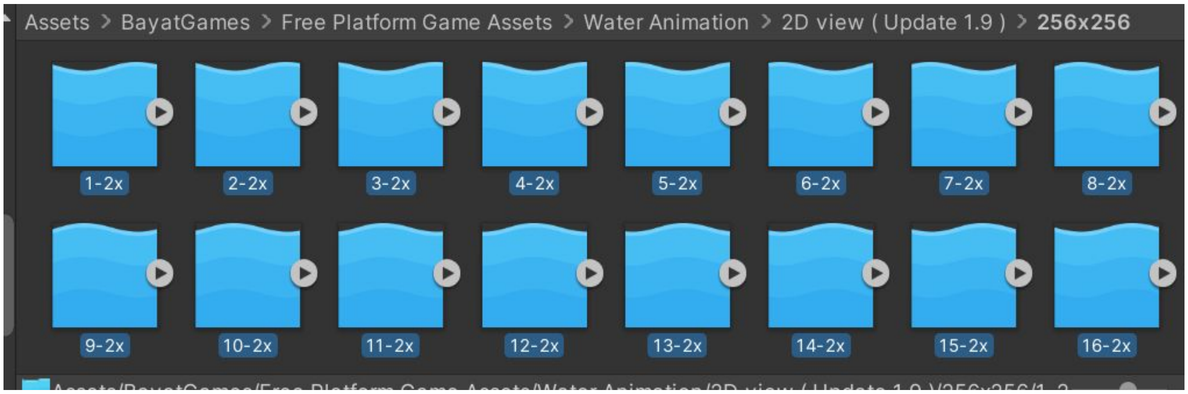


To see the coin actually turning or flipping around, check the pay button above your scene and you will actually see the coin is actually an animation and your working tab will move to Game instead of Scene. Remember to stop the play button via clicking the icon again to continue to work on your scene.





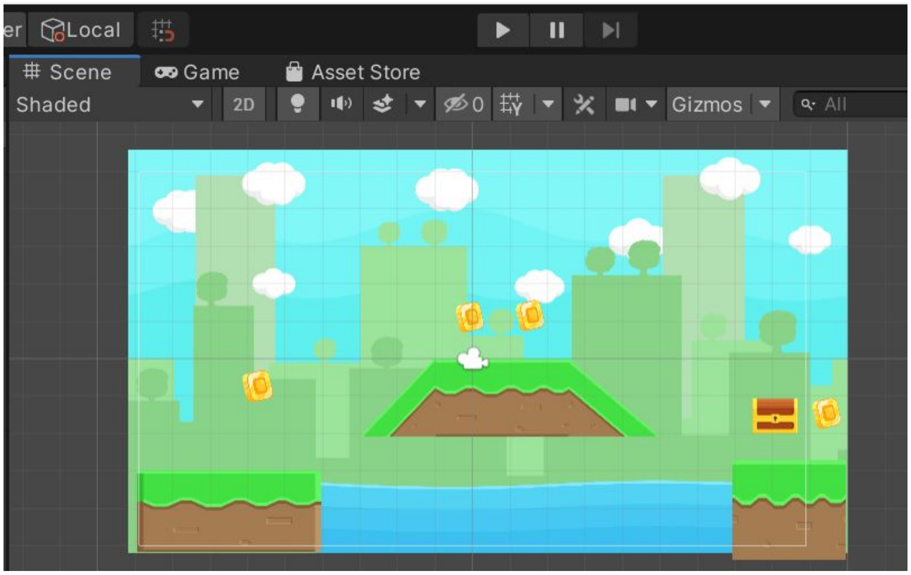
For the water animation, you will apply it with the same techniques as the coin. Go to the following directories: BayatGames -> Free Platform Game Assets -> Water Animation -> 2D view -> 256x256. Select all and drag to the scene, repeat the saving process, go to your project folder directories: Desktop -> Platformer -> Assets -> Animation, this time you will save it as name of WaterAnimation.anim.


Assets > BayatGames > Free Platform Game Assets > Water Animation > 2D view (Update 1.9) > 256x256
1-2x
2-2x
3-2x
4-2x
5-2x
6-2x
7-2x
8-2x
9-2x
10-2x
11-2x
12-2x
13-2x
14-2x
15-2x
16-2x

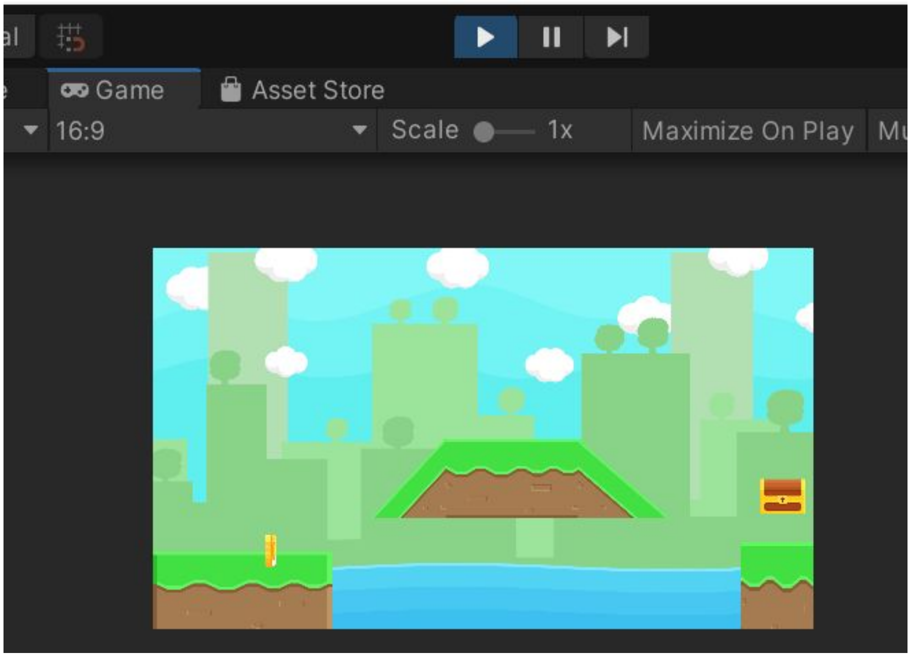
At this stage, you already have a clear idea on how to place your object such as tiles, water, coin into your scene, it’s time for you to build your own design.

Below is a sample level that I created:

[IMPORTANT NOTE]: Things outside the camera box will not be visible, this can be observed when you click the play button, the coin outside the camera box at the most right is not visible. (refer second picture below)



Play button on:

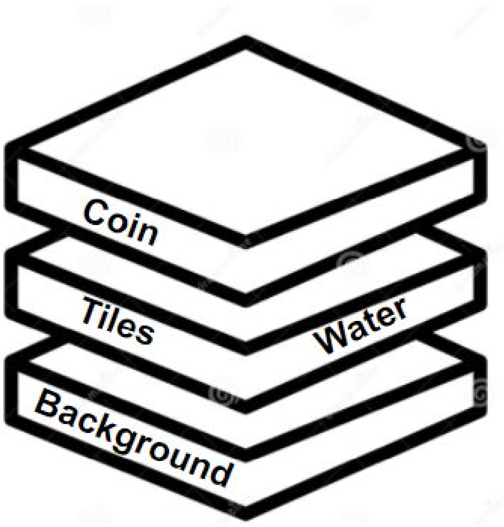


Sorting Layers

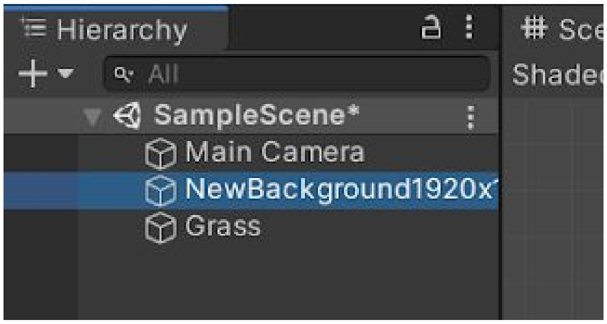
Normally, when you place everything together without assigning an order to them, there will be a problem which is the objects sometimes are covering each other, this is because they do not have any prioritization of which object should be on top and which object should be at the bottom. Therefore, layering plays an important role in a 2D game.

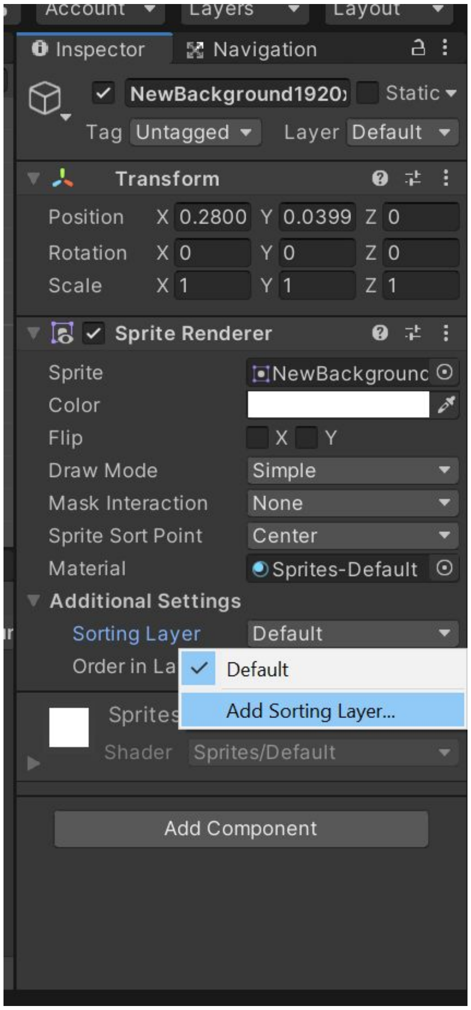
Layer 1
Layer 2
Layer 3
Layer 4
Layer 1
Layer 2
Layer 3
Layer 4

To design the layers, you will first need to identify the priority of your object, in our project, it is obvious that you will have the following few objects that you will need to take care of. The following are the suggested layering that I recommend to follow, which the most bottom will be background and most top can be considered as foreground, but if you like to place the priority one over another, it is your freedom to play around.



Firstly, you will need to go to the left panel of the hierarchy and select the background you added in section 2 (Refer picture 1 below). Then, in your right hand side, the inspector panel, you will need to look for a **sorting layer** under the sprite renderer. Click on the drop down and choose “add sorting layer” (Refer picture 2 below).





NewBackground1920x

Tag Untagged Layer Default

Transform

Position	X 0.2800	Y 0.0399	Z 0
Rotation	X 0	Y 0	Z 0
Scale	X 1	Y 1	Z 1

Sprite Renderer

Sprite	NewBackgrounc
Color	
Flip	□ X □ Y
Draw Mode	Simple
Mask Interaction	None
Sprite Sort Point	Center
Material	Sprites-Default

Additional Settings

Sorting Layer Default

Order in La

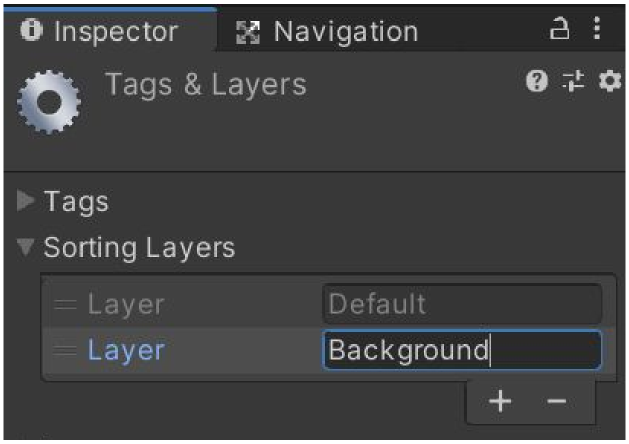
✓ Default

Add Sorting Layer...

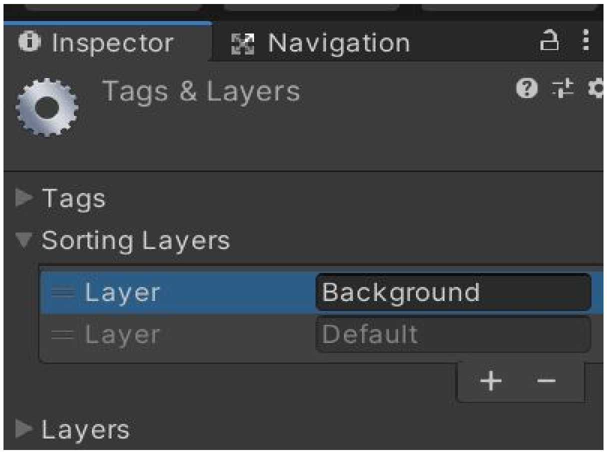
Sprites

Shader Sprites/Default

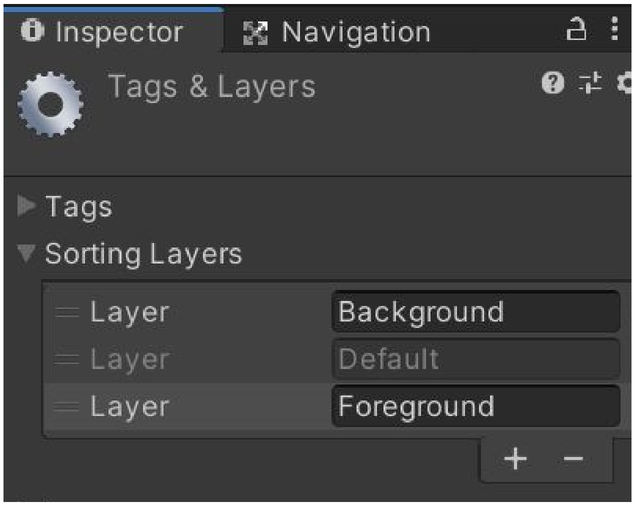
Via clicking “Add Sorting Layer”, you will be brought to the Tags & Layers Page. This page is where you will be manipulating the layers. By default the system in unity will set all your objects to default. Click the + - button at the bottom and click + then name your layered as background. Then, click + and add a foreground layer, Last, remember to move the layer using the 3 vertical lines at the front before the “Layer” word, move the background to the top and move foreground to the bottom (Refer picture 3). The more upwards the layer is, the bottom the layering is, vice versa, the more downwards, the upper the layering is.



Layer Default
Layer Background

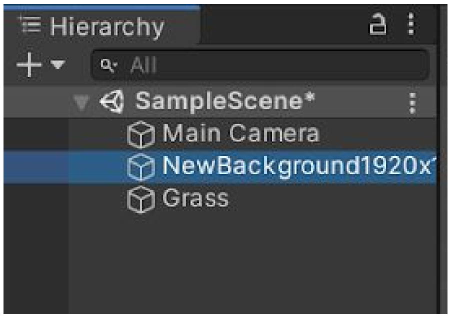


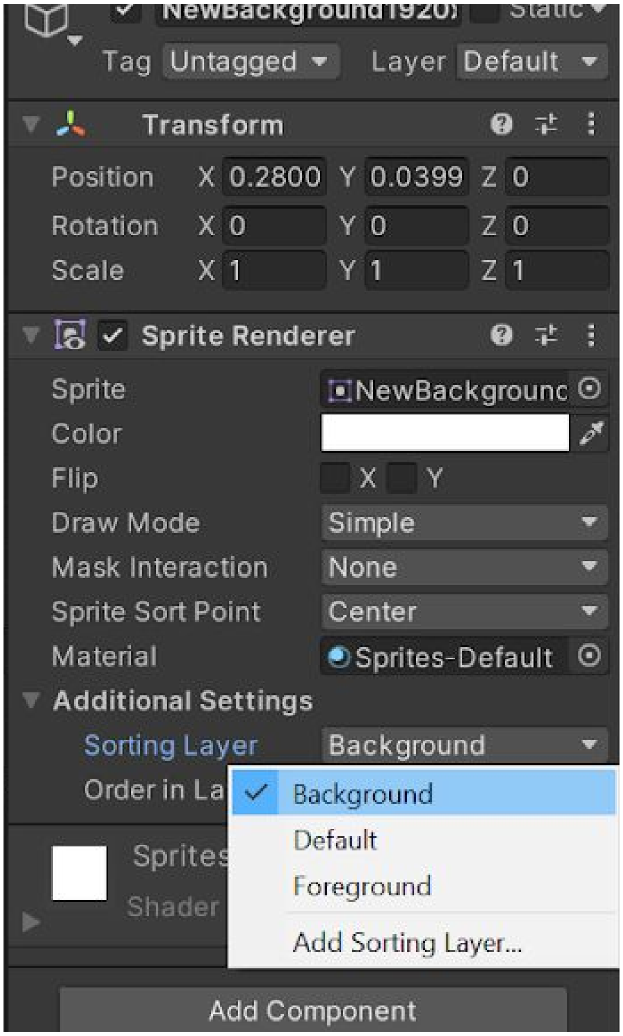
Layer Background
Layer Default



Layer Background
Layer Default
Layer Foreground

After building the layer, you will need to select the background (Refer picture 1). Next, check the inspector on the right hand side, under the sprite renderer, change the sorting layer to background (Refer picture 2). And the background now will be the most bottom layer and will not cover other objects.





Tag Untagged Layer Default

Transform

Position	X 0.2800	Y 0.0399	Z 0
Rotation	X 0	Y 0	Z 0
Scale	X 1	Y 1	Z 1

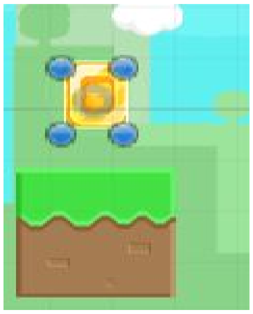
Sprite Renderer

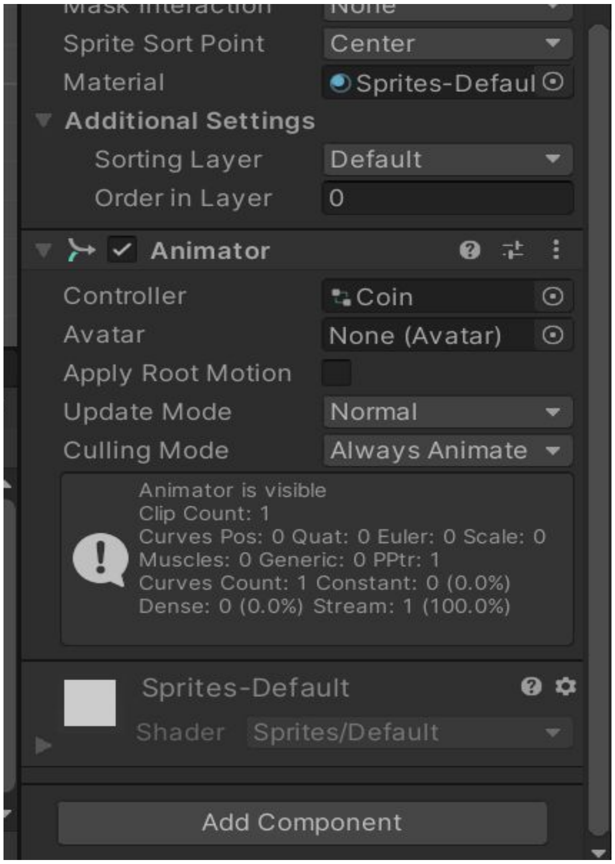
Sprite: NewBackgrounc
Color
Flip: X Y
Draw Mode: Simple
Mask Interaction: None
Sprite Sort Point: Center
Material: Sprites-Default

Additional Settings
Sorting Layer: Background
Order in La

4. Game physics

In this section, you will learn about applying game physics. Select the coin and check the inspector panel. At the bottom of the inspector, click on the "**Add Component**" button.





Mask Interaction None

Sprite Sort Point Center

Material Sprites-Defaul

Additional Settings

Sorting Layer Default

Order in Layer 0

☑ Animator

Controller Coin

Avatar None (Avatar)

Apply Root Motion □

Update Mode Normal

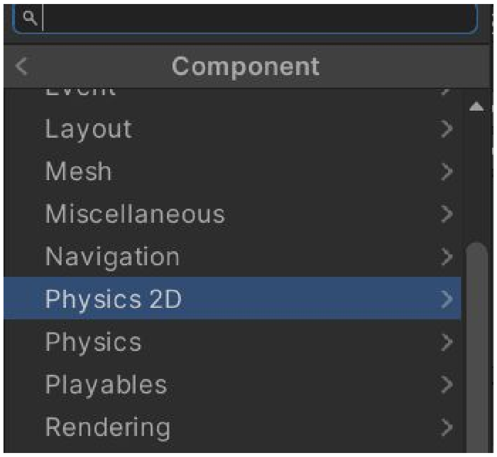
Culling Mode Always Animate

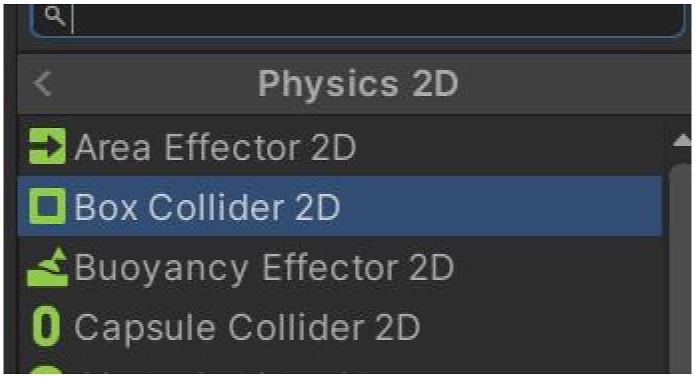
Animator is visible
Clip Count: 1
Curves Pos: 0 Quat: 0 Euler: 0 Scale: 0
Muscles: 0 Generic: 0 PPtr: 1
Curves Count: 1 Constant: 0 (0.0%)
Dense: 0 (0.0%) Stream: 1 (100.0%)

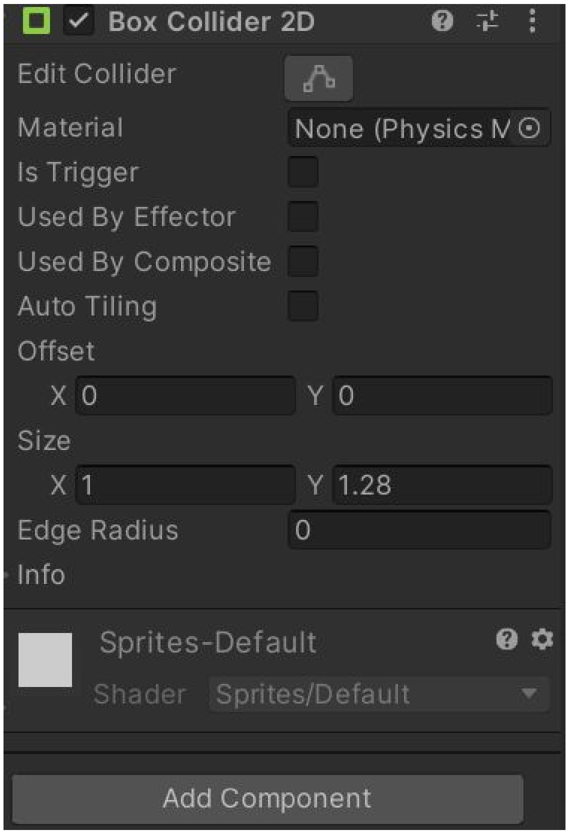
Sprites-Default

Shader Sprites/Default

There are many components you can add, you are going to click “Physics 2D”, and add “Box Collider 2D” to this coin. To check if you successfully added this component, you can see that there is a “Box Collider 2D” in your inspector (Refer picture 3).







☑ Box Collider 2D

Edit Collider

Material None (Physics M

Is Trigger □

Used By Effector □

Used By Composite □

Auto Tiling □

Offset

X 0 Y 0

Size

X 1 Y 1.28

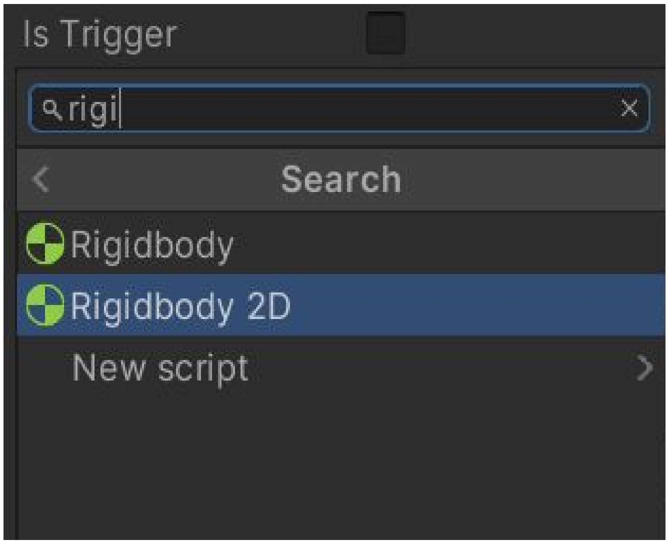
Edge Radius 0

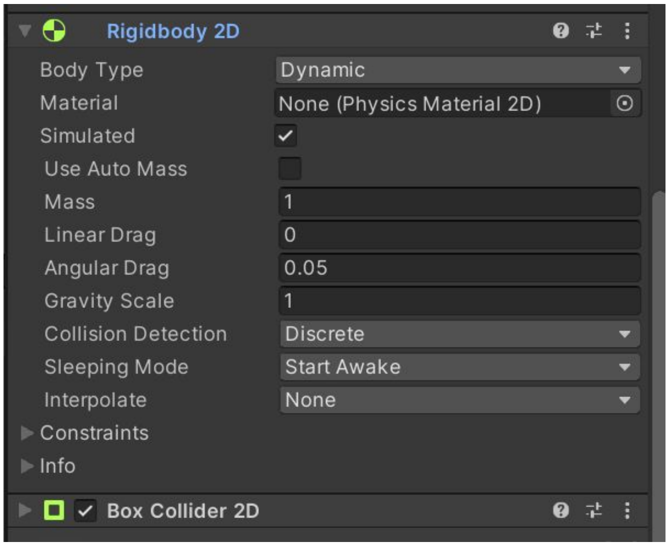
Info

Sprites-Default

Shader Sprites/Default

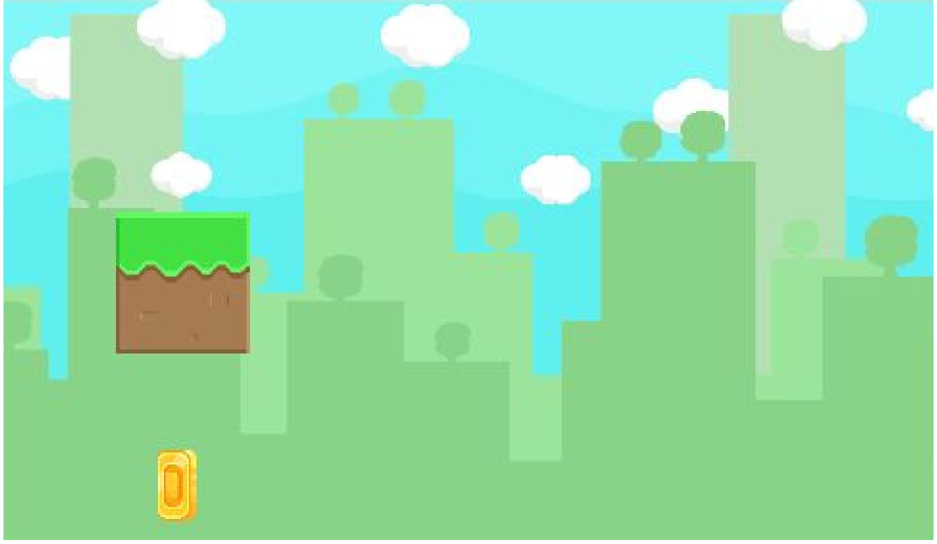
After that, you will add “Rigidbody 2D” to this one coin only, so you can see the difference between this coin and another coin which does not have this component. Same process as adding the Box Collider 2D previously, you will press “Add Component” button and search for “Rigidbody 2D” (Refer picture 1), To make sure you had applied this components, check in your inspector for existence for this the “Rigidbody 2D” row (Refer picture 2).



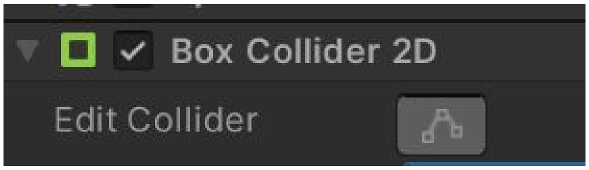


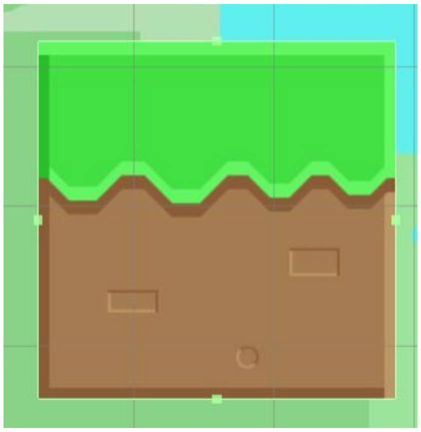
Body Type	Dynamic
Material	None (Physics Material 2D)
Simulated	✓
Use Auto Mass	□
Mass	1
Linear Drag	0
Angular Drag	0.05
Gravity Scale	1
Collision Detection	Discrete
Sleeping Mode	Start Awake
Interpolate	None

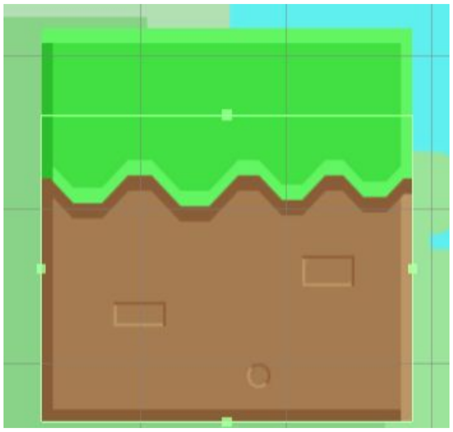
In this stage if you hit play, you will observed that the coin will pass through the block you placed and even pass through and being covered by the block while falling, this is because you will also need to add box collider 2D to the grass block and adjust the layer of the coin so it does not get covered by the box. Continue the steps below to solve the problem.



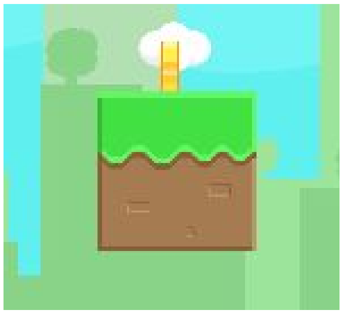
Apply “Box Collider 2D” to your tiles/grass blocks like previously, which is select the grass block and go to inspector and click “Add Component” button and add “Box Collider 2D. After adding, you will see a slim lime outline (Refer picture 2), this is the line of your box collider. Choose Edit Collider and move the top line slightly downward so that when your coin falls (Refer picture 3), it falls on the middle of the platform.







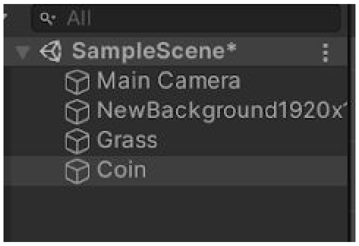
After applying the box collider 2D to our grass block and hit the play button, you will observe that the coin falls onto the grass box, but it is being covered. This is because the grass box and the coin are currently on the same sorting layer and they have the same order within the same layer. So the solution is to set the coin to have higher priority in the order of layer.

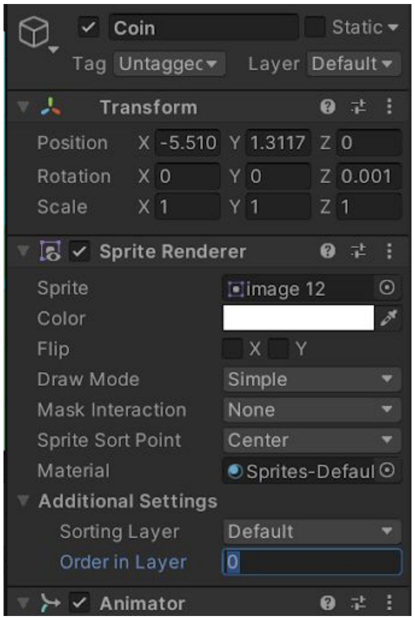


To do that, you will need to select the coin in the hierarchy panel and in the inspector, under sprite renderer, set the order in layer to higher value, if you set anything greater than 1 it will be higher priority than the other that have less value compared to it, so you can set it to 10. Now, if you hit play, the coin will fall on top of the grass block and not be covered.

[IMPORTANT NOTE]: You can also directly change the “Sorting Layer” to Foreground that you created in section 3.

Remember to apply your other tiles and coin to game physics such as Box Collider 2D or Edge collider 2D and so on





☑ Coin ☐ Static

Tag Untagged Layer Default

Transform

Position X -5.510 Y 1.3117 Z 0

Rotation X 0 Y 0 Z 0.001

Scale X 1 Y 1 Z 1

☑ Sprite Renderer

Sprite: image 12

Color

Flip ☐ X ☐ Y

Draw Mode: Simple

Mask Interaction: None

Sprite Sort Point: Center

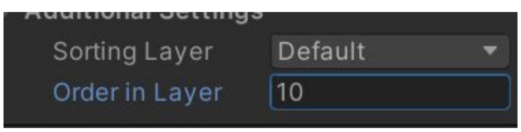
Material: Sprites-Defaul

Additional Settings

Sorting Layer: Default

Order in Layer: 0

☑ Animator

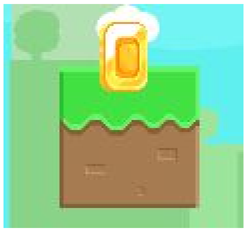


Additional Settings

Sorting Layer: Default

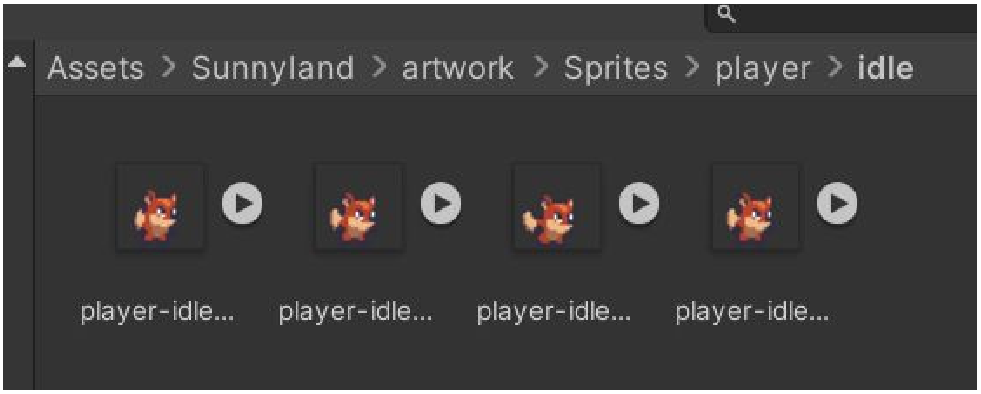
Order in Layer: 10

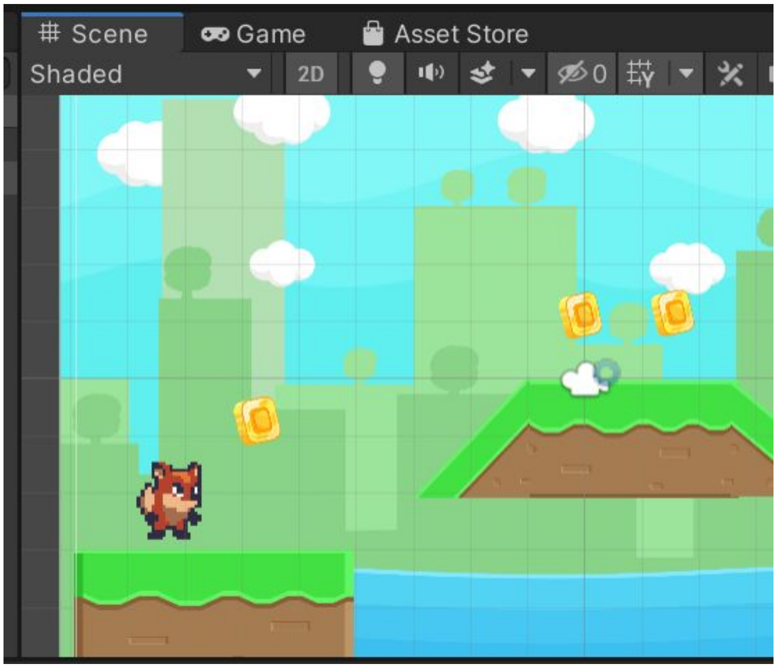
Outcome



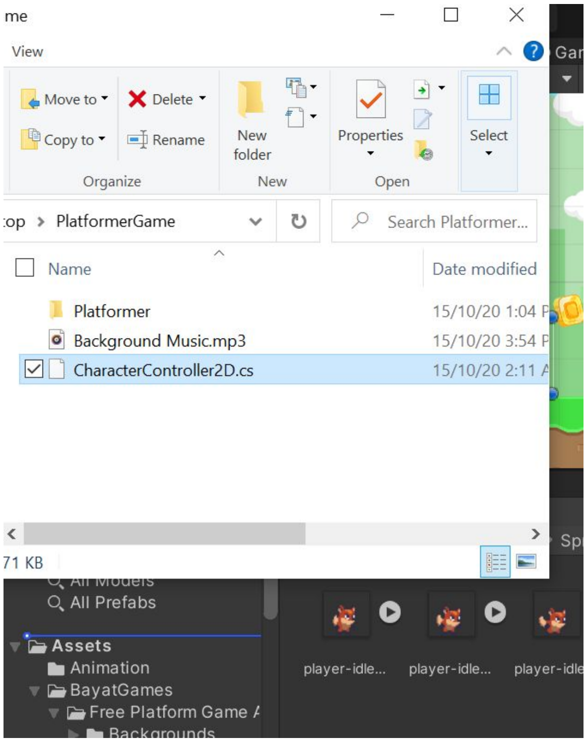
5. Character & scripts

In this section, you will learn how to apply scripts to the character. You will first need to add a character to your scene. Go to the following directories Assets -> Sunnyland -> artwork -> sprites -> plater -> idle. We will just select the first image, click and drag into our scene. When you first drag you will realise the character is too small so you can press F to focus and then enlarge the character to a size that you think is suitable.

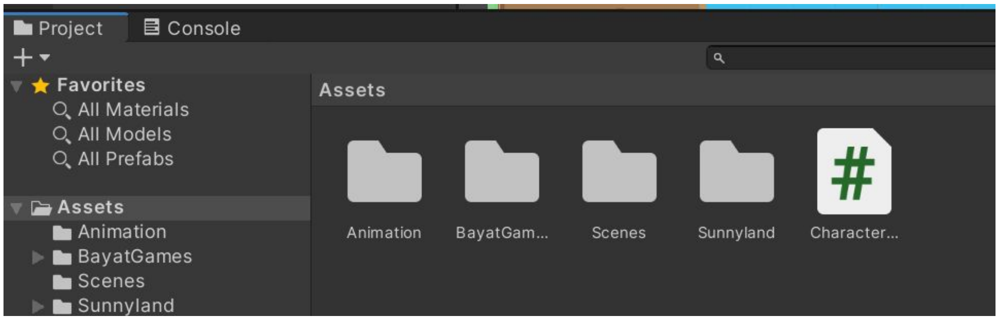




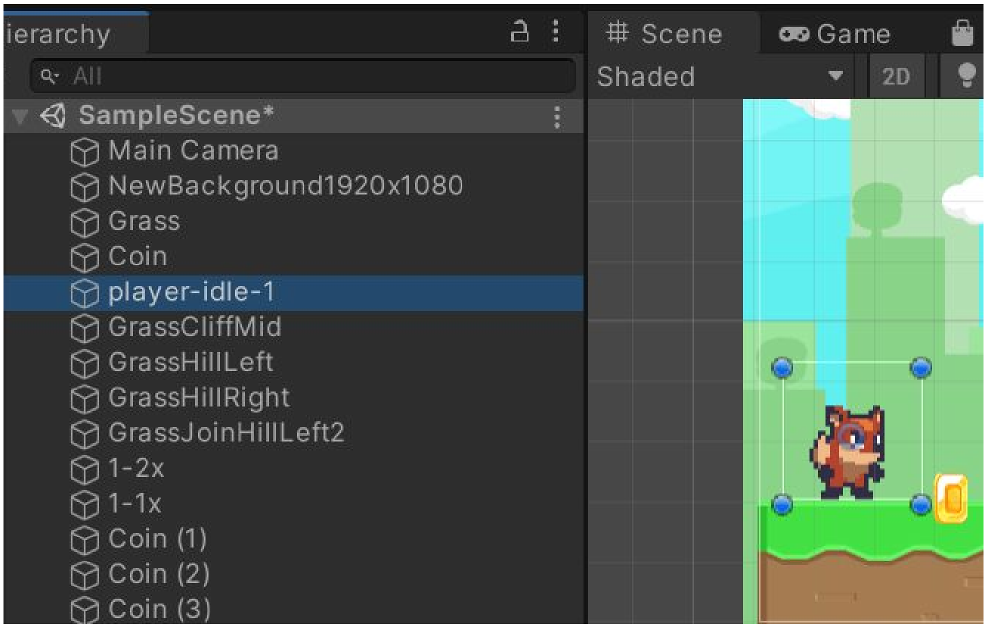
Then open the file that I sent to you, select the c# script named CharacterController2D.cs and drag it into the Assets into the unity. After that, you will see the scripts appear in your Assets folder (Refer picture 2).

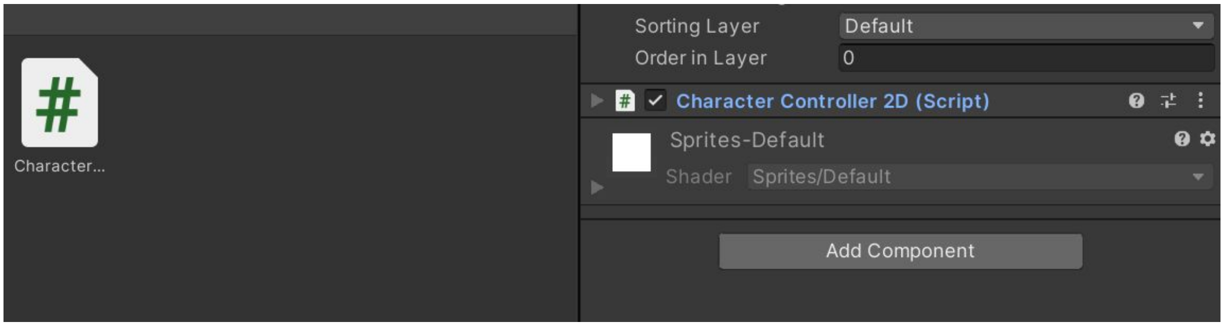


Name	Date modified
Platformer	15/10/20 1:04 P
Background Music.mp3	15/10/20 3:54 P
☑ CharacterController2D.cs	15/10/20 2:11 A



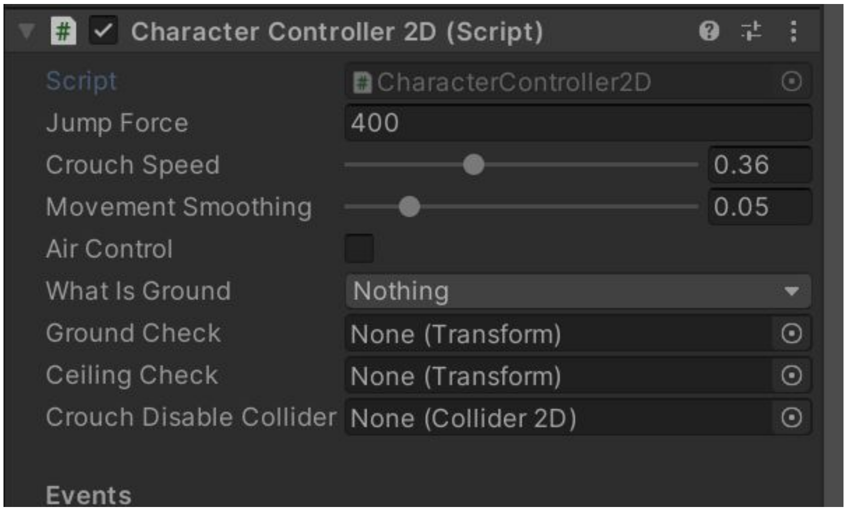
Select the character, by clicking player-idle-1 in the hierarchy. And in the inspector panel, click the script we added earlier, and drag it and move your cursor to the “Add Component” button in order to add the script in (Refer picture 2).





Sorting Layer: Default
Order in Layer: 0
Sprites-Default
Shader: Sprites/Default

Expand the character controller 2D we just added in and you can see that scripts specify how the character should behave. Let us do some tweaking here. You will first change the Jump Force t0 700, Tick the Air Control Box. Change the “Nothing” drop down to “Everything” (Refer picture 2). Picture 3 is how your Character Controller 2D should look like. In the Ground check and Ceiling Check option, you will have to define it by creating an empty object to determine the location, follow the next page to see how you can do that.



Character Controller 2D (Script)

Script: CharacterController2D

Jump Force: 400

Crouch Speed: 0.36

Movement Smoothing: 0.05

Air Control: □

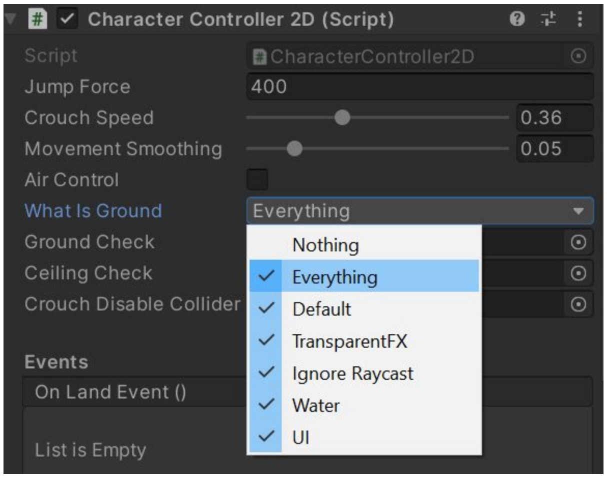
What Is Ground: Nothing

Ground Check: None (Transform)

Ceiling Check: None (Transform)

Crouch Disable Collider: None (Collider 2D)

Events



Character Controller 2D (Script)

Script: CharacterController2D

Jump Force: 400

Crouch Speed: 0.36

Movement Smoothing: 0.05

Air Control: □

What Is Ground: Everything

Ground Check

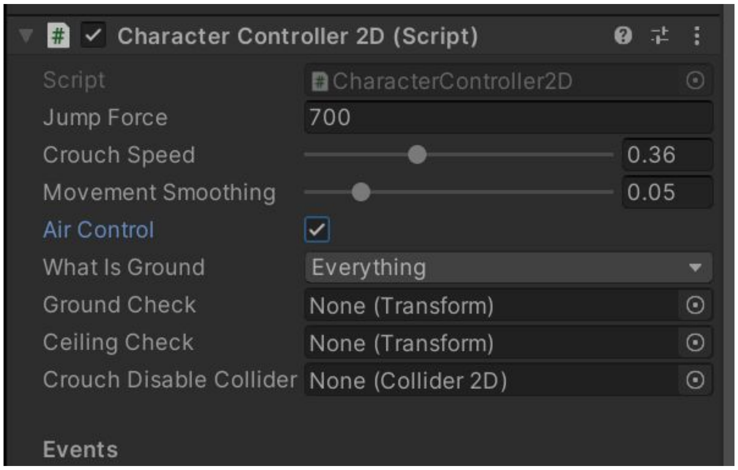
Ceiling Check

Crouch Disable Collider

Events

On Land Event ()

List is Empty



Character Controller 2D (Script)

Script: CharacterController2D

Jump Force: 700

Crouch Speed: 0.36

Movement Smoothing: 0.05

Air Control: ☑

What Is Ground: Everything

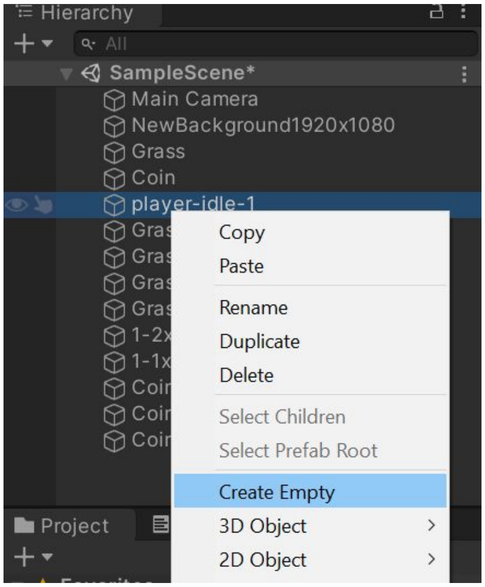
Ground Check: None (Transform)

Ceiling Check: None (Transform)

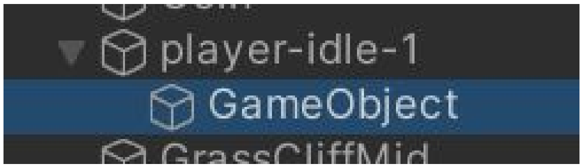
Crouch Disable Collider: None (Collider 2D)

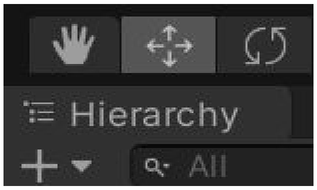
Events

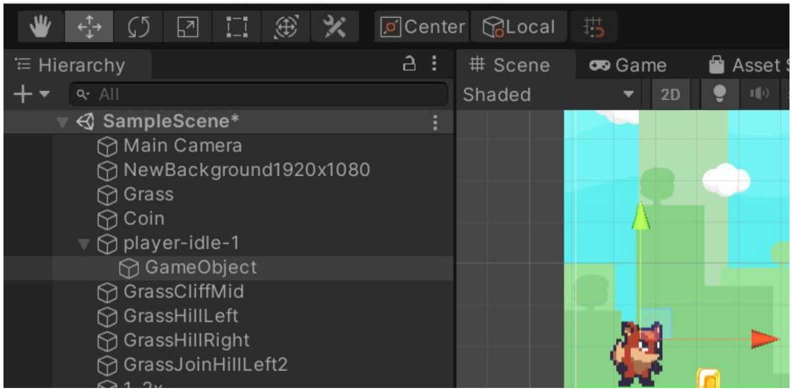
To create an empty object, go to the hierarchy panel, and then select the player and left click on your mouse, and select “Create Empty”.

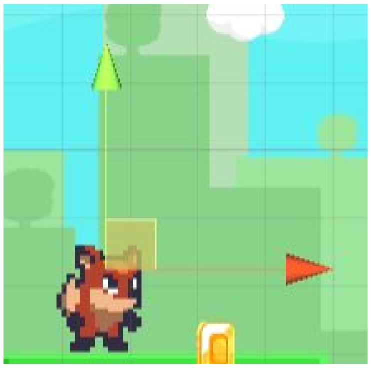


This will create a GameObject for you (Refer picture 1). First click the GameObject and then click the move button beside the hand (Refer picture 2). Next, you will see a green and red arrow appear on your character (Refer picture 3). Then you need to move this empty object using your mouse and move it a little bit above on the head of your character (Refer picture 4).



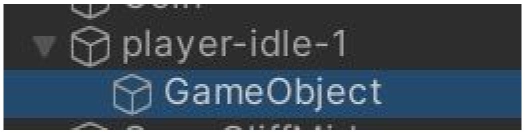




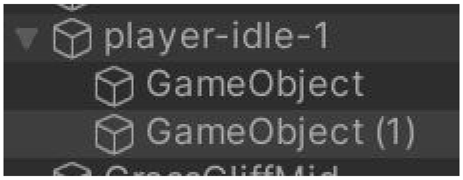


Then, you are going to duplicate this empty object by pressing ctrl+d.

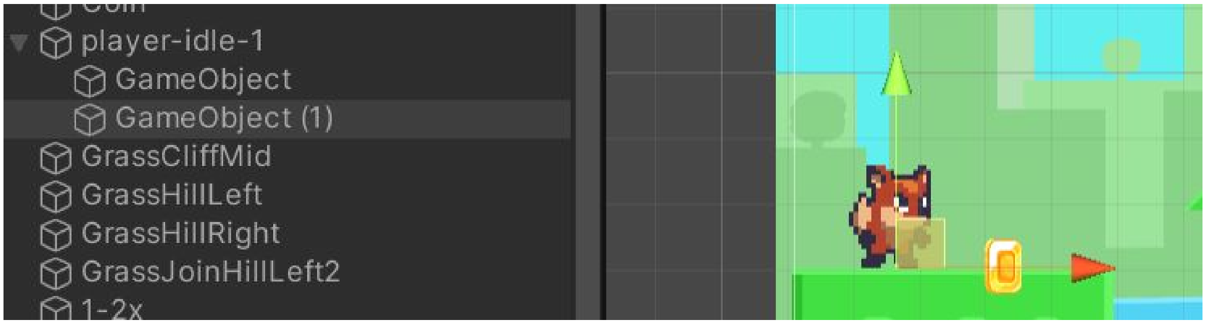
Click the Game object and then ctrl+d



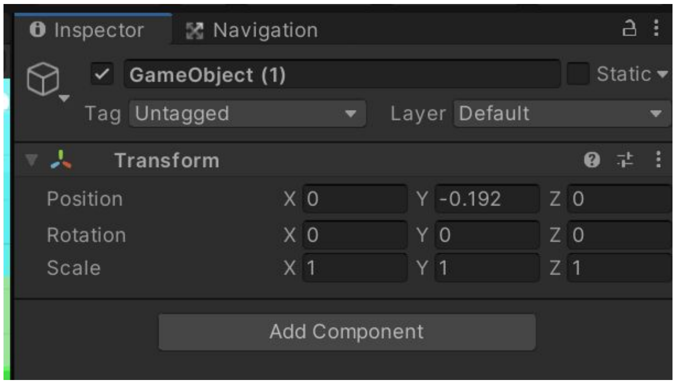
After ctrl+d



Then, you will click the GameObject (1) and move the arrow, this time you will move the arrow to the feet of the character.



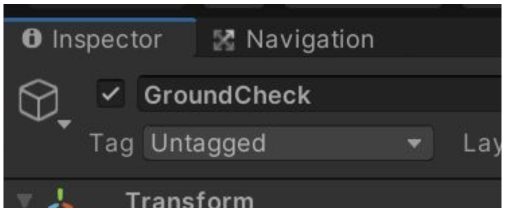
In the inspector, change the name of GameObject (1) to GroundCheck (Refer picture 1 and 2). And theGameObject to CeilingCheck (Refer picture 3 and 4).



☑ GameObject (1)

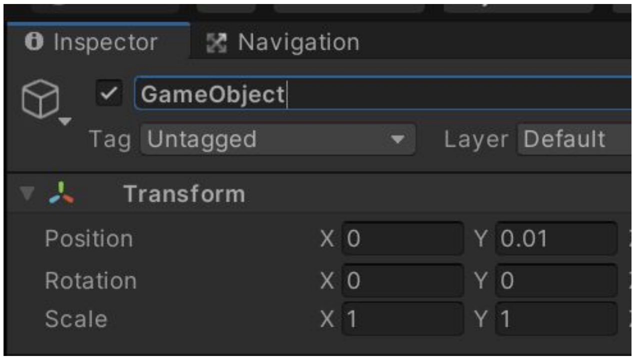
Tag Untagged   Layer Default

	X	Y	Z
Position	0	-0.192	0
Rotation	0	0	0
Scale	1	1	1

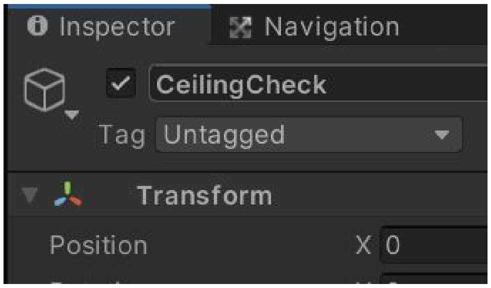


☑ GroundCheck

Tag Untagged

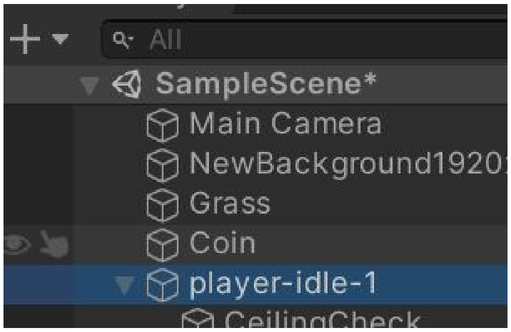


GameObject
Tag Untagged
Layer Default
Position X 0 Y 0.01
Rotation X 0 Y 0
Scale X 1 Y 1

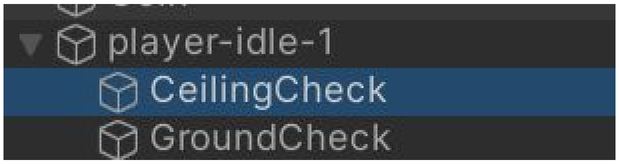


CeilingCheck
Tag Untagged
Position X 0

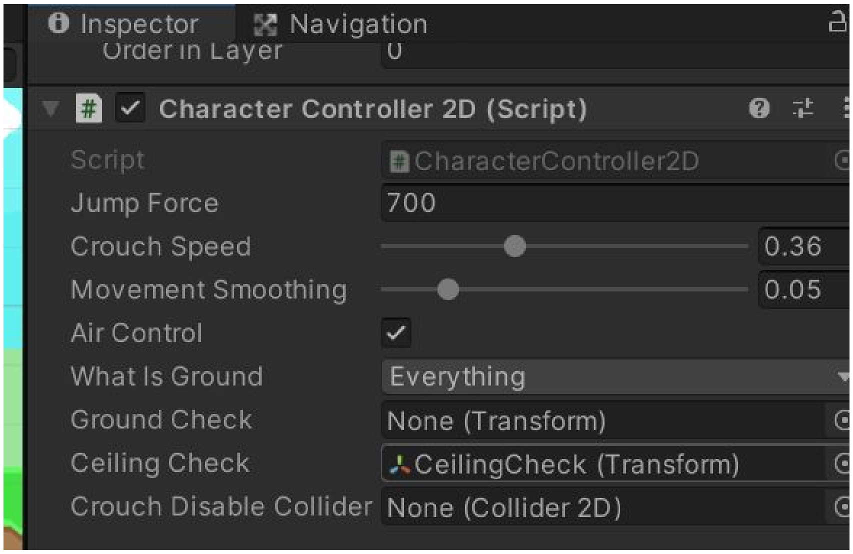
After you create the empty object, select the player again (Refer picture 1). Check the CharacterController2D in your inspector, You will need to drag the GroundCheck and CeilingCheck you just created into the field. To drag it simply just select the object and click with your mouse and drag it into the relevant field (Refer picture 2,3,4,5).



SampleScene*
Main Camera
NewBackground1920
Grass
Coin
player-idle-1
CeilingCheck



player-idle-1
CeilingCheck
GroundCheck



Order in Layer 0

Character Controller 2D (Script)

Script CharacterController2D

Jump Force 700

Crouch Speed 0.36

Movement Smoothing 0.05

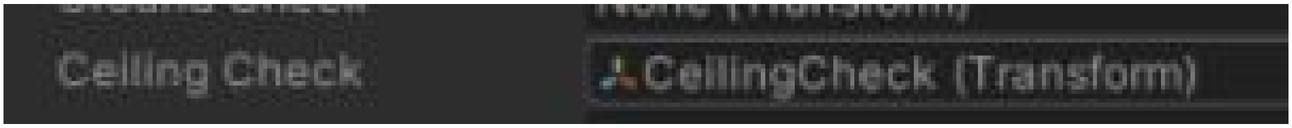
Air Control ✓

What Is Ground Everything

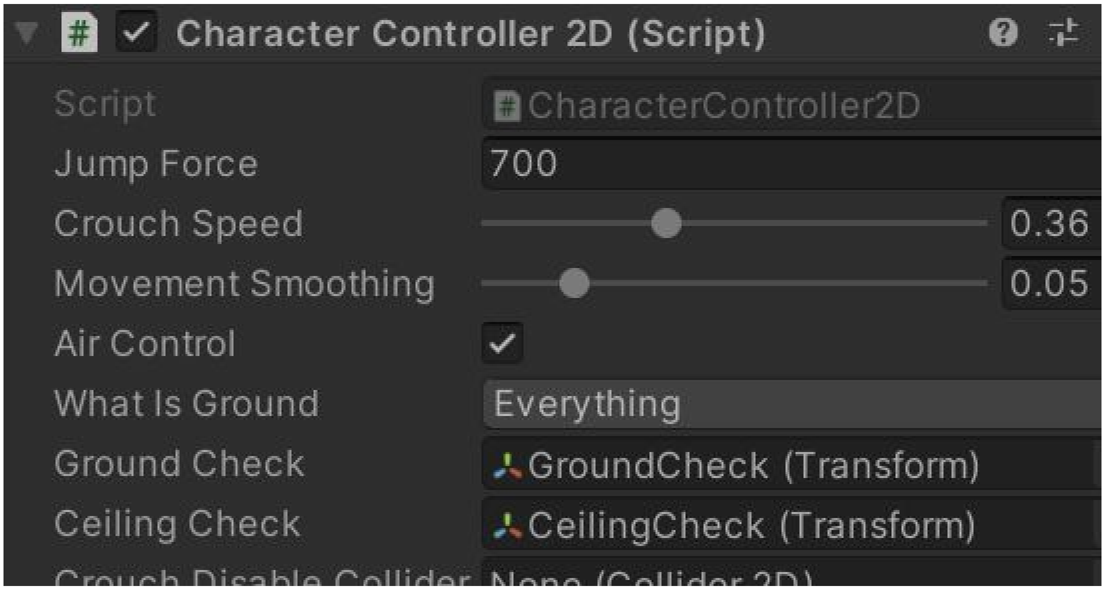
Ground Check None (Transform)

Ceiling Check CeilingCheck (Transform)

Crouch Disable Collider None (Collider 2D)



Ceiling Check CeilingCheck (Transform)



Character Controller 2D (Script)

Script CharacterController2D

Jump Force 700

Crouch Speed 0.36

Movement Smoothing 0.05

Air Control ✓

What Is Ground Everything

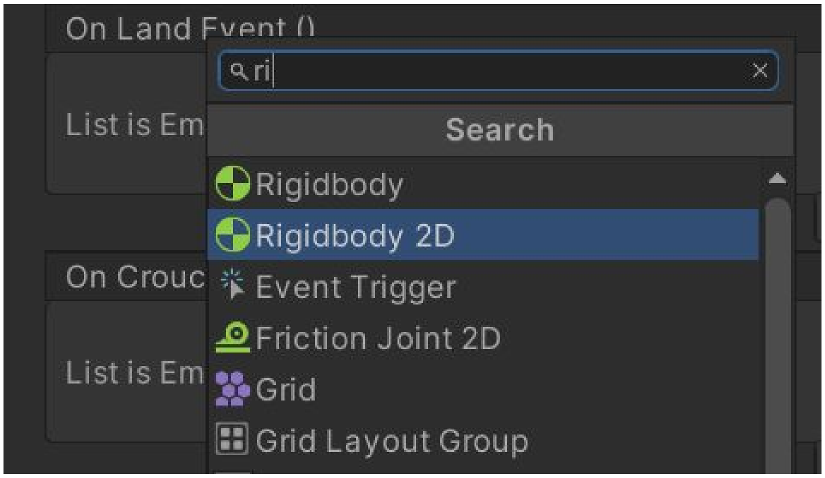
Ground Check GroundCheck (Transform)

Ceiling Check CeilingCheck (Transform)

Crouch Disable Collider None (Collider 2D)

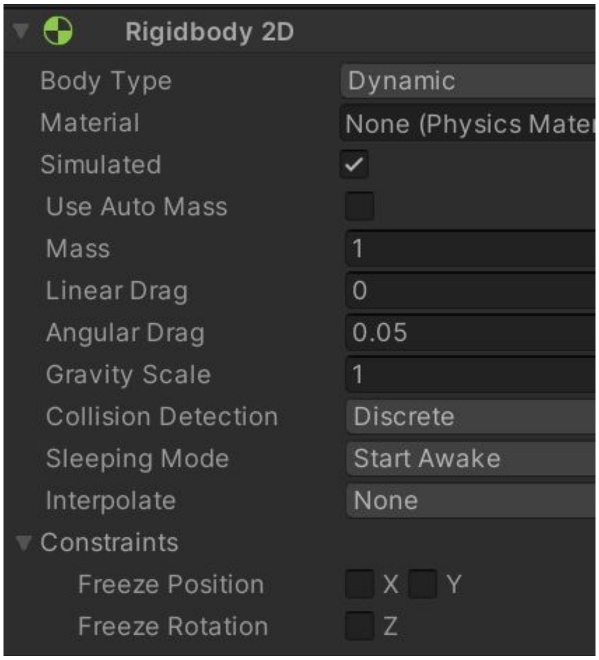
At this stage, you have done setting up your character controller, however, you still need to add components in order for the character to work. The first component will be “Rigidbody 2D”, because this will enable physics to our character.

Select the player and again in inspector, use the “Add Component” button, search for Rigidbody 2D and click on it. Then you will need to use Rigidbody



Once you expand, you will see that it contains many variables for you to tweak, in general, you would like your character to have much more gravity than the other object because it makes jumping and movement more nicer and snappy. So you will change it to 3, you can experiment around with the numbers and change to another value if you like. And then, you will like your character to be always facing upwards but not rotate around, so you will need to freeze the z index.

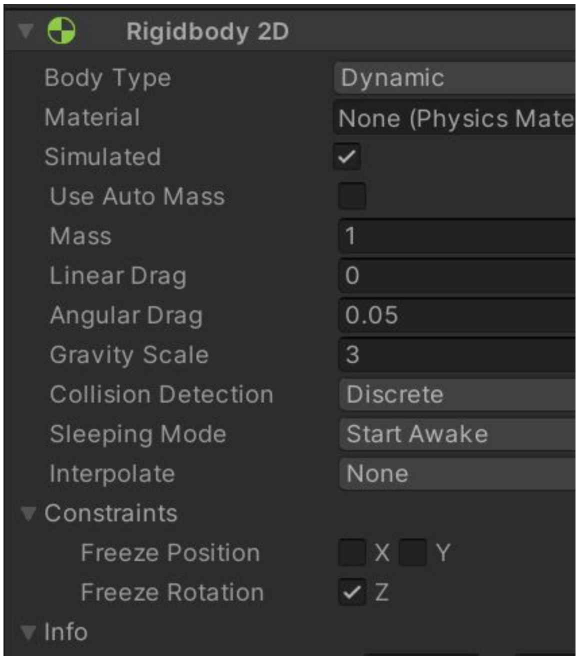
Before



Rigidbody 2D

Body Type	Dynamic
Material	None (Physics Mate
Simulated	☑
Use Auto Mass	□
Mass	1
Linear Drag	0
Angular Drag	0.05
Gravity Scale	1
Collision Detection	Discrete
Sleeping Mode	Start Awake
Interpolate	None
Constraints	
Freeze Position	□ X □ Y
Freeze Rotation	□ Z

After

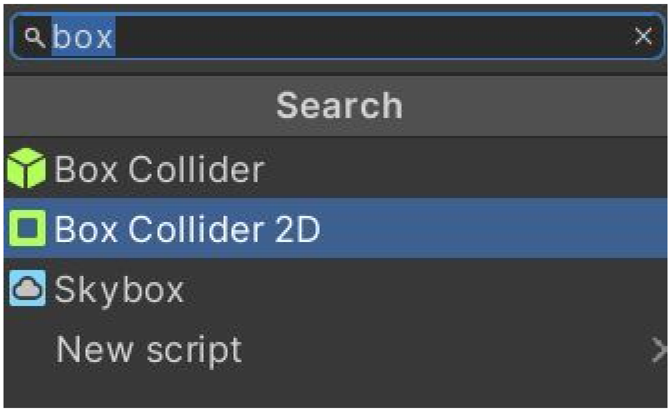


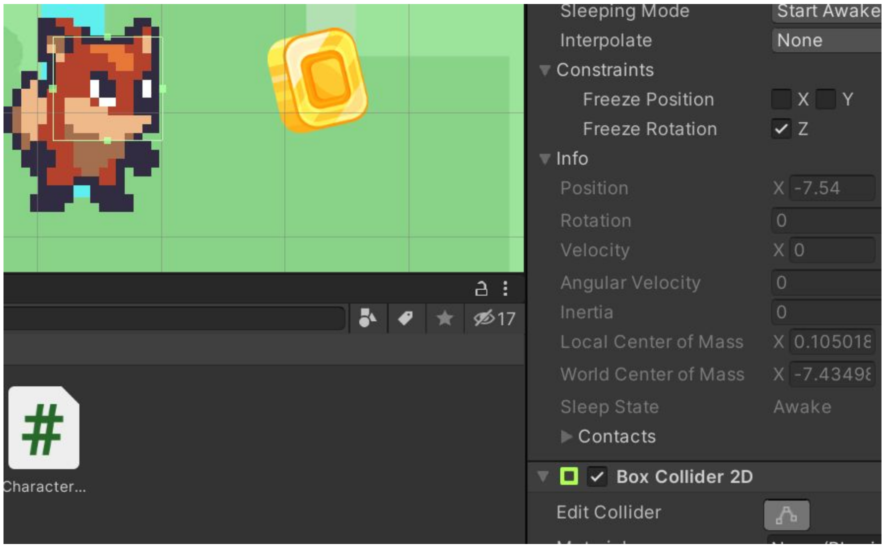
Rigidbody 2D

Body Type	Dynamic
Material	None (Physics Mate
Simulated	☑
Use Auto Mass	□
Mass	1
Linear Drag	0
Angular Drag	0.05
Gravity Scale	3
Collision Detection	Discrete
Sleeping Mode	Start Awake
Interpolate	None
Constraints	
Freeze Position	□ X □ Y
Freeze Rotation	☑ Z
Info	

Now if you place your character in the air and press play button, you will observe that the character will directly fall off the screen and will not stand on the tiles you created, this is because you haven define a Collider 2D for it.

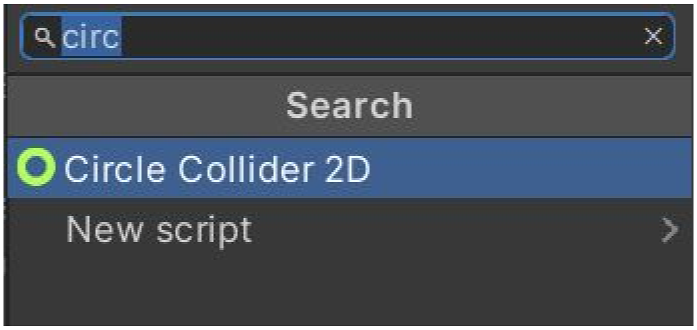
To do that, simply click the “Add Component” button again and look for Box Collider 2D. Use the edit collider button to move the collider to the character’s head (Reder picture 2).

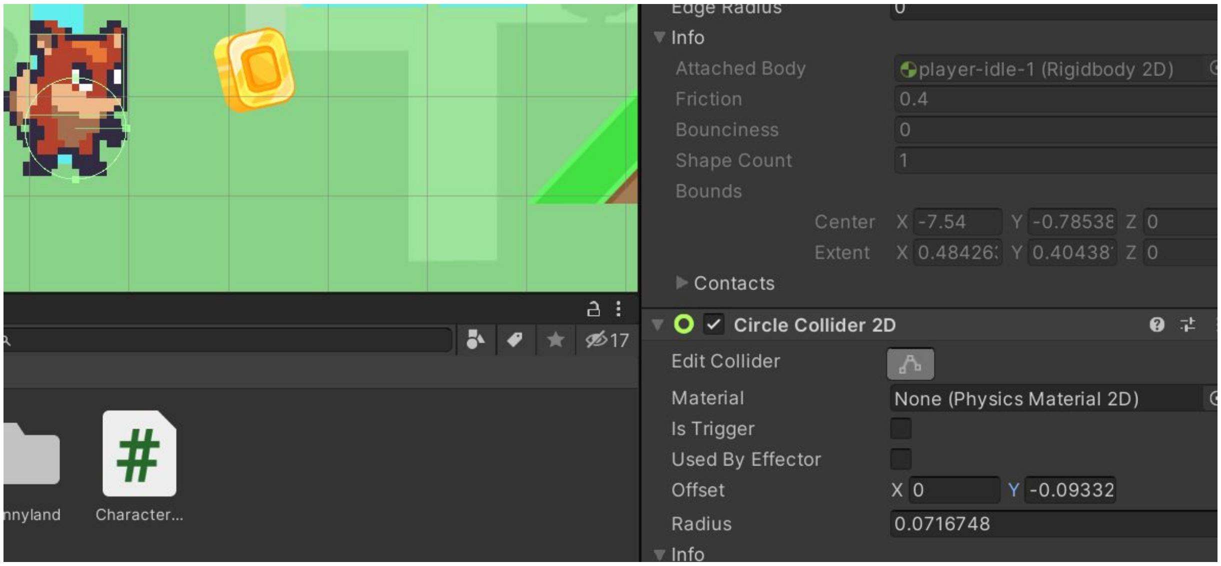




Sleeping Mode Start Awake
Interpolate None
Constraints
Freeze Position □ X □ Y
Freeze Rotation ☑ Z
Info
Position X -7.54
Rotation 0
Velocity X 0
Angular Velocity 0
Inertia 0
Local Center of Mass X 0.105018
World Center of Mass X -7.43498
Sleep State Awake
Contacts
☑ Box Collider 2D
Edit Collider

Now you will use a circle collider 2D to do the collider for the body of the character. Simply click the “Add Component” button again and look for Circle Collider 2D. Use the edit collider button to move the collider to the character’s body (Reder picture 2).





Edge Radius 0

▼ Info

Attached Body player-idle-1 (Rigidbody 2D)

Friction 0.4

Bounciness 0

Shape Count 1

Bounds

Center X -7.54 Y -0.78538 Z 0

Extent X 0.48426: Y 0.40438' Z 0

▶ Contacts

▼ ☑ Circle Collider 2D

Edit Collider

Material None (Physics Material 2D)

Is Trigger □

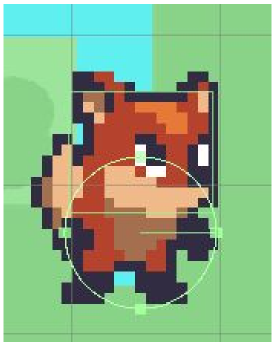
Used By Effector □

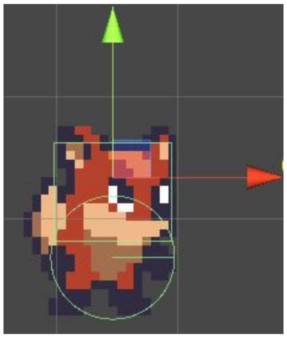
Offset X 0 Y -0.09332

Radius 0.0716748

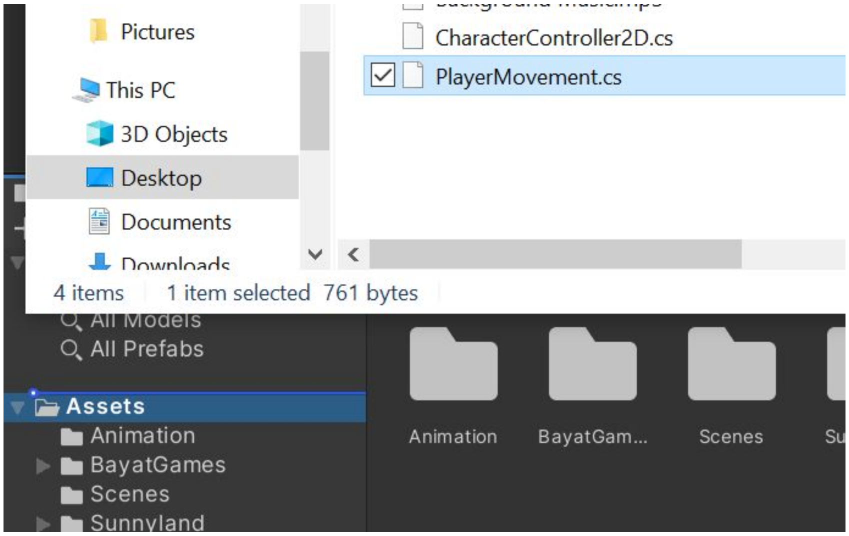
▼ Info

This is how your collider should look like after you have done the above steps,

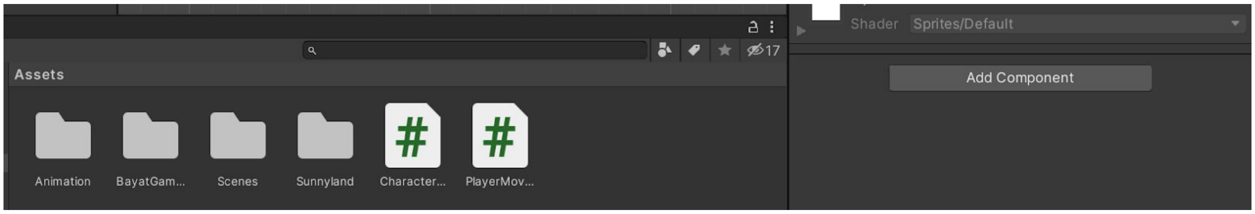


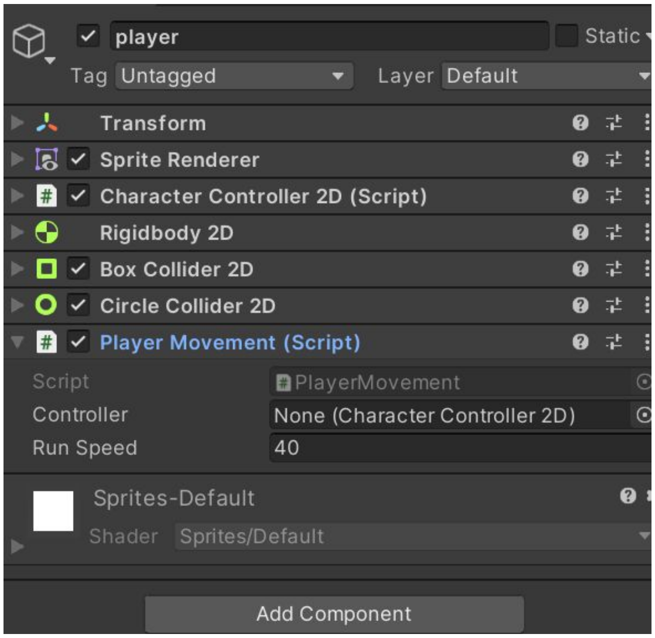


Now, you will again drag the script in the folder named PlayerMovement.cs into the Assets folder.



In your player inspector, drag the PlayerMovement.cs scripts you just imported into the Add Component. Then, the PlayerMovement script is imported (Refer picture 2).





☑ player

Tag Untagged

Layer Default

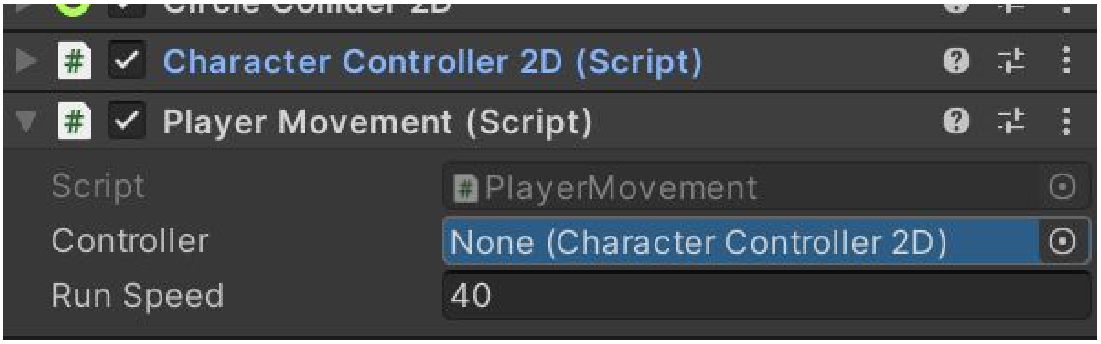
Script PlayerMovement

Controller None (Character Controller 2D)

Run Speed 40

Shader Sprites/Default

In order to make your users control the character, you need to have a reference to the game controller. This part is important where you need to **drag the Character Controller 2D into the “Controller” section into the bar in Payer Movement.**



Circle Collider 2D

Character Controller 2D (Script)

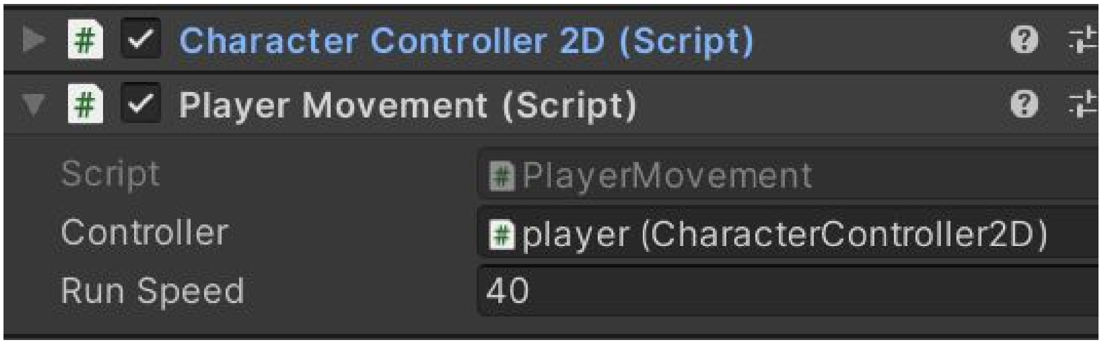
Player Movement (Script)

Script PlayerMovement

Controller None (Character Controller 2D)

Run Speed 40

After dragging:



Character Controller 2D (Script)

Player Movement (Script)

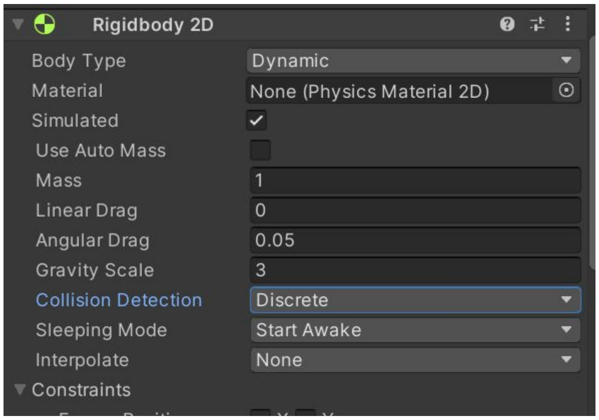
Script PlayerMovement

Controller player (CharacterController2D)

Run Speed 40

Now after you click the play button, everything should work, your character will be able to jump and move left right.

One more thing to make it more smooth is to change the players’ “Collision Detection” from Rigidbody 2D to Continuous instead of Discrete.



Rigidbody 2D

Body Type Dynamic

Material None (Physics Material 2D)

Simulated ✓

Use Auto Mass □

Mass 1

Linear Drag 0

Angular Drag 0.05

Gravity Scale 3

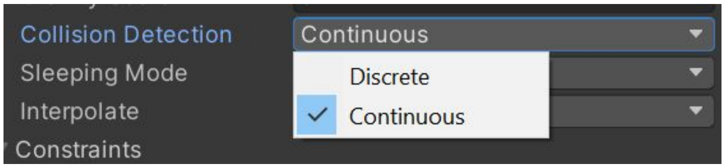
Collision Detection Discrete

Sleeping Mode Start Awake

Interpolate None

Constraints

After Change:



Collision Detection Continuous

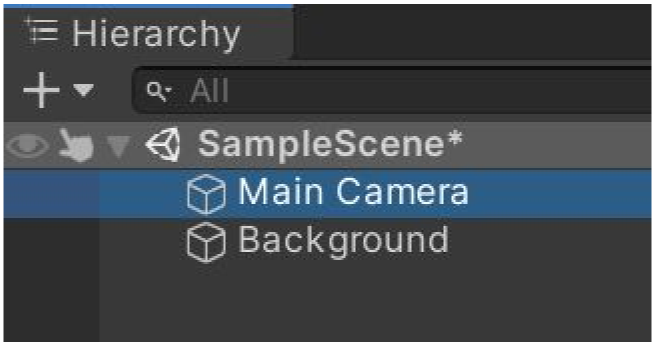
Sleeping Mode

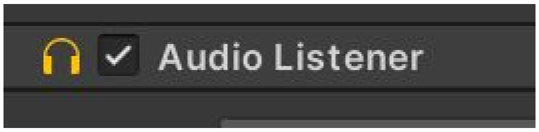
Interpolate

Constraints

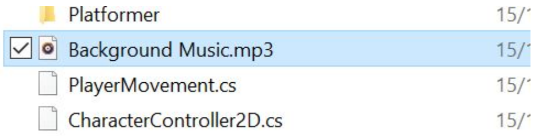
6. Audio

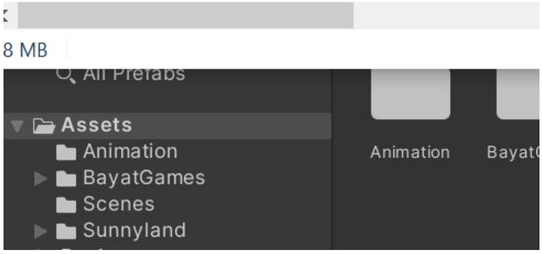
In this section, you can use any background music that you like, but I will stick to using the music that I sent to you. In our right panel, in the hierarchy, on click the Main Camera, you can see that on the left hand side in the Inspector, you shall see the audio listener is there and ticked by default, If it is not you will need to click “Add Component” and add it in manually.

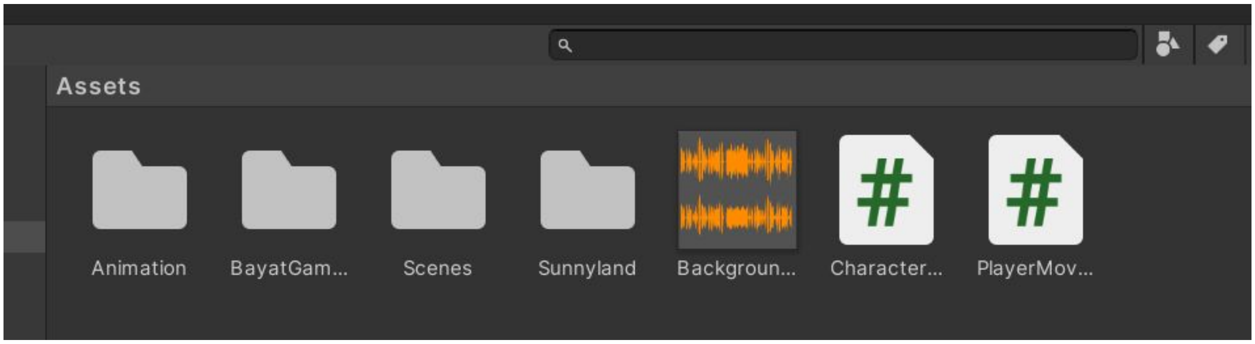




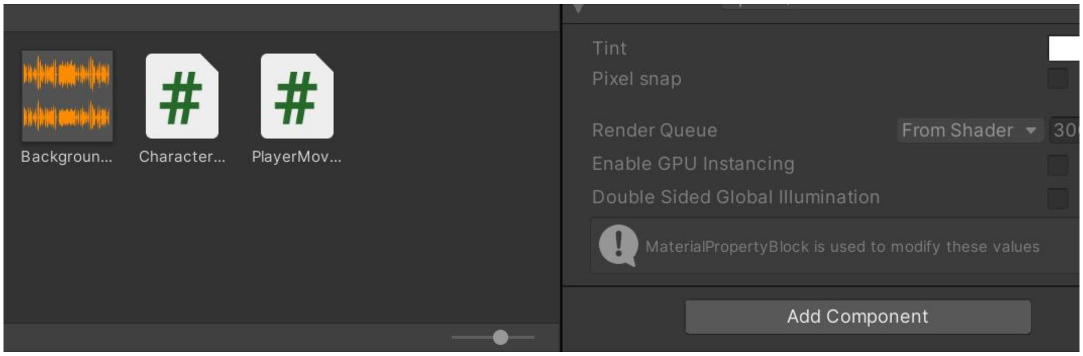
We will first import the mp3 file. We will drag it into the Assets folder, just like how we drag our scripts folder previously.


Platformer 15/
☑ Background Music.mp3 15/
PlayerMovement.cs 15/
CharacterController2D.cs 15/

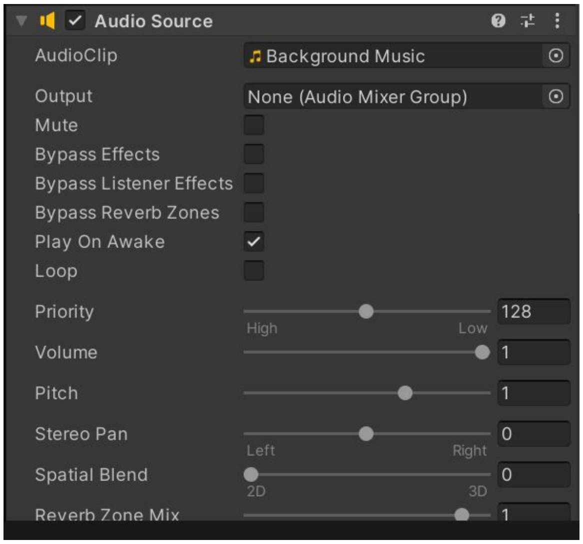




The next thing you need is an Audio source. Select player, and drag the Background music we imported to the inspector on the “Add Component” Button.



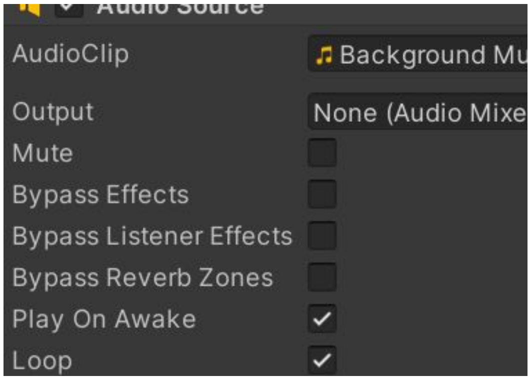
Unity will automatically detect that it is an audio file and you will be having this audio source component added in with a lot of properties that you can manipulate your audio.



Audio Source

AudioClip: Background Music
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

There are two important parts here which is make sure you need to tick the “Play on Awake” and “Loop”. The others like volume, pitch and other properties, you can simply experiment with it and select the one you like.



Audio Source

AudioClip: Background Mu
Output: None (Audio Mixe
Mute: □
Bypass Effects: □
Bypass Listener Effects: □
Bypass Reverb Zones: □
Play On Awake: ☑
Loop: ☑