

Building a Scene – Part I

Hello all.

Welcome back to the advanced course on game development with Unity. In this video we are going to talk about a few fundamentals that we must know before we proceed further. In the last video, we were able to create a project folder called 'Life On Land' and understood the basics of Unity editor's layout. The goal of our project is to reimagine and redesign our world to restore it to its original health. In the end, our player character named Eeshan will help us collect the five basic elements of nature - earth, wind, water, fire and space within a stipulated time to avoid stalling the process of rebuilding the Earth.

Before we can turn this amazing game idea into reality, we would have to learn about the fundamentals of game design using the Unity Editor. At this moment, it is important for us to know how professional game developers create game objects for their game. So, let's understand how to create an object and set their properties too. Before we begin, we must make sure our Unity project is properly opened and the editor is running.

As you can see on the screen now, we have our scene view at the center. The scene view as discussed earlier would help design our game world. When professional video game developers create video games, they start by creating mock-ups of the game world using basic 3D shapes like cube, sphere, prism, cylinders. This process is called "Blocking". It is an essential part of creating a video game prototype and is very similar to what you see on the screen right now. Inside Unity, we have few basic 3D shapes which we will be using to make a sample scene. Before that, let us understand what the word three-dimension means. If you have been looking around in the Unity editor for a while, you would have surely noticed the icon that is on the top right corner of the scene view. This is called a scene orientation Gizmo. Let us hold the right mouse button down and as we move our cursor over the scene view, we see that the scene gizmo starts rotating. Let's rotate the view so that the blue coloured end marked as Z, disappears and, the red coloured end marked as X, points to the right as shown.

3-dimension as the name suggests, is made up of 3 axis. The direction of the scene you are looking at right now, is called the Z-axis or the depth axis. The red end of the gizmo icon, that is towards the right of your scene view is called the X axis. And the green end, which points upward is the Y axis. A 3D space like our scene is made up of 3 different axis.

Now, to demonstrate the use of these axis, let us move to our hierarchy. Place your cursor over the blank space of the hierarchy, right click and scroll down to 3DObject in the sub-menu and then click on Cube. This will create a 3D cube at the center of our view. Select this cube. Now to the right of our Unity Editor you will find the Inspector window, on top of which you will see a text field with Cube written in it. Left click on the text box and name it 'Earth'. Press the enter key on your keyboard to change the name of the GameObject cube to Earth. You will see that the change gets reflected in our hierarchy.

On the top left corner of our Unity editor, we have the Tools panel. This panel offers a number of tools like the hand tool, move tool, Rotate Tool, Scale Tool, Rect Tool and the Transform tool. While our Gameobject named Earth is selected in our hierarchy, we would select the scale tool. Look around a bit in our scene view, our 3d object is having a similar gizmo representing the 3 separate 3D axis. Let us zoom out of our scene view, by scrolling our mouse wheel backwards. We see that if you move your mouse over the axis, they get highlighted. Select the red handle and extend it to increase the size of the cube along the x axis. Now select and expand the z axis in the same way. Are we making a ground floor already?

Now, in the same way we made a block of our earth, we would right click again in the blank space of the hierarchy, to create a cylinder this time. Let us change the name of this cylinder to "Tree". While our tree gameobject is selected, let us use the move tool from our tools menu. The Gizmo on our Cylinder changes to arrows along the three axes. Move your mouse on top of each handle. Select the Green arrow by holding the left mouse button and move your mouse upwards or downwards to lift the cylinder up or down. Use the Red arrow to move the tree left or right. Use the blue arrow to move it inside or outside. So, you can see that we have successfully made a block of our earth's ground and also blocked a tree.

Let us add colours to our 3D gameobjects. To do this, let us focus our attention to the project Window. On the left of the project window, we have an explorer. Click on Assets first. Right click on the blank area and go to the very top of the menu and create “Folder”. Let us keep the name of this folder as “Colours”. It is always a good practice to group files by creating folders. And, we must always follow it whenever we are making games in Unity. Now, double click to open the folder you just created. And, right click on Create and find the Material menu item. Type a name for this material file. Let us change the name of this material to “Green”. Press enter to apply the name. On selecting this material, we just created, we would see our Inspector changing to the material editor. Materials react to light, and help exhibit several characteristics like the sheen and roughness of the object. We can change the colour of this material in the Inspector window. You can now see a small white rectangle popping up on the colour window. On the outer circle click on the green area. And on the inner square click on the greenest part of the box. The small box on the top displays the output colour and existing colour on the right. The outer circle sets the primary colour. We are using the inner square to set the intensity of a colour. Our material is green now.

Let us create another material and call it “Ground”. Let us set a colour like we see on the screen now. Take your time to make the material. Feel free to pause the video at this moment and try doing it on your own. You can also replay the previous step of creating the tree material if you stumble. As soon as you finish creating the material for our ground, we would go back to our projects folder. Now select and drag the tree green material on top of the tree that we have blocked in our scene. Then, drag and drop the Ground material on top of the Earth GameObject within our scene view. We can see that we have been successful in creating an object & colouring it accordingly. The professional 3D game designers always create their own objects to use in their games. Do you now realise why this was very important for us to learn?

We will now, be learning a very important concept of Unity called the “prefabs”, or, pre-fabricated objects. Prefabs are files that are stored in our Asset folder, which can be reused multiple times to design a game world. To understand prefabs, let us create one. Inside the projects window under the sub folder called assets, create another Folder. Name this folder as “TreeBlockPrefabs” and Press

the enter key to apply the name. Double click to open this folder, which is blank right now. Select and drag the tree gameobject from our hierarchy window by holding the left mouse button down and dropping it in the blank area of our folder. We will see a new file added. In the hierarchy window, a small arrow besides the gameobject would appear, which means, this gameobject is saved as a prefab and we can reuse it. We will try to repeat this process backwards. Left click and hold the tree prefab from your project window, and place it on top of our Earth. Repeat this a few times until it looks similar to what you see on the screen. This should look like we idealistically planted our trees.

Next, let us learn to use the “rotate” tool. In our scene view, select a tree gameobject randomly. From the tools panel, let us select the rotate tool. You would see three circles along the three axis this time. Select and hold the red circle with your left mouse button. While holding the left mouse button down, drag along this circle to rotate your tree about the x axis. Select and hold the green circle and drag your mouse along the green circle to rotate the tree about the y axis. Similarly, you can rotate the tree about the z axis by holding and dragging your mouse along the blue circle. You can repeat these steps for all of your trees in the scene. I would be selecting a few trees randomly and would make them lean towards the ground with the help of the rotate tool.

Isn't it nice to see that we have successfully created our first scene that imitates trees on the earth?

In this video we learned the basics of game world creation. We learned how to use the move, rotate and scale tools. We learned to create the prefabs and to reuse them to create our game world!

We are slowly learning the different processes of creating a game world, and this would later help us to work on our own video games. In the next video we would be creating a game world with real life objects. And this time, our game world is going to look real!

So bye for now. See you soon!