

# Unity Tutorial 1

## CSC 3150/9010 - Game Development

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### 1 Starting your project

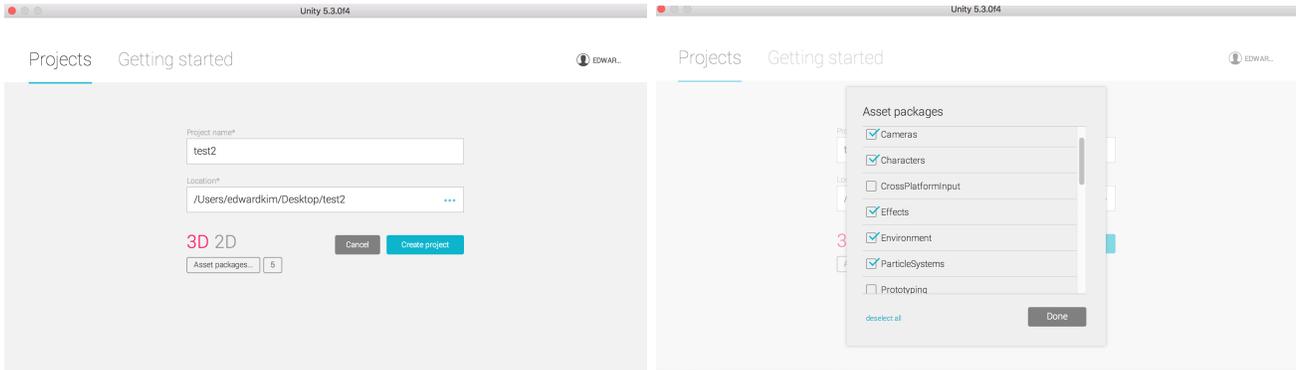


Figure 1: Start screen and asset packages selected.

The Unity Editor comprises of five main areas:

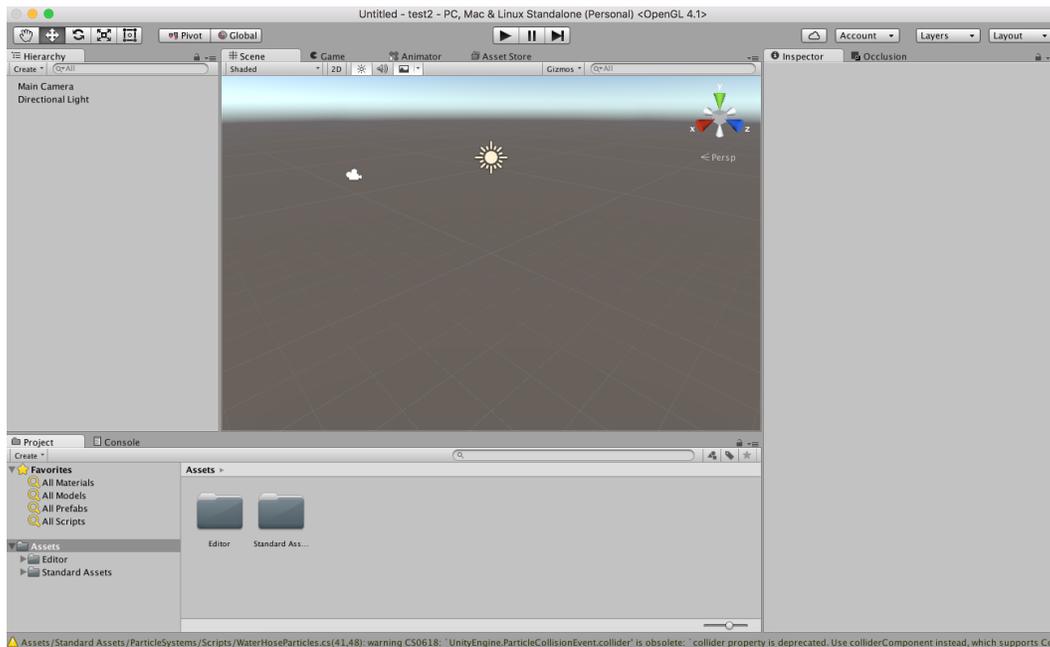


Figure 2: Start screen.

1. **Scene View**: This shows a view of your 3d world. In Unity, the 3d world is called a “scene”.
2. **Hierarchy View**: This shows a list of all the objects in your scene. In Unity, objects are called “game objects”

3. **Inspector View:** This shows detailed information about the currently selected game object.
4. **Project View:** This shows all the resources that your project can make use of. This ranges from source code to 3d objects, images, sounds, fonts, and other files.
5. **Toolbar:** Various other buttons to interact with your project.

## 2 Moving around your scene

First off, you need to be familiar with the controls.

Move your mouse cursor to the Scene View. Hold the **middle mouse button** and move the mouse. This will move the camera. Moving the camera is also known as “panning” the camera.

**Hold Alt and the left mouse button**, then move the mouse. This rotates the camera.

To zoom in and out, you have two options: **use the mouse wheel**, or **hold Alt and the right mouse button** then move the mouse. Practice using these controls until you get comfortable with them.

## 3 Focusing On An Object

In your Hierarchy View, find the object named Simple Cylinder and click on it. Now move your mouse cursor to the Scene View. Press **F on your keyboard**. This will center the camera on the selected object.

While that object is centered, rotating the camera will rotate around that object. Once you pan the camera though, the object won't be centered anymore.

## 4 Moving Around Flythrough Style

An alternative way to navigate the Scene is to use **WASD** style movement. Move your mouse cursor to the Scene View. Hold the **right mouse button**. Use the W and S to move forward and backward. Use A and D to move left and right. Use Q and E to move up and down. Moving the mouse while the right mouse button is held will rotate the camera.

## 5 Introduction To Game Objects

In Unity, **everything you see in the 3d world is a game object**. This includes the player, enemies, floors, walls, lights, and even the buttons of your game. The place where you put game objects is called a scene. You can have multiple scenes in your game, for example, one to hold the main menu, and several others for the levels or stages of your game.

## 6 Creating Game Objects

In the top menu, choose **GameObject > Create Other > Cube**. This will create a default cube at the center of your vision in the Scene View. You'll also find in that menu other default objects that you can create, but we'll concentrate on the cube for now.

## 7 Moving Game Objects

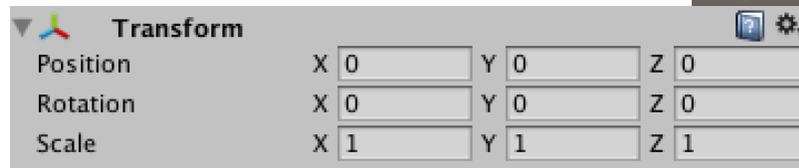
Click on your created cube in the Scene View. Center on it with **F**. You'll see three colored arrows on your cube.



If not, press **W** on your keyboard, or click on the **Move Tool** in the upper-left of the screen.

The three arrows are handles to let you move the cube. The red arrow lets you move the cube left and right. The green arrow lets you move the cube up and down. And the blue arrow lets you move the cube forward and backward.

Simply drag these arrows to move your cube back-and-forth in that



direction.

To move the cube freely in any direction, drag from the white box located at the center of these three arrows.

When you move your game object, look at the Inspector View. You'll see there the numerical values that denote the x, y, and z position of the game object. Those are text boxes, so you can type the exact value you want. You can also cut/copy/paste them.

## 8 Rotating Game Objects

Rotating game objects work the same. Click on your cube to ensure the Scene View can accept keyboard commands, then press **E**. You can also just click on the Rotate Tool in the toolbar.

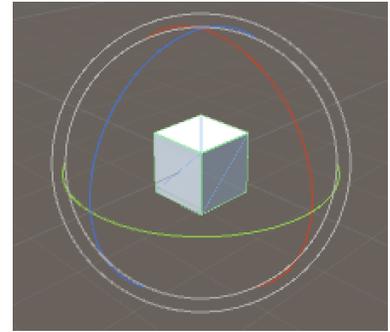
You'll see the three arrows change to three arcs of the same colors. The idea is the same: the three arcs let you rotate the game object in the three axes, x, y, and z. The white outer circle lets you rotate the game object based on the view. Try it out and see.



You'll find the Inspector also lists out the rotation values of your game object. This is in Euler angles. Same as before, you can type exact values or drag the labels to edit them.

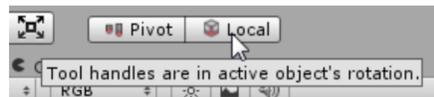
## 9 Scaling Game Objects

Lastly, you can scale game objects to do resizing, enlarging, squashing, flattening and the like. Illustration 7: The Scale Tool selected. Scaling uses three arrows ending with cubes instead of arrowheads. Use the Scale Tool button, or press R on your keyboard to activate the Scale Tool. Like before, simply drag back and forth to resize in that direction. Drag the white cube at the center to resize proportionally in all dimensions.

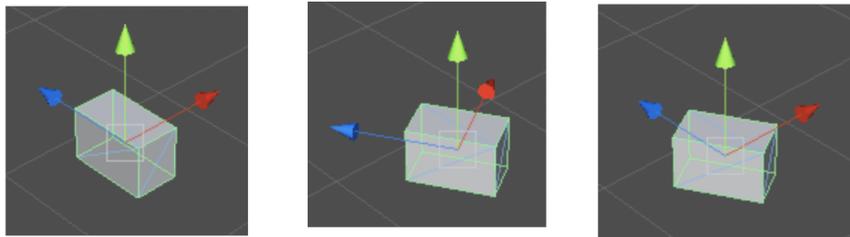


## 10 World Space and Local Space

Now that you know how to rotate, you need to learn something about spaces. When you rotate an object, you are changing where its facing. You could say its “forward” direction is now changed to where you have pointed it. So, for example, let’s say you rotated a game object 45 degrees in the y-axis, its now pointing diagonally. If you want that object to move forward with respect to where its facing now, you are said to be moving it in its local space, or local axis. If you want to do such a thing, make sure you set Unity to work in local space. You can do this by clicking on the corresponding button in the upper left area of the Unity GUI: This will



This will toggle between Global and Local. You can also do this by pressing X on your keyboard.



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## 11 Snapping

You can make movement, rotation, or scaling done in precise increments by holding Ctrl while moving/rotating/scaling. Selecting Multiple Game Objects Hold Shift or Ctrl when selecting a new game object in the Scene View to add it to your selection. You can then move/rotate/scale them simultaneously. In the Hierarchy View, hold Ctrl and click a game object’s name to selectively add or remove it from your selection. Hold Shift, and click a game object’s name to select multiple game objects at once.

## 12 Renaming Game Objects

There are two ways to change the names of your Game Objects. Renaming From Hierarchy Click on the game object's name in the Hierarchy then press F2 (on Windows), or Enter (on Mac), to be able to change the name. Press Enter to confirm.

## 13 Introduction To Unity Components

In Unity, you can give your game objects any kind of properties. These properties are called components. **Components are the things that define what a game object is: what it has, and how it behaves.**

You've already encountered one of them: the "transform" component. This transform component defines the position, rotation, and scale of a game object. If you select a game object, the **Inspector view will show all the components the selected game object has.**

To display a 3d shape, your game object also needs other components. To define its shape to the physics engine, it also needs another different type of component. "Box Collider" specifies its shape (as a box) to the physics engine.

## 14 Interacting With The Physics: The Rigidbody Component

Locate the game object called "Simple Cylinder". Select it. Focus on it by pressing F.

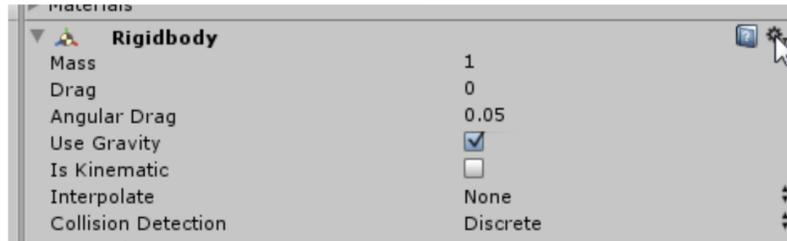
Add a rigidbody component by going to the top menu and choosing **Component > Physics > Rigidbody**. Now in the toolbar, you will see three buttons in the middle like the picture to the left. These buttons control when to start running your game. The leftmost button starts the game. The middle button pauses your game. And the rightmost button lets you advance the game by one step at a time. Go ahead and press the leftmost button to start your game. When your game is being run, Unity calls this "Play Mode". If you did everything correctly, you'll see the cylinder fall to the ground like a real world object. **This is what the rigidbody component does: it makes your game object react to the physics.**

Now, to stop your game from running, click on the play button again. When the game is not running, Unity calls this "Edit Mode".

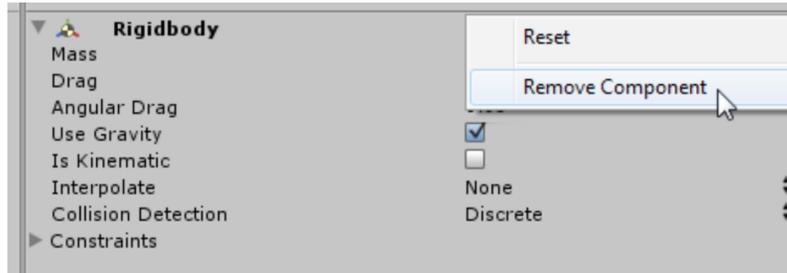
## 15 Removing A Component

In contrast, see what happens when you remove the rigidbody that you previously added. To remove the rigidbody, look at the Inspector view and locate the rigidbody component. You'll see a gear icon at its upper-right hand corner.

Click on it and select "Remove Component" from the menu that appears.



Click on it and select "Remove Component" from the menu that appears.



Now start your game. You'll see that instead of falling, the cylinder remains floating in the air. Since the rigidbody is not present, the cylinder isn't reacting like a real-world physical object anymore.