

Unity Quick Reference Guide

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1 Terrain

- Add Terrain to a Scene

Create Terrain asset in a Scene with **GameObject** → **Create Other** → **Terrain**

Note 1: must have the **Terrain Assets** asset package loaded.

Note 2: The mechanisms for adding Terrain and changing Terrain settings have changed in Unity 4.x (from how they were done in Unity 3.x), so the directions given in the course textbook are outdated.

- Terrain Editing and Painting

As shown below, there are 7 buttons in the terrain toolset:



These seven tools correspond to (in left-to-right order):

- **Raise Height** - Raise the height of the terrain using a variety of brushes.
- **Paint Height** - Raise or lower height of the terrain towards a specified height. Height flattens out to a plateau once reaching specified height.
- **Smooth Height** - Softens the hard edges in the terrain by averaging each point on the terrain (under the brush) with a weighted average of nearby/neighborhood points.
- **Paint Texture** - "Paint" the terrain by selecting terrain texture images (e.g. grass, dirt, rocks, etc.) and mapping them onto the terrain with brushes.
- **Place Trees** - Add clumps of trees to the Scene by selecting the desired trees and then placing them on the terrain with brushes.
- **Paint Details** - In the same fashion as **Place Trees**, allows smaller detail objects, such as foliage, grass, rocks, flowers, etc., to be placed en masse into the terrain with brushes.
- **Terrain Settings** - Allows designer to select a number of terrain settings, most of which increase the visual quality or resolution of the Scene, but at the expense of greater graphics processing demands.

- Set Terrain Resolution

It is strongly recommended that you set your Terrain to the desired size **before** doing any terrain editing. The default Terrain size is 2000 wide × 2000 long × 600 high, whereas a more appropriate size is 500 × 500 × 400 for the initial scenes you'll be doing in CSCI 130.

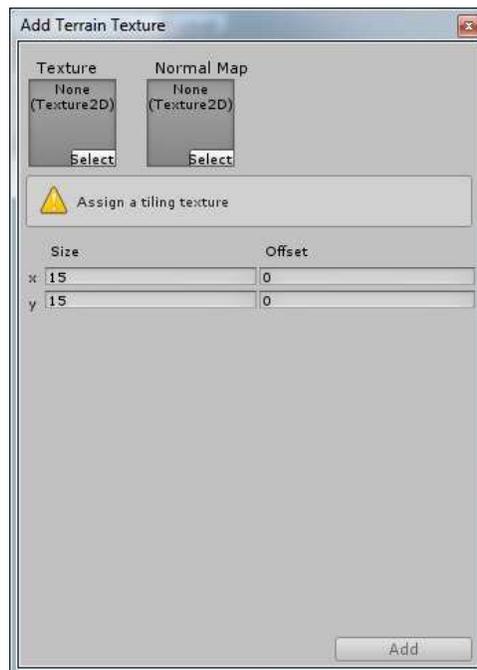
Change width, length, or height by selecting **Terrain** object in Hierarchy window, then clicking the **Terrain Settings** button in the Inspector window (the rightmost button displayed in the figure above). Scroll down to the **Resolution** section of the **Terrain Settings** options and adjust **Terrain Width**, **Terrain Length**, and/or **Terrain Height** as desired.

- Set Initial Terrain Texture

You probably want to start with some other texture than the ugly gray texture initially provided for the Terrain object, so add a texture for Terrain painting.

Note: The first Terrain texture that you add will serve as the default terrain texture for the entire Terrain, so it's beneficial if you choose a terrain texture that will be widely used.

Add a terrain texture by selecting the Terrain object in Hierarchy window, then clicking the **Paint Texture** button in the Inspector window (the 4th or middle button displayed in the figure above). Under the **Textures** section, click on the **Edit Textures...** button, and select **Add Texture....** This will open the Add Terrain Texture window.



In the Add Terrain Texture window, click on the **Select** button in the upper left-most window, the one titled "Texture". This will open a pop-up window that displays some texture options. Select an initial texture image, like "GoodDirt", "Grass&Rock", or "Grass (Hill)". Double-click on the desired texture image, then click on the **Apply** button in the Add Terrain Texture window.

If you decide to change to a different base texture image, simply repeat the process, but select the **Edit Texture...** option instead of the **Add Texture...** option, after clicking on the **Edit Textures...** button.

Note: There aren't many texture images available in the standard assets packages, but we'll see how to add more texture options in short order.

2 Other Environmental Objects

- Add Sky

Add a Skybox to the Scene with **Edit** → **Render Settings**

in Inspector window, under "Render Settings", find the **Skybox Material** option. Click on the little circle to the far right of **Skybox Material** to open the **Select Material** window. Select the desired skybox material.

Note 1: must have the **Skyboxes** asset package loaded.

Note 2: to view the available materials, open the **Skyboxes** folder under **Standard Assets** in the Project window.

- Add Lighting

There is initially no light in the scene, so you need to add basic lighting. Basic lighting of the environment is best achieved using the **Directional Light** asset, since directional lighting provides the same degree of illumination over the entire environment (like the sun), in the specified direction.

Add a **Directional Light** asset to a Scene with **GameObject** → **Create Other** → **Directional Light**

Since directional lighting provides constant illumination over the entire scene, it's position doesn't matter. However, it's direction definitely matters. If you want to model mid-day, then you'll want it facing straight down, whereas if you want to model dusk or dawn, you'll want the lighting to be at a fair angle with the ground.

One way to adjust the direction is to select the desired **Directional Light** asset in the Hierarchy window, then adjust the **Rotation** options in the Inspector window. Straight down would be $(X, Y, Z) = (90, 0, 0)$, whereas dusk or dawn might be more 45 degrees for the X value, with the Y and Z values to give the appropriate direction from the sun.

To change the intensity of the light, you can adjust the **Intensity** field for the directional light in the Inspector window. A value between 0.5 and 1 is usually a good starting point for modeling the sun.

It is important to note that the **Directional Light** asset *ONLY* provides light in the specified direction... in other words, it doesn't provide any ambient light. To model ambient light, I recommend creating a second **Directional Light** asset that faces straight downwards, i.e. $(90, 0, 0)$, and has a low intensity like 0.1 to 0.15.

- Add Water

In the Project window, under **Standard Assets**, open the **Water (Basic)** folder. The Project window will show the available water options. Select one, and drag and drop it into the Scene window. (*see section 4*)

Note 1: must have the **Water (Basic)** asset package loaded.

3 Assets Packages

- Import from Standard Assets (*built-in assets in Unity Basic*)

Assets → **Import Package** → {*desired package*}

- Import from Assets Store

Window → **Assets Store**

in Asset Store window, select desired type of asset, e.g. **3D Models**

- Import Assets from File (e.g. **book_assets**)

Assets → **Import Package** → **Custom Package**

in file browser window, select asset package, e.g. **book_assets**

4 Assets in Scene

- Add Simple Assets to Scene

The majority of assets can be added into the scene simply by drag and drop. In the Project window, under **Assets**, open the desired assets folder (e.g. **Models** under **Book Assets**). The Project window will show the available assets in that folder. If the thumbnail view for an asset contains a small arrow on the right edge of the thumbnail, you can add that asset to the scene by dragging it into the Scene window.

5 Player Character

- Add First Person Controller to Scene

In the Project window, under **Standard Assets**, open the **Character Controllers** folder. The Project window will show a couple of player controller options. Select the **First Person Controller** asset, and drag and drop it into the Scene window.

Note: must have the **Character Controller** asset package loaded.

After dropping **FPController** into Scene, need to set player's starting view. Move **FPController** to desired start location in Scene.

You can also adjust the rotation of the **FPController** to achieve the desired player starting view. The best way to do this is to select the **FPController** object in the Hierarchy window, then use the rotation tool and rotate around the **Y axis** to the desired view. **Only** rotate the **FPController** around the Y axis. If you want to rotate the camera up or down at all (rotation around X axis), then first select the **Main Camera** object **inside** the **FPController** object hierarchy, then rotate it slightly around the X axis.

Note: you do **not** want to rotate the **FPController** around the X axis as it will screw up forward movement of the player