Project 3 – Create Terrain

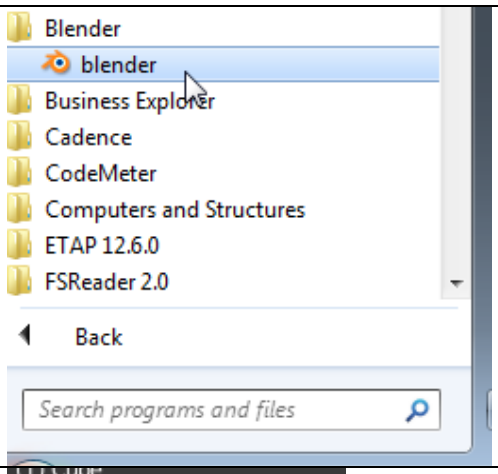
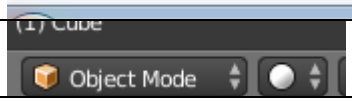
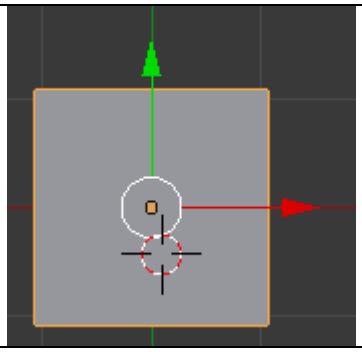
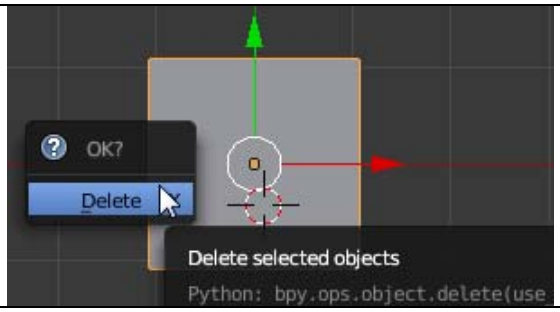
Introduction	Project Preview
In this project, you will: • Create a landscape of hills and valleys. • Add dirt and grass to the landscape. • Create a cloudy sky. • Create a colorful moon that glows. • Add stars to the nighttime sky.	Here's an example of what you'll make. 

LAB 1 - Introduction

In this lab, you'll transform a flat surface into hills and valleys.

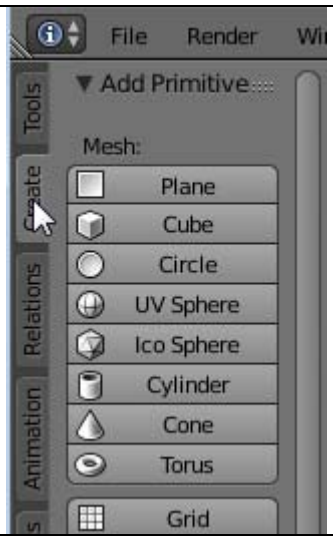
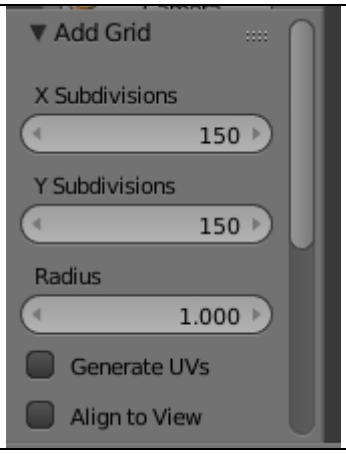
Set Up the Workspace

Complete these steps to delete the cube that Blender automatically adds to new projects. When you're done, you'll have an empty Blender workspace.

1. On the Start menu, left-click All Programs, left-click Blender Foundation, left-click Blender, and then left-click Blender again.	
2.Make sure you are in Object Mode.	
3.Right-click the cube to select it.	
4.Press the X key.	
5.Left-click Erase Selected Object.	

Add a Grid

Complete these steps to add a grid. This will help you create your terrain.

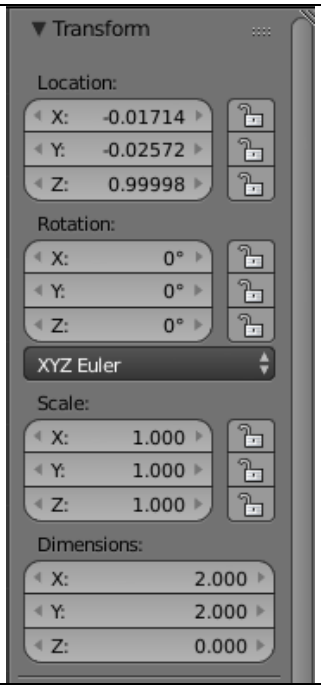
1.At the top of the 3D View window, left-click the Create Tab from Add Primitive and then left-click Grid.	
2.Left-click X res and type 150. This adds 300 vertices along the X-axis. Press ENTER. 3.Left-click Y res and type 150. This adds 300 vertices along the Y-axis. Press ENTER.	
4.Left-click OK.	
5.If Blender slows down too much on your computer, you may want to set the X and Y res to 100 or less.	

Transform Properties Panel

You can use the **Transform Properties Panel** to change the position, spin, and size of your 3D objects.

When you know exactly how much you want to translate, rotate, or scale a 3D object, you can type those numbers into this panel.

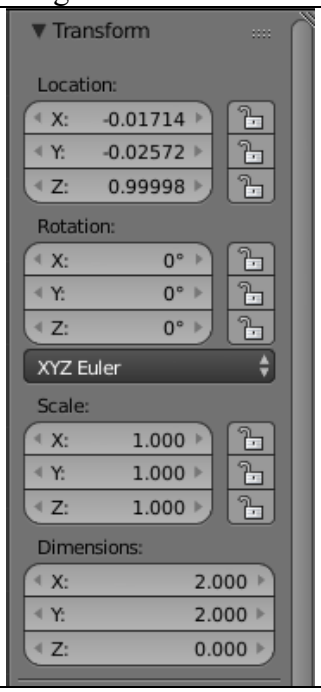
If you have the Transform Properties Panel open, it will update those numbers automatically when you use the 3D Transform Manipulator to modify the object.

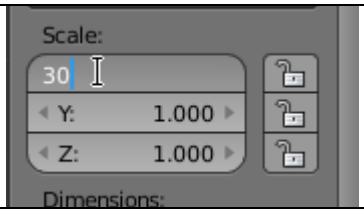
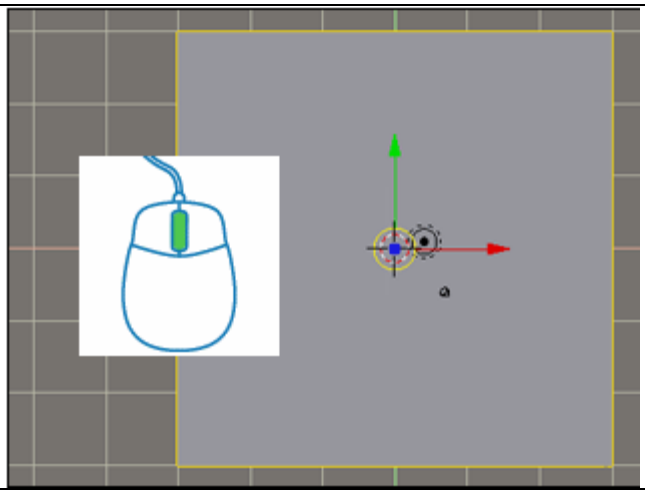


Scale the Grid

Complete these steps to increase the size of the grid.

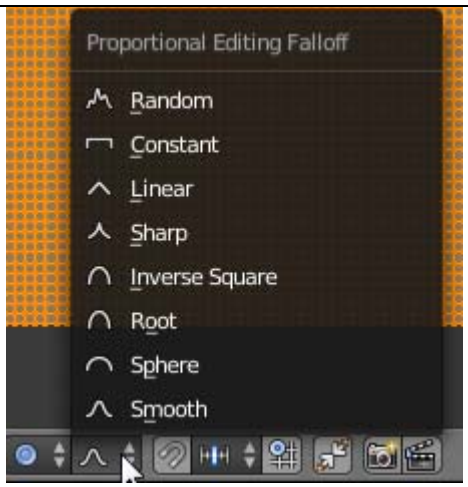
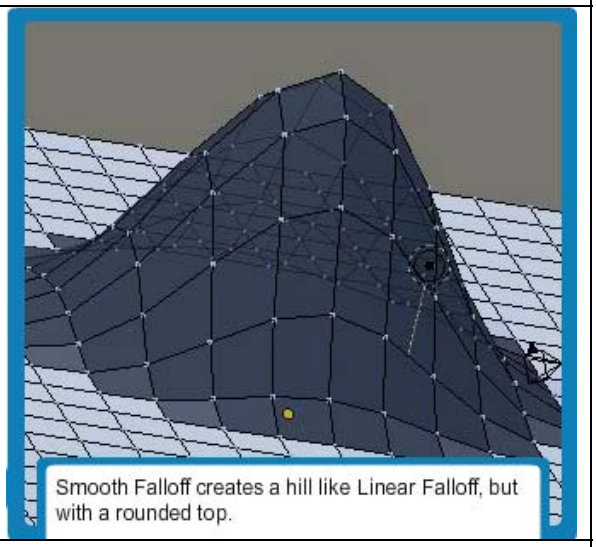
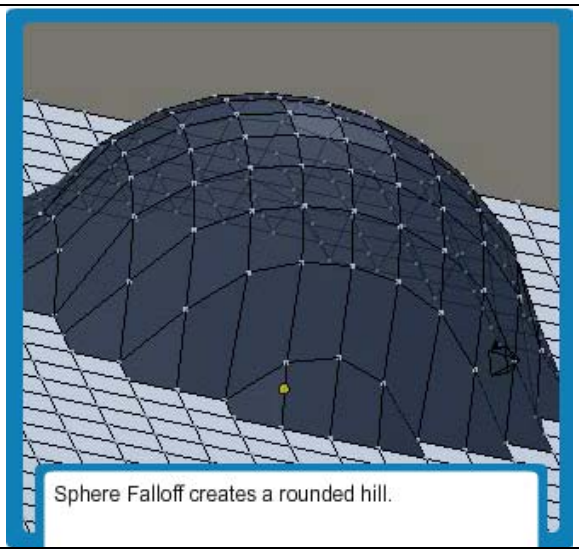
1.Press the N key to open the Transform Properties panel.

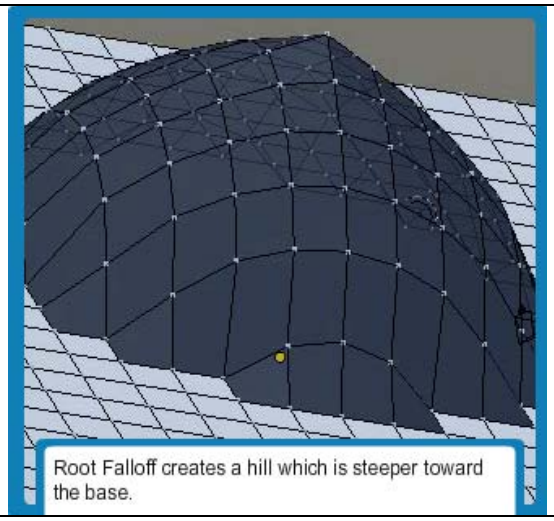
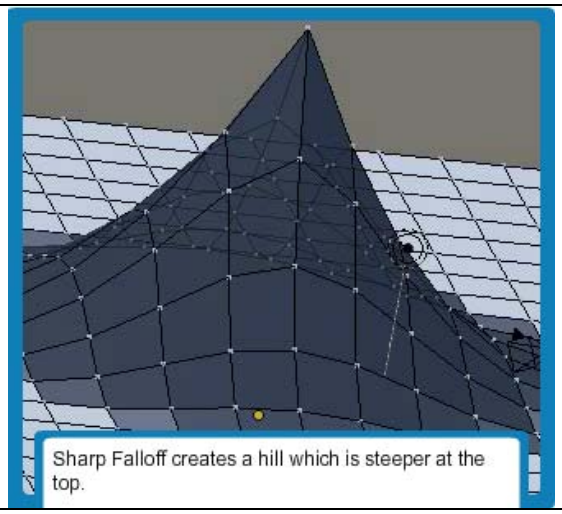
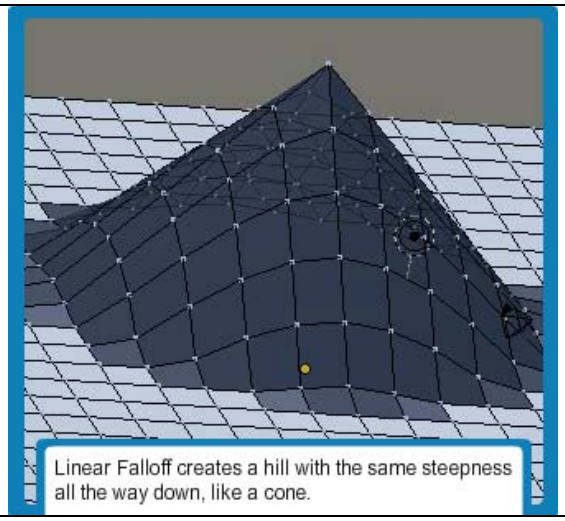


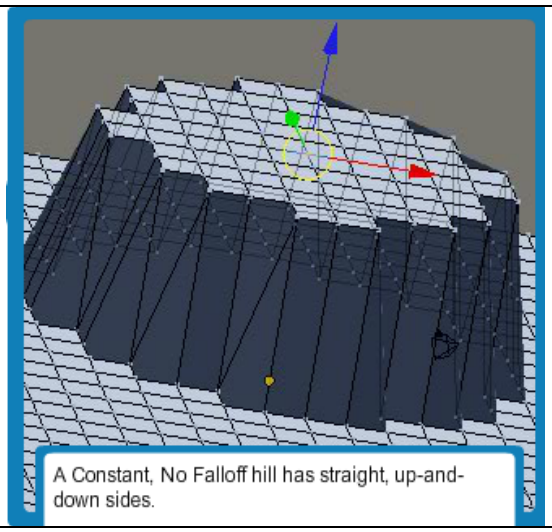
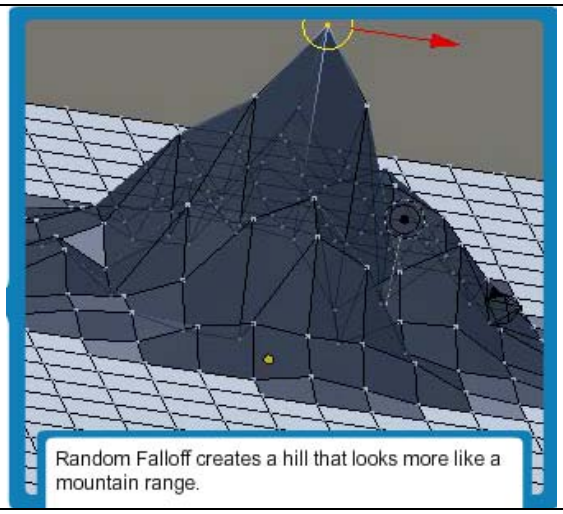
2.Left-click ScaleX and type 30 to increase the size of the grid along the X-axis.	
3.Left-click ScaleY and type 30 to increase the size of the grid along the Y-axis.	
4. Press the N key again to close it.	
5.Rotate the mouse scroll wheel downward to zoom out until you can see the entire grid.	

Proportional Edit

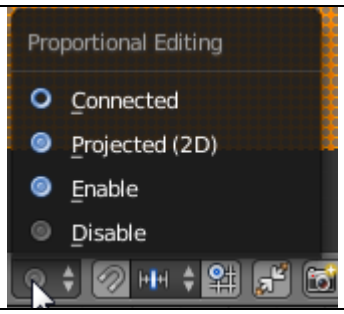
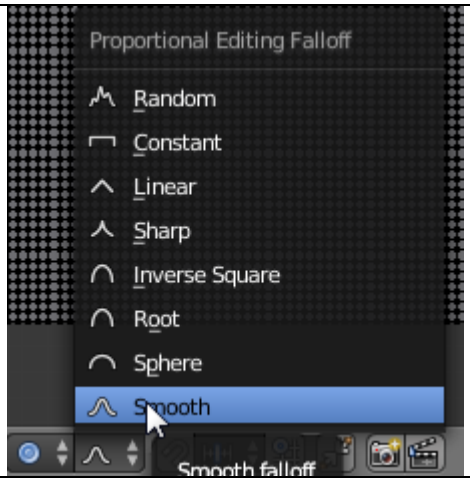
Falloff

The Falloff setting controls how the vertices inside the Proportional Edit circle behave. Falloff controls the type of curve created when you move a vertex. The types of fall off are listed with examples below.	
Smooth Falloff	
Sphere Falloff	

Root Falloff	
Inverse Square Falloff	
Sharp Falloff	
Linear Falloff	

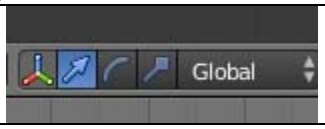
Constant, No Falloff	
Random Falloff	

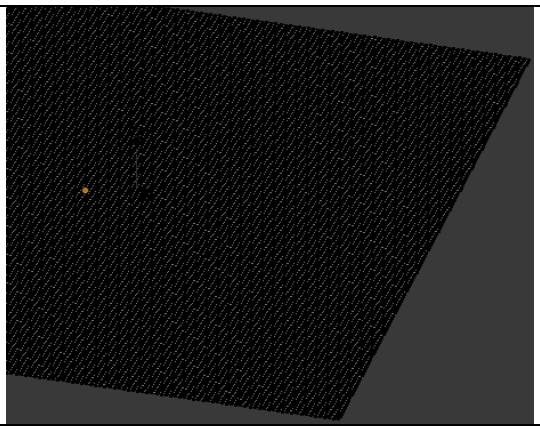
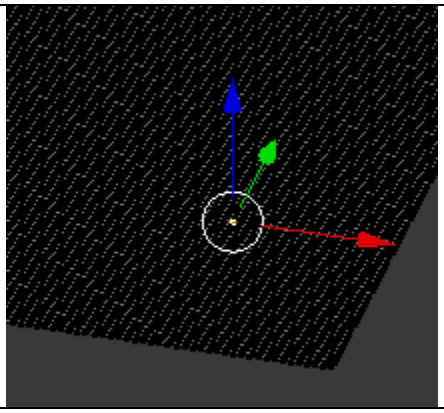
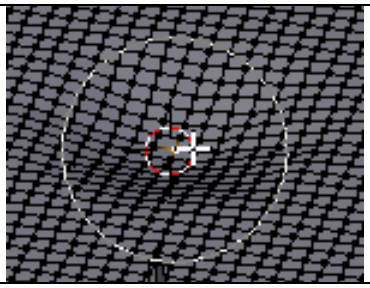
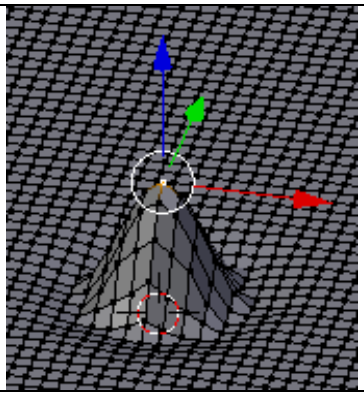
Turn on Proportional Edit	
Complete these steps to turn on the Proportional Edit tool.	
1.Make sure the grid is selected. If not, right-click the plane to select it.	
2.Press TAB to switch to Edit Mode.	

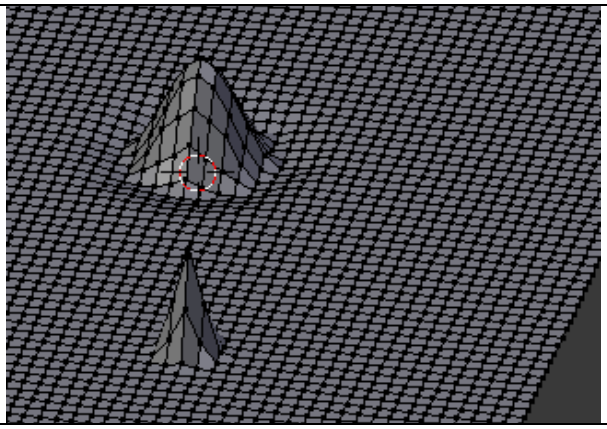
3.Left-click the Proportional button and left-click On. The button should now be blue.	
4.Left-click the Proportional Edit Falloff button and left-click Smooth Falloff. TIP: Try different Falloff options to see which ones you like best.	
5.Press the A key to deselect everything.	

Make a Hill

Complete these steps to add a hill to the grid.

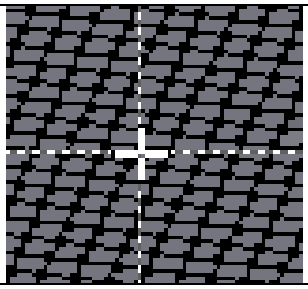
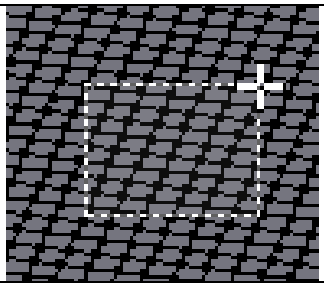
1.Make sure the Translate Manipulator Mode button is turned on. If not, left-click it.	

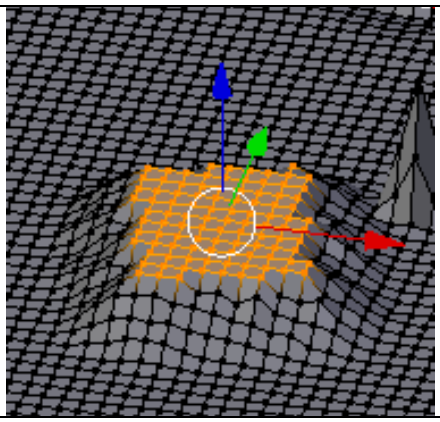
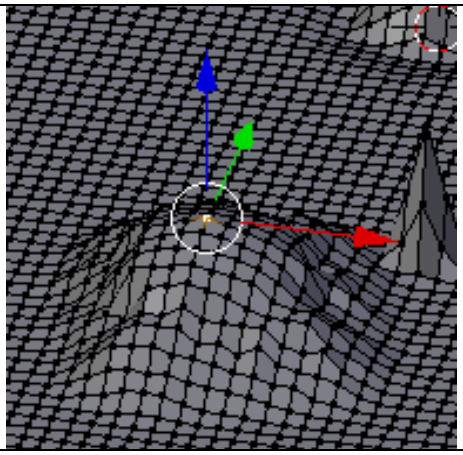
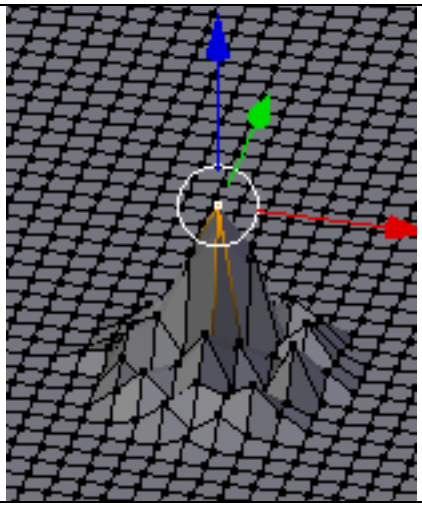
2.Pan down around the grid so that you're not looking at it from straight up. Look at the example if you need help.	
3.Right-click a vertex and left-click the blue Z-axis translate arrow. Move the mouse to increase and decrease the hill's height.	
4.Hold the left mouse button down and at the same time scroll the mouse wheel downward to increase the area changed by the proportional editing. Scroll the mouse wheel upward to decrease it. TIP: This step will only work if you have a vertex selected.	
5.Left-click again when you like the size of the hill.	

6.Press the A key to deselect everything.	

Make More Hills and Valleys

Complete these steps to add more hills to the grid and experiment with different Proportional Falloff types. The spaces between the hills will be valleys.

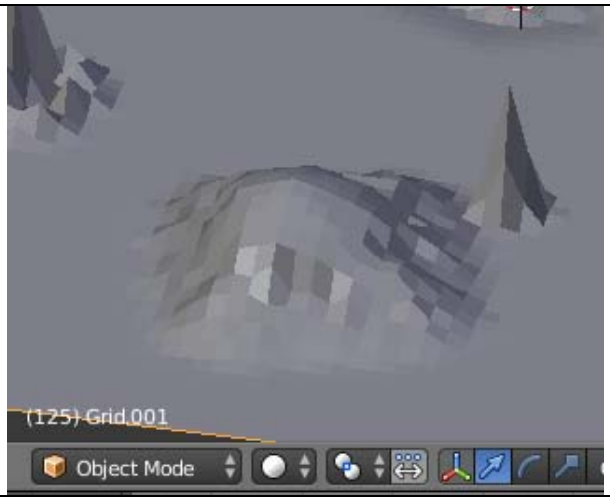
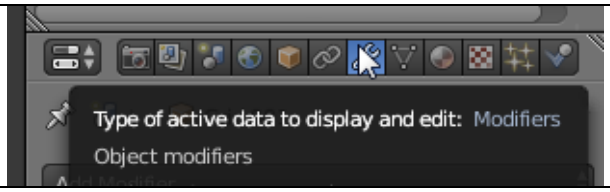
1.Press the B key to use Box Select Mode.	
2.Draw a box around some vertices.	

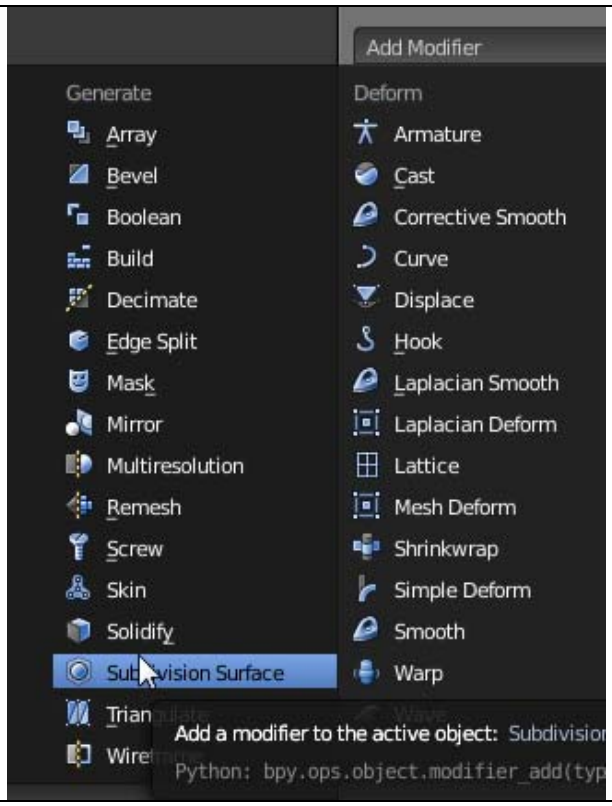
3.Right-click a vertex and left-click the blue Z-axis translate arrow. Move the mouse to increase and decrease the hill's height.	
4.Scroll the mouse wheel down to increase the area changed by the proportional editing. Scroll the mouse wheel up to decrease it.	
5.Press the A key to deselect everything.	
6.Left-click the Proportional Edit Falloff button and left-click a different Falloff type.	
7.Repeat this process until there are several hills on the	

grid.	

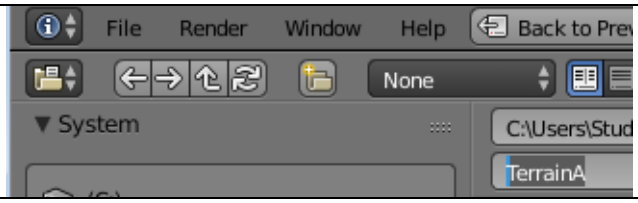
Smooth the Hills

Complete these steps to make the hills smoother.

1.Press TAB to switch to Object Mode.	
2.At the Buttons too bar, left-click the Modifiers button.	

3.In the Modifiers mini-window, left-click Add Modifier and left-click Subsurf. Your hills will look smoother.	

Save Your Terrain

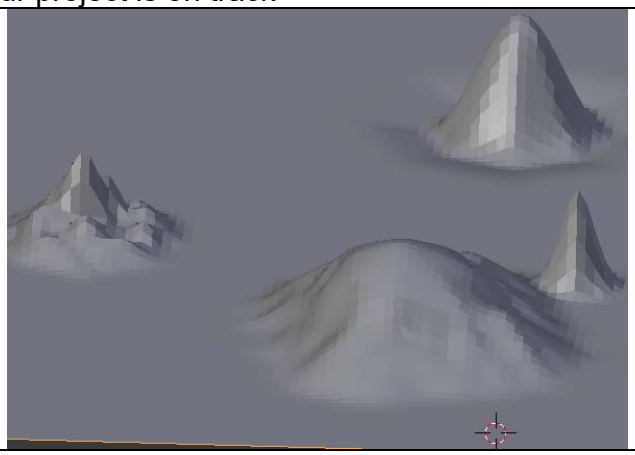
1.On the File menu, click Save As, and then name the project terrain.	

Check Your Work

Complete the steps below to make sure your project is on track

1. Are you happy with how the grid looks? If not, add some more hills or change the height of the hills you have. You may want to remove the Subsurf modifier first by clicking on the X in the top right corner of that mini-window.

2. When you're done making changes, save your project.



SUMMARY

In this lab, you:

- Added a grid with lots of vertices.
- Made the grid much larger using the Transform Properties Panel.
- Used Proportional Edit and Falloff with selected vertices to create hills and valleys.
- Smoothed the hills with the Subsurf modifier.

Lab 2 Introduction

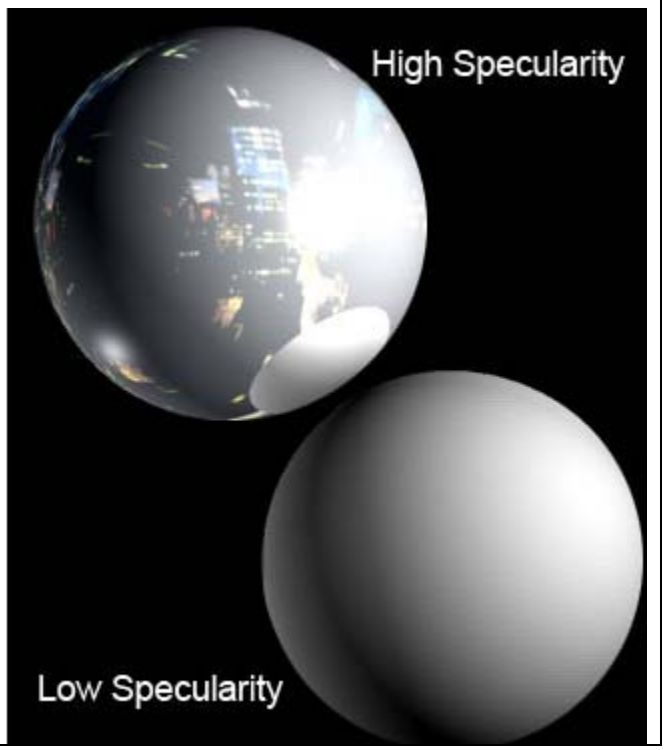
In this lab, you'll add grass and dirt to the landscape.

Specularity

Specularity is how reflective an object is. For example, a mirror has a high specularity because it reflects a lot of light.

In Blender, you can use specularity to control how much light is reflected back from an object. You can also change the color of the light that's reflected from an object.

On the next screen, you'll change the specularity of the hills' material.

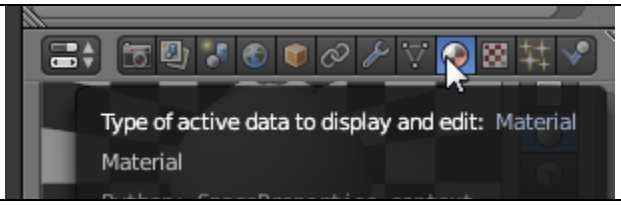


Add a Material to the Hills

Complete these steps to add a material to the hilly grid and make it unreflective.

1.At the right select Buttons Too Bar, left-click the Material button.

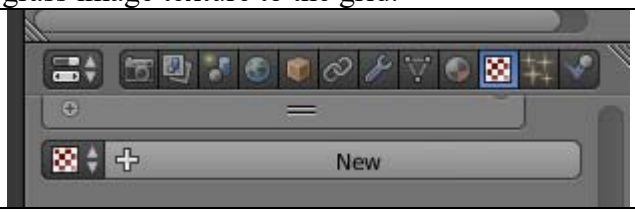
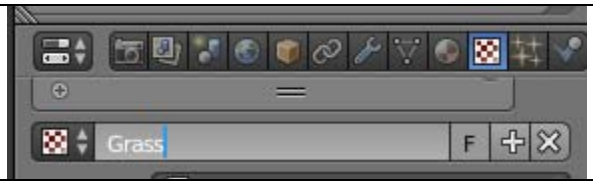
2.Make sure that the Material Buttons button is selected. If not, left-click to select it.

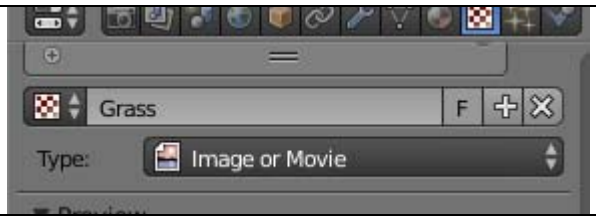
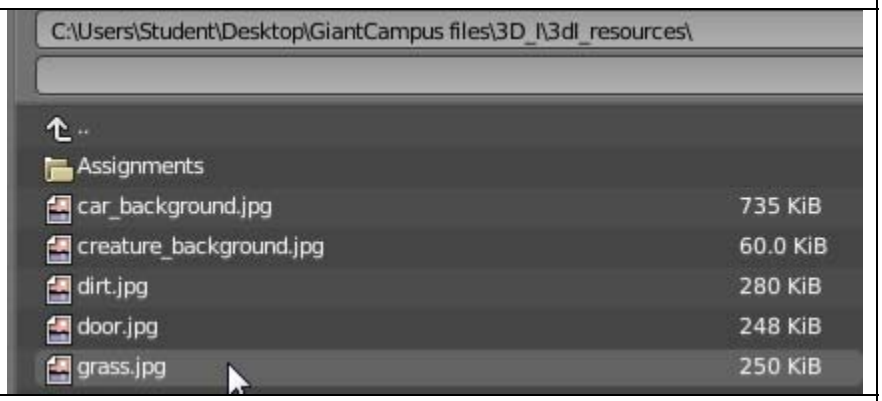


3.In the mini-window, left-click Add New.	
4.In the Material mini-window, left-click the arrow beside SPECULAR button to change the new material's Specular value.	
5.Left-click and make the R, G, and B values 0.	

Add a Grass Texture to the Hills

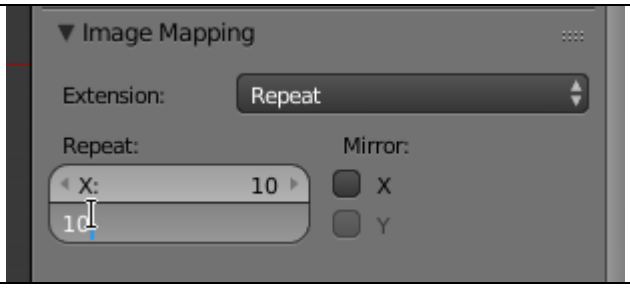
Complete these steps to add a grass image texture to the grid.

1.Select the Texture tool, left-click Add New.	
2.Left-click TE:Tex.001 and type Grass. Press ENTER.	
3.At the top of the Buttons window, left-click the Texture Buttons button. TIP: You can press the F6 key to get to the Texture panel quickly.	

4.In the Texture mini-window, left-click the Texture Type drop-down list and then left-click Image.	
5.In the Image mini-window, left-click Open.	
6.Left-click grass.jpg.	
7.Left-click SELECT IMAGE.	

Change Grass Texture Settings

Complete these steps to make the grass texture more detailed.

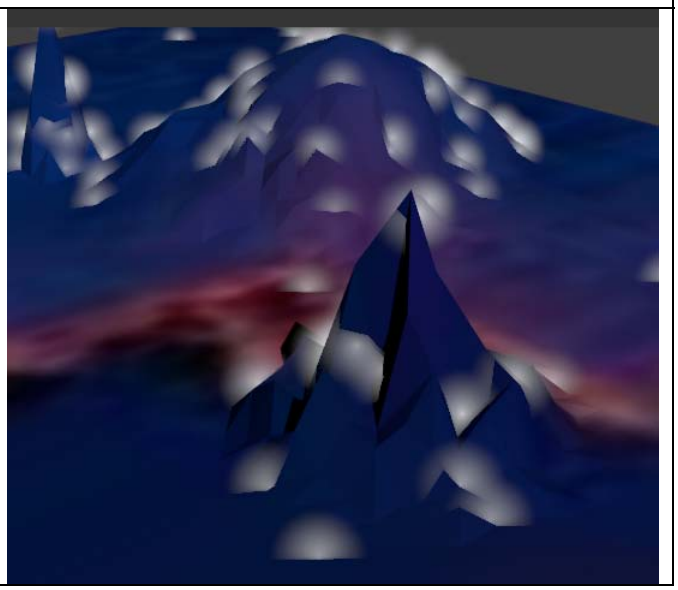
1.In the Map Image mini-window, left-click the Normal Ma button. This makes the image use RGB values.	
2.In the Map Image mini-window, left-click Xrepeat and type 10. Press ENTER. 3.In the Map Image mini-window, left-click Yrepeat and type 10. Press ENTER.	

Check Your Work

Complete the steps below to make sure your project is on track.

1. Are you happy with how the landscape textures look? If not, you can change the Stencil texture to a different texture type.

2. When you're done making changes, save your project.



SUMMARY

In this lab, you:

- Added grass and dirt textures to the terrain.
- Used a Stencil texture to change the way the grass and dirt textures layer on top of one another.

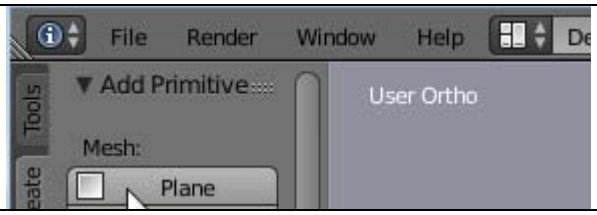
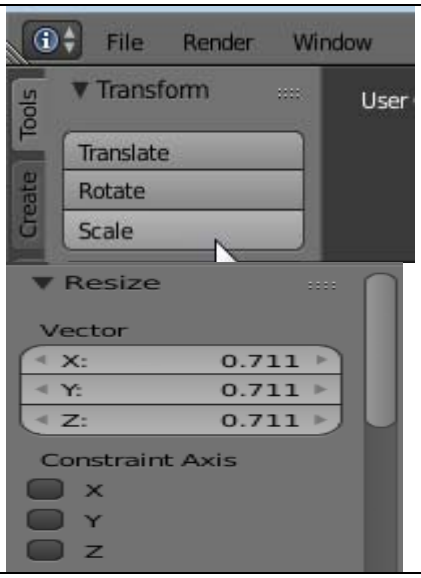
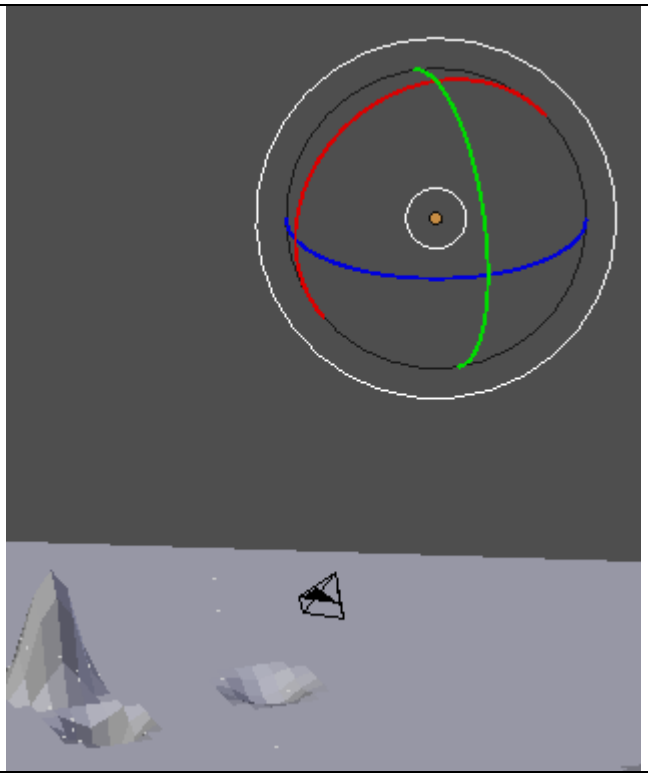
Lab 3 Introduction

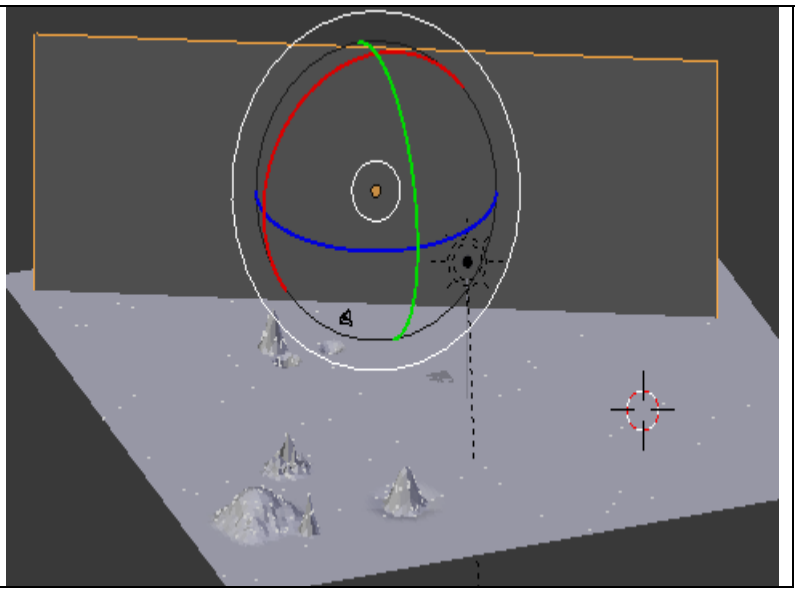
In this lab, you'll add a cloudy sky to the landscape.

Add a Plane

Complete these steps to add, resize, and position the plane that will become the sky

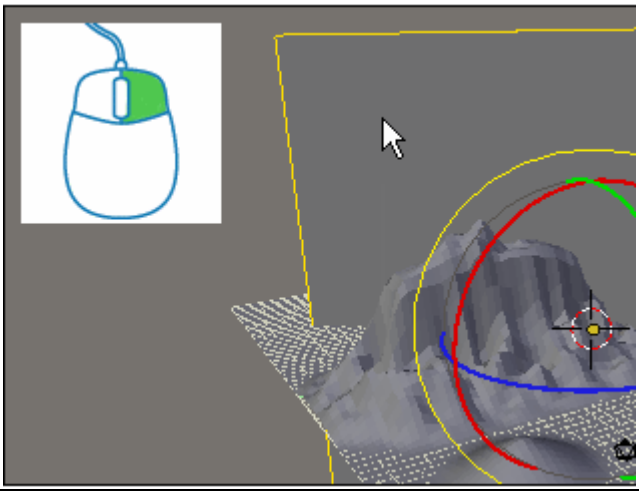
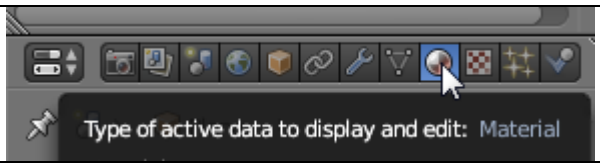
1.Make sure you're in Object Mode. If not, press TAB to switch to Object Mode.	

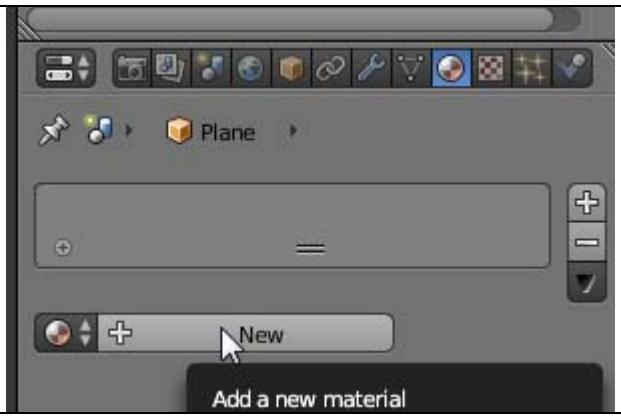
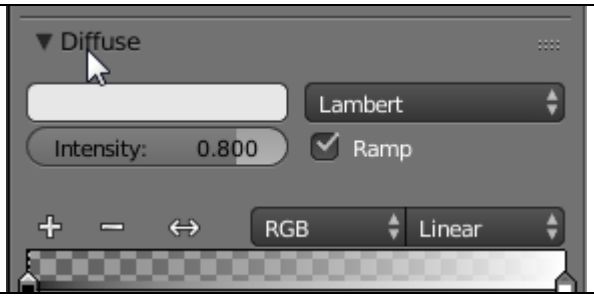
2.From the Create Tab in Add Primitive Select Plane.	
3. Select the Tools tab and scale graphically using the mouse or type in 30 for X and Y press ENTER.	
4.Left-click the Rotate Manipulator Mode button.	

5.Rotate the plane until the flat surface of the plane is lined up with the Z-axis.	

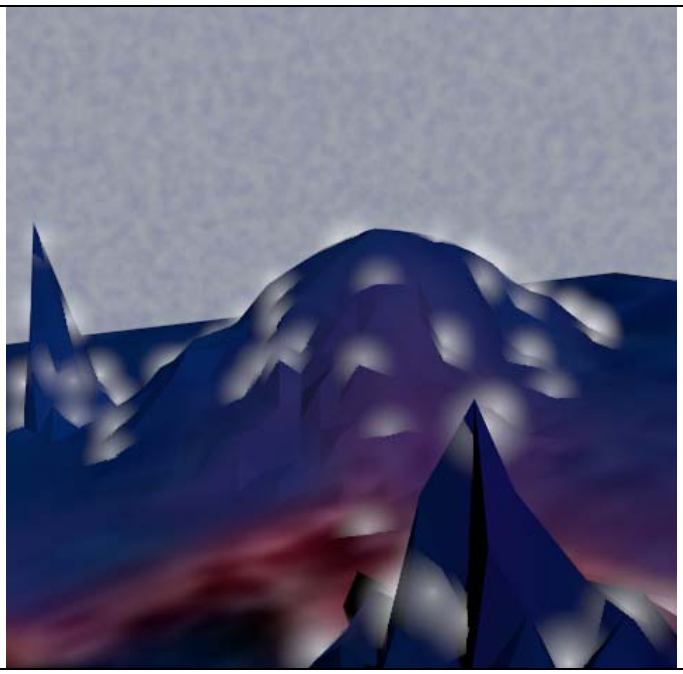
Color the Sky

Complete these steps to add color and texture to the plane to make it look like a cloudy sky.

1.Make sure the new plane is selected. If not, right-click the plane to select it.	
2.Left-click the Material button.	

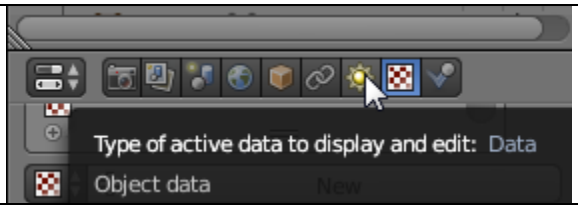
3.Left-click Add New to add a material to the plane. Name it Sky.	
4.In the Material mini-window select Diffuse of the COL button, left-click on the blank button to change the material's color.	
5.In the Color Pallette, left-click the color you'd like to use.	
6.Move the mouse pointer outside of the Color Picker to close it.	

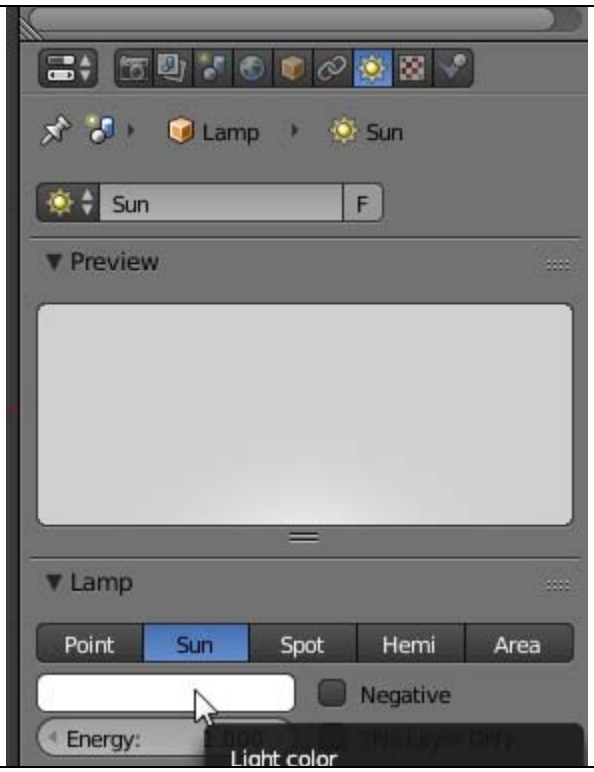
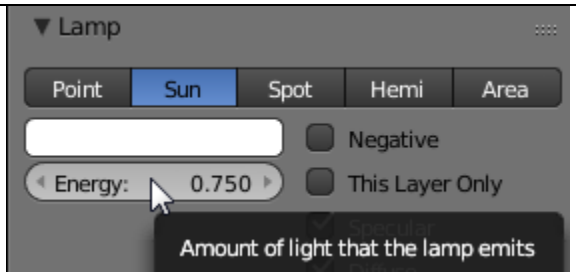
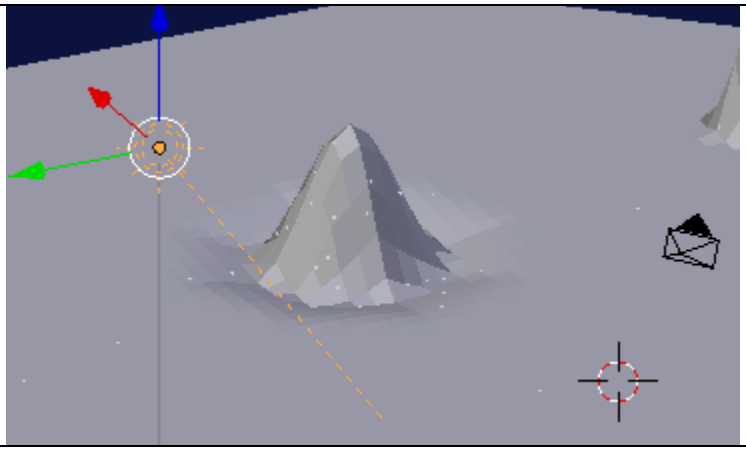
7.In the Texture mini-window, left-click Add New. Name it Sky.	
8.Left-click the Type and select Cl0ouds.	
9.Select Clouds and change any of the parameters listed eg. Grayscale or Color.	

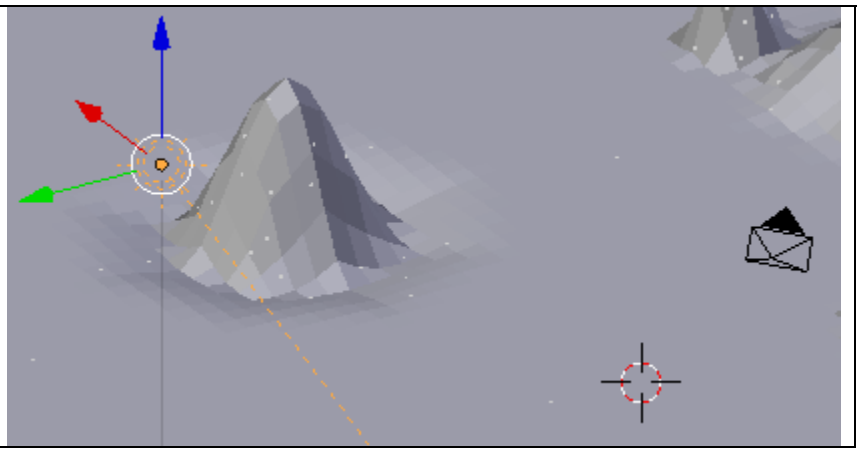
10. Now try Render > Render Image to see what you have. If you like it save it. If not change other parameters.	

Add a Sun or Change Your Lamp to a Sun

Complete these steps to add a sun lamp to light the landscape.

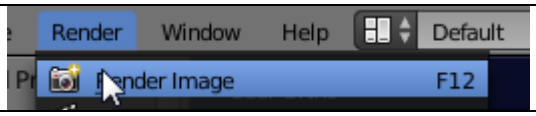
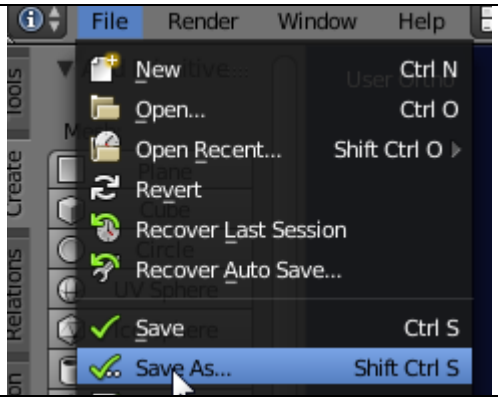
1.Make sure you're in Object Mode. If not, press TAB to switch to Object Mode.	
2.Right click on your Lamp, and make it a sun. or	

Add a new light source Sun. Note: You can change your sun to any color and increase or decrease the Energy of your sun. Try it.	
3.At the top of the Buttons window, left-click the Lamp Buttons button. 4.In the Lamp mini-window, left-click Energy and type .75. Press ENTER. This will decrase the brightness of the sun.	
5.Left-click the Translate Manipulator Mode button.	

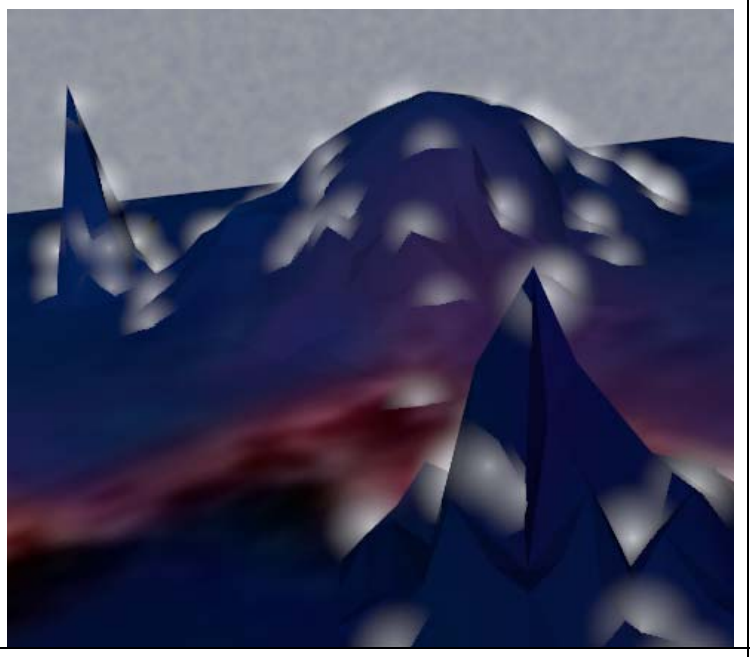
6.Move the sun up along the Z-axis until it's out of the camera's view.	

Render the Image

Complete these steps to render the image and save the file with a new name.

1.At the top of the 3D View window, left-click Render > Render Image.	
2.At the top of the 3D View window, left-click File and left-click Save As.	
3.Name the file as a new file name sunny_terrain. Do not save over the terrain.blend file.	

Check Your Work

Complete the steps below to make sure your project is on track. 1. Do you like how the sky looks? If not, change the marble texture settings and color. You can also try a different texture type. 2. Did you like how the landscape rendered? If not, move the camera and render again. 3. When you're done making changes, save your project.	

Summary

In this lab, you:

- Added a plane, made it bigger, and moved it into place to become your landscape's sky.
- Added color and texture to the plane to make it look more like a cloudy sky.
- Added a sun lamp to the project to add natural-looking light.

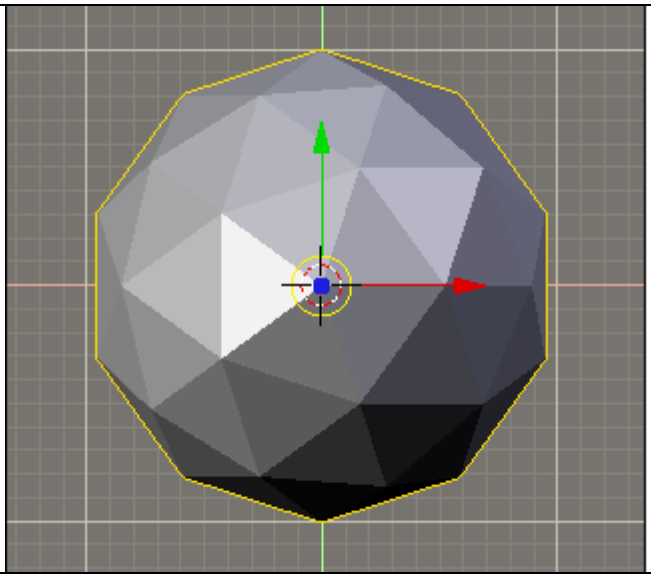
Lab 4 Introduction

In this lab, you'll create a moon for the landscape.

IcoSphere

An **IcoSphere** is a sphere made up of triangles.

It's one of the standard mesh objects that Blender provides for you.

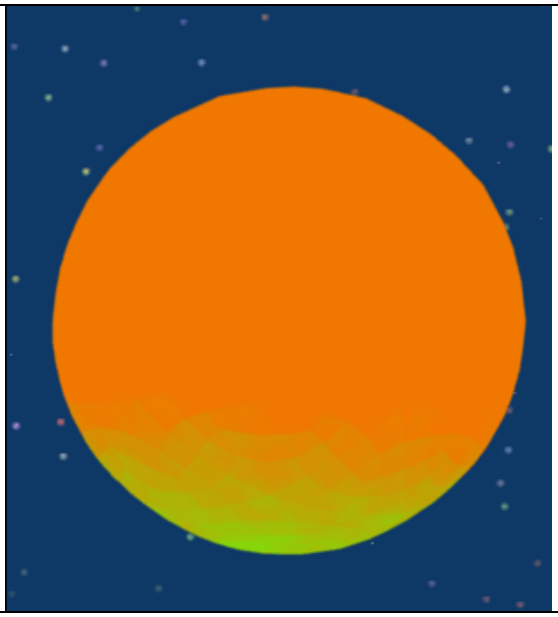


Transparency Button

The **ZTransparency** button makes materials transparent so that light can shine through them.

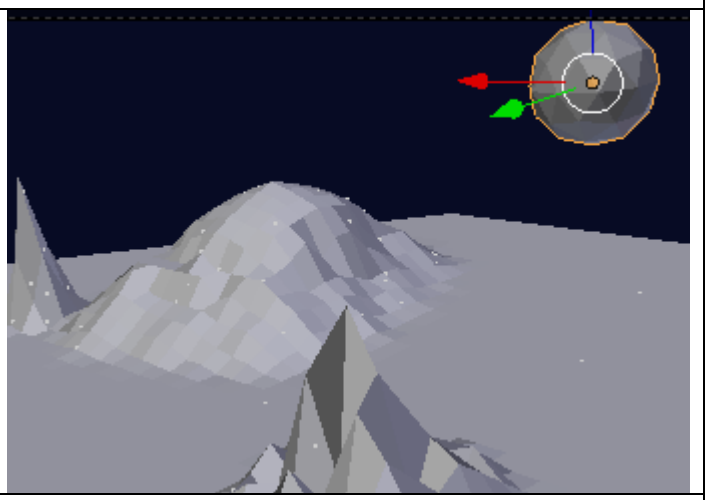
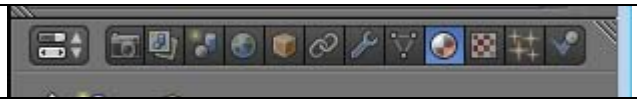
You'll use the Ztransparency button when you want to create objects that glow.

You'll use it to create a glowing moon on the next screen.



Add a Moon

Complete these steps to add the sphere for the moon and make it glow.

1.Open the terrain.blend file.	
2.From the Create Tab select IcoSphere from the list of Add Primitive and click OK.	
3.Move the IcoSphere up along the Z-axis until it's above the landscape and in view of your camera. Set your view to Camera to make sure you can see the IcoSphere.	
4.Click the Material Buttons button.	

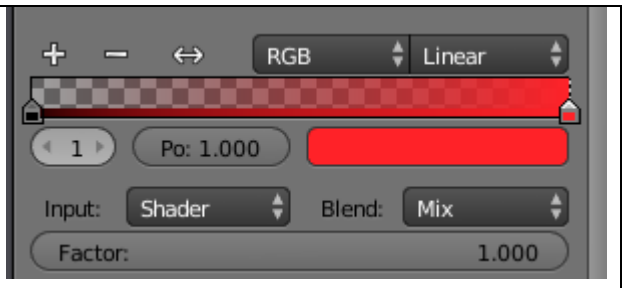
5.In the Properties Editor, left-click Add New.	
6. Name it Moon.	
7.Select the arrow next to Transparency and check Transparency to turn on the option.	

Ramps

The **Ramps** mini-window lets you add a color gradient to a material.

A **color gradient** is a gradual change from one color to another. A rainbow is an example of something which has a lot of color gradients, as it goes from red to violet.

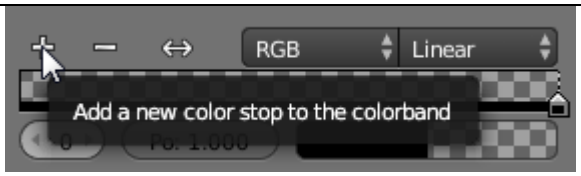
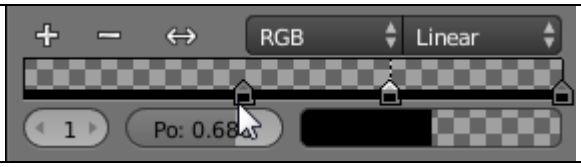
Colorband

The **Colorband** is the way that Blender represents color gradients. It's also the tool you'll use to create color gradients. The black and white lines are position markers which you'll use to set specific colors in the Colorband gradient. There are two in the example, at the right and left ends of the Colorband. You'll use the Colorband to create things like planets and tie-dyed cloth.	

Set Up the Colorband

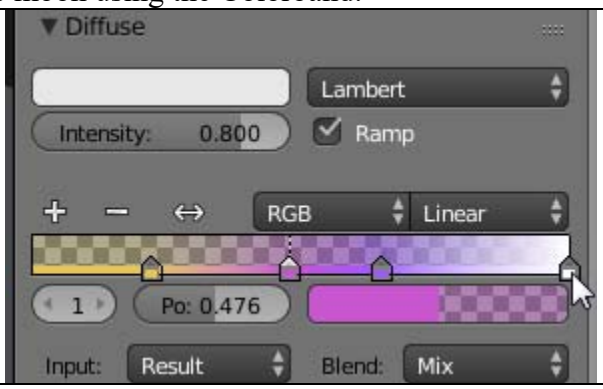
Complete these steps to set up the Colorband so you can add color to the moon.

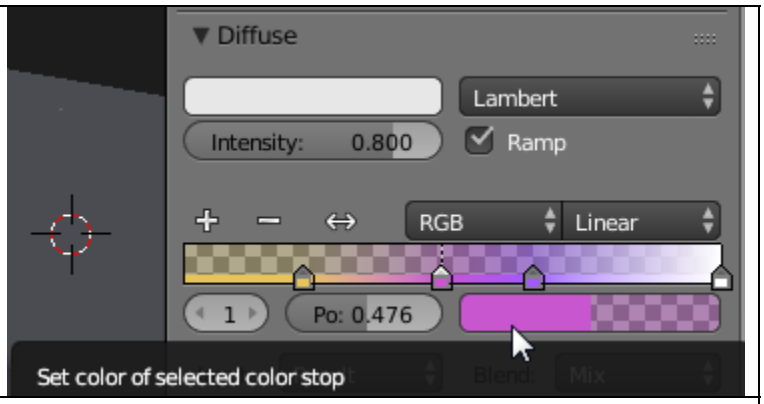
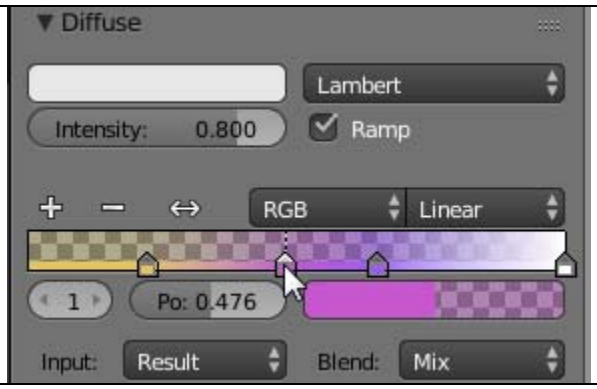
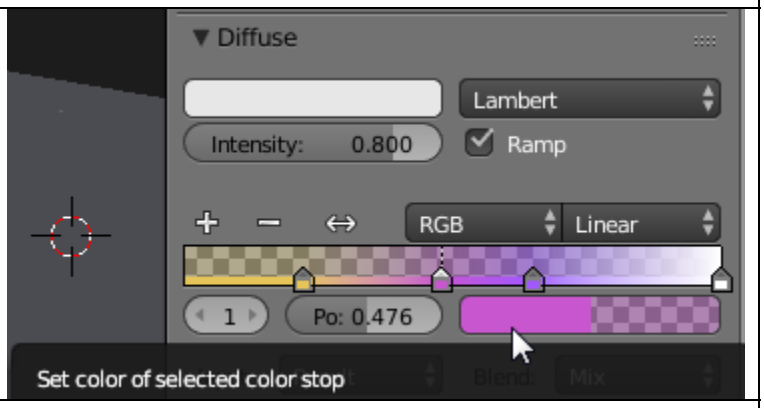
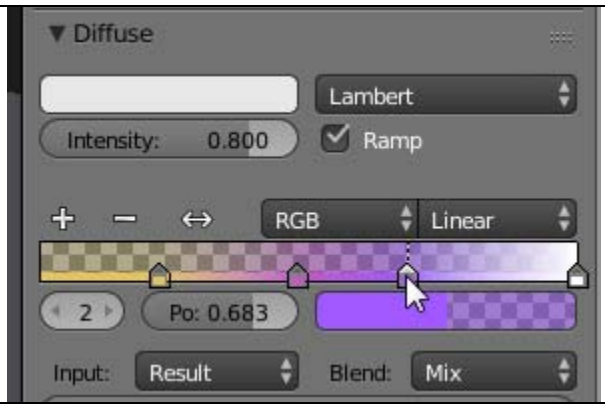
1.Left-click the Ramps option in the Diffuse Properties Editor to create a band of colors.	
2.Left-click Colorband to create a band of colors.	
3.Left-click the Input drop-down list and left-click Result. This will show you what the Colorband will look like when you render.	

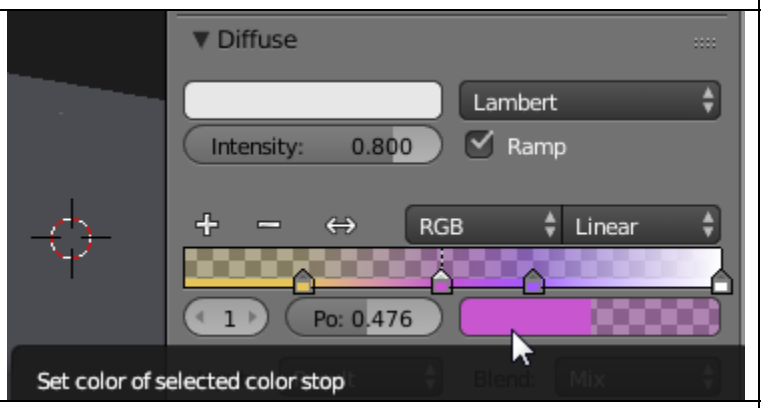
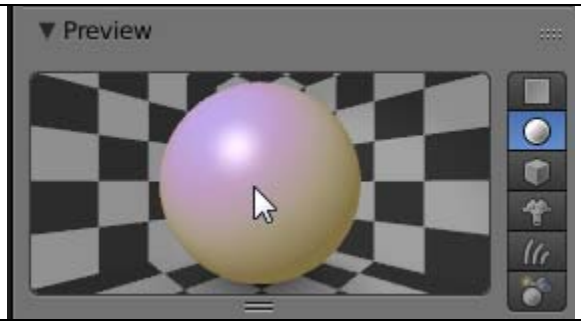
4.In the Ramps Properties Editor, on the right of the Colorband button, left-click the Del button to delete the colors there.	
5.Left-click and drag the position marker toward the left end of the Colorband.	
6.Left-click the Add button. Another dotted position marker will appear in the Colorband. TIP: When position markers are unselected, they look half white and half black.	
7.Left-click and drag the new position marker toward the right end of the Colorband.	
8.Left-click the Add button. Another dotted position marker will appear in the Colorband.	

Create a Colorband for the Moon

Complete these steps to add color to the moon using the Colorband.

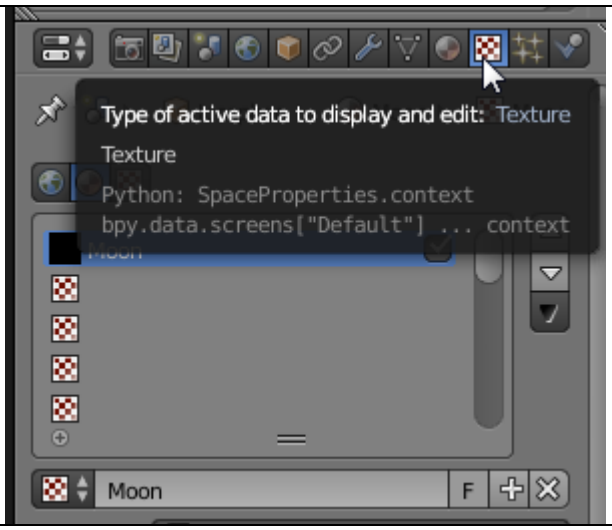
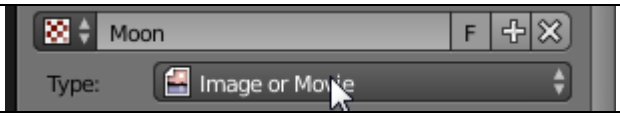
1.Left-click the left position marker to select it. It will become a black and white dotted line.	

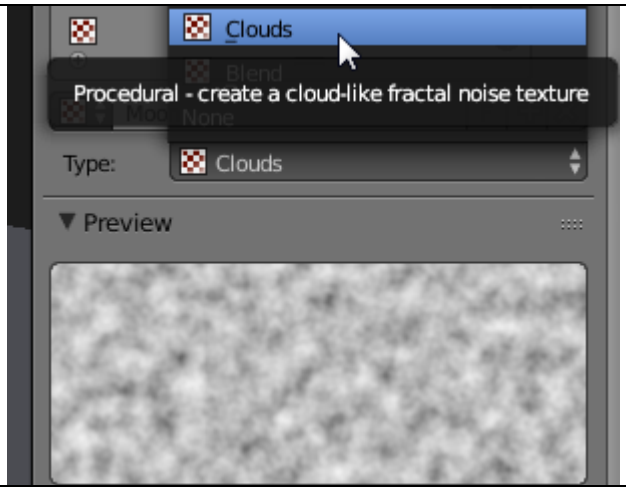
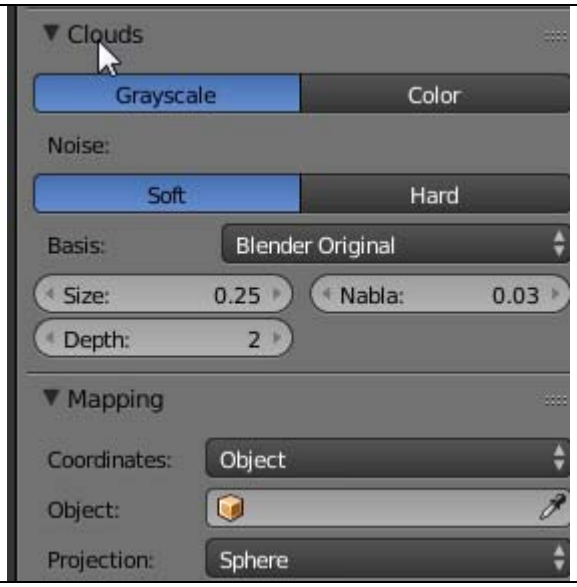
2.Under the Pos button, left-click the blank color button to open the Color Picker. Left-click a color that you like.	
3.Left-click the center position marker to select it.	
4.Use the Color Picker to pick a different color.	
5.Left-click the right position marker to select it.	

6.Use the Color Picker to pick a third color.	
7.Change the colors for the three or more position markers until you like how they look in the Preview mini-window.	

Add a Texture to the Moon

Complete these steps to add a texture to the moon.

1.Use the Texture tool to add a texture to the moon, left-click Add New. Name it Moon.	
2.At the top of the Buttons window, left-click the Texture Buttons button.	

3.Left-click the Texture Type drop-down list, and left-click Clouds. TIP: You can pick another texture that you like better.	
4.Try some of the Properties in the Cloud properties list and Render > Render Image. See what you like.	

Smooth the Moon

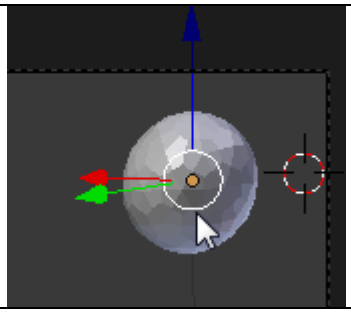
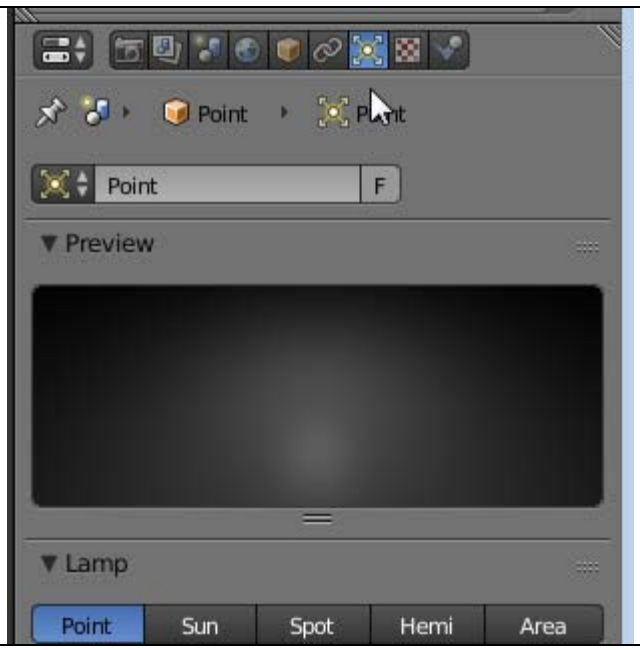
Complete these steps to add a Subsurf modifier to make the moon smoother.

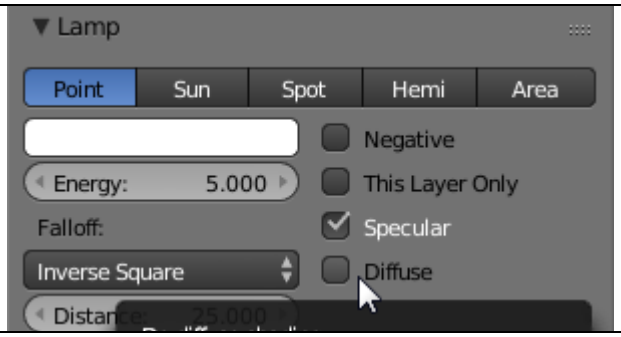
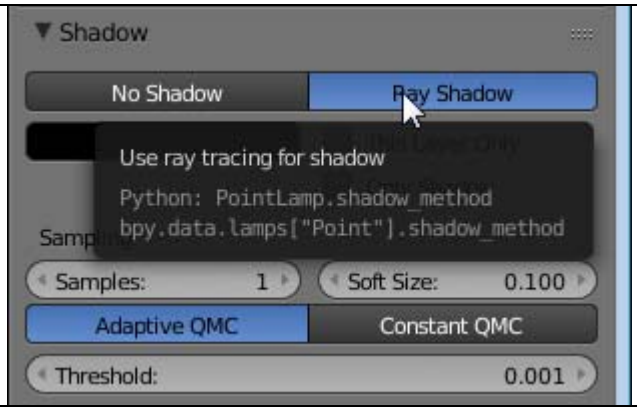
1.Now select the Modifier tool.	
2.In the Modifiers mini-window, left-click	

Add Modifier and left-click Subdivision Surface.	
3.Press the A key to deselect everything.	

Add a Light Inside the Moon

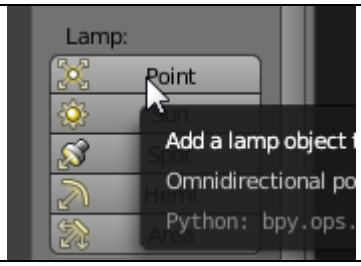
Complete these steps to make the moon shine.

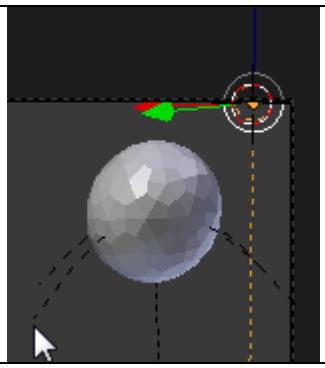
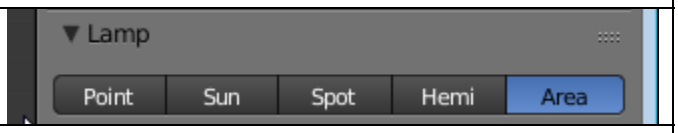
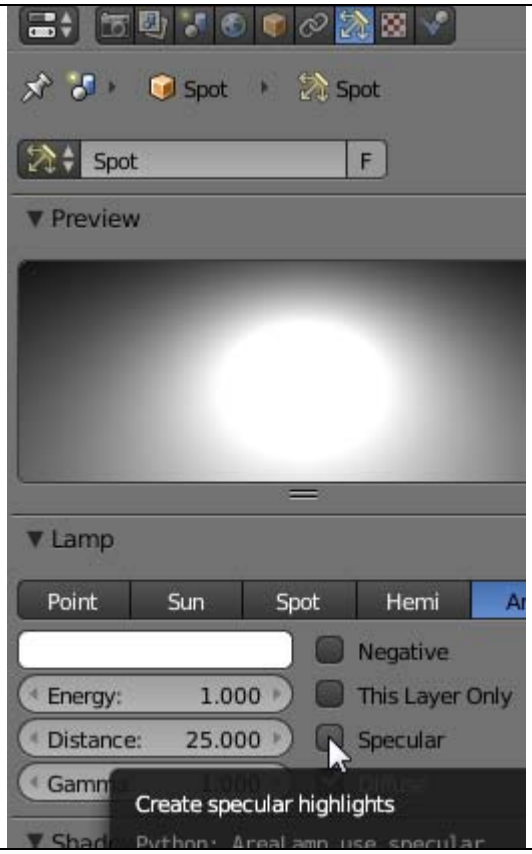
1. Select the Create Tab to Add Primitive Lamp then select a Lamp.	
2.Left-click the Translate Manipulator Mode button and move the lamp inside the sphere. TIP: Pan around the moon to make sure the new lamp is inside it.	
3.At the top of the Buttons window, left-click the Shading button and left-click the Lamp Buttons button.	

4.In the Lamp mini-window, left-click No Diffuse. This will let the light shine through the surface of the moon.	
5.In the Shadow and Spot mini-window, left-click Ray Shadow. This will make more realistic looking shadows.	
Note: Try Different Lamps and increase the Energy. Then Render > Render Image to see what you have. When you are satisified save the file.	

Add a Light Outside the Moon

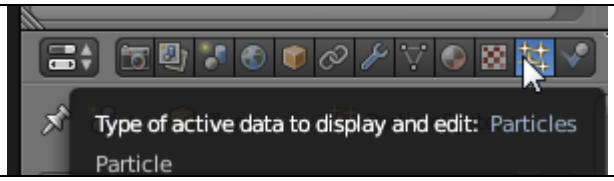
Complete these steps to make extra light for the moon. This will make it look more like a moon.

1.From the Create Tab list Add Primitive click Add a Lamp.	

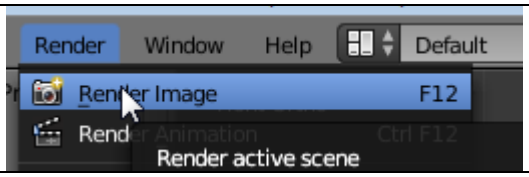
2.Move the new lamp right next to the sphere.	
3.Select your Lamp Type	
4.In the Lamp mini-window, left-click No Specular. This will keep the light from shining off the moon or terrain.	

LAB 5 - Option

Add Stars

1.Select the Particles button eft-click it.	
2.Left-click the World Buttons button. This panel will let you add background color and stars to the whole 3D environment.	
3.In the Mist/Stars/Physics mini-window, left-click the Stars button. This will add stars to the 3D background.	
4.In the Mist/Stars/Physics mini-window, left-click StarDist and type 8. Press ENTER. This will increase the number of stars.	
5.In the Mist/Stars/Physics mini-window, left-click Size and type 1. Press ENTER. This will add stars of different sizes.	
6.In the Mist/Stars/Physics mini-window, left-click and drag the Colnoise slider. This will add colored stars.	
7.Change these settings until you like how the stars look. You'll render the scene on the next page.	

Render the Image

1.At the top of the 3D View window, left-click Render > Render Image.	
2.At the top of the 3D View window, left-click File	

and left-click Save As.	
3.Name the file moon_terrain.	

Check Your Work

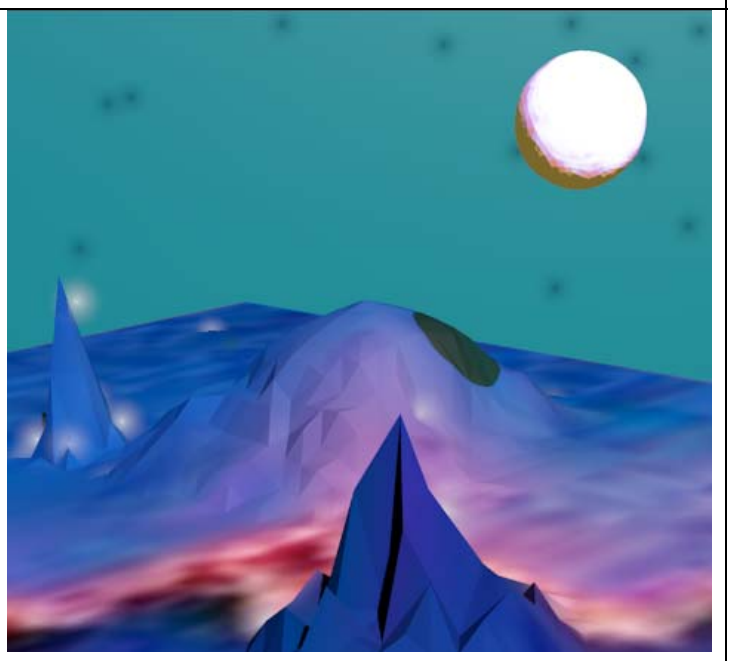
Complete the steps below to make sure your project is on track.

1. Do you like how the moon looks? If not, you can change its Colorband settings to give it different colors. You can also change the texture type of the moon to something else.

2. Do you like how the sky looks? If not, you can change the Star settings on the World Buttons panel. You can use the Color Picker in the World mini-window to change the color of the sky.

3. Did you like how the landscape rendered? If not, move the camera and render again.

4. When you're done making changes, save your project.



Summary

In this lab, you:

- Used a sphere to create a glowing moon.
- Added texture and a color gradient to the moon.
- Added stars to the sky.

Fly your Camera Around the Terrain

Use your experience from the House project.

Create a path that moves through your terrain and put the camera on it.