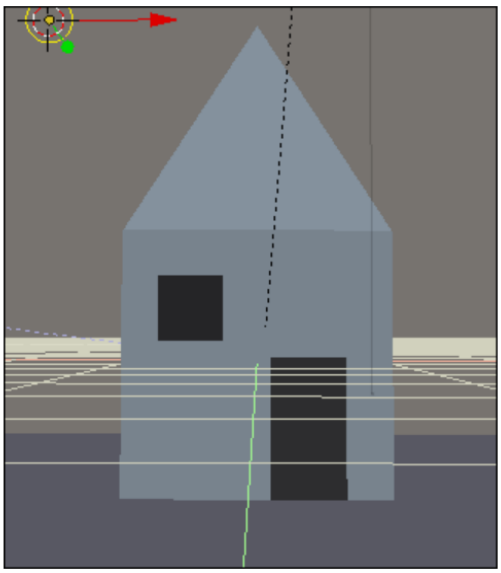
Project 2 – Build a House



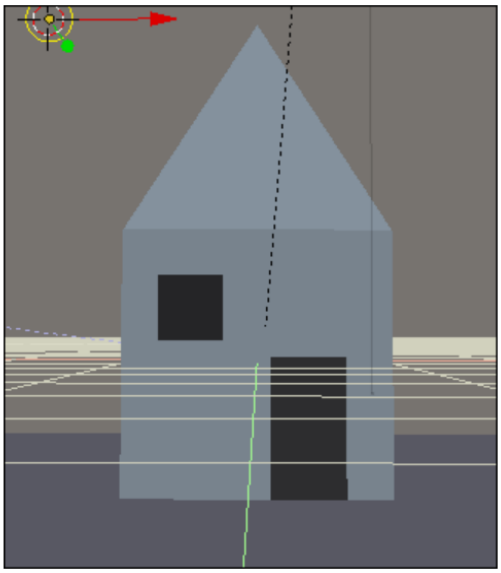
Introduction

In this project, you will:

- Build a house using basic shapes.
- Make a door and a window for the house.
- Paint the house different colors.
- Create an animation.

Project Preview

Here's an example of the house you'll make with basic shapes.



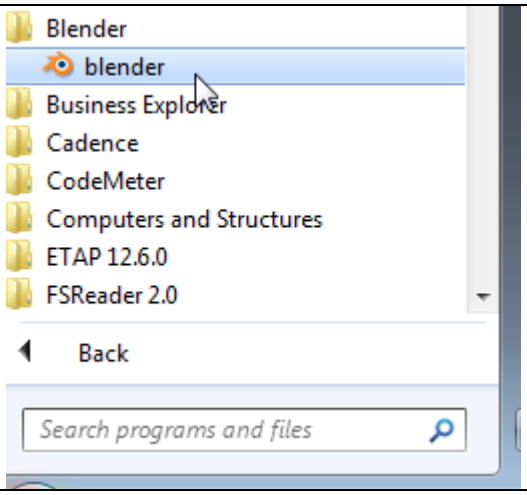
LAB 1 Introduction

In this lab, you'll add the basic shapes for your house. You'll use planes to make flat surfaces for the door and window.

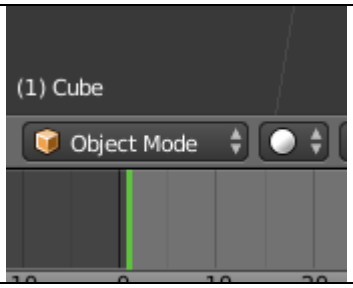
ADD A CUBE

In this lab, you'll add the basic shapes for your house. You'll use planes to make flat surfaces for the door and window.

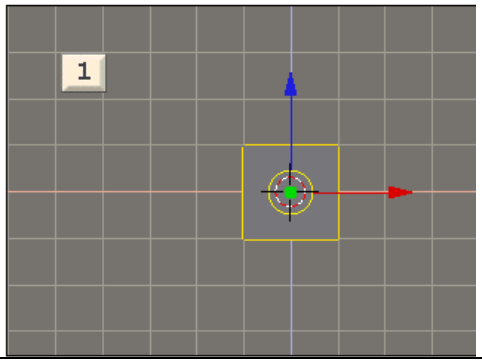
1. Open Blender.

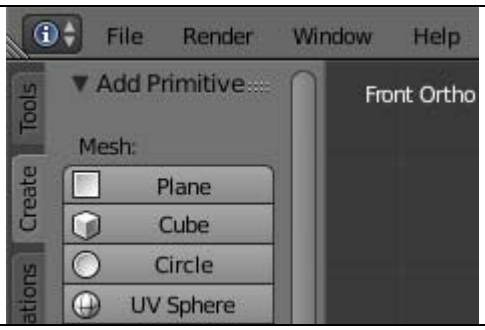
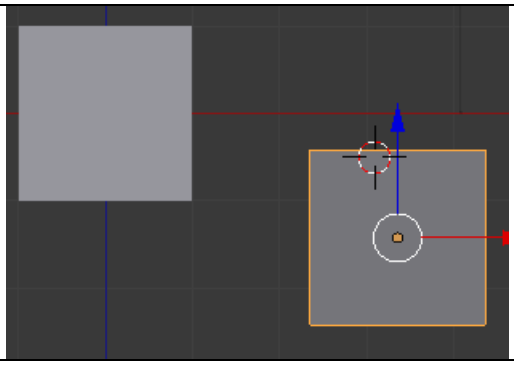
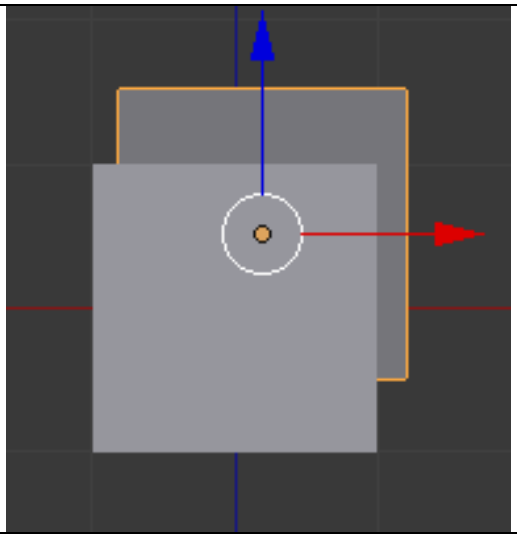


2. At the bottom of the 3D View window, make sure that you are in Object Mode. If not, press TAB.

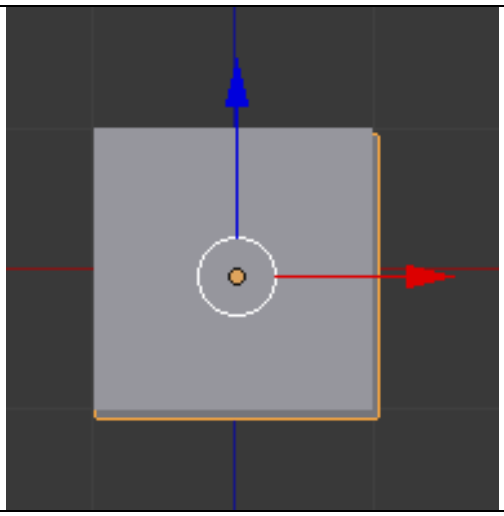


3. Press NUM1 to return to Front view.



4. Select the Create Tab to Add Primitive CUBE then left-click the Cube.	
5. Left-click the Translate manipulator mode button.	
6. 6.Left-click the 3D Transform Manipulator's blue arrow.	
7. Move the new cube on top of the original cube. TIP: Holding down the LEFT MOUSE BUTTON while moving the mouse might make this step easier.	

8. .Left-click to stop moving the cube.

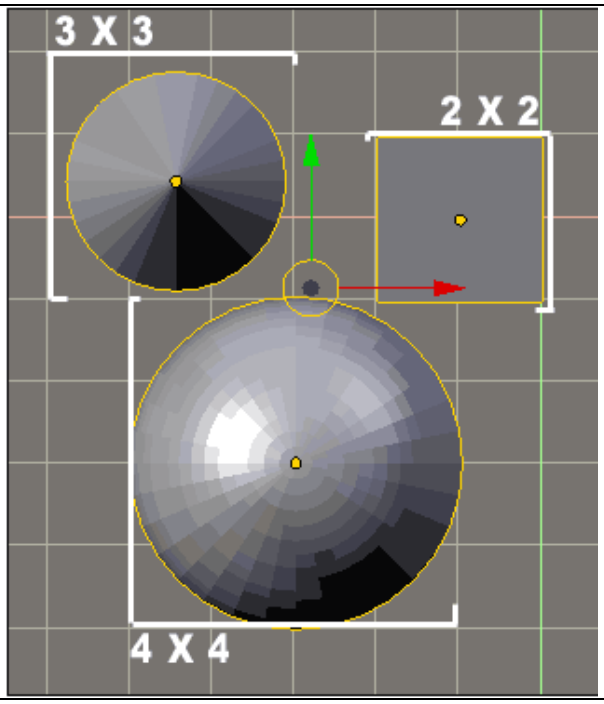


The Grid as a Guide

The **grid** is the series of lines in the background of the 3D View window's preset views. These lines form boxes.

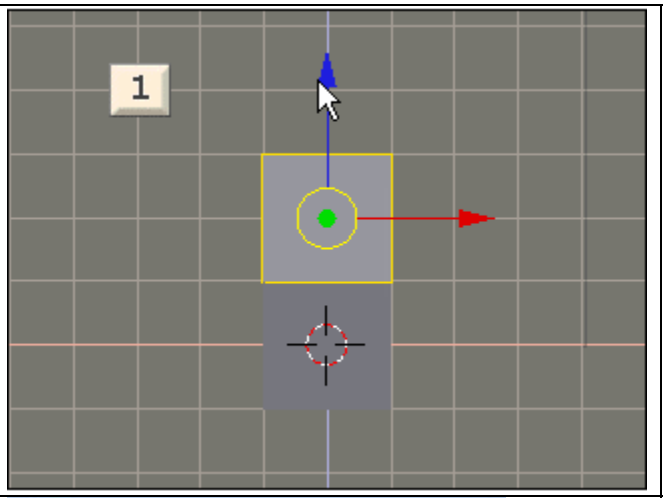
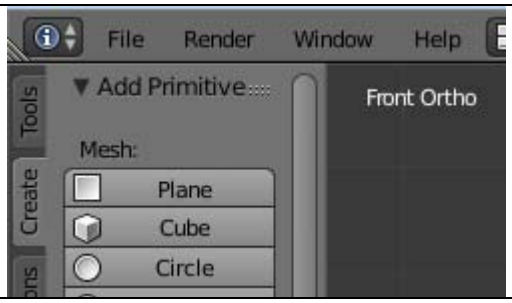
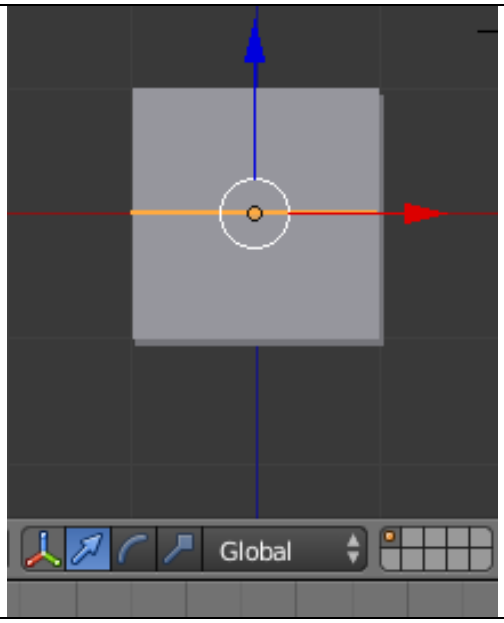
You'll use these boxes to help you make objects the right size.

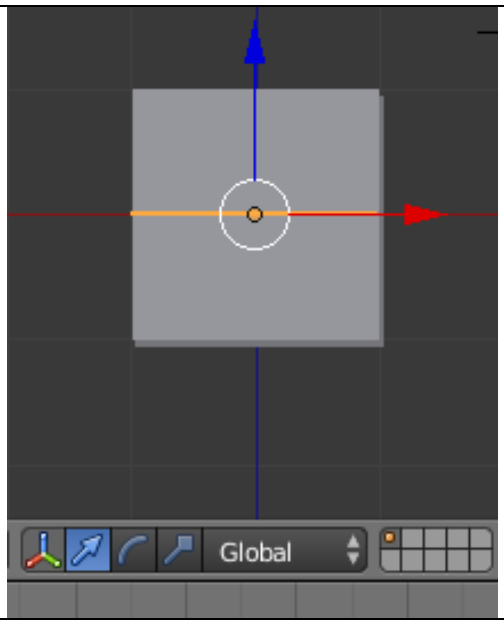
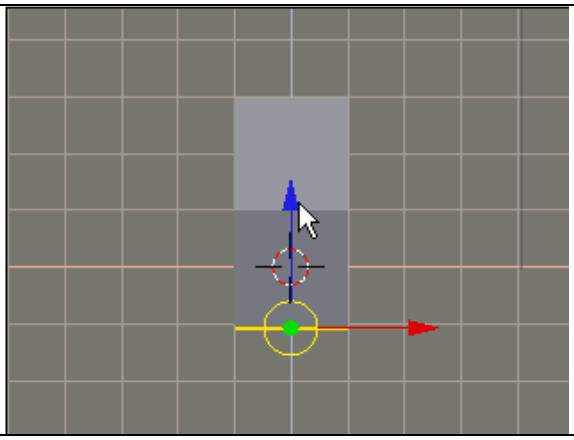
When you pan around, the grid forms a plane that you can use to remind you where up and down is.

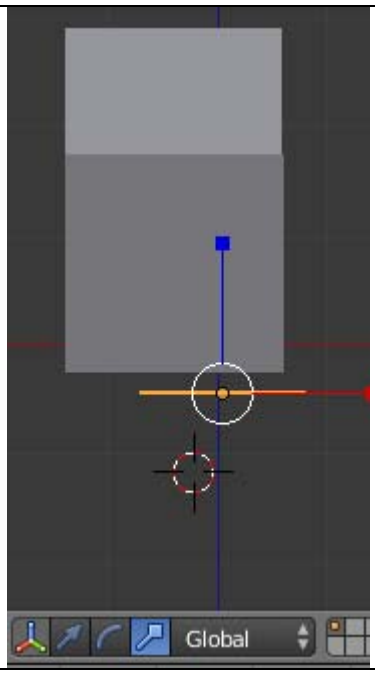
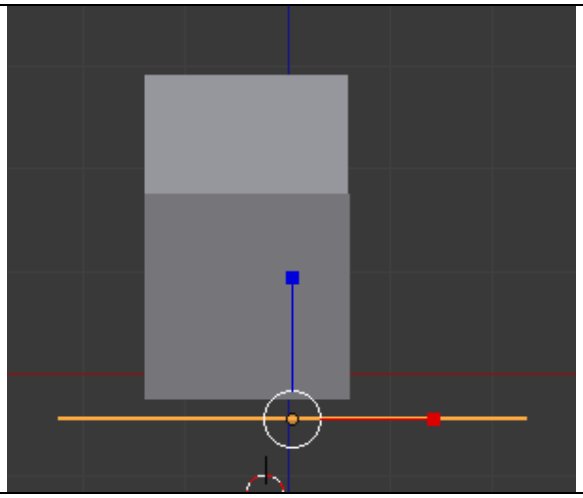


Add a Plane

Complete the steps below to add a plane. You'll add a plane any time you want to create a flat surface for your 3D objects to sit on.

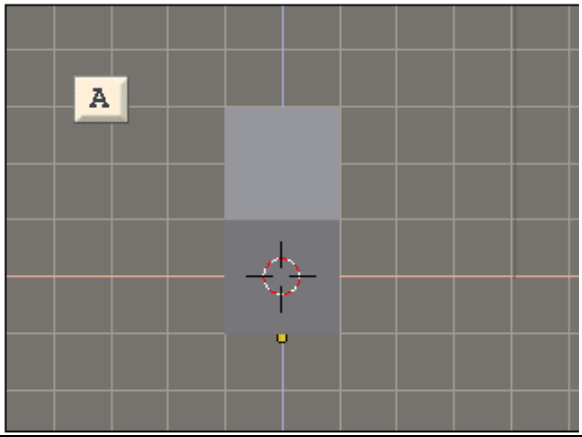
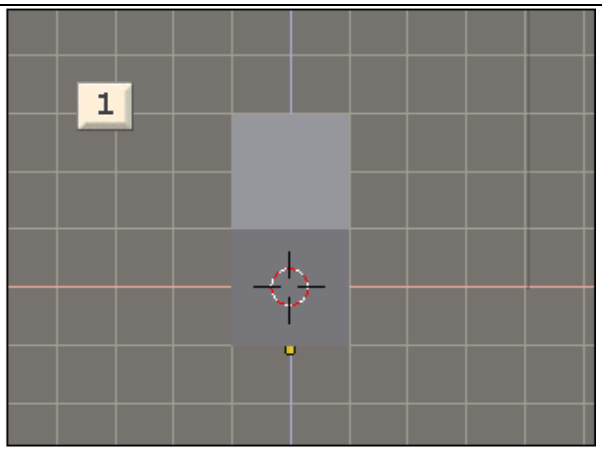
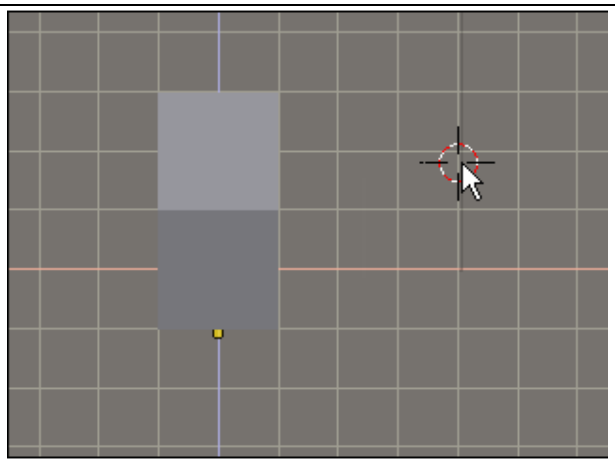
1. Make sure you're still in the Front view by pressing NUM1.	
2. Select the Create Tab to Add Primitive then add a PLANE then left-click the PLANE. The new plane will look like a straight line.	
3. Make sure you still have the Translate manipulator mode button selected.	

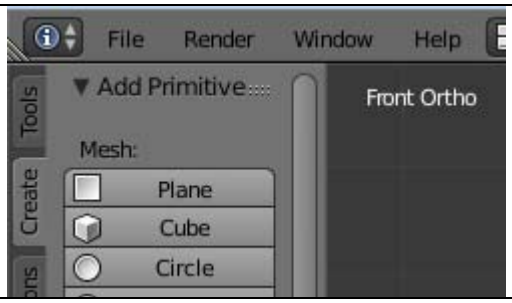
4. Left-click the 3D Transform Manipulator's blue arrow.	
5. Move the plane to the bottom of the original cube. Left-click again when it's in the right place.	

6. Left-click the Scale manipulator mode button.	
7. Scale the plane until it's about six boxes wide.	

ADD A DOOR

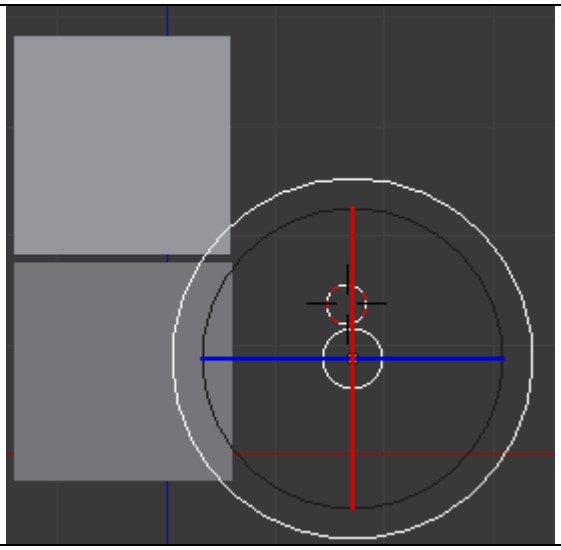
You'll add a door to the house by creating another plane.

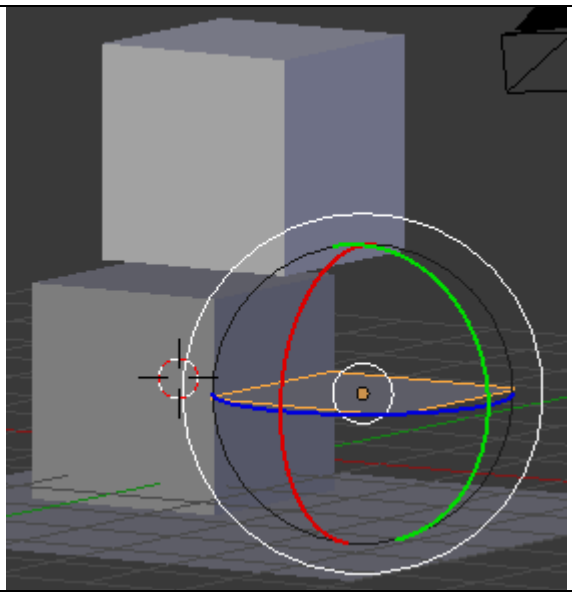
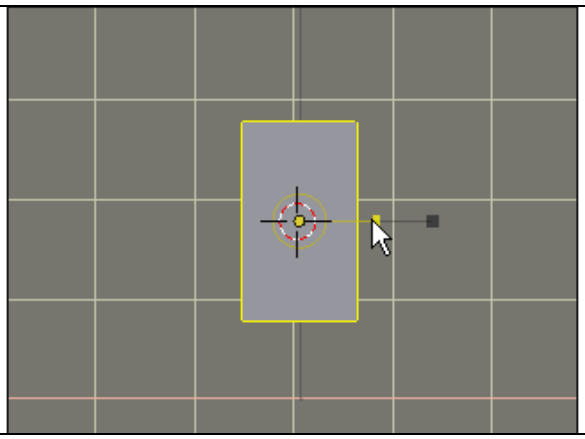
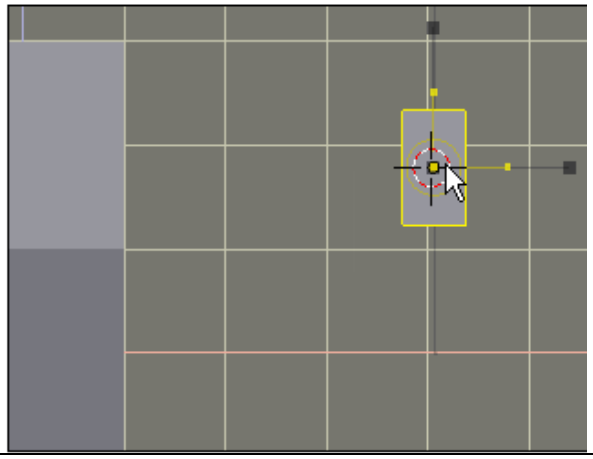
1. Make sure that nothing is selected. If something is selected, press the A key to deselect.	
2. Press NUM1 to return to the Front view of the house.	
3. Left-click outside the house to move the 3D cursor. This is where you will add the plane. You'll move it to the front of the house later.	

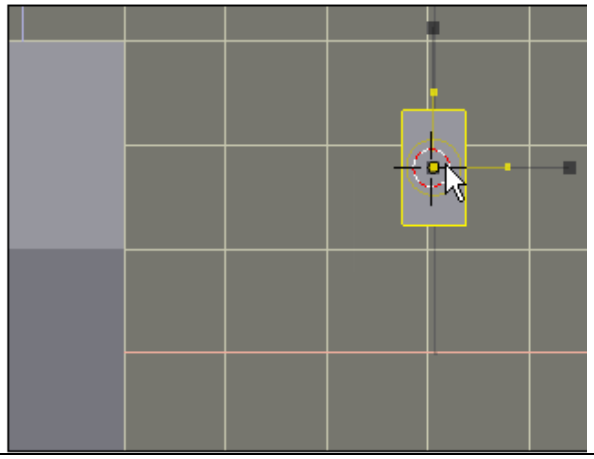
4. Select the Create Tab to Add Primitive then add a PLANE then left-click the PLANE. The new plane will look like a straight line.	

MOVE THE DOOR

Complete the steps below to resize the door and place it on the front of the house. You may need to scale and then move the door more than once to get it where you want.

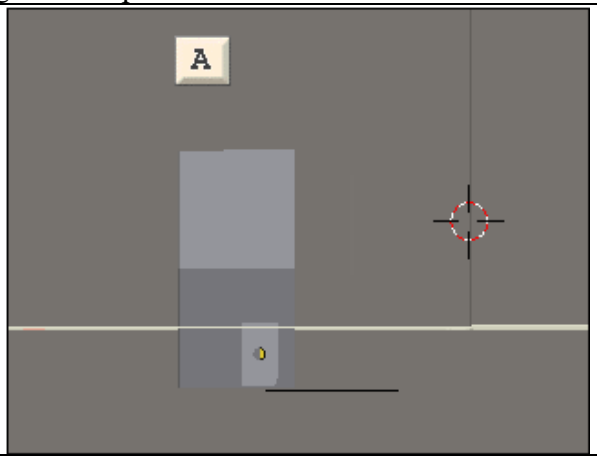
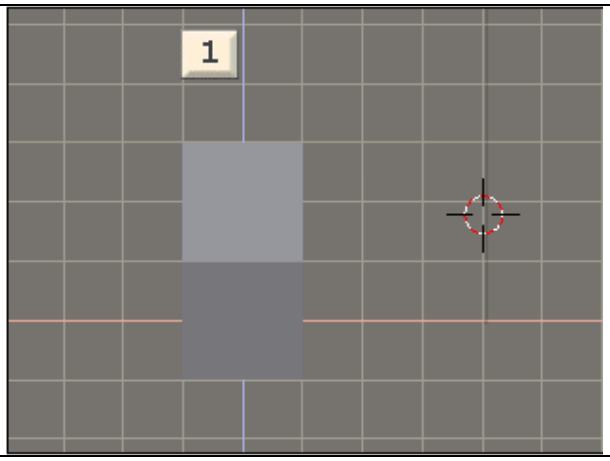
1. Left-click the Rotate manipulator mode button.	
2. If necessary, right-click the plane to select it.	

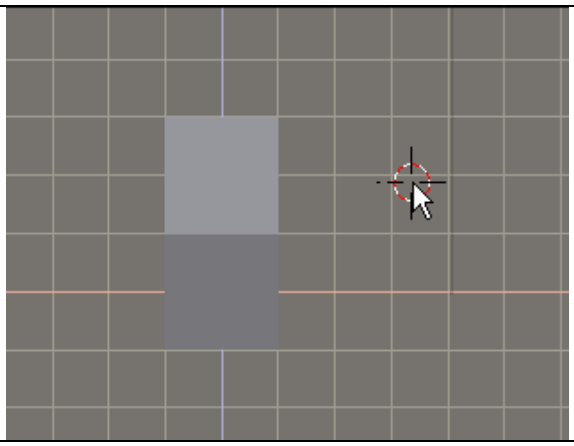
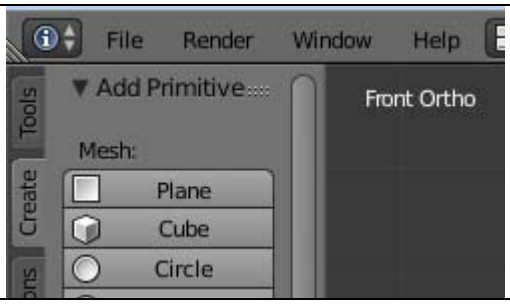
3. In the 3D Transform Manipulator, left-click the red circle to rotate the plane along the X-axis. You want to make the plane parallel to the house. Take a look at the example. TIP: Panning around the house so that you can see the plane from the side may make this easier.	
4. Left-click the Scale manipulator mode button and use the square handles to shape the plane into a rectangle.	
5. Once the plane is a rectangle, scale the entire rectangle to fit on the front of the house.	

6. Left-click the Translate manipulator mode to move the rectangular plane to the bottom right of the front of the house.	

ADD A WINDOW

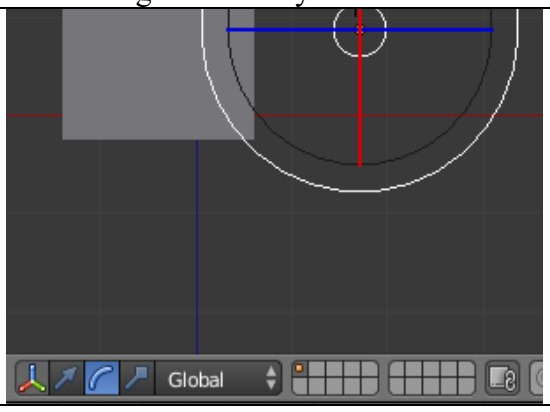
You'll add a window to the house by creating another plane..

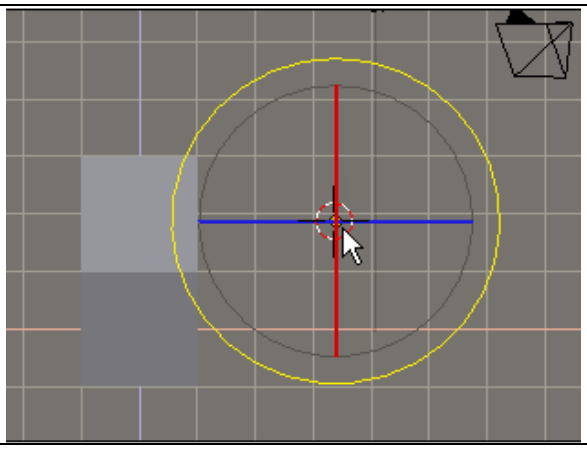
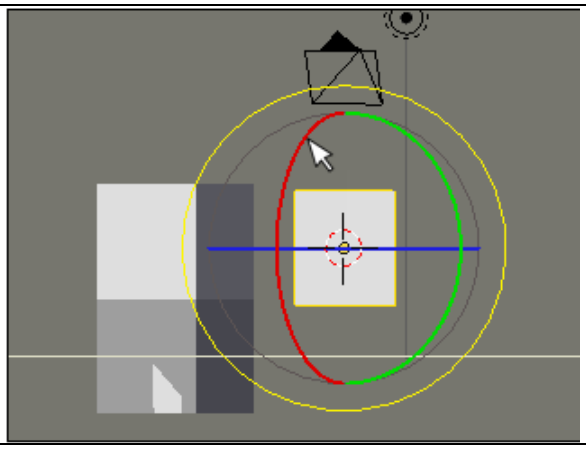
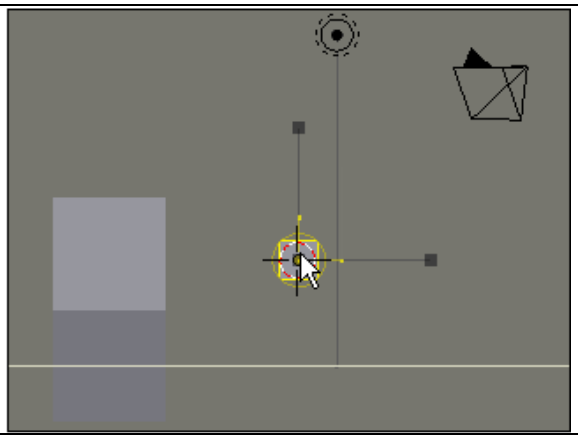
1. Make sure that nothing is selected. If something is selected, press the A key to deselect.	
2. Press NUM1 to return to the Front view of the house.	

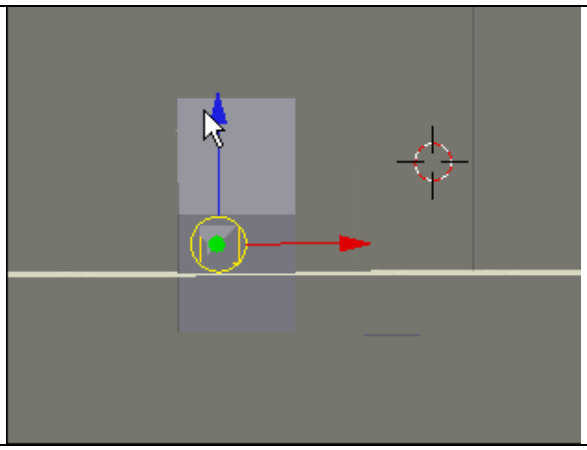
3. Left-click outside the house to move the 3D cursor. This is where you will add the plane. You'll move it to the front of the house later.	
4. Select the Create Tab to Add Primitive then add a PLANE then left-click the PLANE. The new plane will look like a straight line.	

MOVE THE WINDOW

Complete the steps below to scale the window and place it on the front of the house. You may need to scale and move the window more than once to get it where you want.

1. Left-click the Rotate manipulator mode button.	

2. If necessary, right-click the plane to select it.	
3. In the 3D Transform Manipulator, left-click the red circle to rotate the plane along the X-axis. You want to make the plane parallel to the house. Take a look at the example. TIP: Panning around the house so that you can see the plane from the side may make this easier.	
4. Scale the square to fit on the front of the house.	

5. Left-click the Translate manipulator mode and then move the plane to the front of the house.	

Check Your Work

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

1. Make sure your house has two cubes, a window, and a door.

2. Make sure the two cubes are right on top of each other with no gap between. You may need to rotate the camera to check this.

3. If everything is in the right place, save your project into the **C:\Users\Student\Desktop\UHD\3D Animation** directory before moving on.

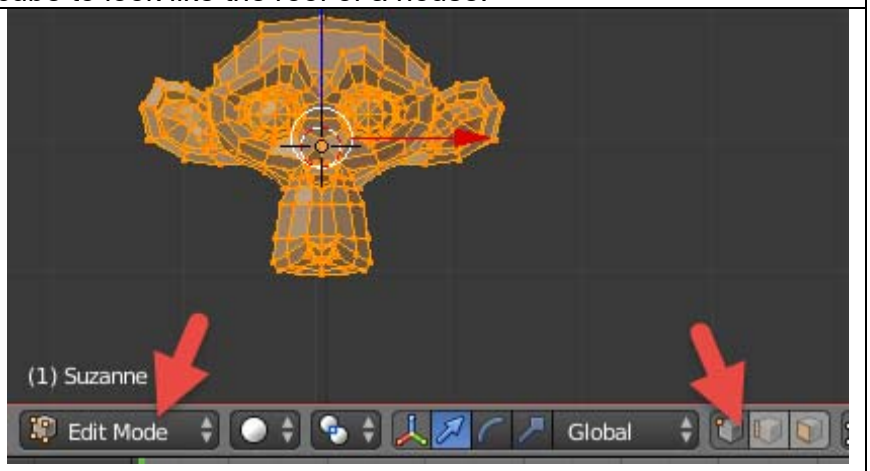
SUMMARY	In this lab, you: • Used simple shapes to build more complicated objects. • Added planes in different shapes and sizes. • Used the 3D Transform Manipulator to prepare the building blocks of a house.

LAB 2 Introduction

In this lab, you'll change a cube to look like the roof of a house.

VERTEX SELECT MODE

In Edit mode, the **Vertex Select Mode** button lets you select the points where the lines meet.

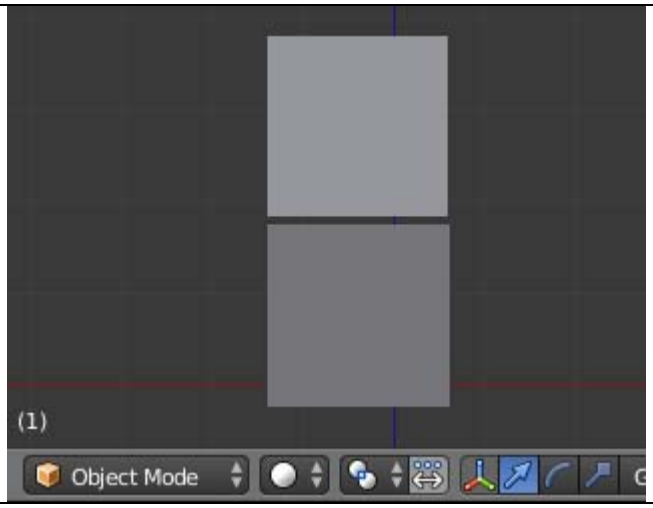


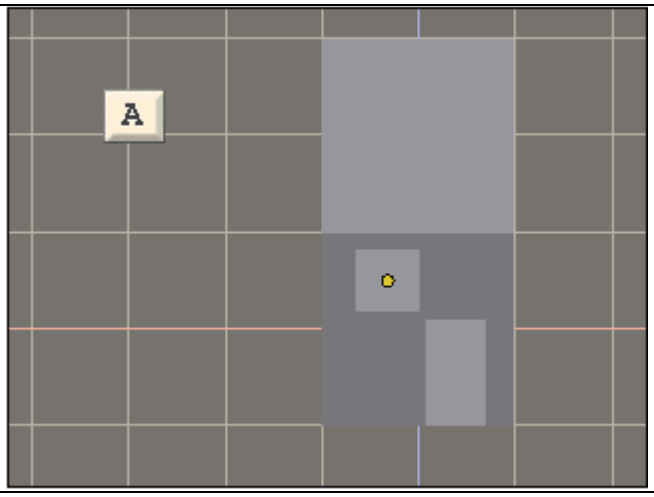
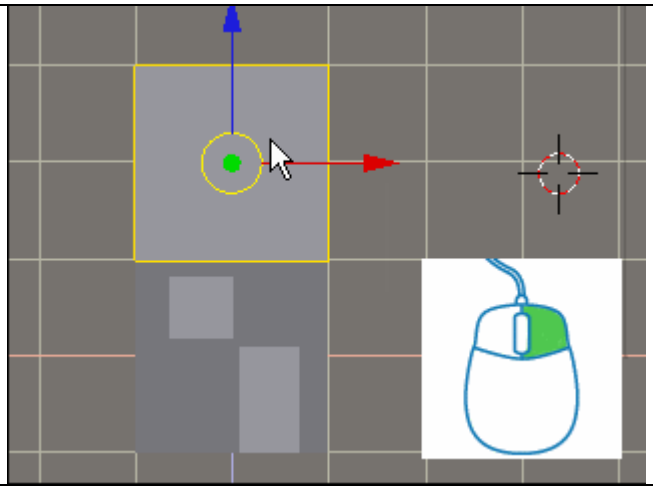
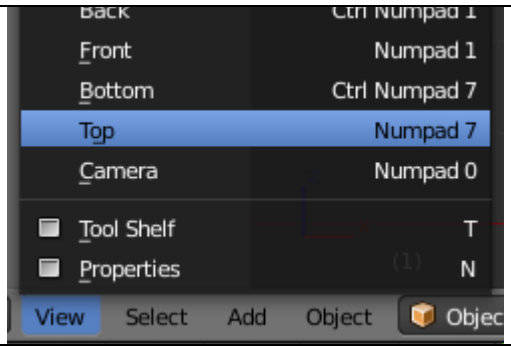
You'll use this button when you want to translate, rotate, or scale vertices.

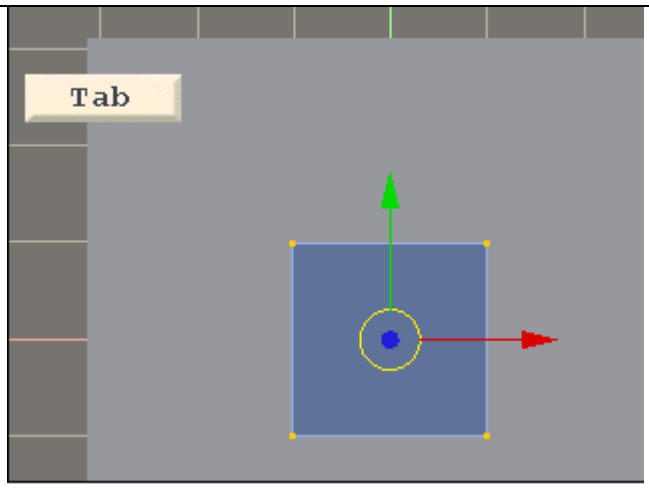
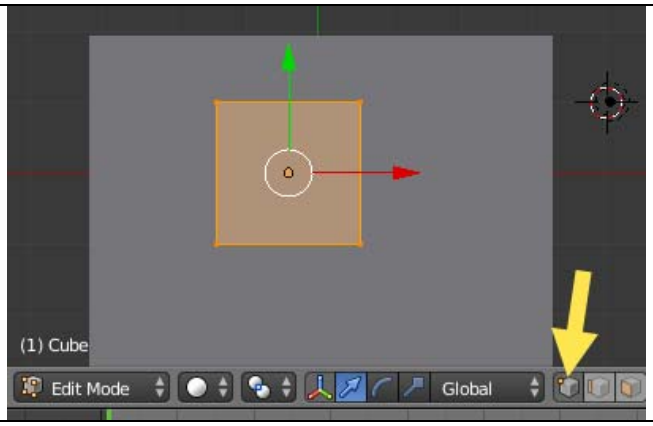
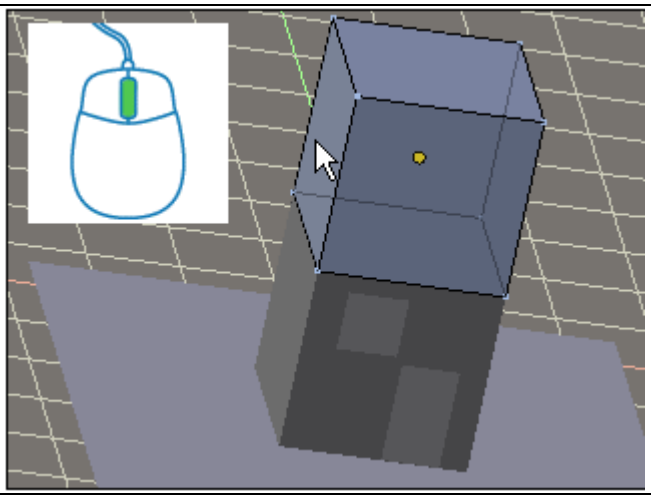
Create a Basic Roof

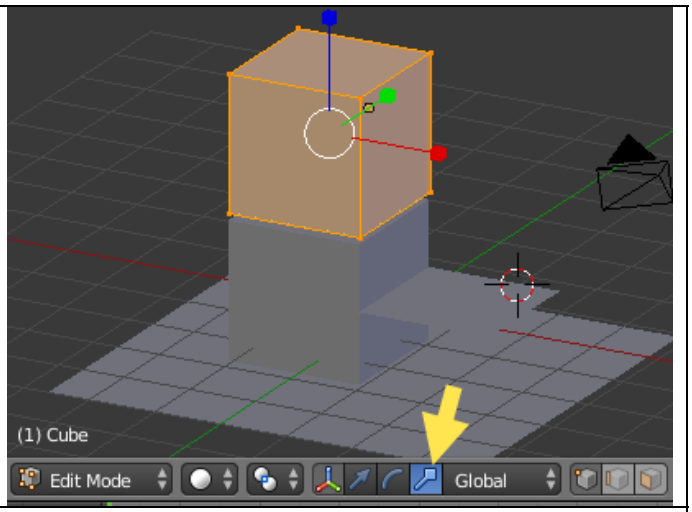
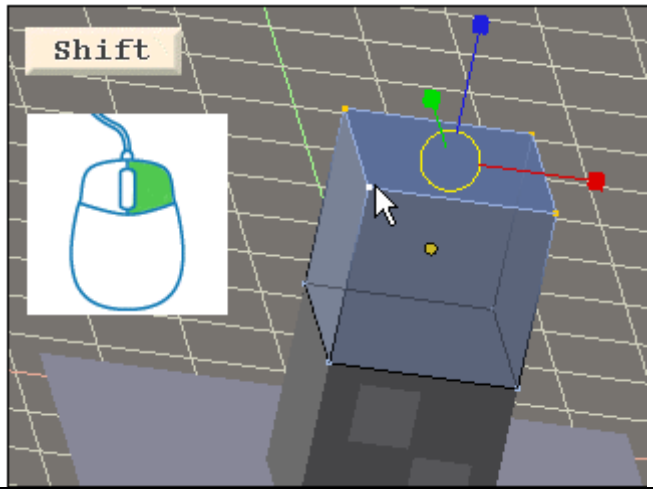
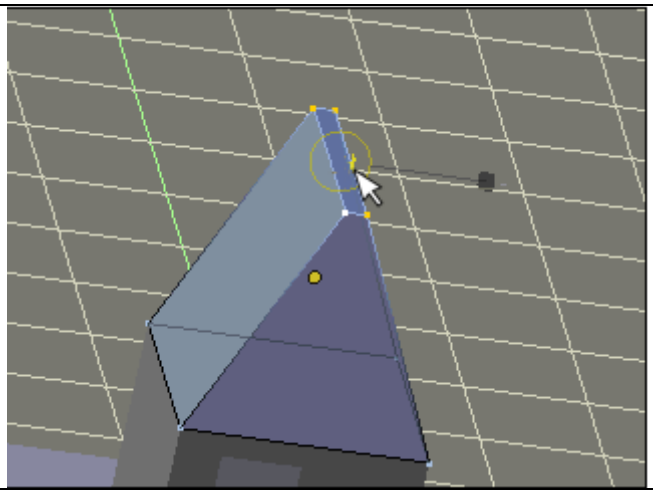
Complete the steps below to make a cube into a triangle. You'll select the vertices of the cube and scale it.

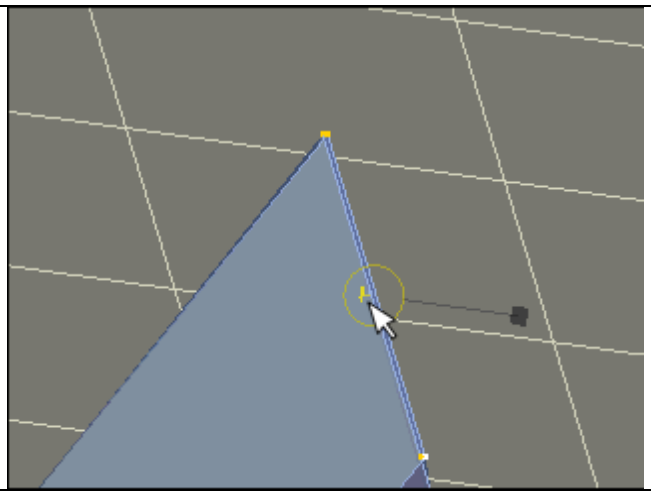
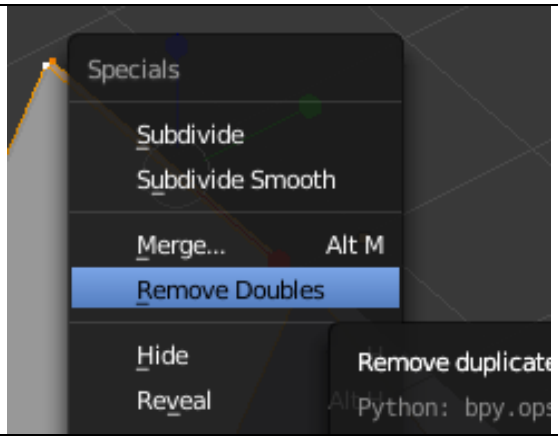
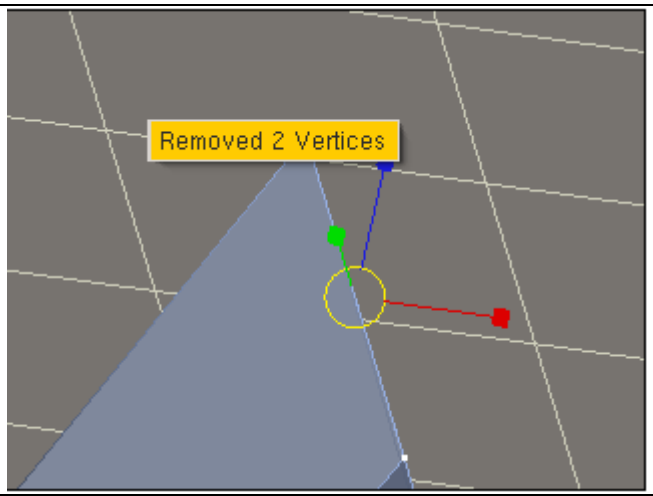
1.Make sure you are in Object Mode. If not, press TAB.



2.Press the A key until you don't see any yellow lines.	
3.Right-click the top cube to select it.	
4.On the View menu, left-click Top.	

5.Press TAB to switch to Edit Mode.	
6.At the bottom of the 3D View window, left-click the Vertex select mode button.	
7.Press and hold the scroll wheel to pan until you can see the top and sides of the cube. Make sure your cube looks like the example.	

8.Left-click the Scale manipulator mode button.	
9.Press and hold the SHIFT key while right-clicking the four vertices at the top of the cube. TIP: When all the face's vertices are selected, the top of the cube will turn a darker blue.	
10.In the 3D Transform Manipulator, left-click the red box and drag until the cube looks like a pointed roof.	

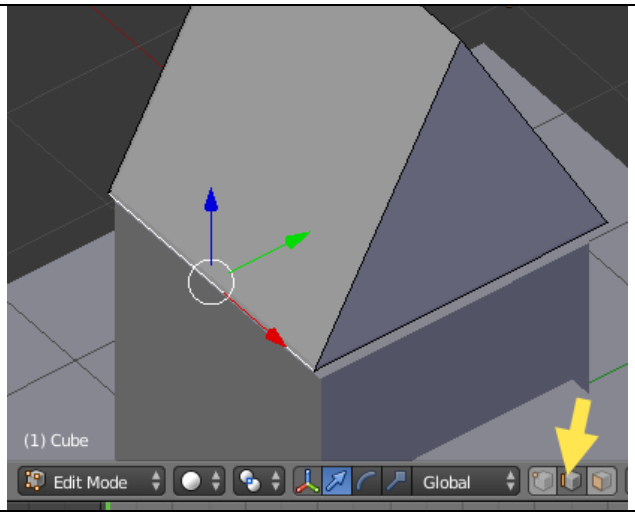
11.You may need to drag it back and forth to make it a look like a roof. Make sure the top lines up perfectly. TIP: Zooming in may make it easier to join the two edges together.	
12.Press the W key and then left-click Remove Doubles. This will remove the two vertices you don't need in a triangular roof.	
13.Make sure the message that appears says Removed 2 vertices. If it says Removed 0 vertices, press CTRL + Z to undo and do it again. CAUTION: You have to remove two vertices, or you will not be able to change the height of your roof.	

Edges

An **edge** is the line between two vertices. A triangle has three edges. A square has four.

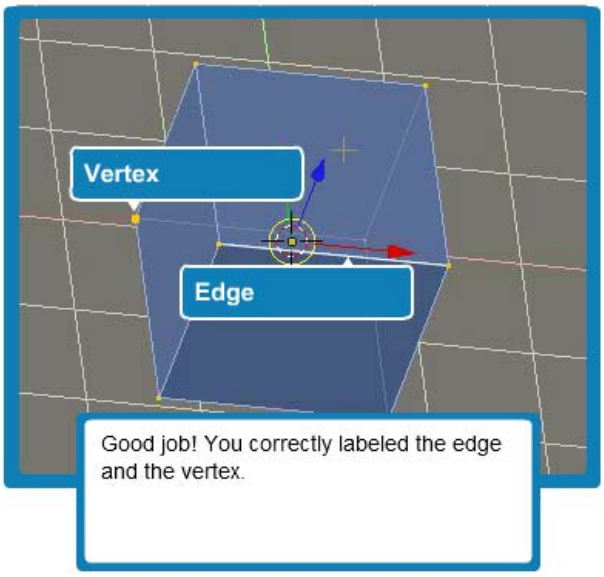
The **Edge Select Mode** tool lets you select specific edges in your 3D object.

You'll use this tool when you want to translate, rotate, or scale the edges of an object



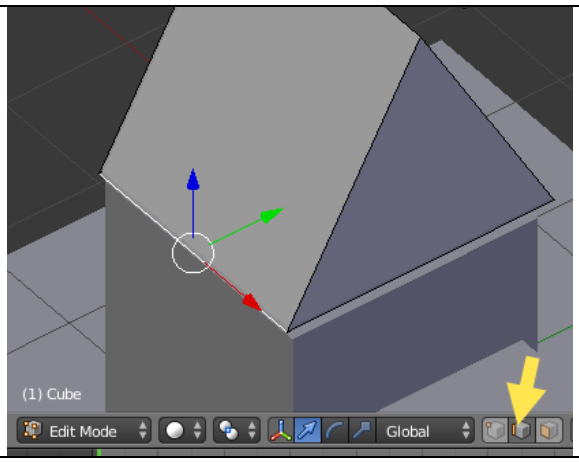
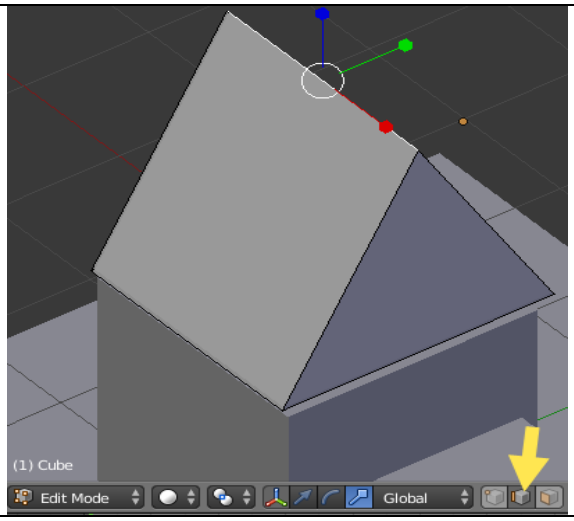
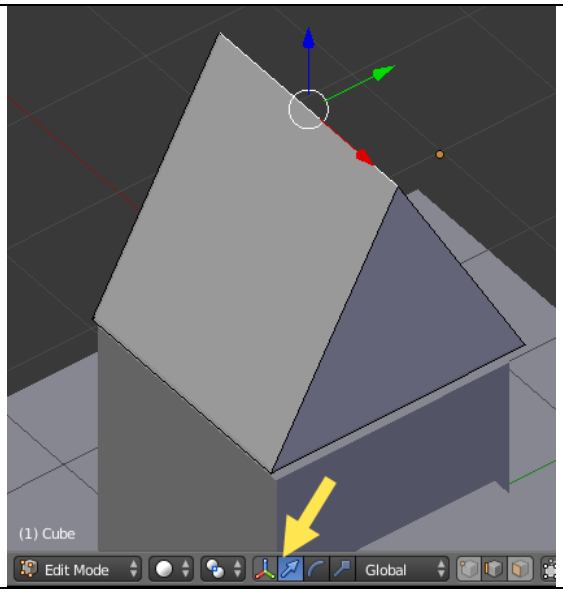
Test Yourself

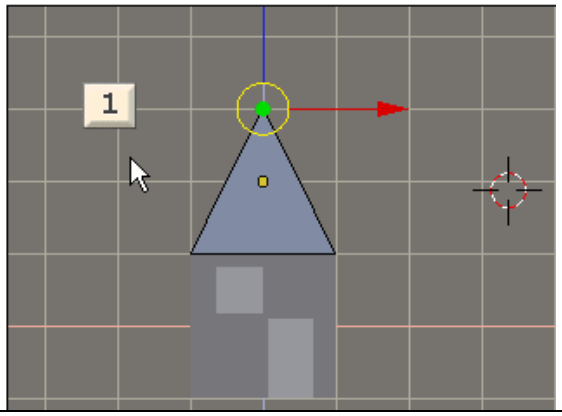
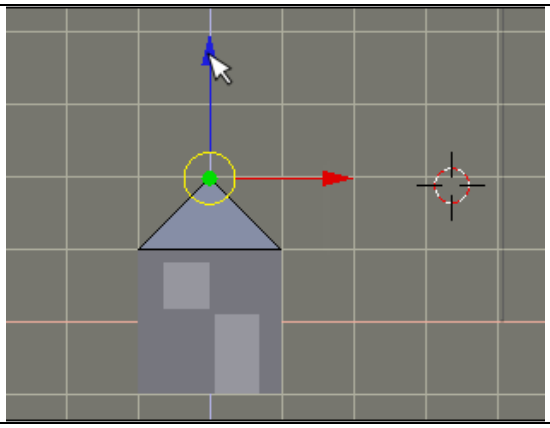
What is a Vertex?
Answer: A Vertex is simply a Point.
Describe an Edge?
Answer: A Edge is where to planes connect.



Change the Roof's Height

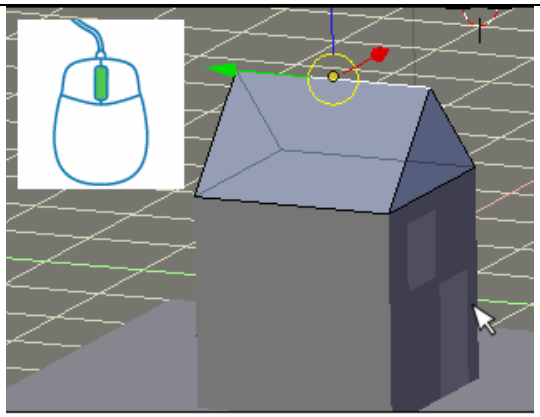
You'll use the Translate manipulator to change the shape of the roof. First, you'll change the height of the roof.

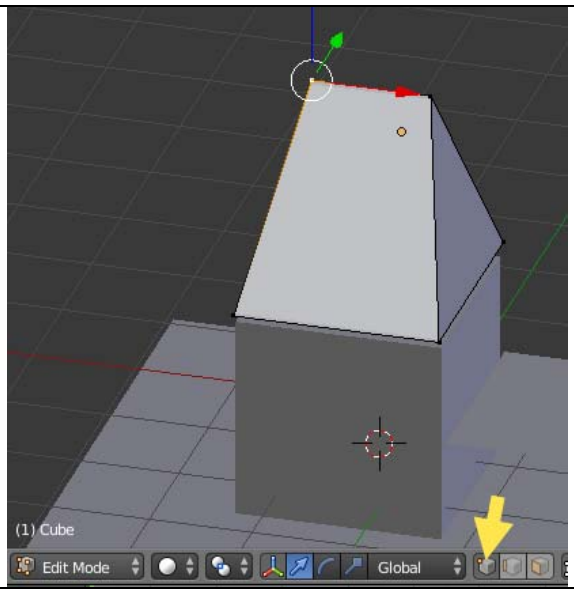
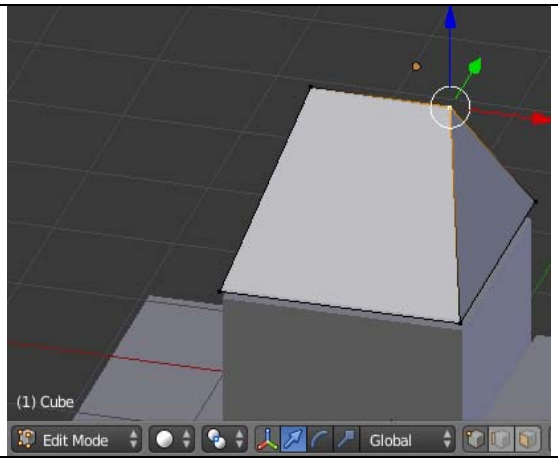
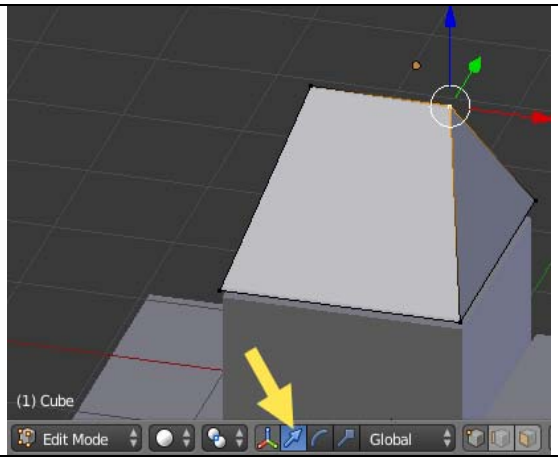
1.Left-click the Edge select mode button.	
2.Right-click the top edge of the roof. It will turn white when it is selected.	
3.Left-click the Translate manipulator mode button.	

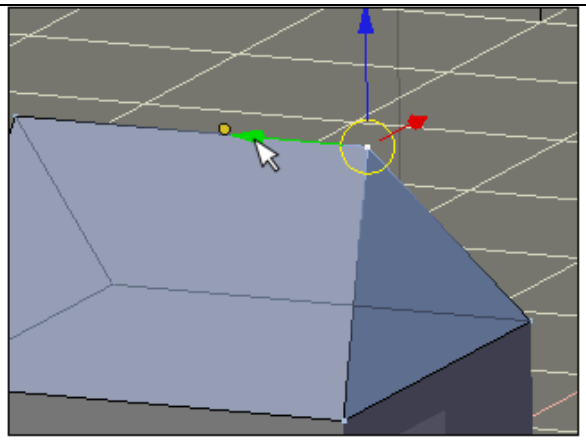
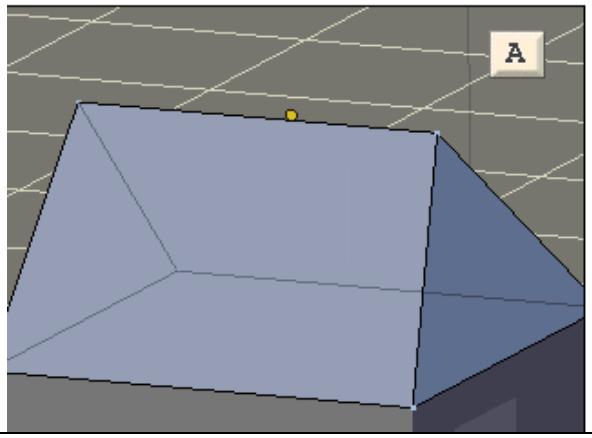
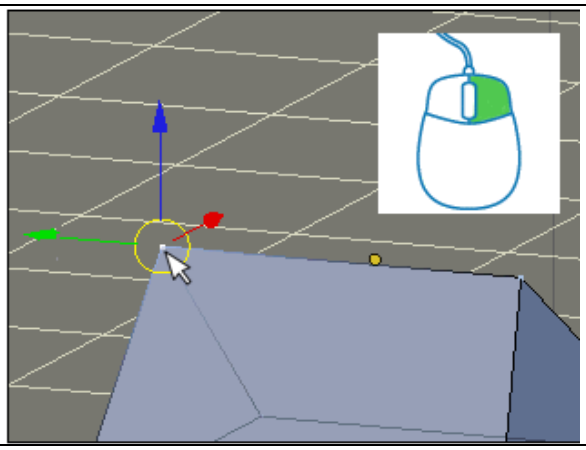
4.Press NUM1 to return to the Front view. TIP: You may need to zoom in or out to see the entire house.	
5.Left-click and drag the 3D Transform Manipulator's blue arrow until the roof is the height you want. You can look at the example for ideas on what your house should look like.	

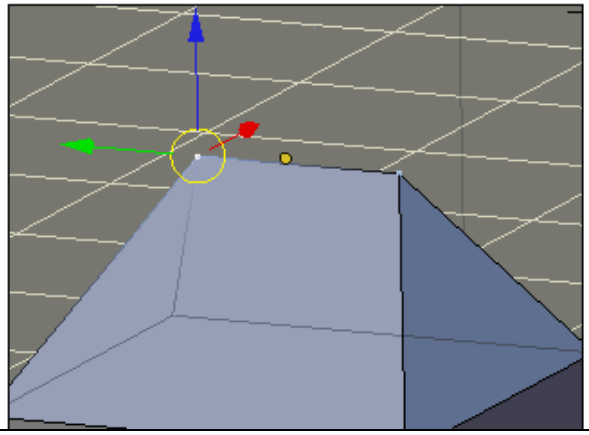
Change the Roof's Shape

Next, you'll angle the roof in so that it's not so straight. You'll select the top vertices of the roof and move them toward the center of the house.

1.Press and hold the scroll wheel to pan around the house until you can see the side of the house. Take a look at the example image.	

2.Left-click the Vertex select mode button.	
3.Right-click one of the top vertices.	
4.Make sure that you still have the Translate manipulator mode button selected.	

5.Using the 3D Transform Manipulator, left-click and drag the green arrow to make the top edge of the roof shorter.	
6.Press the A key to deselect the front top vertex. TIP: Pressing the A key is an easier way to deselect small things like vertices and edges that can be hard to click with your mouse.	
7.Right-click the other top vertex.	

8.Continue moving the top two vertices until the house has a shape that you like.	

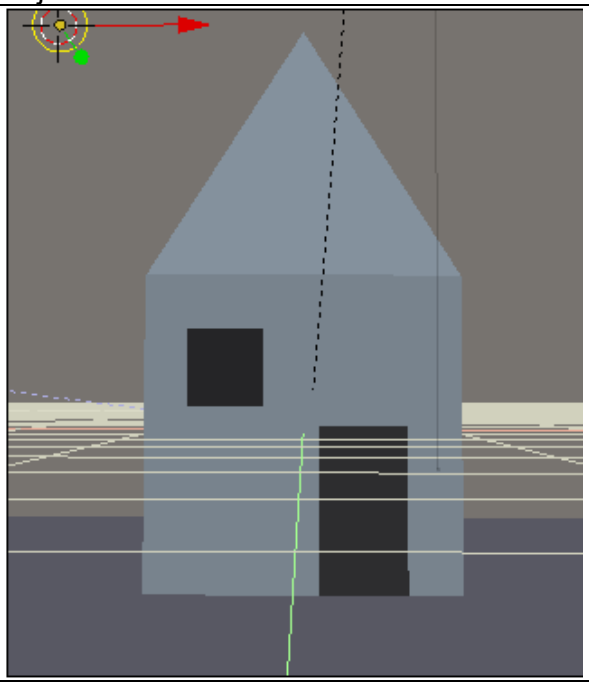
Check Your Work

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

1. Rotate around your house and check to see that the roof looks the way you want it to.

2. Make any changes to the height or angle of your roof.

3. If everything is in the right place, save your project before moving on.



SUMMARY

In this lab, you:

- Scaled vertices to change a cube into a triangle.
- Translated an edge to change the height of the triangle.
- Translated vertices to change the shape of parts of the triangle.

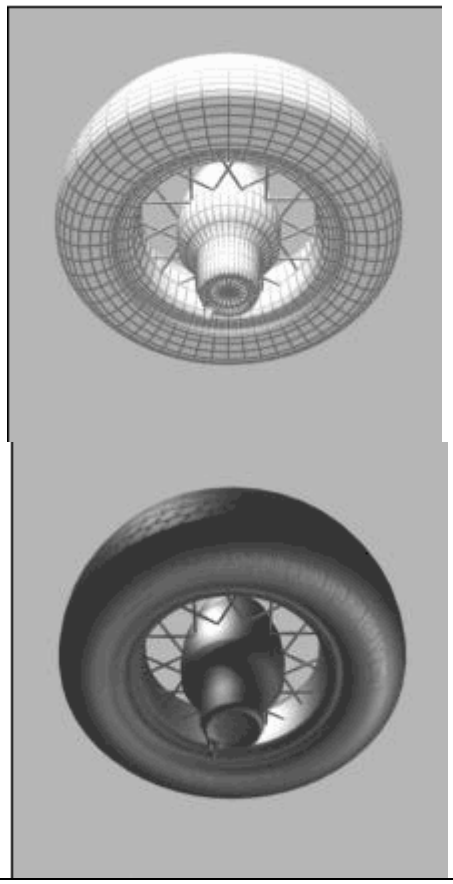
Lab 3 Introduction

In this lab, you'll change the color of your house. You'll use images to make the planes look like a window and door

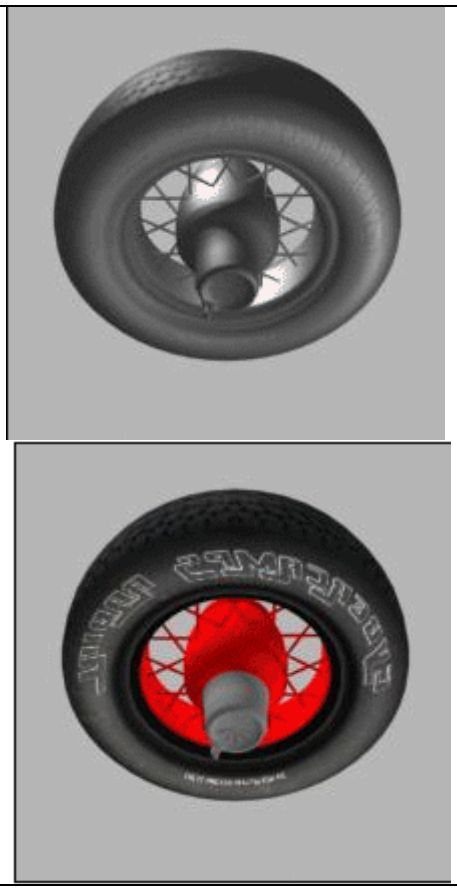
Material

Material is what lets you add color to your 3D objects in Blender. It also lets you change how shiny something is.

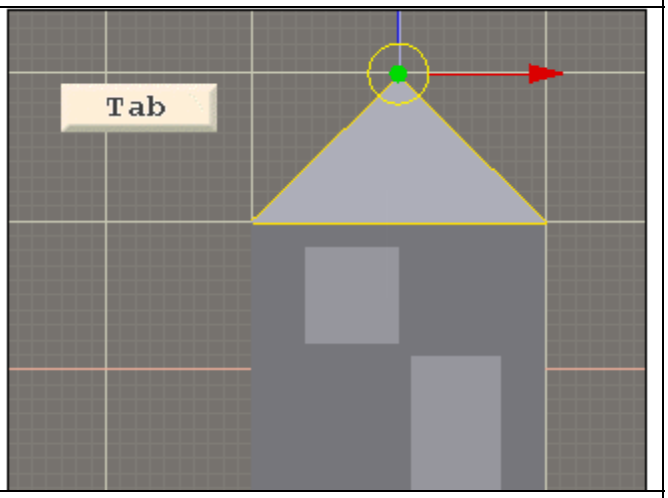
You can play around with materials as much as you want without affecting the shape of your 3D object.

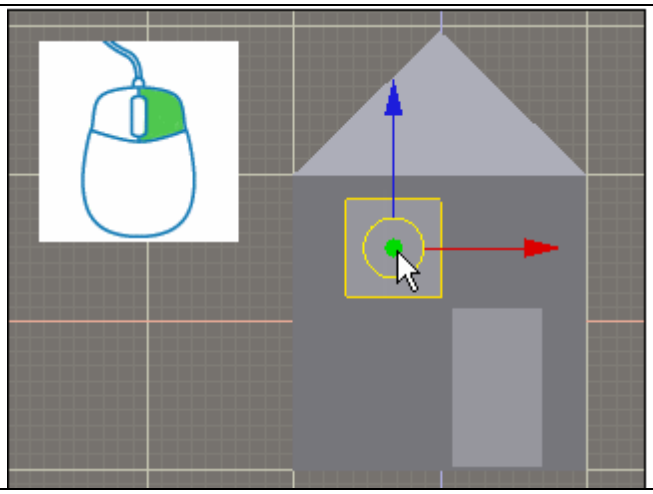


Texture

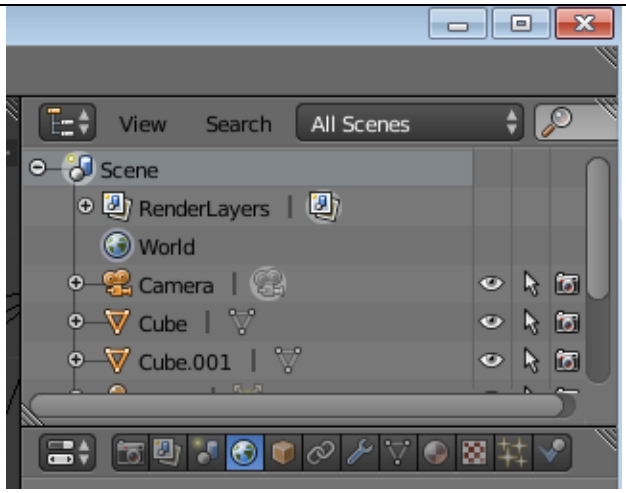
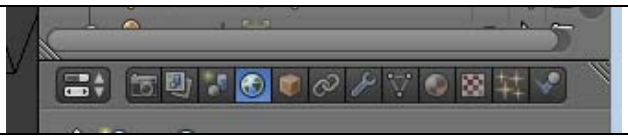
Textures are patterns or images that you can layer on top of a material to make it look different, like stripes on a zebra. They can also add bumpiness to your 3D object. You'll always need to add a material before you can add a texture.	

Select the Window

1.Make sure you are in Object Mode. If not, press TAB.	

2.Right-click on the house's window to select it.	

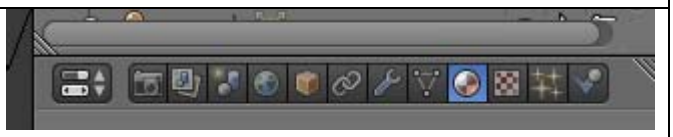
Buttons Window

Below the View, Search and All Scenes menu is the **Buttons Window**. The Buttons Window is made up of panels. **Panels** are how Blender breaks up groups of options. The panel buttons are an easy way to get to the options that you want.	
1. Find the Buttons window. You'll use it on the next screen	

Open the Material Editor

Complete the following steps to open the Material Editor. You'll do this any time you want to change how your 3D objects look.

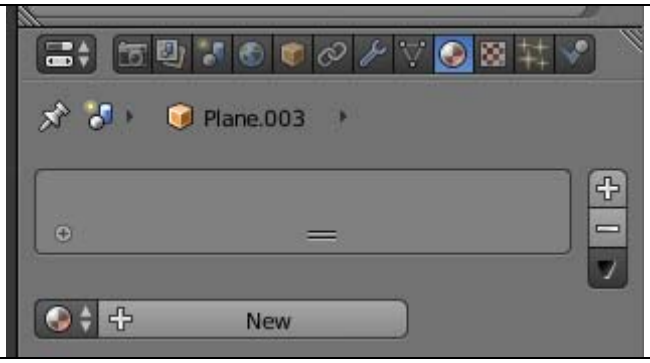
1.Left-click the Material Buttons button to select it. This will open the Material Editor. TIP: You can return to the Material Editor at any time by pressing F5.



Shading Panel

The **Shading panel** lets you add and change materials and textures for your 3D objects.

At first, it may look confusing, because there are a lot of buttons to choose from. These buttons can't mess up the shape of your 3D object, and you can always press CTRL + Z to undo a change you don't like

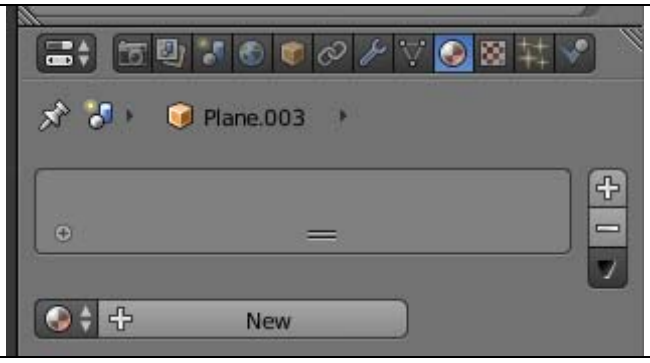


Property Editor Mini-Windows

Each panel in Blender is made of **Property Editor mini-windows**. The Property Editor miini-windows are simply addition options.
You'll use mini-windows to change the settings of the different panels option.

You can left-click the arrows to the left a property editor options to the left corner of each option.

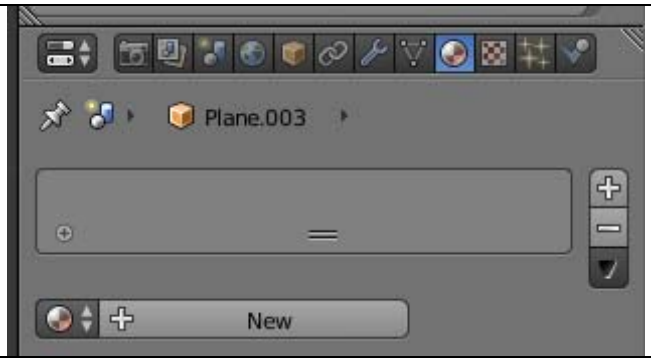
1. To access a material for an object you must first name it. Select the NEW button.



Add a New Material to the Window

You'll need to add a new material to a 3D object before you can change the object's color or add a texture to it.

1. To access a material for an object you must first name it. Select the NEW button.

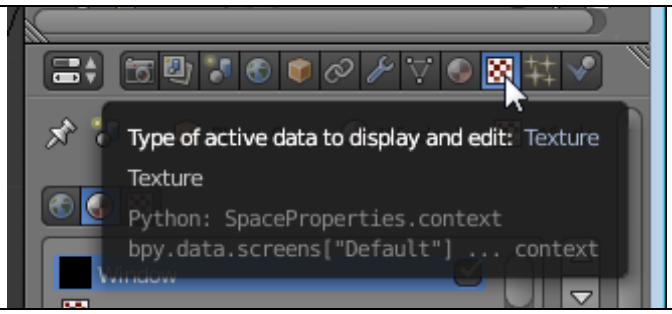


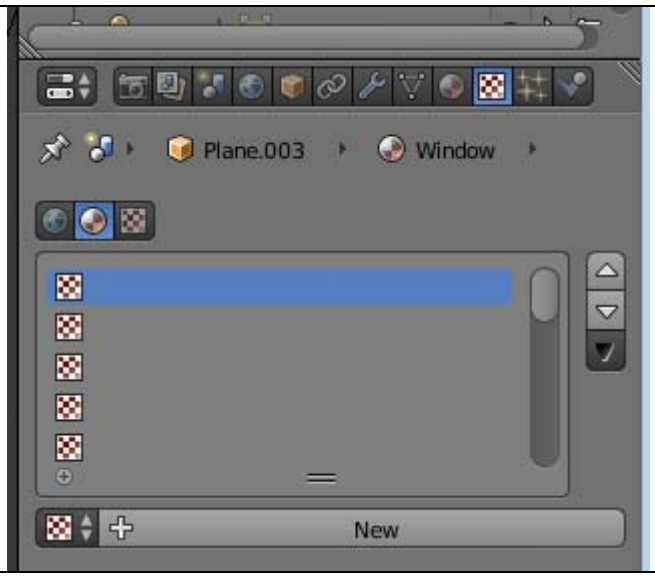
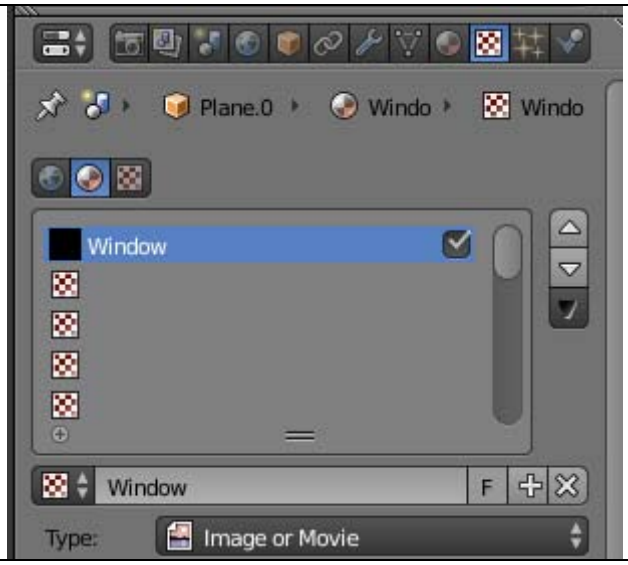
2. Left-click the Materials name field. This will highlight the material name. Type WINDOW for the window name and press ENTER.

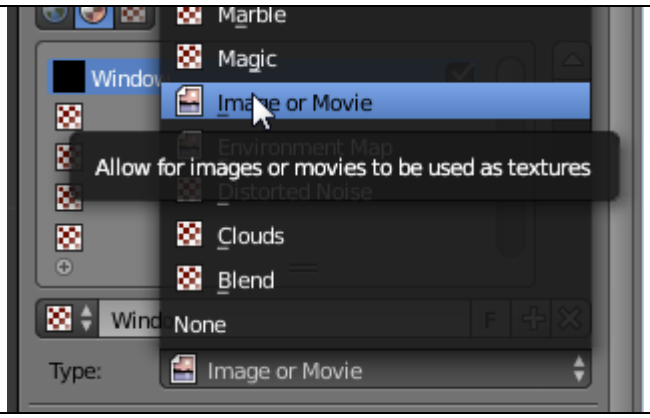
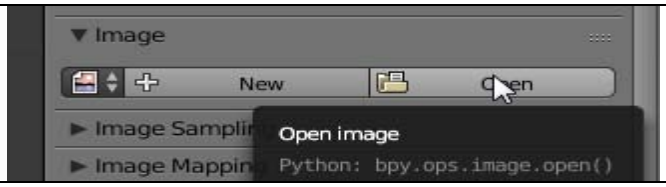
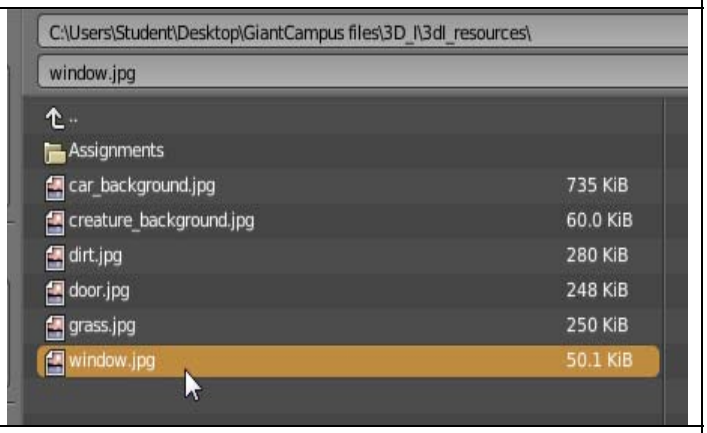
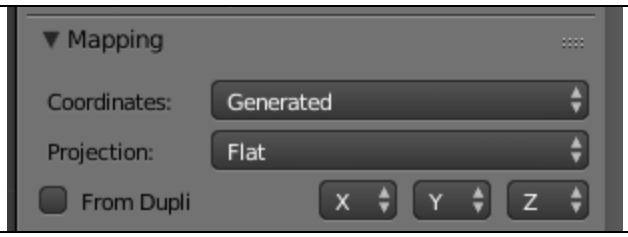
Add a New Texture to the Window

Complete the steps below to add an image as a texture to the window. After you complete this procedure, you'll render the image so you can see how it looks.

1.Left-click the Texture Buttons button to switch to the Texture Buttons panel.



2.Left-click New.	
3.Left-click the Texture name field. This will highlight the texture name.	
4.Type WINDOW and press ENTER.	

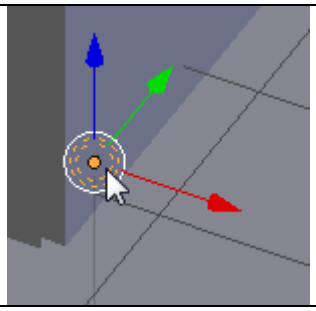
5.Left-click the Texture type list and then left-click IMAGE OR MOVIE.	
6.In the Image mini-window, left-click OPEN.	
7.Left-click window.jpg.	
8.Left-click OPEN IMAGE.	
NOTE: If image is not mapped correctly. Look at MAPPING and change coordinates to GENERATED.	

The Blender Lamp

Before you can see your textures in the rendered image, you need some light. The lamp provides light for your 3D objects.

This is important when rendering your 3D objects because without a light, it would be like taking a photo in a dark room.

1. Find the lamp. You'll use it on the next screen with the right mouse button.



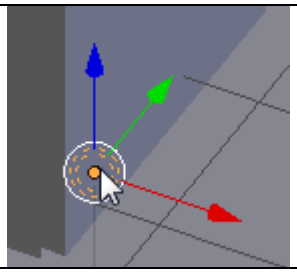
2.The Lamp tool button.

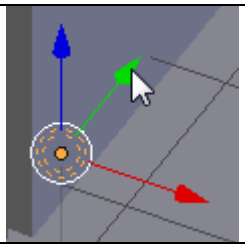
Move the Light

You can render the current frame, but the light might not be in the right place for the door and window to show up in the rendered image. Complete the steps below to move the light.

1.Make sure you are in Object Mode. If not, press TAB.

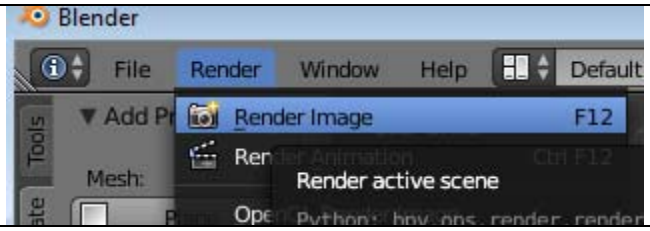
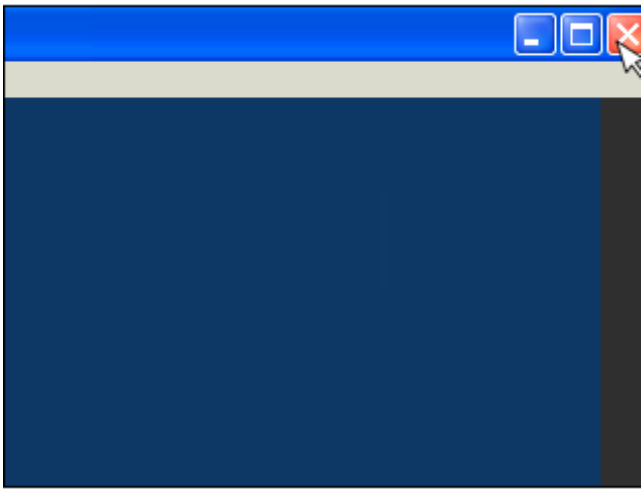
2.Right-click the light to select it.



3.Left-click the Translate manipulator mode button.	
4.Use the 3D Transform Manipulator to move the light in front of the house.	

Render the Image

You can render the current frame, but the light might not be in the right place for the door and window to show up in the rendered image. Complete the steps below to move the light.

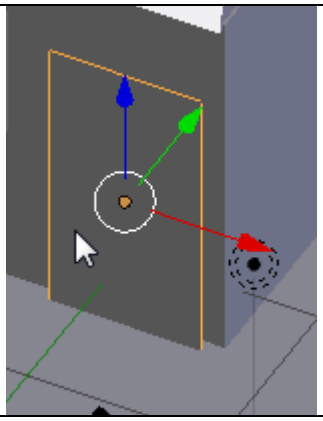
1.On the Render menu, left-click Render then Render Image.	
2.If your rendered image looks like the example, your camera isn't pointing at anything. Move and rotate the camera until you get it into position.	
3.Close the Render window when you're done or press the ESC. Key.	

Add a New Material to the Door

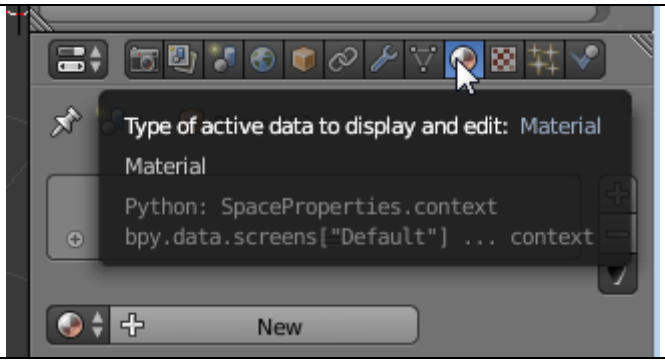
Complete the steps below to add a new material to the door. This is just like the process you used to add a new material to the window.

1.Make sure you are in Object Mode.

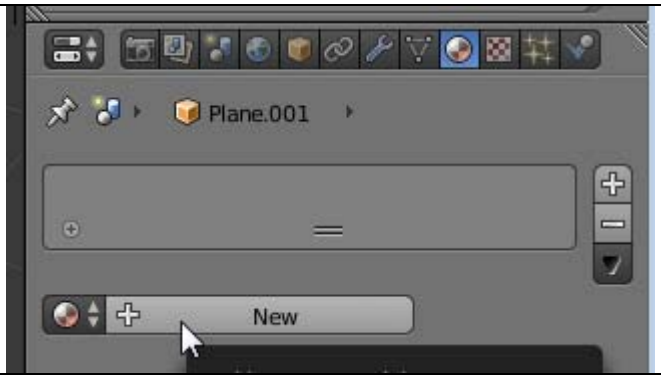
2.Right-click the door to select it.



3.At the top of the Buttons Window, make sure the Material Buttons button is selected. If not, press F5.



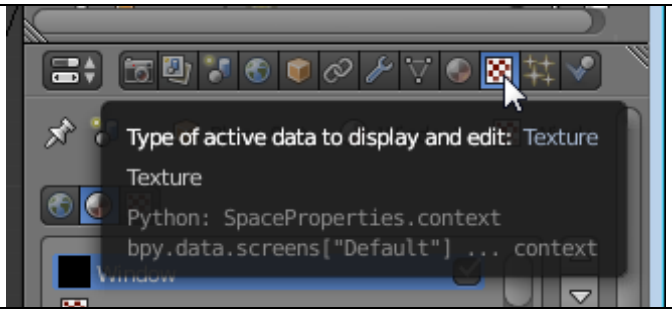
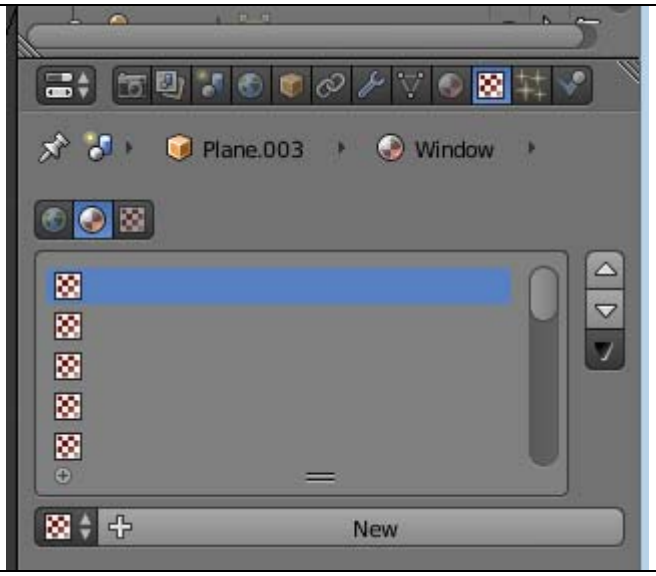
4.In the Properties Editor mini-window, left-click Add New.

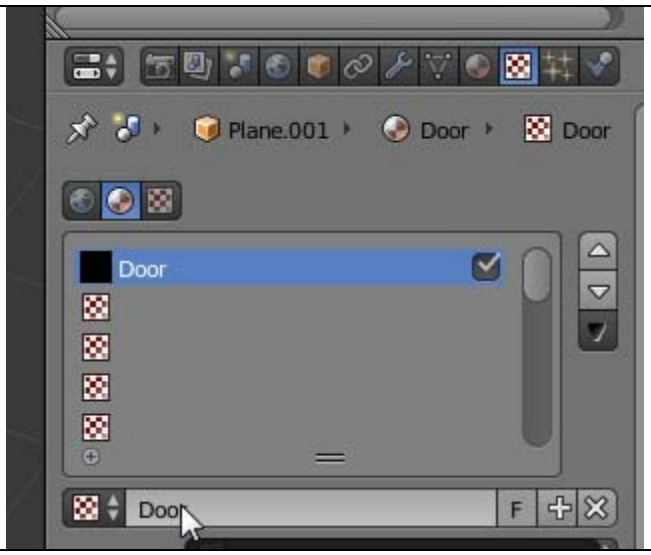
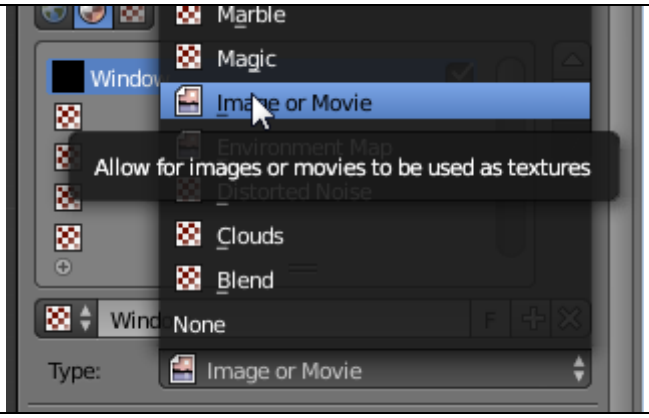
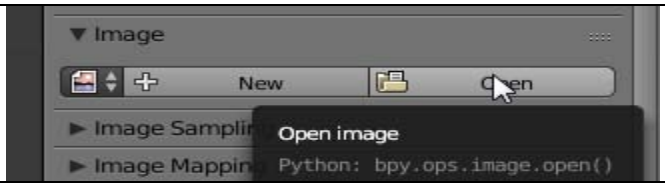


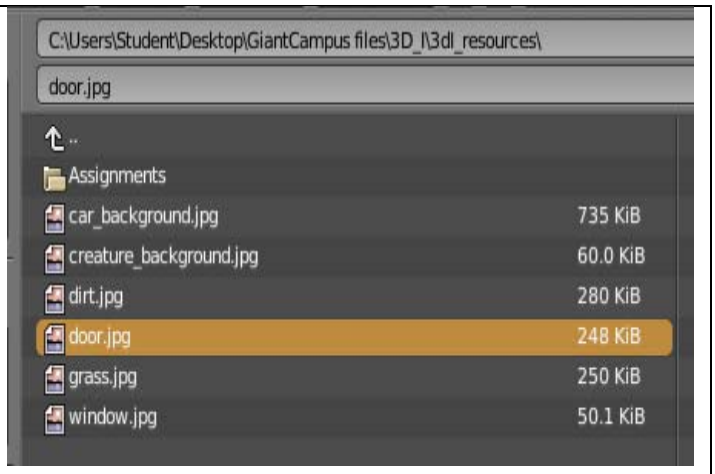
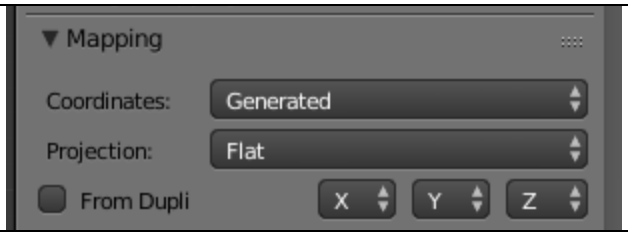
5.Left-click the Materials name field. This will highlight the material name. Type DOOR and press Enter.	

Add a New Texture to the Door

Complete the steps below to add a new texture to the door. You'll be adding an image for the texture, just like you did for the window.

1.Left-click the Texture Buttons button to switch to the Texture Buttons panel.	
2.Left-click New.	
3.Left-click the Texture name field. This will highlight the texture name.	

4.Type DOOR and press ENTER.	
5.Left-click the Texture type list and then left-click IMAGE OR MOVIE.	
6.In the Image Properties Editor, left-click OPEN.	

7.Left-click window.jpg.	
8.Left-click OPEN IMAGE.	
NOTE: If image is not mapped correctly. Look at MAPPING and change coordinates to GENERATED.	

Check Your Work

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

1. Render an image of your house and make sure the textures look the way you want them to.

2. If everything looks good, save your project before moving on to the next lab!

SUMMARY

In this lab, you:

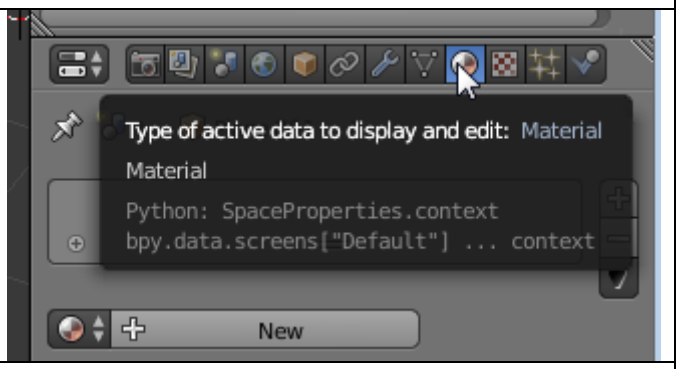
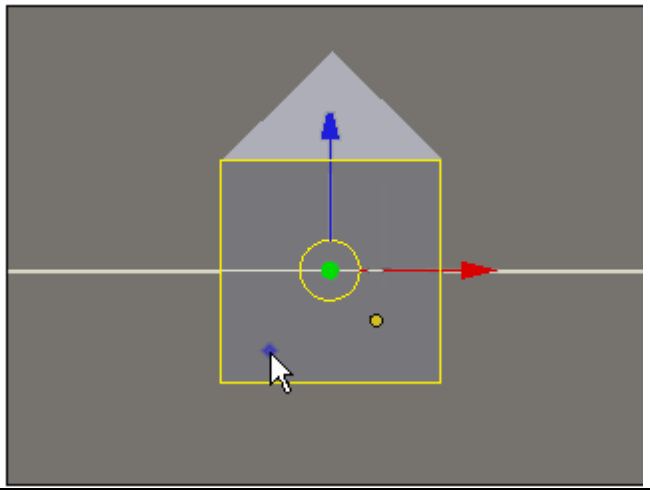
- Changed the appearance of objects by using materials and image textures.
- Moved the light to improve the rendered object's appearance.

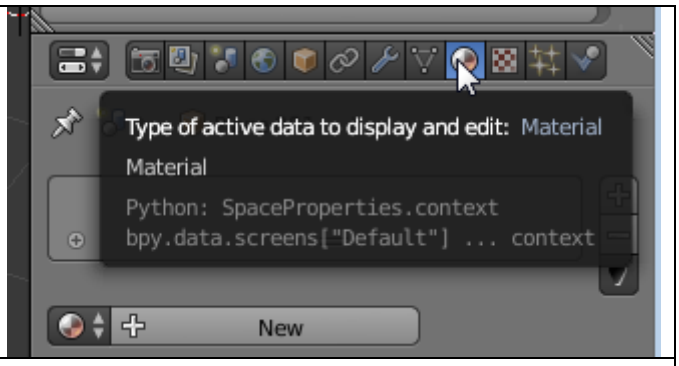
Lab 4 Introduction

In this lab, you'll use color with materials and textures to create new styles for your 3D objects.

Create a New Material for the House

Follow the steps you learned for creating materials to create a new material for the house. The exact steps aren't given, since you've done this before.

1.Make sure you're in Object Mode. If not, press TAB.	
2.Left-click the Material Buttons button.	
3.Right-click the bottom cube of the house to select it.	

4.In the Properties Editor, left-click the arrows next to the Material name and left-click Add New.	
5.Left-click the material name field and type House. Press ENTER.	

Color Picker

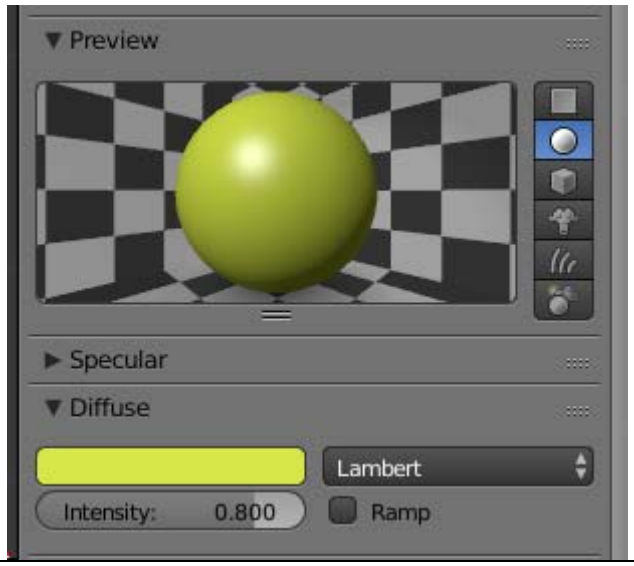
The **Color Picker** is how you choose colors for your 3D objects. You'll use the color picker any time you need to choose a color for part of your project.

The thin strip at the bottom of the Color Picker lets you select a color from all the colors of the rainbow.

The big box lets you pick a specific shade of the color you picked in the strip.

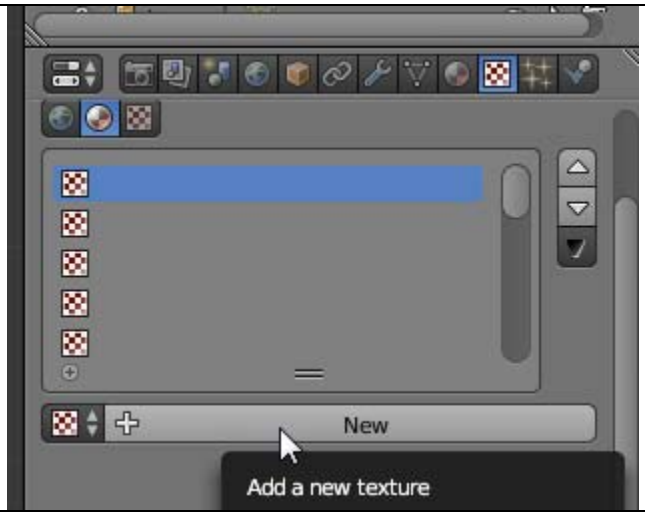
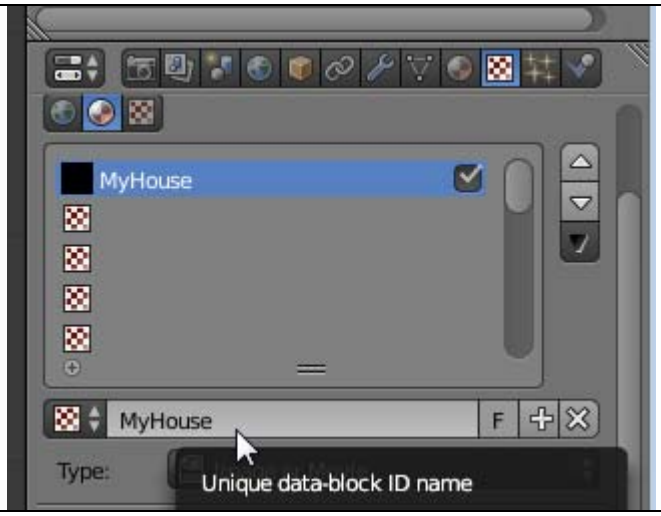
Add Color to a Material

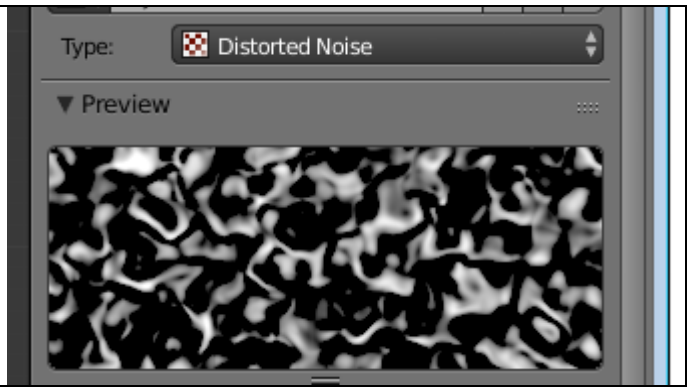
Complete the steps below to color the material for the bottom half of the house.

1.In the Material mini-window, left-click on the blank button to the left of the DIFFUSE button to change the material's color. This opens the Color Picker.	
2.In the Color Picker box, left-click the color you'd like to use. Don't pick white, because this color won't show up when you pick a texture for this material. TIP: You can always change it later if you don't like the first color you pick.	
3.Move the mouse pointer outside of the Color Picker to close it.	

Add a New Texture to the House

Complete the steps below to color the material for the bottom half of the house. Complete the steps below to add a texture to the house. Instead of an image, you'll use a different texture

type.	
1.Left-click the Texture Buttons button to switch to the Texture Buttons panel.	
2.In the Texture mini-window, left-click Add New. CAUTION: If you do not see Add New, left-click one of the blank buttons under the other texture names, and then left-click Add New.	
3.Left-click the Texture Name field. This will highlight the texture name.	
4.Type House and press ENTER.	

5.Left-click the Texture type list and then left-click Distorted Noise.	

The Map To Mini-Window

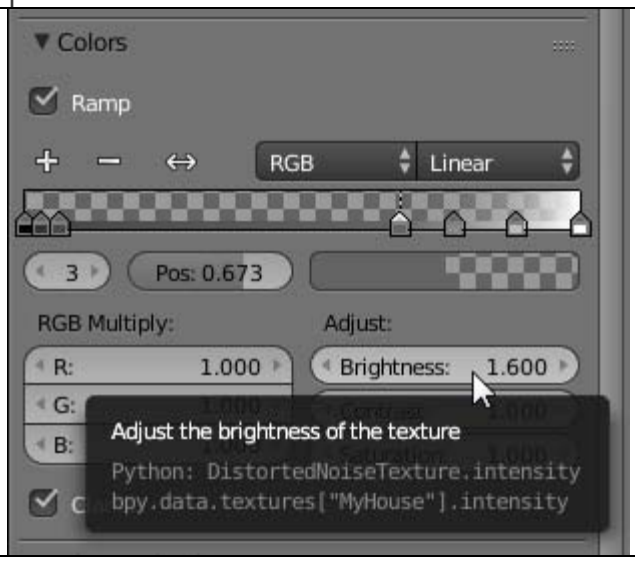
The **Map To** mini-window is what you will use to change the color of the texture that you have selected. There are lots of buttons in this mini-window. You'll learn what they're for when you need to use them.	

Color in Blender

Blender creates its colors by combining three colors: Red, Blue, and Green.

You'll use combinations of Red, Blue, and Green (or RGB) to create colors for your 3D objects

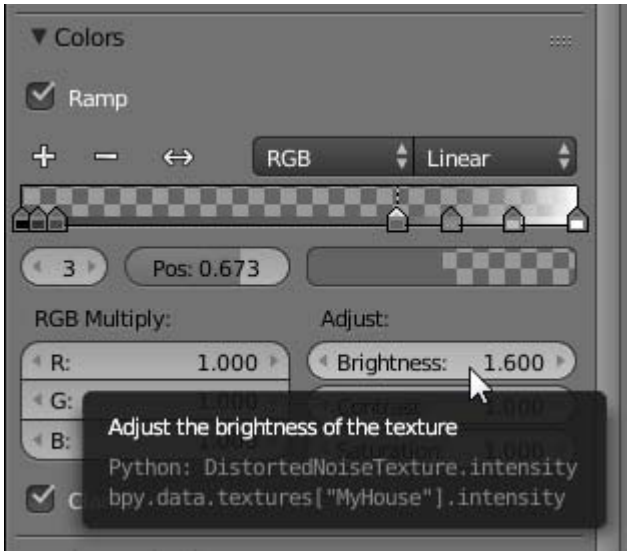
R	G	B		
0.000	0.000	0.000	Black	
1.000	1.000	1.000	White	
1.000	0.000	0.000	Red	
0.000	1.000	0.000	Green	
0.000	0.000	1.000	Blue	
1.000	1.000	0.000	Yellow	
0.000	1.000	1.000	Cyan	
1.000	0.000	1.000	Magenta	



Color Picker Arrows

Open the Color Arrow big box, there are three options labeled R, G, and B.

Moving a arrow to the left will decrease the amount of that color in the mix. Moving it to the right will increase it.

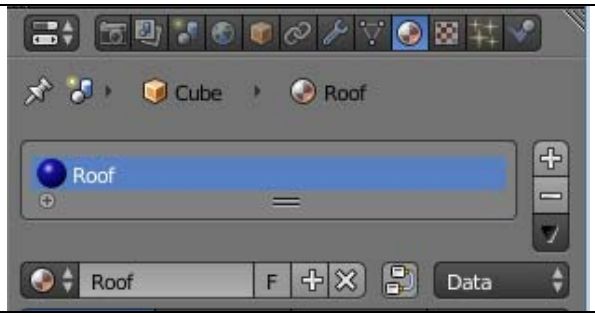
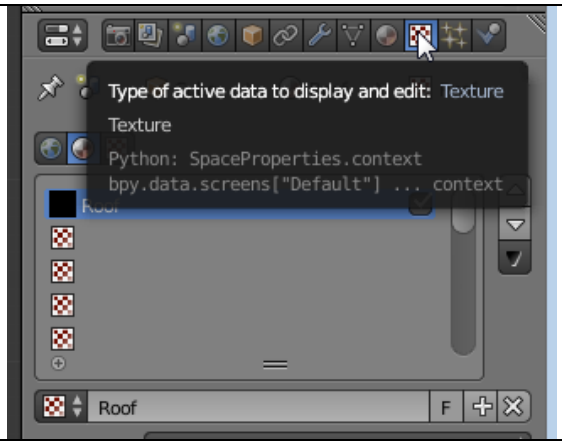


Change the Color of the Texture

When you change the color of the texture, you'll be able to see the color of the material and the color of the texture layered on top of it.

Select INFLUENCE then go to RGB to Intensity color bar. The Color palette will appear.

Create a New Material and Texture for the Roof

1.Make sure you're in Object Mode. Right mouse button to select the roof and name it.	
2.Right-click the roof of the house to select it. Name it first with Material and give it a color.	
3.Next with Texture name it also with Add New.	
4.Add a new material to the Roof. If you want to add color to the texture use INFLUENCE.	

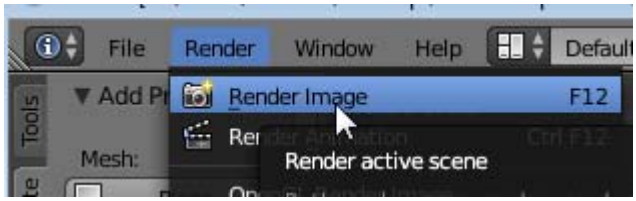
Check Your Work

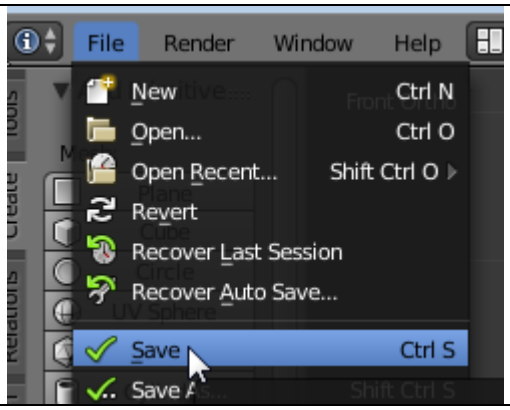
Complete the steps below to make sure your project is on track.

1. Render the house with the top menu. Select RENDER > RENDER IMAGE. Make sure the colors and textures are the way you want them.

2. Make any changes to the color or textures.

3. If everything looks good, save your project before moving on.





Summary

In this lab, you:

- Used color-based materials and textures to change the appearance of objects.
- Picked colors for materials and textures using the Color Picker.

Lab 5 Introduction

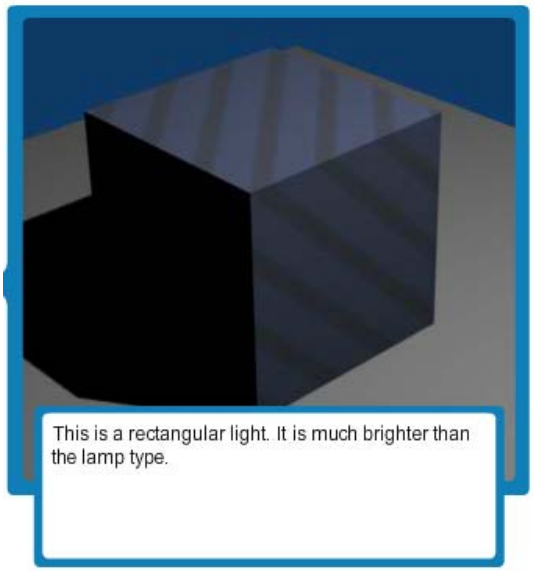
Earlier, you learned that rendering can be used to take snapshots of your 3D images.

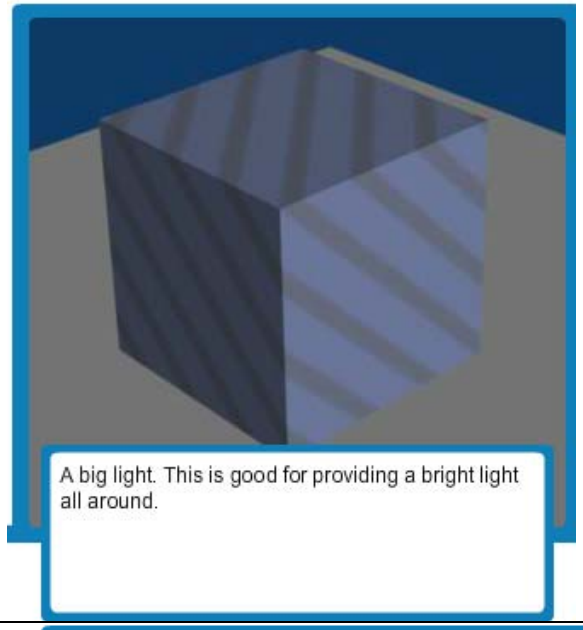
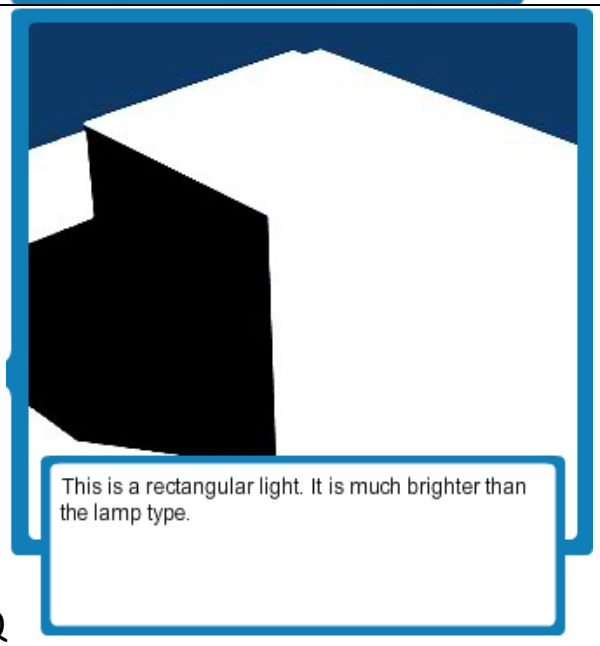
In this lab, you'll use rendering to make animated movies of your 3D objects.

Different Lighting Types

You can assign different lighting types to the lamp. This will change the way your 3D object looks when you render it.

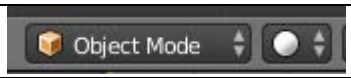
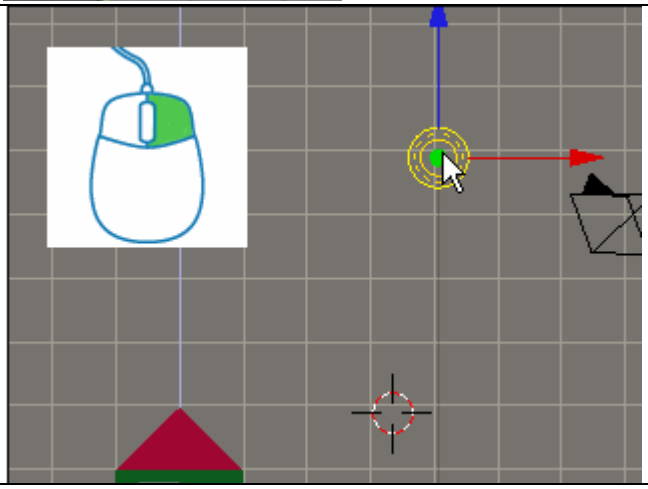
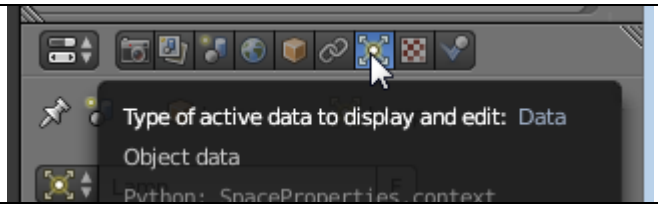
Click the buttons below to view the different lighting types.

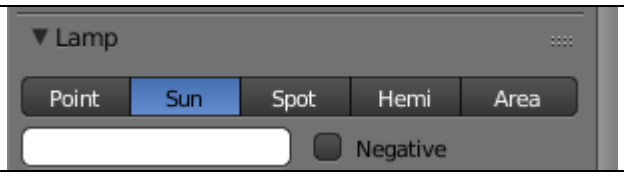
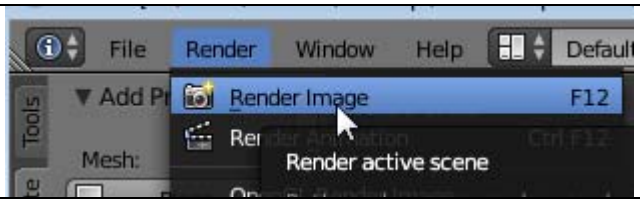
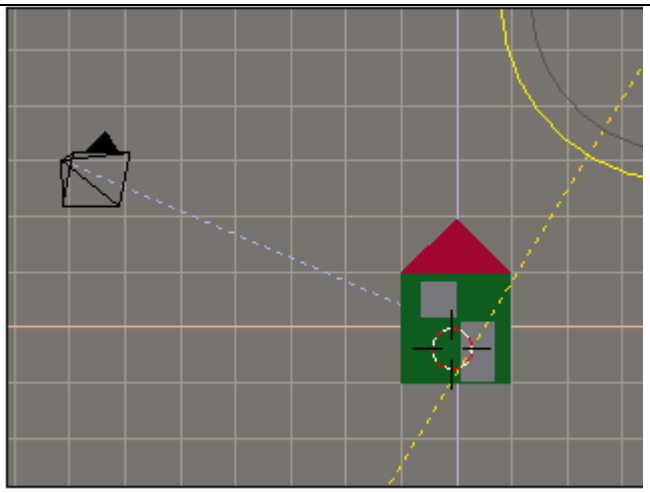
Lamp or Point	
Spot	

Hemi	 A big light. This is good for providing a bright light all around.
Area	 This is a rectangular light. It is much brighter than the lamp type. Q

Sun	

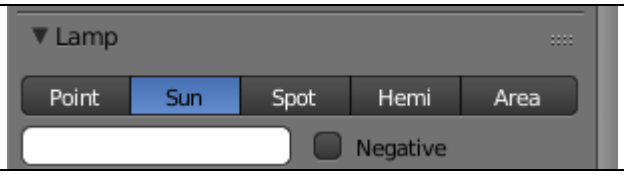
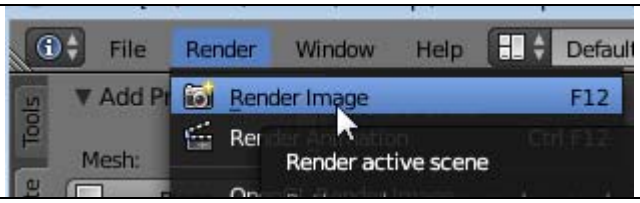
Change the Lighting

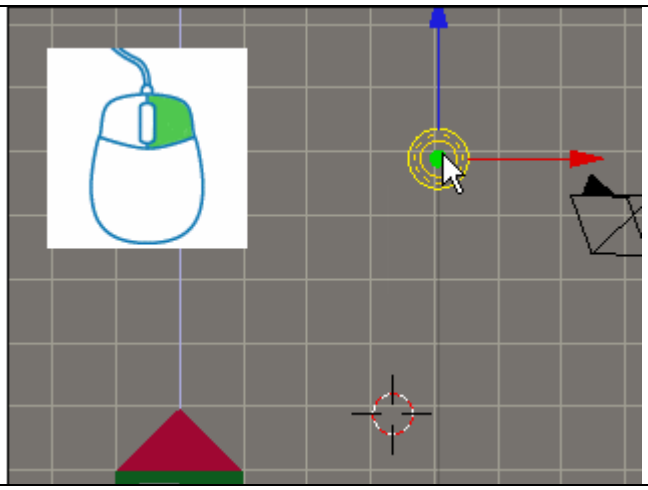
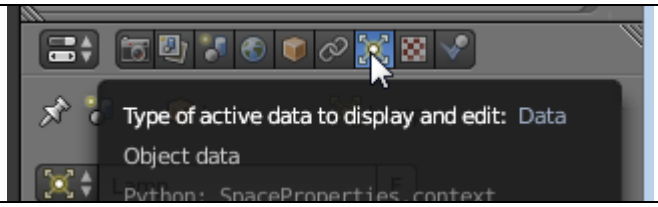
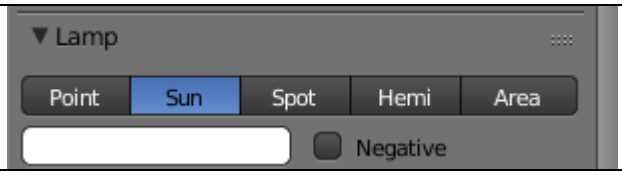
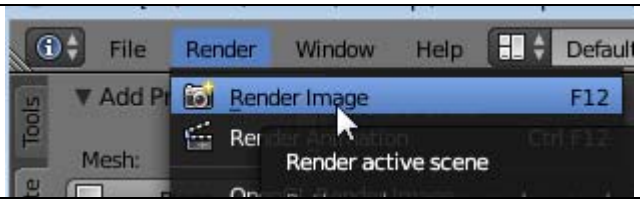
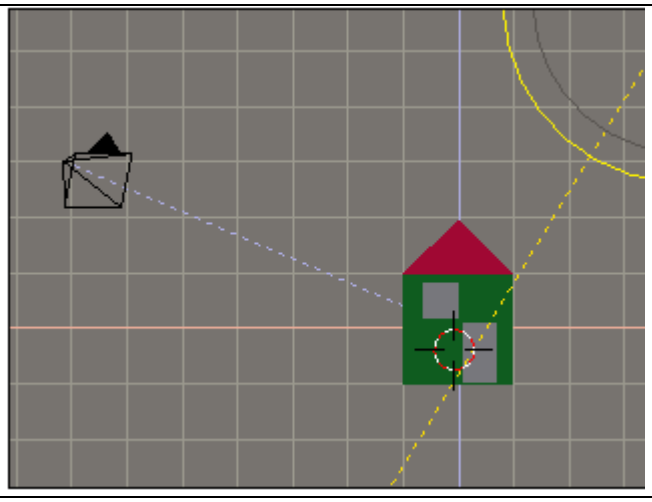
1.Make sure you are in Object Mode. If not, press TAB.	
2.Right-click the light to select it.	
3.Select the data object LAMP.	

4.Left-click the Lamp button.	
5.In the Render menu at the top of the screen Select RENDER > RENDER IMAGE see how your house looks with this lighting.	
6.If the rendered image is dark, rotate the lamp until the dotted line is pointing in the the general direction of the house.	

Try Other Lighting Types

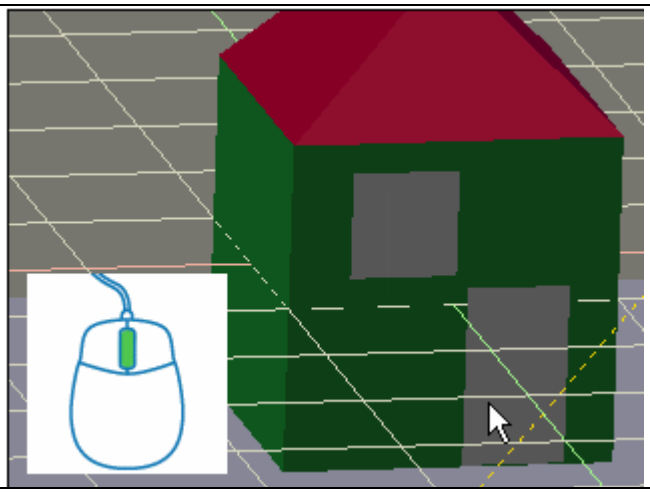
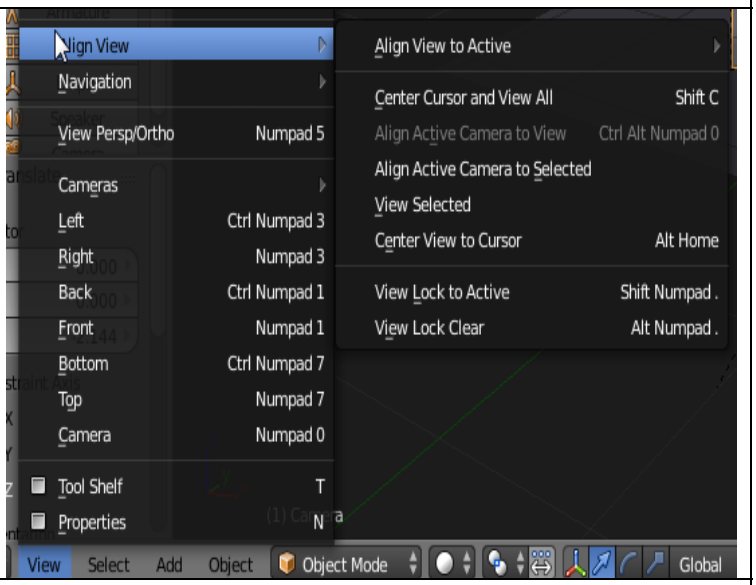
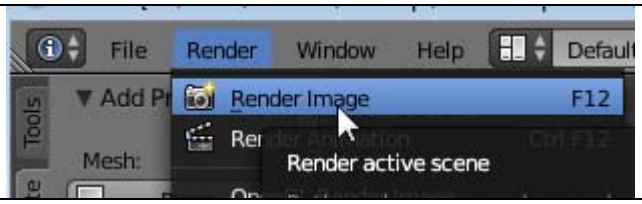
Explore the other lighting options.

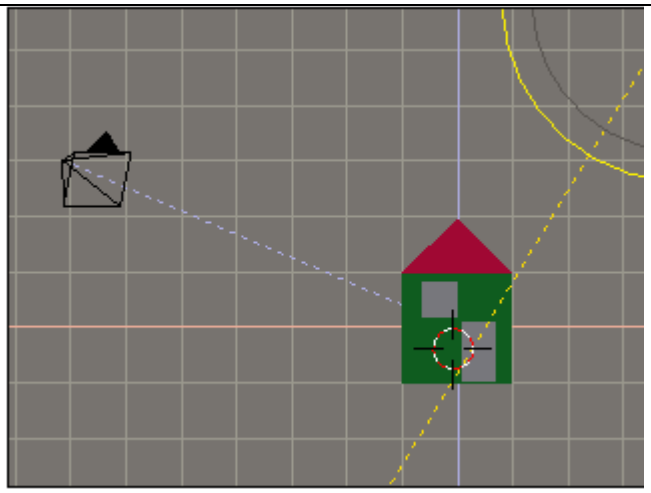
1.Repeat the previous steps for Area, Spot, and Hemi.	
2.Use the RENDER > RENDER IMAGE command to see how your house looks with the different lighting.	

2.Right-click the light to select it.	
3.Select the data object LAMP.	
4.Left-click the Lamp button.	
5.In the Render menu at the top of the screen Select RENDER > RENDER IMAGE see how your house looks with this lighting.	
6.If the rendered image is dark, rotate the lamp until the dotted line is pointing in the the general direction of the house.	

Set Camera Location

Complete the steps below to set the camera view to your current view. This is a way to change the camera position without moving the camera.

1.Make sure you are in Object Mode. If not, press TAB.	
22.Press and hold the mouse scroll wheel to pan around the house until you like how it looks.	
3.At the bottom of the 3D View window, left-click View, left-click Align View, and left-click Align Active Camera to View. TIP: You can also use CTRL + ALT + NUM0 to do this.	
4.In the Render menu at the top of the screen Select RENDER > RENDER IMAGE see how your house looks with this lighting.	

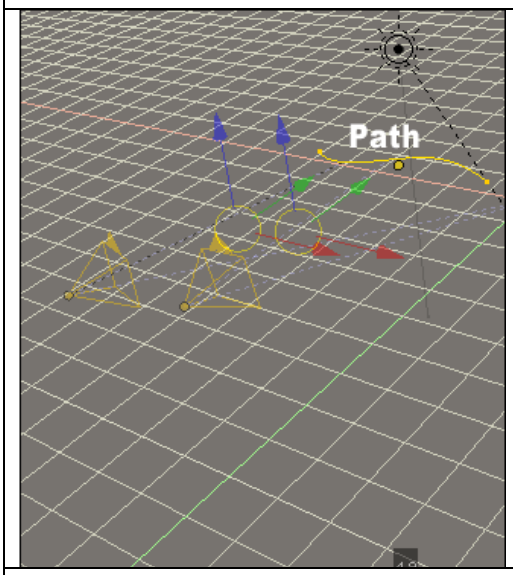
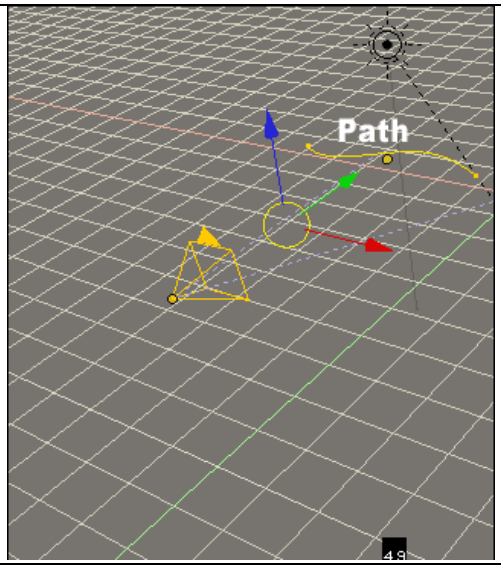
6.If the rendered image is dark, rotate the lamp until the dotted line is pointing in the the general direction of the house.	
7.**Save this file as a New name. You will use the old file to create a neighborhood or city to be used for a future project.**	

Path

When you want to make an animation of an object moving in 3D space, you'll make a path for the camera to follow. A **path** is a line or curve that an object will follow along when it's animated.

The path can be modified like any other Blender object. It can be translated, rotated, and scaled.

Like the Blender light, the path will be invisible when you render.

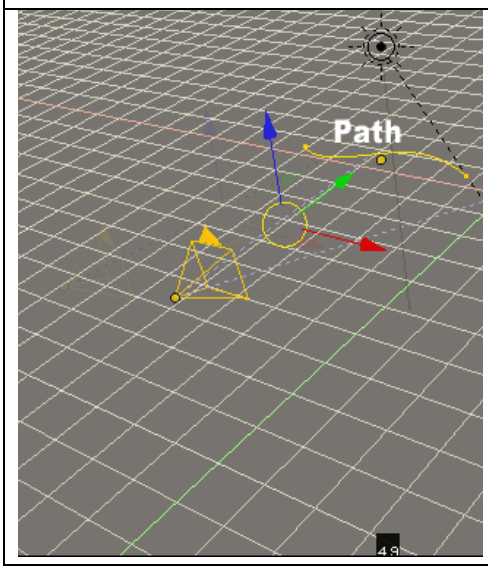
	

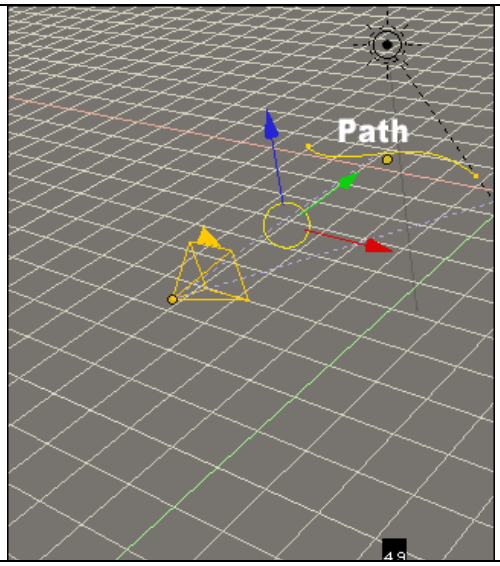
Path Constraint

Path constraint is the option you'll use to get the camera to follow along the path. The path constraint is like a leash connecting a path and an object.

With a path constraint, the camera will follow the path's direction, even if the camera is far away from the path.

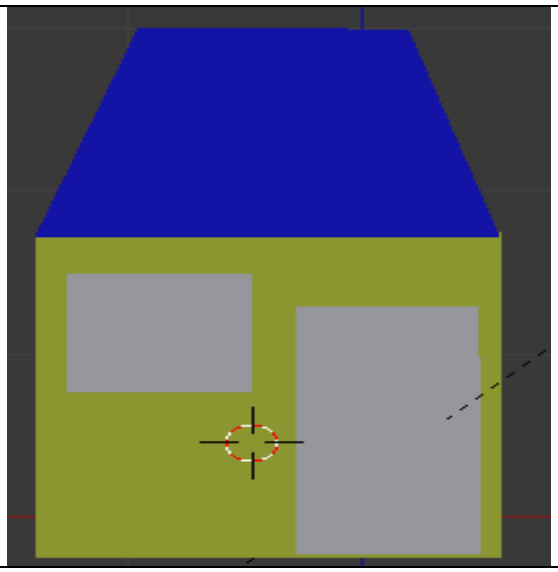
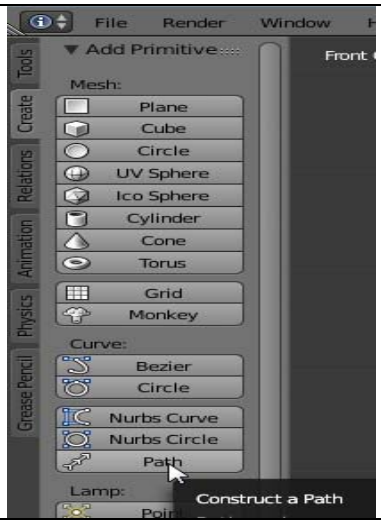
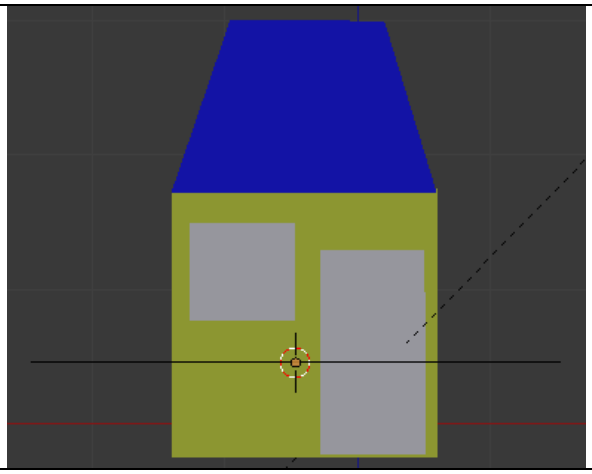
If you change the direction of the path, the camera's direction will change too.





Create a Path for the Camera

1.Make sure you are in Object Mode. If not, press TAB.	

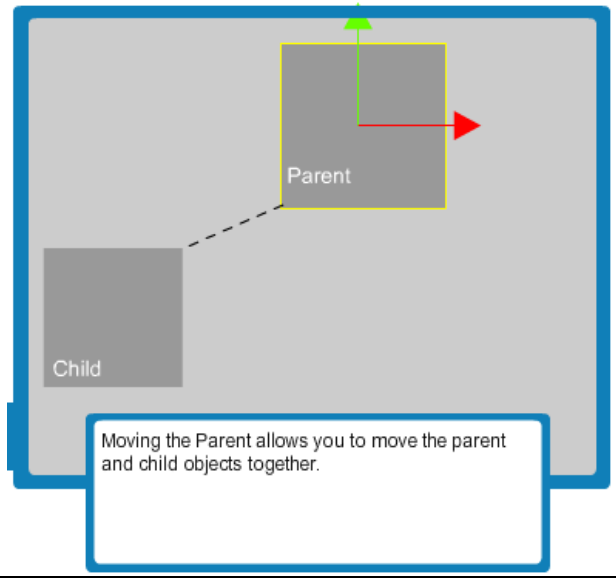
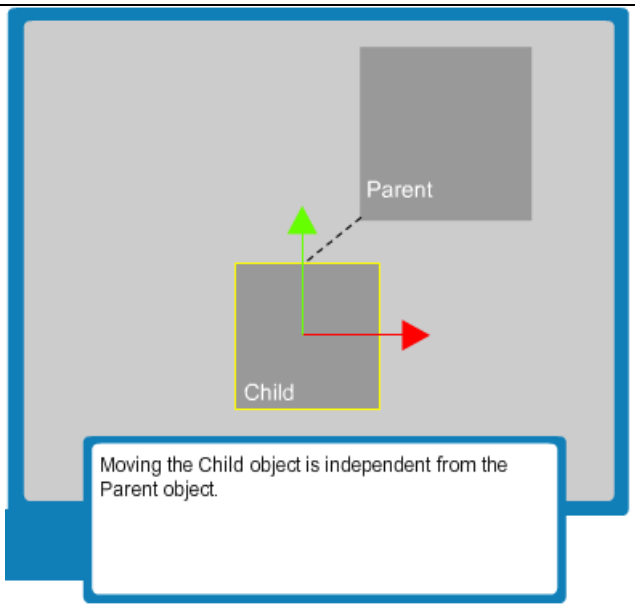
2.Left-click in front of the door to place the 3D cursor. This is where you'll add the path. TIP: Pan around the house to make sure the 3D Cursor is in front of the door.	
3. From the Create Tab use the Add Primitive menu then left-click Path.	
4.Press the A key to deselect the new path.	

Parent and Child Objects

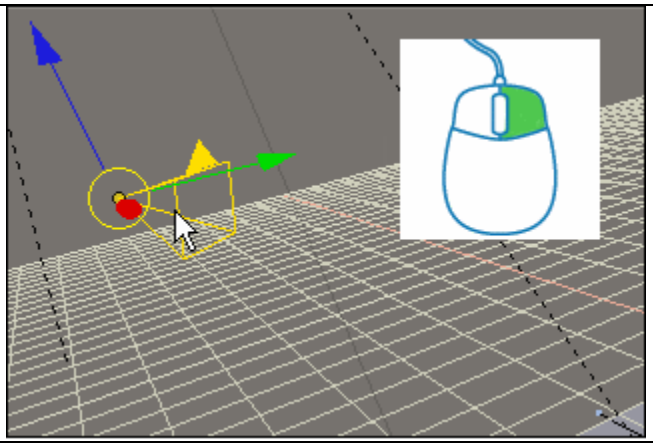
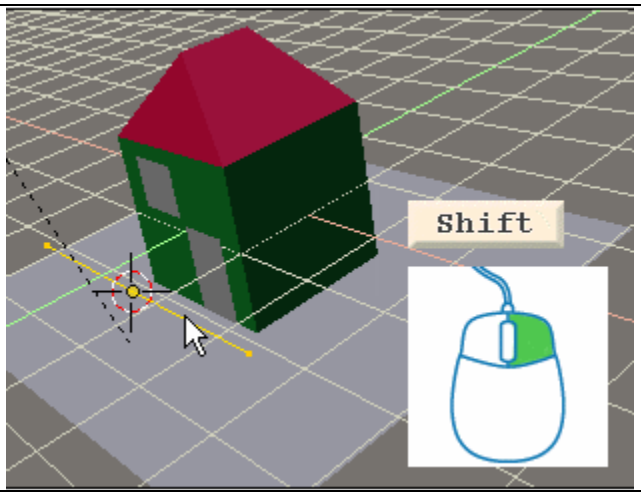
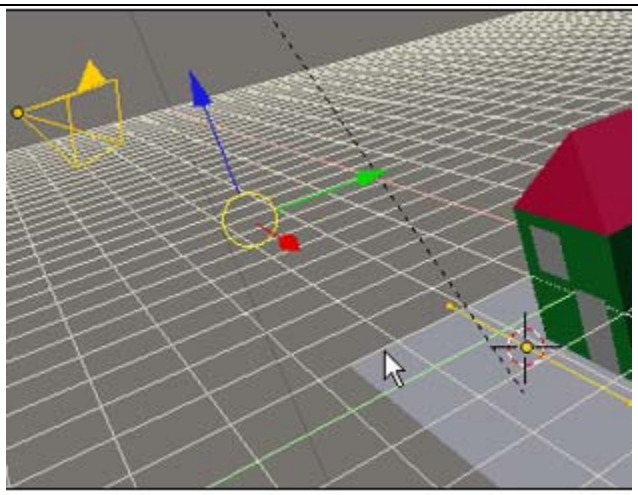
Before you can make a path constraint between the camera and path, you have to set up a parent-child relationship between them. The camera will be the parent, and the path will be the child.

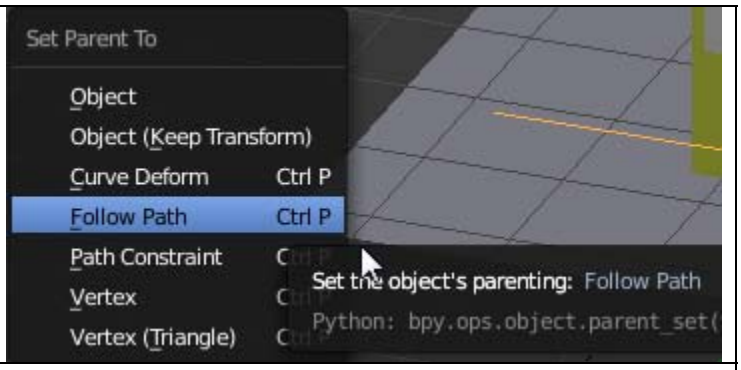
When you move, rotate, or scale a parent object, the child object will also move, rotate, or scale.

Changing a child object doesn't change the parent. Since the path will be the child, you'll be able to move the path wherever you want without moving the camera from its starting point.

Moving the Parent	
Moving the Child	

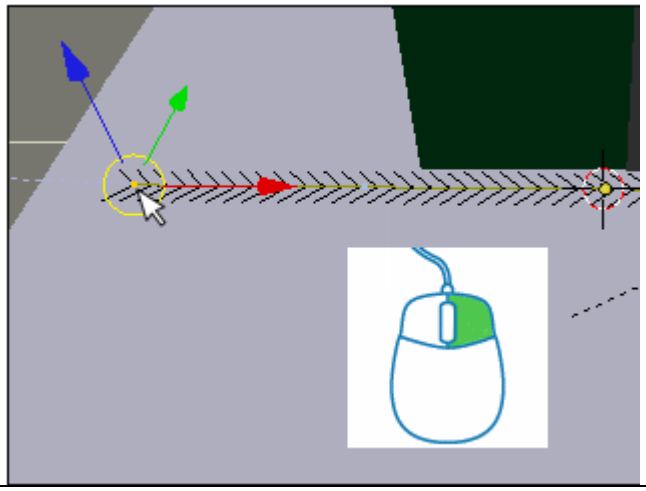
Constrain the Camera to the Path

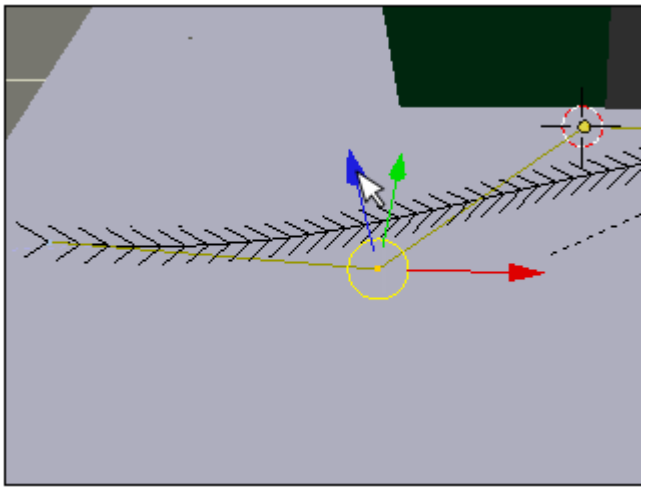
Complete the steps below to make the camera a parent of the path with a path constraint. You'll do this anytime you want to use the camera's movement to create an animated movie.	
1.Right-click the camera. TIP: By selecting the camera first, you are making it the parent object.	
2.Press and hold SHIFT and right-click the new path. TIP: By selecting the path last, you are making it the child object.	
3.Make sure that both the camera and the path are outlined in yellow.	

4.Press CTRL + P and then left-click Fololow Path. CAUTION: If the OK? box has only the Make Parent option, then you've selected things in the wrong order. Deselect everything and then follow the process again.	
5.Press ALT + A to watch the camera move along the path.	
6.Press ESC to stop the animation.	

Change the Path's Direction

Complete the steps below to change the shape of the path. You'll do this whenever you want the camera to move in a curving line.

1.Press the A key to deselect everything.	
2.Press TAB to enter Edit Mode.	
3.Left-click the Translate manipulator mode button.	
4.The path is made up of five points. Right-click along the path to select different points.	

5.Use the red, blue, and green arrows to move the points. This will change the curve of the path.	
6.Press ALT + A to watch the camera move along the curve of the path. TIP: The path constraint made the camera curve along with the path.	
7.Press ESC to stop the animation. When you're happy with the new path, you're ready to create an animation.	
1.Press the A key to deselect everything.	

Making Movies in Blender

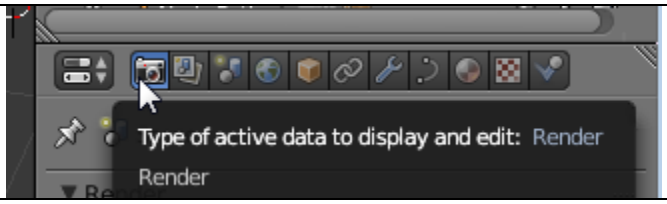
When you pressed ALT + A to see how the camera moved, you may have noticed numbers appearing at the bottom of the screen. These are the numbers of the frames in the animation.

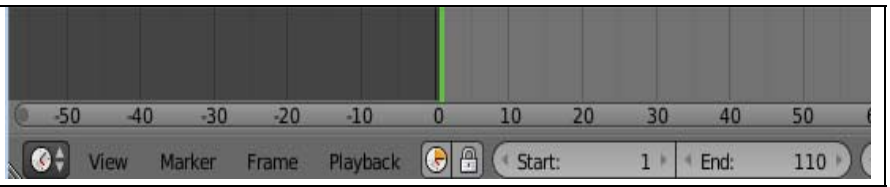
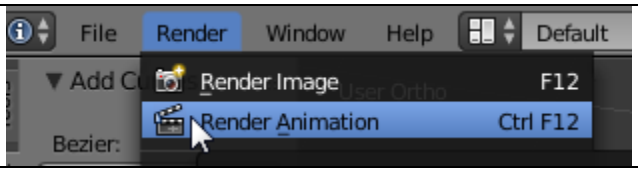
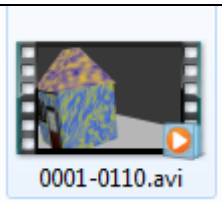
An **animation** is made up of a series of still images, which are called frames. The number of **frames** determines the length of your animation.

The more frames you have, the longer it will take for your computer to render the animation.

Save Time

Unless you have a very fast computer, rendering animations can take a while. Complete the steps below to speed up that process.

1.Save your project.	
2.In the Buttons Window, left-click the Scene button.	
3.In the OUTPUT, left-click the Images are saved in this file format button, and left-click AVI Jpeg. This means the image will be saved as a movie instead of an image. Note: You can use Mpeg with the VLC media player.	

4.At the bottom of your window find the START and END FRAME. Leave start frame at (1) and set end frame to (100).	
5.Select RENDER > RENDER ANIMATION. You are creating your Move.	
6.When last frame is finished press ESC key to close the render window.	
7.You can find your saved movie in the C:/tmp directory. It will be an .avi file. In the tmp directory, the .avi file will look like 0001_0010.avi.	

Check Your Work

Complete the steps below to make sure your project is on track. You'll use the Windows file system to complete these steps.

1. Go to **C:\tmp** to find your movie. Double-click it to watch it. Then close it.

2. In the **C:\tmp** folder, left-click your movie file to select it. Press CTRL + C to copy it.

3. Go to your project folder at **C C:\Users\Student\Desktop\UHD\3D Animation**, and press CTRL + V to paste.

4. Right-click on the movie file and then left-click **Rename**. Type **house_movie.avi** as the name, and press ENTER.

Summary

In this lab, you:

- Used different lighting types to change a rendered object's appearance.
- Created a path and used a path constraint to move the camera along a path.
- Sped up the rendering process.
- Rendered the scene to create an animation of the camera's movement.

Review

Congratulations! You built a house.

In this project, you:

- Used basic shapes to build a house.
- Manipulated vertices to make a cube into a roof.
- Used image files to create materials for the window and door.
- Used materials and textures to give your house color and shading.
- Picked the type of lamp that best lights your house.
- Created an animation based on the camera's movement down a path.

From a House to a Neighborhood to a City

Use your creativity. Create a Neighborhood or small city with streets, building, houses, street lights and other objects. You will be able to combine this later with another project.