Using Google SketchUp

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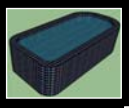
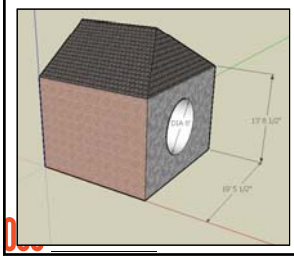


What is Google SketchUp?

Google SketchUp is a program which lets you sketch in 3D. It is excellent for creating buildings, houses, and even mechanical designs.

And, it's easy to do. As their tagline says "SketchUp is for Everyone".

And, it can be downloaded for free!



Getting Google SketchUp for Free

Go to:
`http://sketchup.google.com`

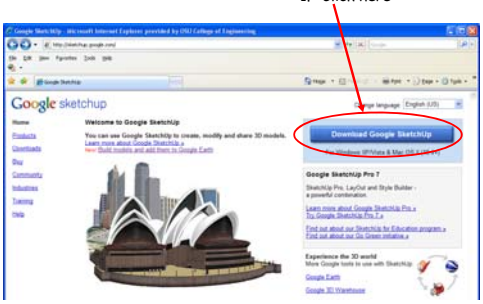
Follow the links to the free download (see the next page).

There is also a SketchUp Pro which costs money.

Google SketchUp comes in Windows 2000/XP/Vista and Mac OS X versions.

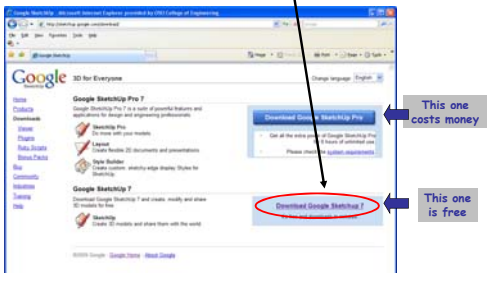
Getting Google SketchUp for Free

1. Click here



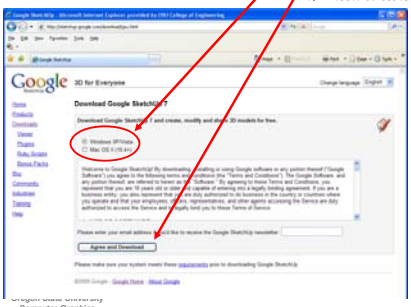
Getting Google SketchUp for Free

2. Then click here



Getting Google SketchUp for Free

3. Select the operating system (Windows or Mac)
4. Then click here



SketchUp Student Learning Objectives

1. Learn that the computer can be used to enhance creativity. It's not just for nerds and gamers!
2. Learn that the computer can be used to design and plan.
3. Learn the basics of 3D interaction. This will have further application in fields ranging from engineering CAD to art and animation.

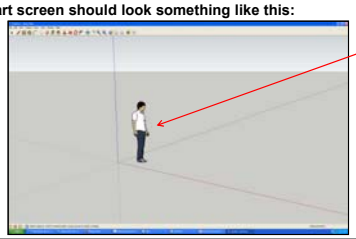
Getting Started

Double-click the Google SketchUp icon

or click:

Start →All Programs →Google SketchUp 7 →Google SketchUp

The start screen should look something like this:

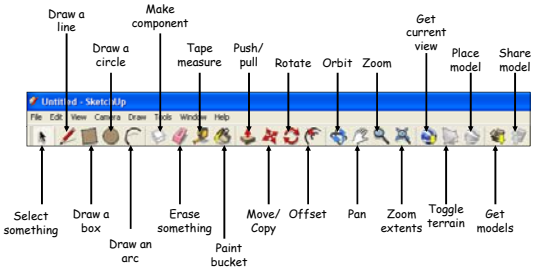


This person is 5' 9" tall – this sets the scale for what you are about to create

Right now, click **File→Save As** – and hit Save often while you are editing

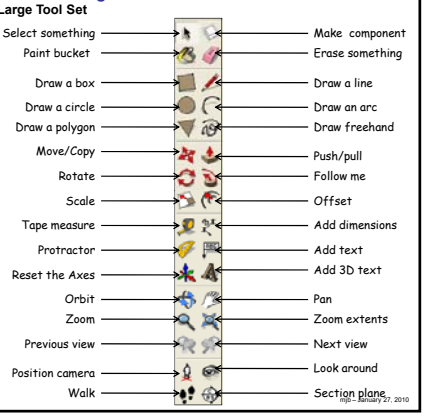
Getting Started Toolbar

The icons across the top are *really* important:



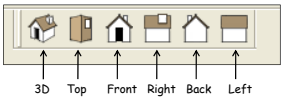
Large Toolset Toolbar

Select **View→Toolbars→Large Tool Set**



The Views Toolbar

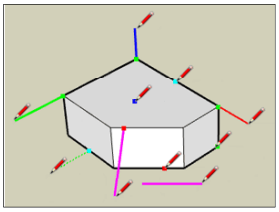
Select **View→Toolbars→Views**



This is a *very* handy toolbar to have active because it lets you change to a specific view of your scene with one mouse click!

SketchUp "Inferences"

One of SketchUp's key strengths is that it doesn't require you to enter every little piece of information as many 3D computer programs do. Instead, it tries to infer what you really mean by how you do things. Oftentimes it uses colors to tell you what it is inferring.



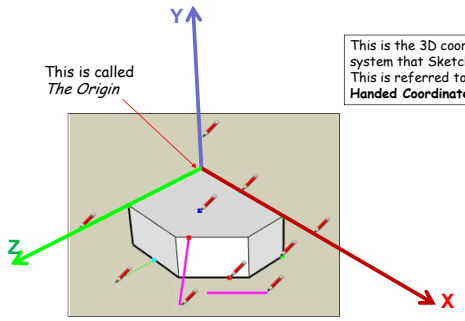
- Green dots = Endpoints
- Red dots = On an edge
- Cyan dots = Midpoints of edges
- Blue dots = On a surface

- Red line = X axis
- Blue line = Y axis
- Green line = Z axis

- Magenta line = something is parallel or perpendicular to an edge

- ***Hold SHIFT to capture and lock an inference***

Axis Coordinate System



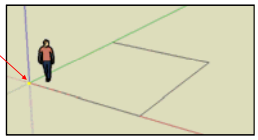
This is called *The Origin*

This is the 3D coordinate system that SketchUp uses. This is referred to as a **Right-Handed Coordinate System**

- Red line = X axis
- Blue line = Y axis
- Green line = Z axis

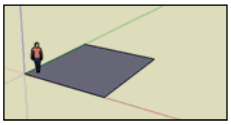
Drawing a 2D Box

This is called *The Origin*



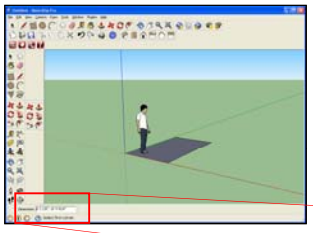
Click on the **Draw-a-Box** icon, then click on the origin, and while holding down the mouse, drag in this direction

You'll end up with something like this:



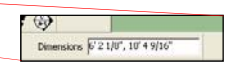
We are going to build a house, so make this square an appropriate size, given that the person is almost 6 feet tall. **Hint:** also look at the box in the lower-right corner.

Notice the Bottom of the Screen



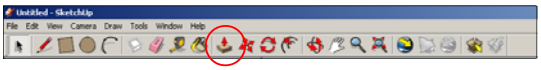
This is the **Measurement Toolbar**, or **MTB**

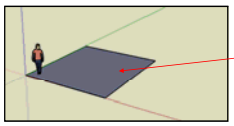
It is used to show you the dimensions, size, angle, etc. that you are currently setting



It can also be used to set exact values – just type into it while you are sizing with the mouse. But, if inputting length, be sure to use units: ' for feet and " for inches.

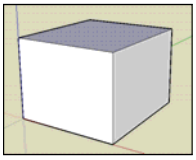
Extruding it into a 3D Box





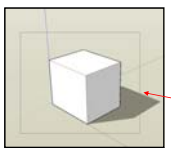
Click on the **Push/pull** icon, then click on the box you just created, and while holding down the mouse, drag in this direction

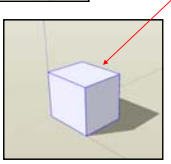
You'll end up with something like this:

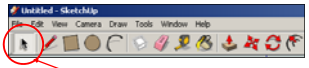


We are going to build a house, so make this height an appropriate size, given that the person is almost 6 feet tall. . **Hint:** also look at the VCB box in the lower-right corner.

Deleting an Object

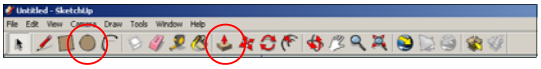


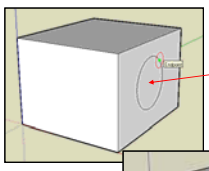




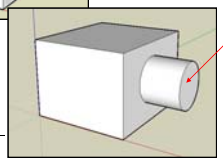
1. Select the **Select** icon
2. Select the object to delete by dragging a box around it with the cursor
3. Hit the **Delete key** *(not Backspace)*

Adding more detail to an existing face



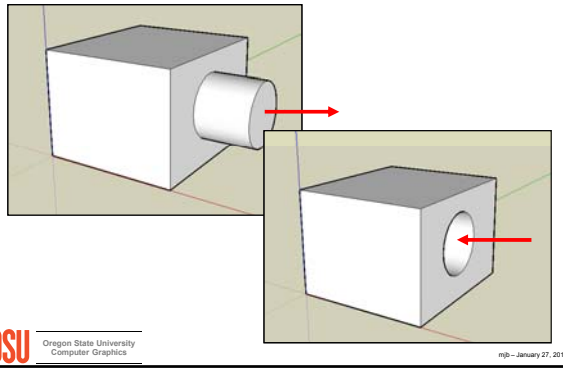


Click on the **Draw-a-circle** icon, then click on one face of the 3D solid you just created, and while holding down the mouse, drag in some direction



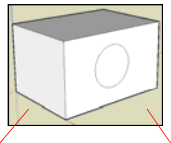
Click on the **Push/pull** icon, then click on the circle you just created, and while holding down the mouse, drag in this direction

An outie or an innie :-)

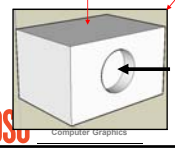


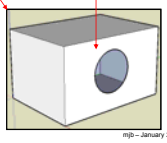
The difference between pushing a hole and cutting a hole

If you push the circle in, you get a tunnel with walls and a back face

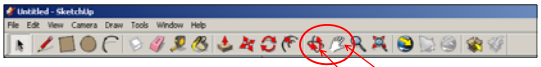


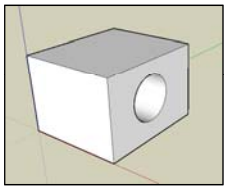
If you erase the circle by clicking on the circle, then hitting **Delete** (*not* **Backspace**), you get a window cut in the wall.





Want to see it from a different view?

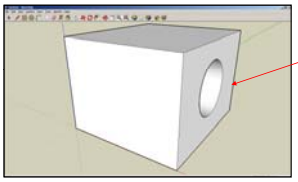




Click on the **Orbit** or **Pan** icon, then click in the scene, and while holding down the mouse, drag in some direction

You can also **Orbit** by pushing down on the middle button on the mouse. On many mice, the middle button is also the scroll wheel.

Want to zoom in?



The **Zoom extents** icon will zoom in as much as possible without making any of your object disappear off the screen

The **Zoom** icon will allow you to zoom as much or as little as you want

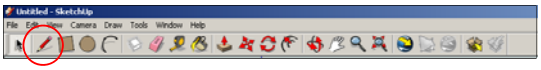
You can also **Zoom** in and out with the scroll wheel on the mouse

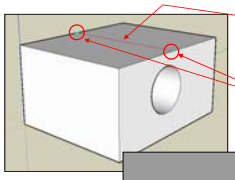
Controlling the SketchUp Camera with a 3D Input Device

The systems in the Oregon State University Computer Graphics Education Lab (CGEL) are each equipped with a 3D input device called a *Space Navigator* (from a company called 3DConnexion). They come with a SketchUp plug-in that allows them to be used to move the camera all around.

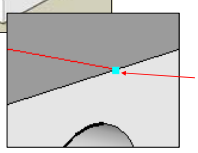
Try it! *Gently* push and twist the black rubber handle and see what happens. *Do it slowly and gently.*

Let's give it a roof



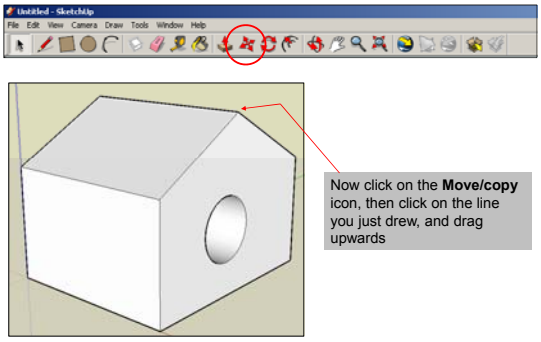


Click the **Draw-a-Line** icon to draw a line across the top of the solid. But, you want the line to go midpoint-to-midpoint, which is a good place to raise the roof line from.



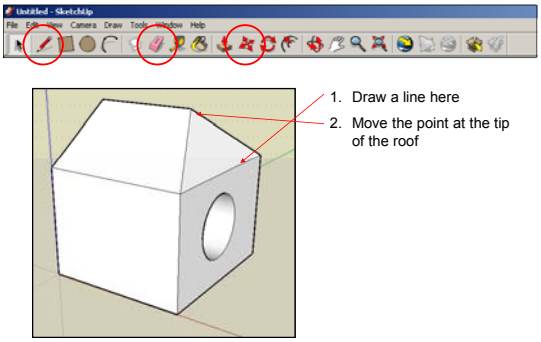
So, before clicking to draw the line, slide the pencil back and forth until the cyan dot appears, indicating that you've found this edge's midpoint,.

Let's give it a roof



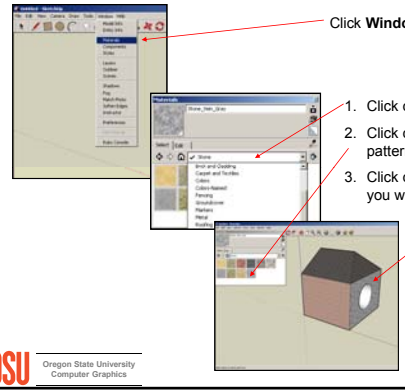
Now click on the **Move/copy** icon, then click on the line you just drew, and drag upwards

Want to bevel the edge of the roof?



1. Draw a line here
2. Move the point at the tip of the roof

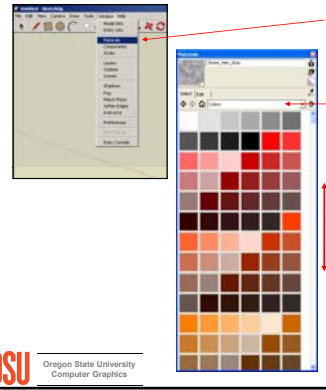
Want to make it look more interesting?



Click **Window→Materials**

1. Click on a category
2. Click on a specific color or pattern
3. Click on the surface(s) you want to apply it to.

Pure colors are considered Materials too

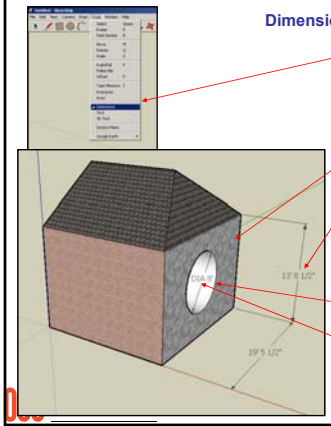


Click **Window→Materials**

1. Select **Colors**
2. Treat the color just like you did the material

Scroll up and down to get more colors

Dimensions



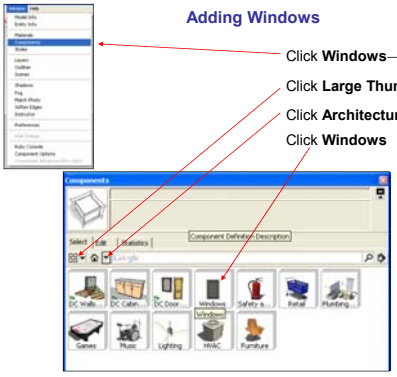
Click **Tools→Dimensions**

1. Click on an edge
2. Drag where you want the dimension to be drawn

Dimensions are useful if you are giving your design to someone so that they can build it

1. Click on the circumference of a circle
2. Drag where you want the dimension to be drawn

Adding Windows



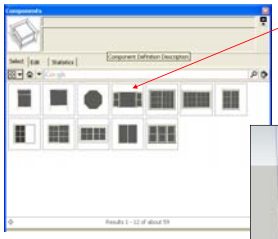
Click **Windows→Components**

Click **Large Thumbnails**

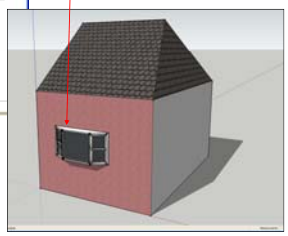
Click **Architecture**

Click **Windows**

Adding Windows



Drag a window type onto a wall of the house

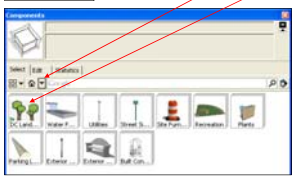


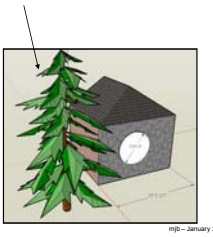
Adding Landscape Components

Click **Window→Components**

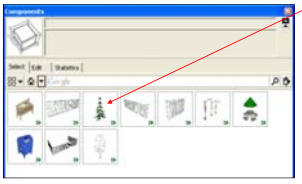
Click **Landscape**

Click **DC Landscape**



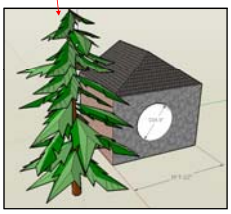


Adding Landscape Components



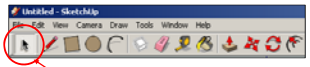
Click **Dynamic Pine Tree**

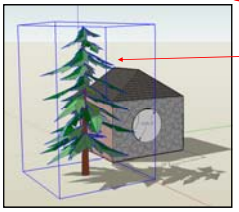
Drag it into the scene where you want it



To release it, click on the black **Select Arrow icon** and then click in some empty spot in the scene

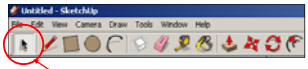
Moving and Copying

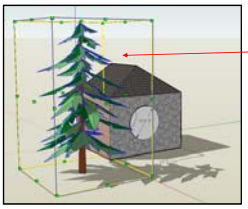




1. Select the **Select** icon
2. Select the object to move
3. Click the **Move** icon
4. Move the object
5. Holding down the **Control key** will result in a *Copy* instead of a *Move*

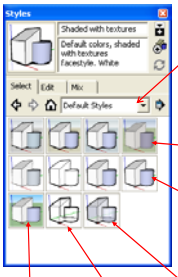
Scaling





1. Select the **Select** icon
2. Select the object to scale
3. Select **Tools→Scale** or click the **Scale** icon in the **Large Toolset** toolbar
4. Grab a grip point and scale the object

Styles



Click **Window→Styles**

Select **Default Styles**

Click on the style you want

Earth Modeling – adds grass and sky

Shaded with textures (this one is good)

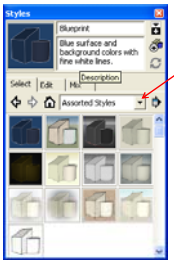
Wireframe

X-ray

The X-ray style is good to use if you want to see and place objects inside a structure

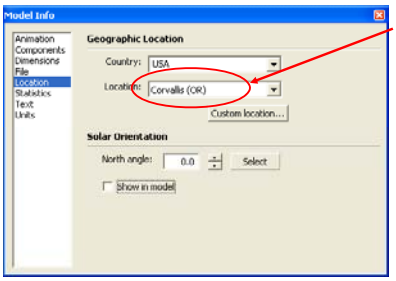
Simple Style -- this one is good

Try Some of the Assorted Styles – They're Fun!



Tell SketchUp Where in the World you Are

Click **Window→Model Info→Location**

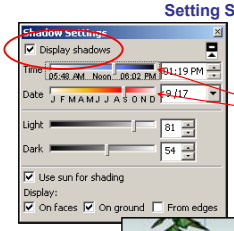


Wow! SketchUp even knows about Corvallis!

This sets your latitude

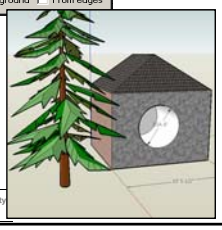
You care about setting your latitude because SketchUp also lets you . . .

Setting Shadows in SketchUp

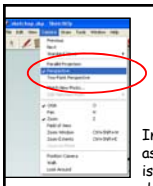


Click **Window→Shadows**

Set time of day and day of year



Projections

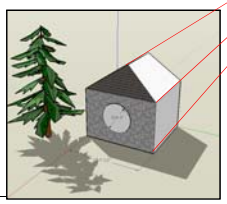


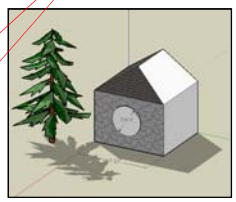
Click **Camera→Perspective**

Click **Camera→Parallel Projection**

In perspective, things get smaller as they get farther away, which is more realistic. In parallel, they don't. But parallel helps you see if front and back faces line up.

"Vanishing Point"

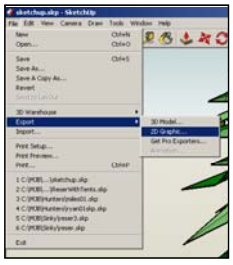




Perspective

Parallel

Exporting an Image File



Click **File→Export →2D Graphic**

Your image can be exported in one of 4 formats:

1. **BMP**
2. **JPEG** ← **Web browsers all know about this format**
3. **TIF**
4. **PNG**

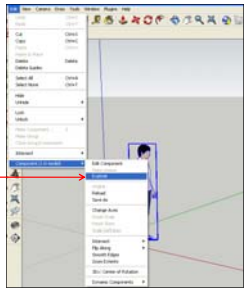
You would do this, for example, to email someone an image of your scene, to import it into a document, or to put it on your website

You can also export the 3D scene, but in the free version, only to Google Earth format. For more 3D formats, you need the Pro version.

Other Cool Things you can do with SketchUp

Changing the Person's Clothing

The person in the default scene is a SketchUp "Component", that is, he is a group of geometry collected together. To change his clothing, you need to first break, or "Explode", the collection apart.



Even easier, right-click on the person and select Explode from the pop-up menu.

After that, you can click on **Window→Materials** and re-color or re-pattern the clothing

Creating Groups

Sometimes you would like to collect several pieces of geometry together and be able to treat them as a single unit. This is called a SketchUp **Group**.

Create a SketchUp Group by first clicking on the **Select** icon.

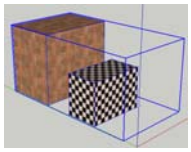
Then, click on the first object you want in the Group. It will turn blue.

Then, hold down the **Shift** key and click on all other objects you want in the group. They will also turn blue. If you select the wrong item, just click it again to un-select it.

You can select many things at once by creating a rectangle around all of them with the Select cursor.

When you are done, right-click and select **Make Group** from the pop-up menu.

To ungroup the objects, right click on them and select **Explode** from the pop-up menu.



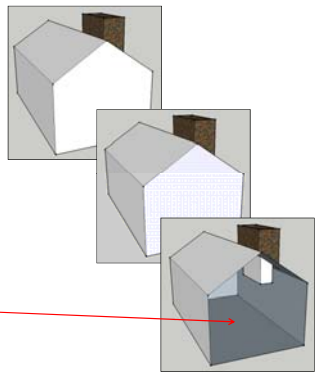
Hiding Geometry

Sometimes it would be nice to temporarily eliminate some geometry so that you could see inside something. This is referred to as **Hiding**.

To hide one or more pieces of geometry, select all of them as if you were about to create a group.

Then, right-click and select **Hide** from the pop-up menu. The selected objects look like they are gone, but they aren't. They're just hidden.

This is useful for putting things into an object (such as furniture) or for editing the object (as is needed here).

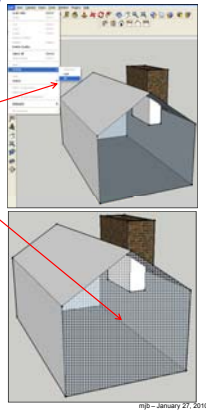


Un-Hiding Geometry

There are two ways to bring back hidden geometry.

The first is to select **Edit→Unhide→All**, like this:

The second is to select **View→Hidden Geometry**. This will make hidden geometry show up like this: From there, you can right-click on it and select **Unhide** from the pop-up menu.

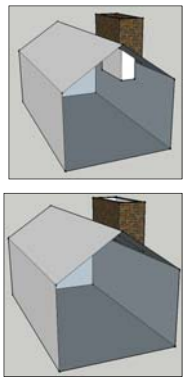


Eliminating Geometry

Sometimes extruding geometry results in it existing places it shouldn't.

To eliminate any geometry, take the **Eraser** tool and click on the edges of the geometry you want to eliminate.

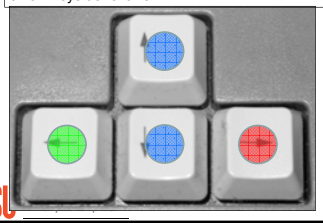
As soon as an edge of a surface has been eliminated, the surface will disappear too.



Move Tricks

You can turn the Move into a Copy by holding down the **Control** key.

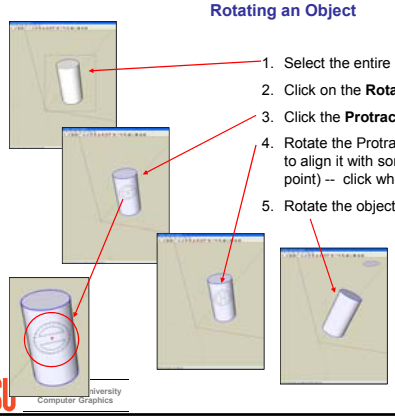
You can force the Move/Copy to move along one of the 3 axes (red, green, or blue) by holding down one of the arrow keys as follows:



Adding 3D Text

1. Click on **Tools→3D Text**
2. Type the text into the dialog box
3. Make any text settings you want
4. Place the text by clicking on an object

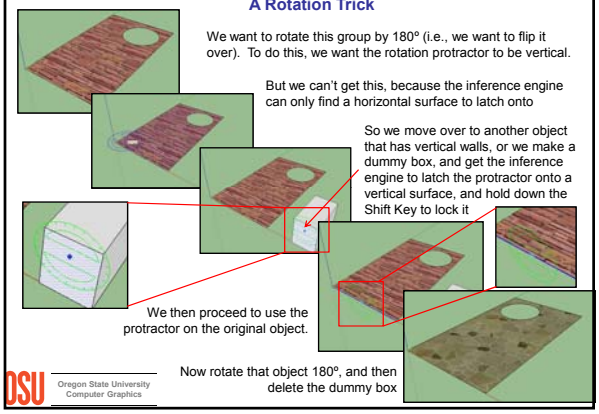
Rotating an Object



1. Select the entire object
2. Click on the **Rotate Tool**
3. Click the **Protractor** onto the object
4. Rotate the Protractor with the mouse to align it with something (e.g., a key point) -- click when ready.
5. Rotate the object. Click when done.

Once you've started rotating, you can also type in an exact angle into the Measurement Toolbar (MTB)

A Rotation Trick



We want to rotate this group by 180° (i.e., we want to flip it over). To do this, we want the rotation protractor to be vertical.

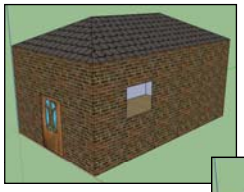
But we can't get this, because the inference engine can only find a horizontal surface to latch onto

So we move over to another object that has vertical walls, or we make a dummy box, and get the inference engine to latch the protractor onto a vertical surface, and hold down the Shift Key to lock it

We then proceed to use the protractor on the original object.

Now rotate that object 180°, and then delete the dummy box

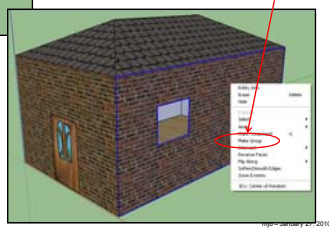
An Interesting Use for Rotation -- Building a Real Model from Paper!



Start with a model. "Boxy" models with flat faces work best.

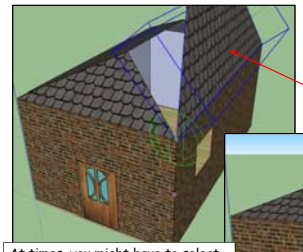
For each face:

1. Select the face and its edges by double-clicking on the face
2. Right-click the mouse to bring up the menu and select ***Make Group***

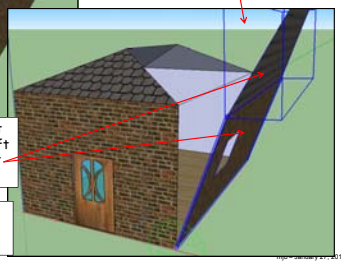


By doing this for each face, you are separating each face and its edges from the rest of the model so they can be rotated independently.

An Interesting Use for Rotation -- Building a Real Model from Paper!



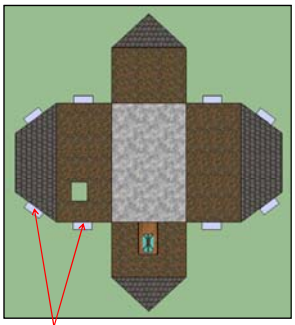
Now, for each face, select it (and other unfolded faces attached to it) and use the ***Rotate*** function to "unfold" it with respect to the face next to it, or with respect to the ground



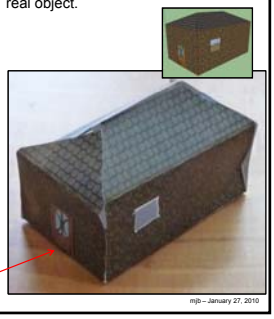
At times, you might have to select multiple faces (hold down the Shift key and click on each one), so that they can Rotate together.

This is sometimes easier in a Parallel view (**Camera→Parallel Projection**)

An Interesting Use for Rotation -- Building a Real Model from Paper!

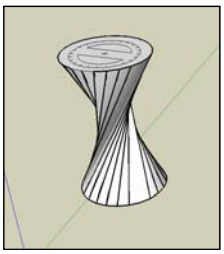


Print the unfolded scene from the bottom view (you might have to select all faces and rotate them over together), and then fold them up into a real object.



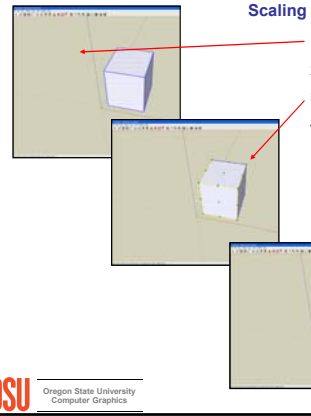
These tabs were added to make the object easier to glue together.
This was a pretty sloppy job, but you get the point…

Rotating a Face



Strange as it may seem, you can also rotate just a face. Follow the same procedure, but select only the face.

Scaling an Object

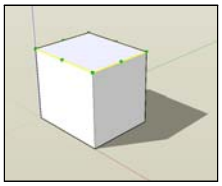


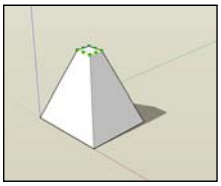
1. Select an object
2. Select **Tools→Scale**
3. Move the grips with the mouse
4. Hold down the **Control key** if you want scaling about the object's center

Moving a side grip will stretch the object in that direction. Moving a diagonal grip will scale the object equally in all directions ("uniform scaling")

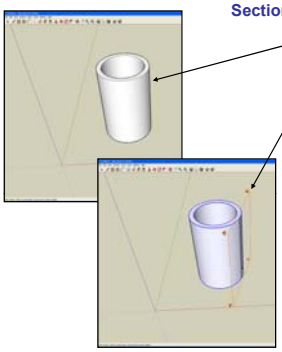
You can also scale just a face

1. Select a face
2. Select **Tools→Scale**
3. Move the grips with the mouse
4. Hold down the **Control key** if you want scaling about the object's center

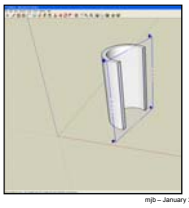




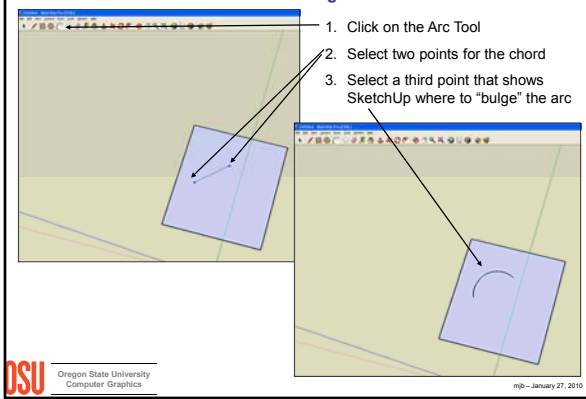
Sectioning an Object



1. Select an object
2. Select **Tools→Section Plane**
3. Select the section plane
4. Use the **Move Tool** to slide it into the object

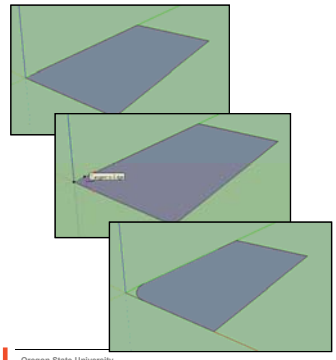


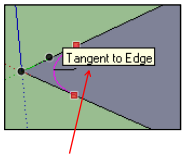
Drawing an Arc



1. Click on the Arc Tool
2. Select two points for the chord
3. Select a third point that shows SketchUp where to "bulge" the arc

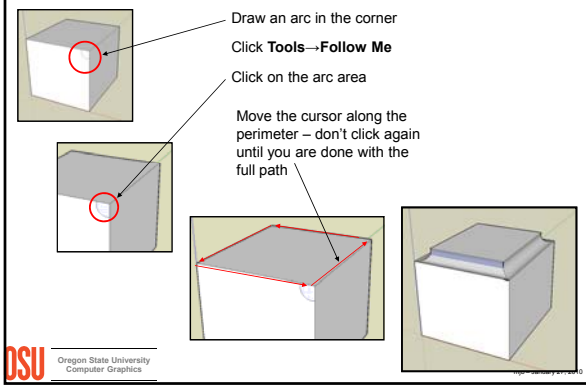
Arcs are Often used to Round Corners





1. Click on both edges surrounding a corner. The line will turn purple when you are the same distance from the corner.
2. When you place the third point, the inference engine will also tell you when the arc is tangent to (aligned with) the edges.

Want to create Crown Molding?



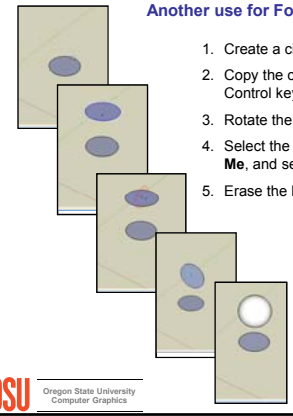
Draw an arc in the corner

Click **Tools→Follow Me**

Click on the arc area

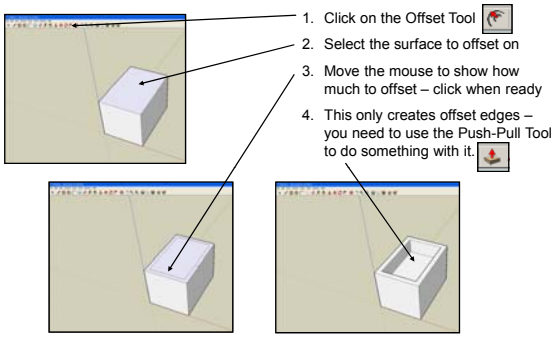
Move the cursor along the perimeter – don't click again until you are done with the full path

Another use for Follow Me – make a Sphere



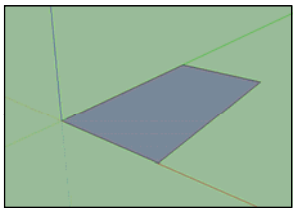
1. Create a circle
2. Copy the circle using the Move Tool with the Control key held down
3. Rotate the top circle 90°
4. Select the bottom circle, select **Tools→Follow Me**, and select the top circle
5. Erase the bottom circle and Delete it

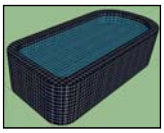
Offsetting a Surface



1. Click on the Offset Tool
2. Select the surface to offset on
3. Move the mouse to show how much to offset – click when ready
4. This only creates offset edges – you need to use the Push-Pull Tool to do something with it.

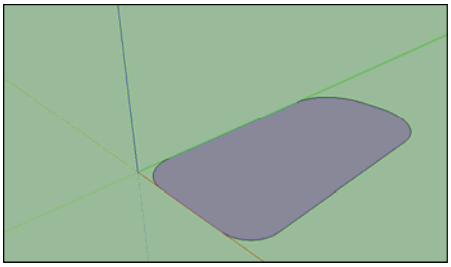
Combining Several Techniques: Making a Swimming Pool



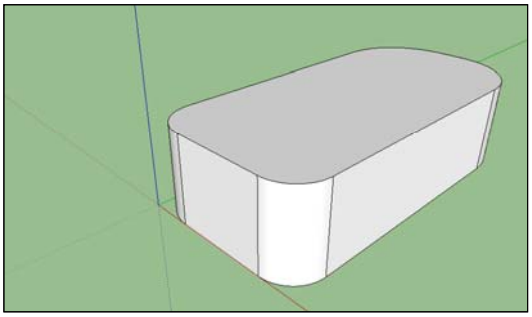


Start by creating a rectangle on the floor

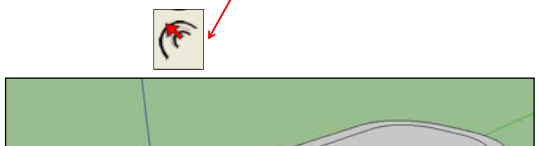
Use the Arc Tool and the Erase Tool to Create 4 Arcs to Round the Corners



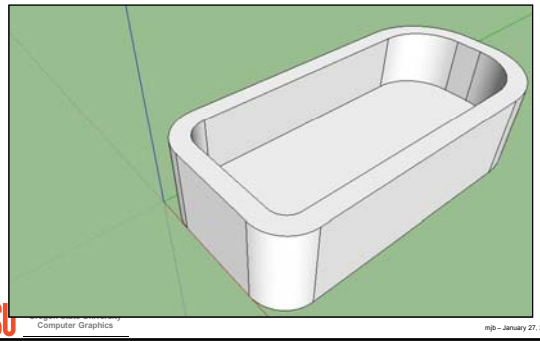
Use the Push/Pull Tool to Lift it into 3D



Use the Offset Tool to Create an Inner Edge

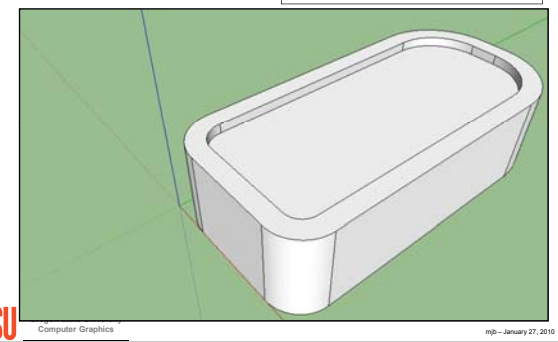


Use the Push/Pull Tool to Push the Middle Down



Use the Move Tool *with the Control Key Pressed*, to Copy the Floor of the Pool and Raise it Up

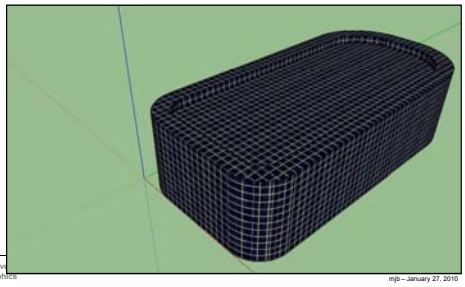
This will become the water surface



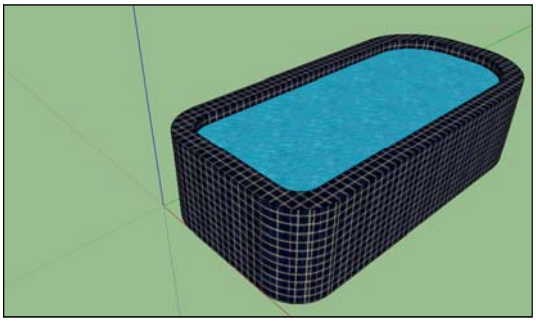
Select Window→Materials→Tile to Apply a Surface to Your Pool

If you hold down the *Control Key* when adding the tile pattern, it will apply it to all surfaces, not just one. This saves you a lot of time.

This isn't right – the top surface of the water is currently tile instead. We'll fix this next.

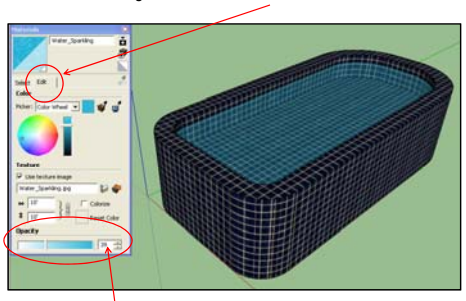


Select Window→Materials→Water and click on the top surface to change it to water



Make the Water Surface Translucent

In the Materials→Water dialog box, click on the Edit tab.



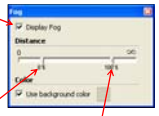
Then lower the Opacity until the water surface looks properly translucent.

Adding Fog

Click **Window→Fog**

This brings up the Fog dialog box

Click here to turn the fog feature on

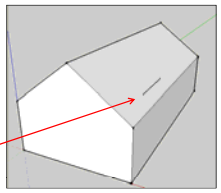


This slider adjusts how far in front of your eye the fog starts. Items closer to you than this will not be fogged at all.

This slider adjusts how far in front of your eye the fog completely hides your scene. Items farther away than this will not be visible at all.

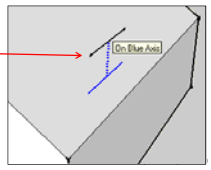
Adding Fog

Adding a Vertical Chimney to a Sloped Roof



1. Draw a line along the roof using the pencil tool. SketchUp's inference engine will try to force it to be parallel to an axis. Let it do that.

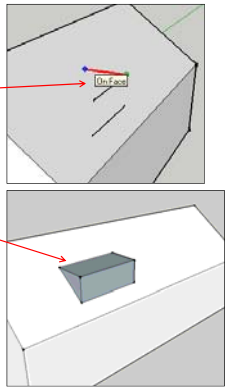
2. Select the line you just drew. Use the Move/Copy icon with the Control Key held down to lift it up in the air. (The Control key will force it to do a Copy.) Wiggle it a little bit until you get the phrase "On Blue Axis" to appear. This indicates that you are lifting it straight up.



Adding a Vertical Chimney to a Sloped Roof

3. Draw lines using the pencil tool from the ends of this new line to the face of the roof. SketchUp will tell you when you are there. Be sure the line is a color (red in this case) to indicate that you are parallel to an axis.

4. Using the pencil tool, connect up all the points to form edges. You should have 9 lines in all. (Don't forget to look at the back of the chimney.) SketchUp will turn the edges into faces as you complete them. There should be 4 faces in all.

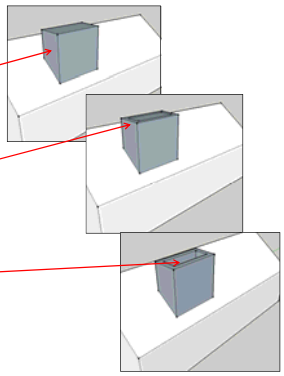


Adding a Vertical Chimney to a Sloped Roof

5. Use the Push/Pull tool to lift the top surface.

6. Use the Offset tool to make an inner surface on that top surface.

7. Use the Push/Pull tool to push that inner surface down.

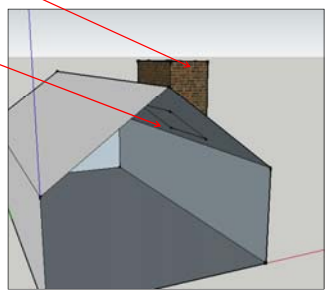


Adding a Vertical Chimney to a Sloped Roof

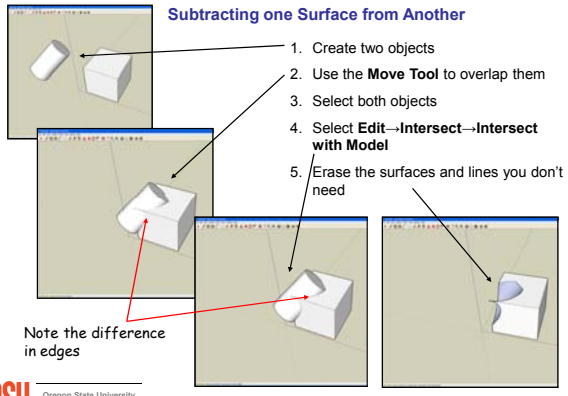
8. Add whatever **Window→Material** decoration you want

9. Get rid of the excess chimney under the roof by hiding an end face and erasing those edges. (See previous sections.)

10. Unhide the end face when you are done



Subtracting one Surface from Another

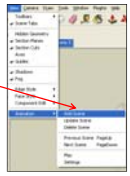


1. Create two objects
2. Use the **Move Tool** to overlap them
3. Select both objects
4. Select **Edit→Intersect→Intersect with Model**
5. Erase the surfaces and lines you don't need

Creating a Flying Animation

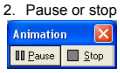
To create an animation:

1. Create a view of the scene
2. Select **View→Animation→Add Scene**
3. Create a different view
4. Select **View→Animation→Add Scene**
5. . . .

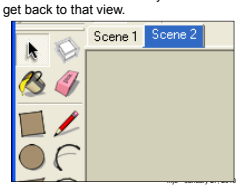


To play the full animation:

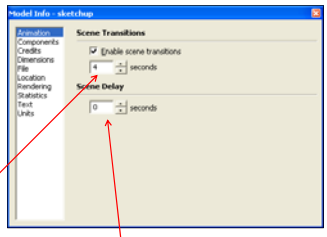
1. Select **View→Animation→Play**
2. Pause or stop the scene with these buttons



As you add scenes, SketchUp will list them. You can click on any of them to get back to that view.



Animation Settings



Set how long each scene transition lasts

How long to wait before starting the animation

Exporting Your Animation

To save an animation to a file:

1. Select **File→Export→Animation**
2. Save as an AVI file

To play the animation file:

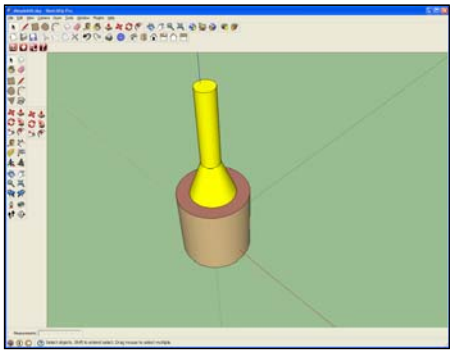
Double-click on your AVI file

To import your animation into PowerPoint:

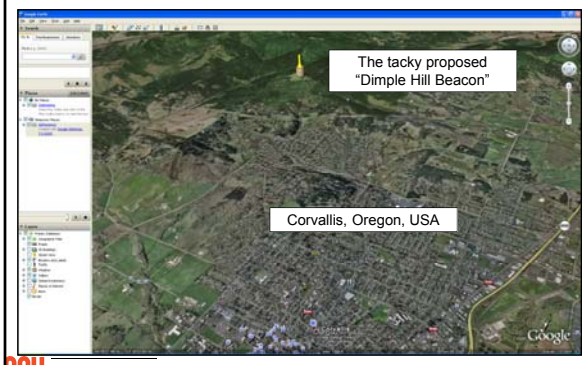
1. Select **Insert→Movies and Sounds→Movie from File**
2. Double-click on the image when editing the slide
3. Click on the image in Slide Show mode

Making SketchUp Work with Google Earth

What if you want to show your creation . . .



. . . where it really belongs on the Earth?

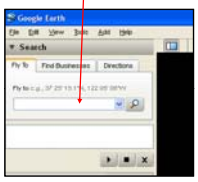


Steps

1. Launch Google Earth
2. Navigate to where you want your model to go

Navigating

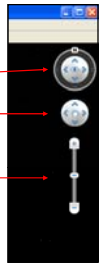
Type in a city name or street address here



Rotate the scene CW and CCW (the right mouse button also does this, plus zooming)

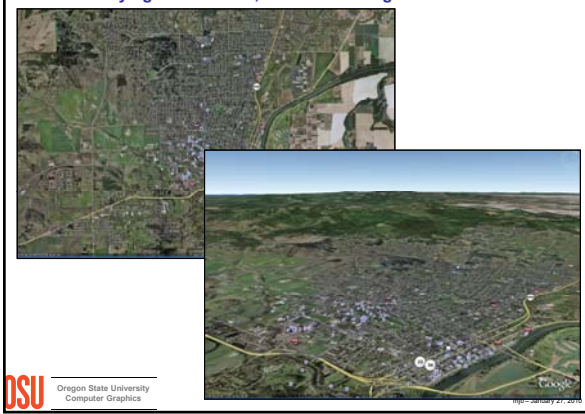
Pan the scene (the left mouse button also does this)

Zoom the scene (the mouse scroll wheel also does this)



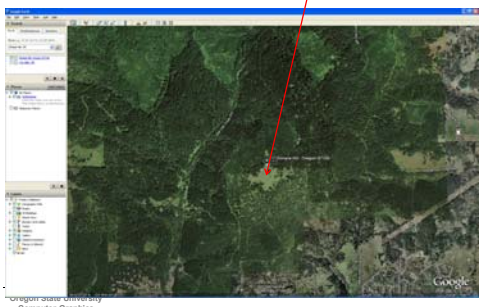
Plus, the middle mouse button will rotate the scene to change from a top-down view to a 3D view

Flying to "Corvallis, OR" and Getting a 3D View

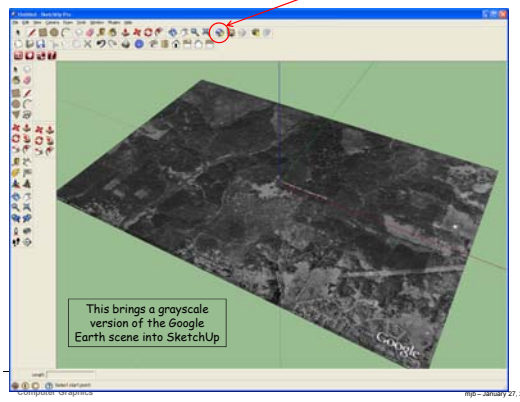


Next Step: Navigate to a Top-down View of Where you want to put Your Structure

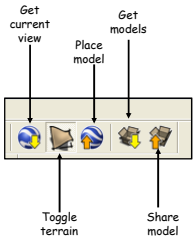
Dimple Hill, OR



Over in SketchUp, click on the *Get Current View* Icon



SketchUp Menu Icons Related to Google Earth



Get current view – copy the Google Earth scene into SketchUp

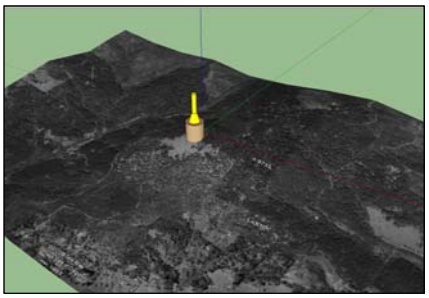
Toggle terrain – change the terrain in SketchUp from flat to 3D and back again

Place model – send your model back to Google Earth to see how it looks

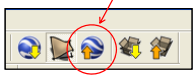
Get models – Get 3D models that others have created

Share models -- Publish the model so that others who use Google Earth can get them too (you need a Google account to do this)

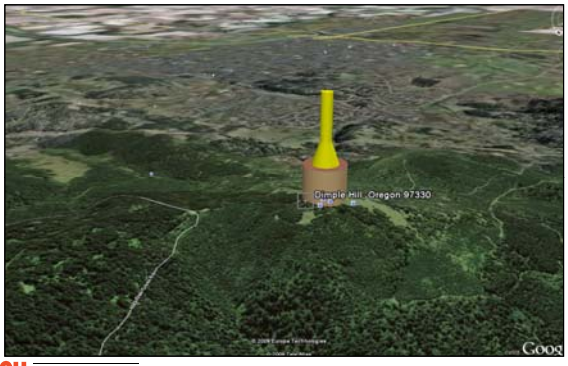
Use SketchUp to Draw a New Model, or *File→Import* an Existing One



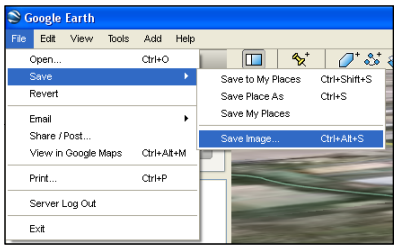
Then, use *Place model* to ship it back to Google Earth



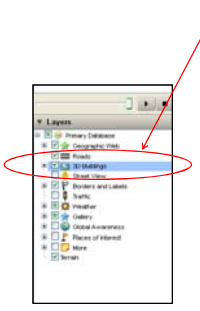
Placing the Model



In Google Earth, select *File→Save →Save image* to write an image file of this scene, suitable for displaying on a web page or a poster



In Google Earth, you can also turn on the *3D Buildings* layer to see what other buildings people have published – this is really fun



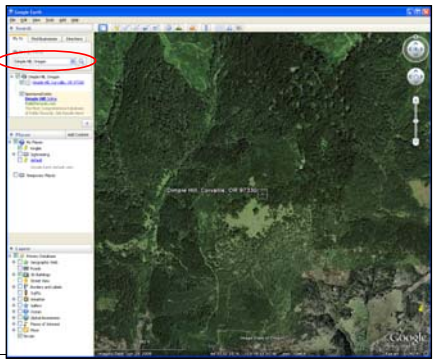
If you want to be seriously awed, *Fly To* Washington, DC or New York City and turn the *3D Buildings* on

Marking GIS Areas with SketchUp and Google Earth

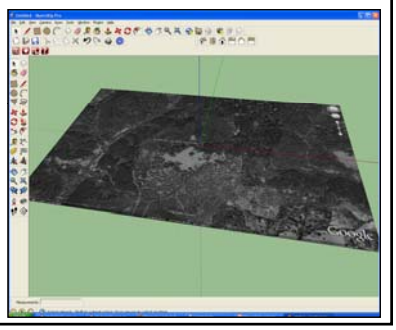
Outlining the meadow area of Dimple Hill

In Google Earth, Navigate to Where you Want to Be

Dimple Hill, Oregon

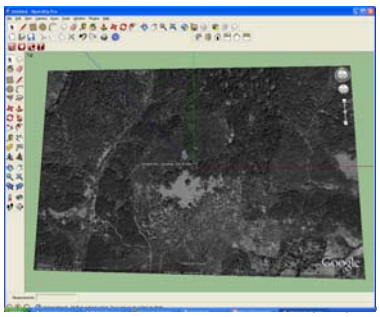


Fire Up SketchUp, and Import the Google Earth Image



Get a Top-Down View

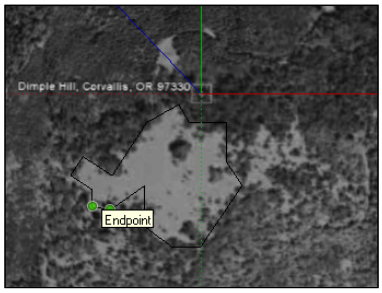
(You might have to hit *Zoom Extents* to Center the View)



Using the *Line Tool*, Click Multiple Times to Draw a Connected Series of Lines Around the Dimple Hill Meadow Area

The outline will be a little hard to see because the lines are black and the background is gray. Oh well.

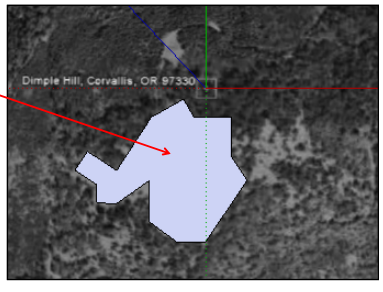
Be sure the last point you click matches the point you started with. SketchUp will help you do this by popping up the ***Endpoint*** inference. Click there . . .



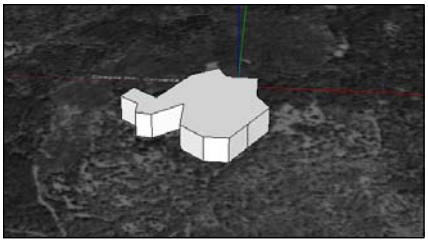
Use the Line Tool, Click Multiple Times to Draw a Line Around the Dimple Hill Meadow Area

. . . to form a polygon.

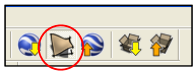
You can tell that a polygon has been formed because it will color the inside, like this.



Use the Push-Pull Tool to Lift the Polygon into 3D

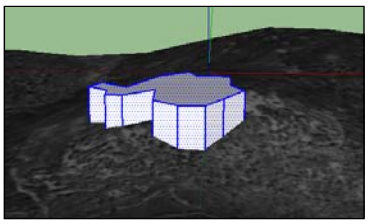


Turn the Google Earth Terrain into 3D, Sweep over the Entire 3D Box with the Selection Tool, then use the *Move Tool* to Push the Building Down into the Terrain



You might have to hold the Down Arrow key to force the movement to be along the vertical (blue) axis only.

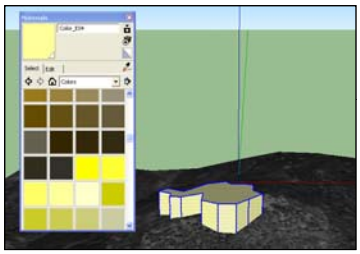
You also might need to Push-Pull the top of the box higher.



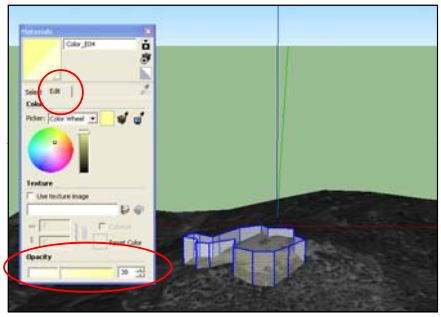
Select *Window* → *Material* → *Colors* and Pick a Nice Color for the Box. Holding down the Control Key, click the Paint Brush on the Box

You hold down the Control Key when you click the paint bucket on your box so that it will color all the faces connected to the one face that you click.

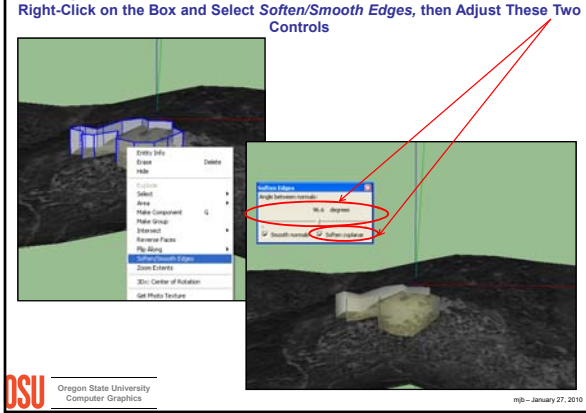
Otherwise, you will need to click the paint bucket on each face individually. Yuch.



While We're at it, Click on the Edit Tab and Adjust the Opacity of the Colored Box



If you want to make the Box Look "Softer"(like it is made from Jello), Right-Click on the Box and Select *Soften/Smooth Edges*, then Adjust These Two Controls



Now, Send your Box Back to Google Earth

If Google Earth has changed your height exaggeration, go to:

Tools → Options

and change the *Elevation Exaggeration* back to 1.0

Good SketchUp Web Links

These Notes
http://cs.oregonstate.edu/~mjb/sketchup

General SketchUp Site
http://sketchup.google.com

Download SketchUp Models
http://sketchup.google.com/3dwarehouse

Tips and Tricks
http://sketchupdate.blogspot.com/search/label/Tips%20and%20Tricks

Step-by-Step SketchUp Examples
http://www.3dvinci.net/teacherguide

SketchUp Blogs
http://sketchupdate.blogspot.com

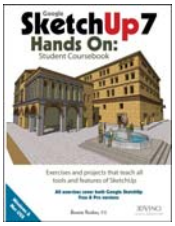
More Good SketchUp Web Links

Video Tutorials
http://sites.google.com/site/3dbasecamp2008

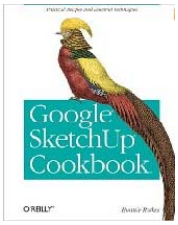
Developing Plug-ins (Advanced!)
http://groups.google.com/group/SketchUp-Plugins-Dev/web/index.html
http://groups.google.com/group/SketchUp-Plugins-Dev

Reference Books

Bonnie Roskes, *SketchUp 7 Hands On*.

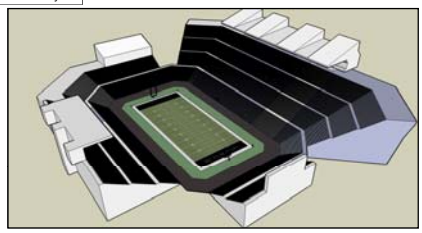


Bonnie Roskes, *Google SketchUp Cookbook*.



Other Examples

Hassan Sinky



OSU's Reser Stadium

Other Examples – the OSU 3D Campus Map Project

Kris Hemenway
Chris Wasco
Oliver Forral