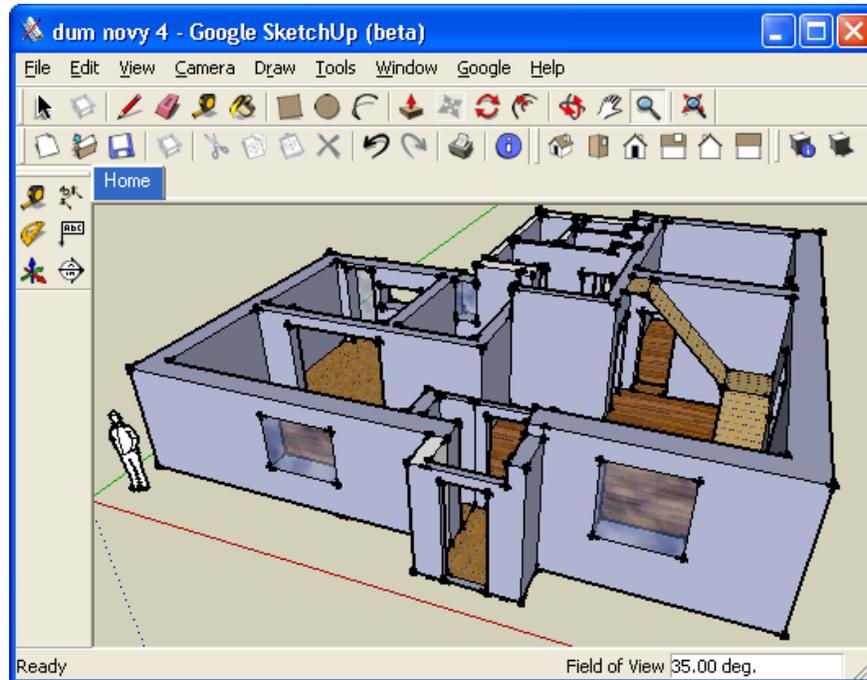# 3D modeling with Sketchup
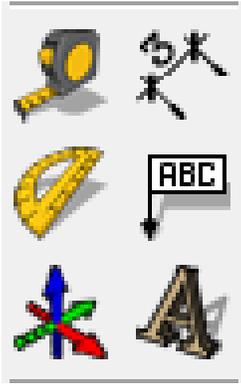


# Ramsey County Library

# Sketchup
# Toolbar Reference Sheet

Measure tool: Click start and endpoint to find distance

Dimension tool: Click any line to create a visible dimension figure next to it

Protractor tool: Click once then move to measure angles of a face

Text tool: Click to create a 2D text label

Axis Tool: Click to change the axis of the design field

3D Text: Click to create a 3D text label

Orbit Tool: Click and hold then move around to view objects in 3D

Pan Tool: Click and hold then move mouse to pan view of an object
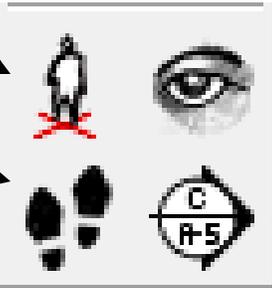
Zoom Tool: Click to enable zooming by scrolling

Zoom Object Tool: Click to zoom to view of entire object

Zoom Previous: Revert to previous zoom distance

Zoom Next: Go on to next zoom distance, similar to re-do button

Position Camera Tool: Click a particular spot that you want to zoom an object from

Eye Tool: Click and drag to view object without moving from perspective

Walk tool: Click and hold to move perspective while moving camera as well

Draw Plane Tool: Click on a line of plane within object and drag to outside to view interior dimensions

# Sketchup
# Toolbar Reference Sheet

**Instructor tool:** Click on any tool *then* this ? in the bottom left hand corner to view a tutorial of the tool

**Select tool:** Click to select object

**Paint Bucket:** Highlight object first and then use paint bucket to fill in color

**Component Tool:** Click object to make multiple copies or save for other projects

**Erase tool:** Click and drag over object to highlight and then press delete to erase

**Rectangle tool:** Use to make rectangles and squares

**Circle tool:** Use to make circles, click center and then pull out to create

**Polygon tool:** Use to make polygons of any number of sides; click center and then pull out to create
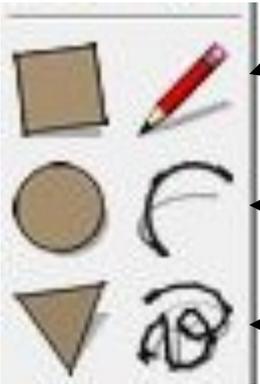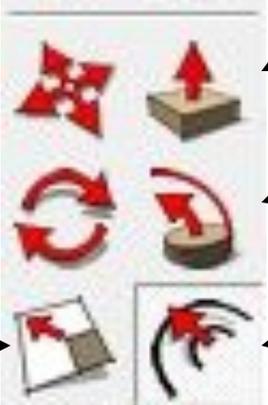
**Pencil tool:** Use to draw straight lines

**Arc tool:** Create arcs by selecting two endpoints first and drag out middle

**Free form tool:** Use to draw freehand shapes and lines

**Move tool:** Use to move objects around and transform their dimensions

**Rotate tool:** Use to rotate objects around a selected axis

**Scale tool:** Use to scale objects up and down

**Push/Pull tool:** Use to make 2D faces into 3D objects

**Follow me tool:** Use to create 3D objects along a selected path

**Offset tool:** Use to create objects perpendicular to selected faces.

# Navigating Around Sketchup

Before we get to actually making things within Sketchup, we first have to learn to move around in it. Your most useful tool for moving around is the orbit tool.  (O on Keyboard)

Click and drag the orbit tool around until you see the three axes of the Sketchup environment. Blue is the Z axis, Green the Y axis, and Red the X axis.
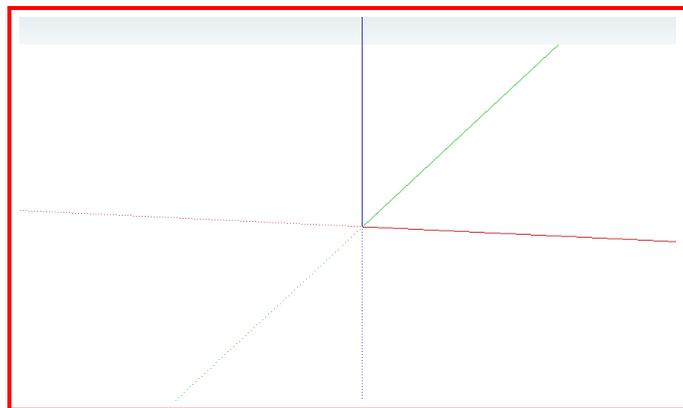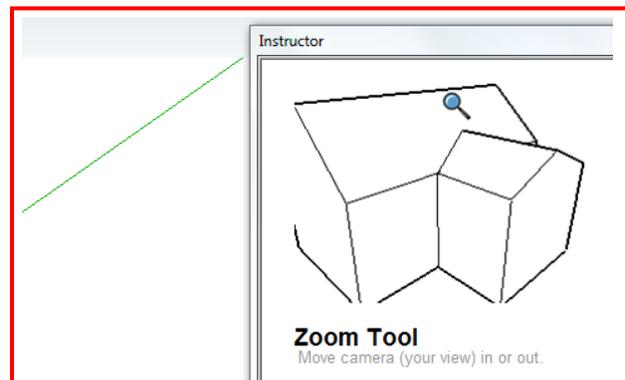


Click on the Pan tool to move your view horizontally and vertically by dragging the mouse.  (H on Keyboard)



Instructor

**Pan Tool**
Move camera (your view) vertically or horizontally.
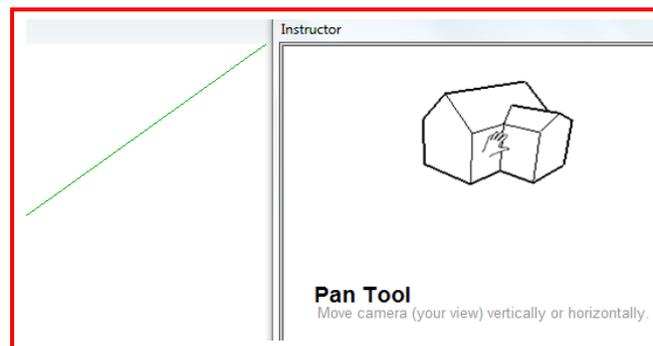
You can also try practicing with the Zoom tool.  (Z on keyboard)

Click and hold then move up to zoom in and move down to zoom out.



Instructor

**Zoom Tool**
Move camera (your view) in or out.

# Drawing Lines and Shapes

Drawing simple lines and shapes is the first step to creating objects. Click on the pencil tool to start drawing a line. (P on Keyboard)



You can set precise distances for your lines by entering in distances on the keyboard after starting a line. After entering the number, use ' for feet and " for inches. It will appear in a box in the lower right hand corner.
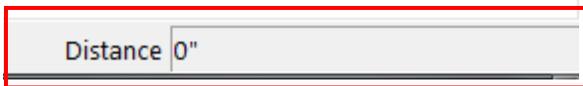


After you attach the points together, the inside of the shape should change color and become a face that you can move around.
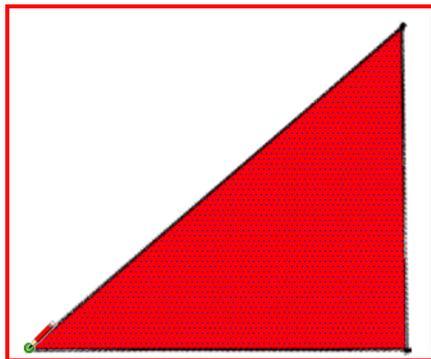


Click once to start a line and once again to end a line. The line will change color if it is parallel to an axis, for example green = forward and back, red = side to side, blue = up and down.
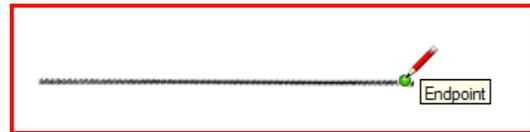


The next step is creating faces. Faces are 2 dimensional shapes that you can manipulate into 3D objects. To make a face, make a couple of lines that connect until they create a closed shape.
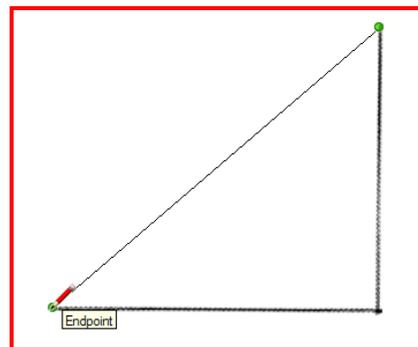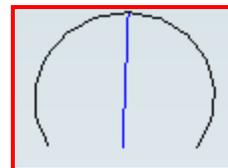
# Drawing Lines and Shapes Continued

Along with creating straight lines, you can also freeform lines. 

To create curved shapes, you can use the Arc tool.  (A on key-board)

Click once to start arc and again to end the edge of arc, then stretch the arc out from its middle point .
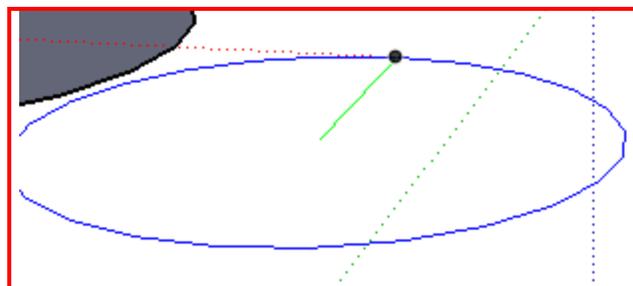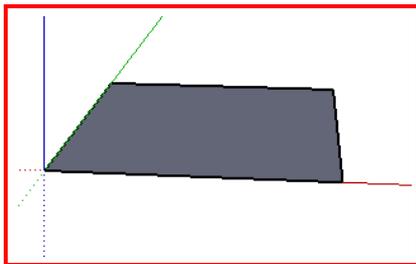


You can also create fully formed faces with the rectangle, circle, and polygon tools.  With the rectangle tool, click once to start a corner of a rectangle, drag your curser out,  and let go to create the rectangle. (S on Keyboard) 

To create a circle or a polygon, click once at the center of your desired shape, drag out  and click again to create shape.  (C on Keyboard)
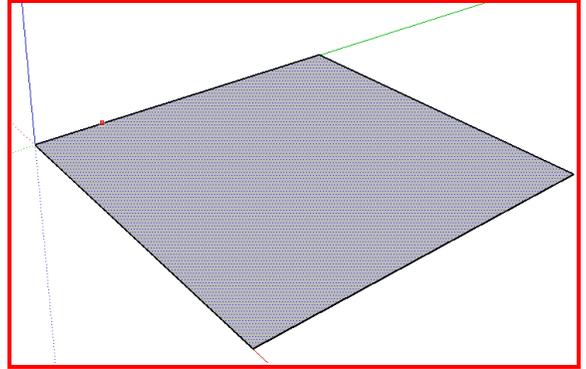
# Using the Push/Pull Tool

The Push/Pull tool allows you to push or pull out a 3D object from a 2D face. Click on the push pull tool ![icon] (P on the Keyboard) and hover your mouse over a face until black dots appear on the face.

Click on the face once and then push or pull the face to create a 3D object. The 3D object can only be pushed or pulled in a direction exactly perpendicular to the face.
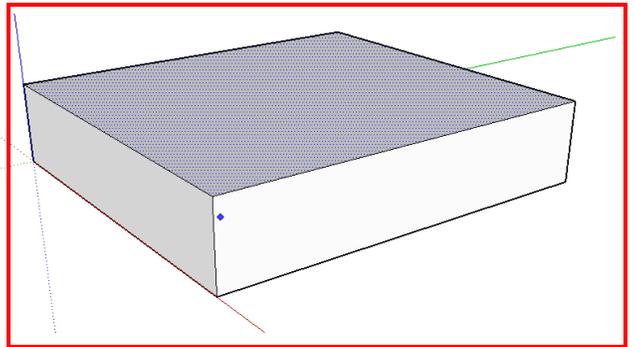
You will notice that new faces have been created on the sides of your 3D object. Click the arrow button and select a new face, then try pushing and pulling the side faces of your object .
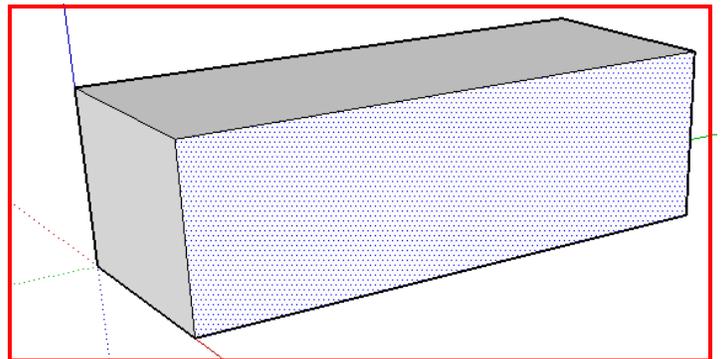
You can also draw on the faces of your object to make smaller faces that are separate. You can then push and pull on these shapes to cut out or add to your shape.
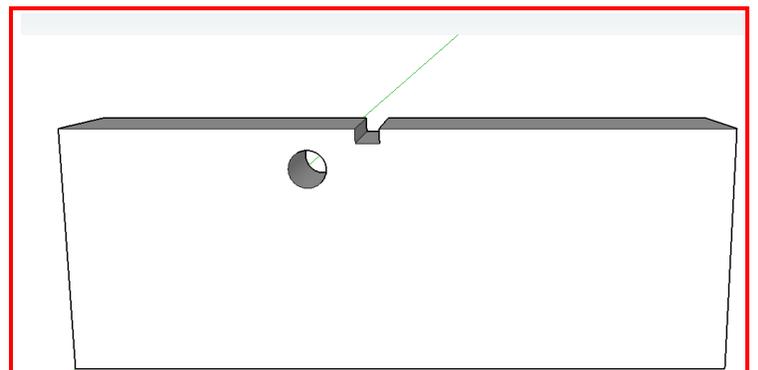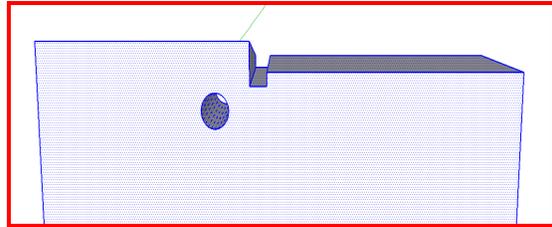
# Moving and Resizing objects

To move around objects you have created, you must first select the entire object with the select tool ![cursor] (Spacebar on Keyboard)

Click once to select an edge, twice for a face, and three times for an entire object. Whatever is selected should be highlighted blue.
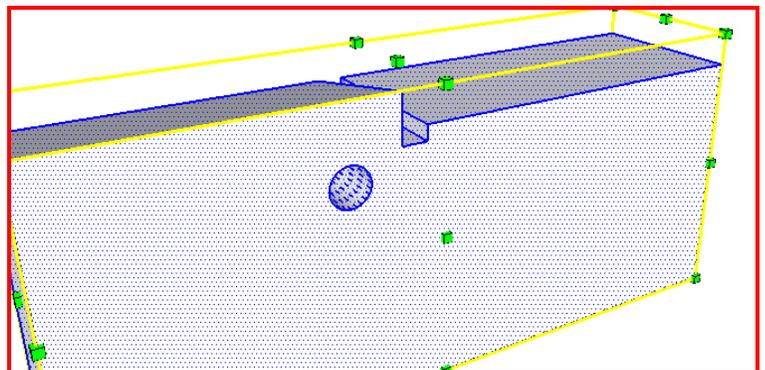
After your object is selected, click the move tool ![move] (M on Keyboard) and then click and          drag and object to move it around. A dotted line will appear in the color of the axis your moving the line
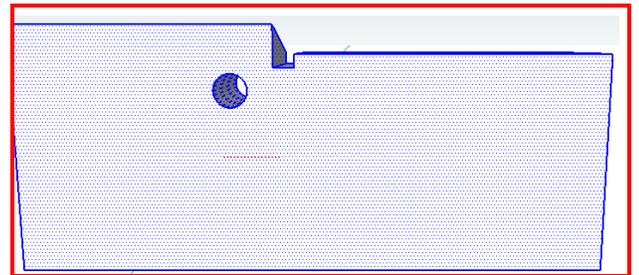
To resize your object, use the scale tool ![scale] ( XS on keyboard)

Click on any of the green boxes and change size of object in that direction.

# Printing Out Your Model Using a 3D Printer

We won't be able to print out all the models we make in class today, but you'll be able to come back in a week or so to pick up your completed model.

Before you leave, be sure to save your model on the instructor's USB.  Save the model using your first name. Write your name + email address on the sign-in sheet.
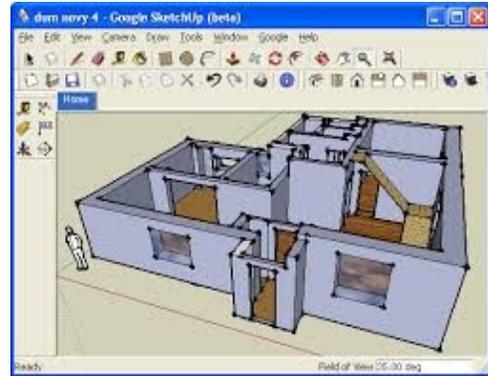
## Links and trainings

For more advanced training on how to use sketchup, visit *http://sketchup.google.com/intl/en/training/*

 Sketchup is a free program and can be downloaded at http://*www.sketchup.com/download/*

Visit *thingiverse.com* to view and download lots of other 3D models created by other people!

Like SketchUp? Want to create your own
3D models at home?

**Download SketchUp for free!**

http://www.sketchup.com/
(Download the normal version, not the Pro version)
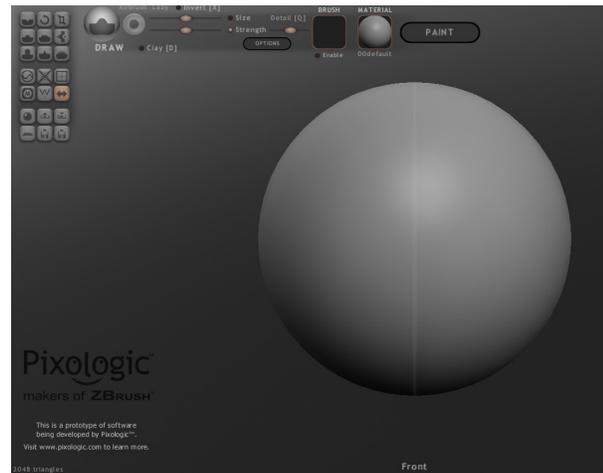




Explore an alternative 3D program in which you can make
stunning models out of digital balls of clay.

**Download Sculptris for free!**

http://pixologic.com/sculptris/