3D modeling with Sketchup

Ramsey County Library
**Sketchup Toolbar Reference Sheet**

- **Measure tool**: Click start and endpoint to find distance.
- **Protractor tool**: Click once then move to measure angles of a face.
- **Axis Tool**: Click to change the axis of the design field.
- **Dimension tool**: Click any line to create a visible dimension figure next to it.
- **Text tool**: Click to create a 2D text label.
- **3D Text**: Click to create a 3D text label.
- **Orbit Tool**: Click and hold then move around to view objects in 3D.
- **Zoom Tool**: Click to enable zooming by scrolling.
- **Zoom Previous**: Revert to previous zoom distance.
- **Pan Tool**: Click and hold then move mouse to pan view of an object.
- **Zoom Object Tool**: Click to zoom to view of entire object.
- **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.

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.

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.

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)

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.
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)

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.

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

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.

After you attach the points together, the inside of the shape should change color and become a face that you can move around.
Along with creating straight lines, you can also freeform lines.

To create curved shapes, you can use the Arc tool. 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 cursor out, and let go to create the rectangle.

To create a circle or a polygon, click once at the center of your desired shape, drag out and click again to create shape.
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 (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 (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 (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 (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!
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