SketchUp

Good project ideas

* Make a shape, add text to the face, and extrude it.
* Draw a silhouette with freehand tool. Use an image as the bottom layer and your line as the top layer.
* Make two pieces that fit together
* Make a piece for the robot.

Tutorials:

* Open the Instructor window (from Window menu) to see tips on each tool you grab.
* <http://www.mastersketchup.com/10-sketchup-tips/>
* Accuracy in sketchup
  + <http://www.youtube.com/watch?v=DVO1cpDLbrs&safe=active>
* How to make a hole in a solid object:
  + <http://www.youtube.com/watch?v=62QsYLhxcZ4&safe=active>

Setup

* Window >> Model Info >> Units >> Decimal, mm
* View Toolbars >> Large Tool Set, Measurements, Section, Solid Tools, Views
* View Hidden Geometry, Section Cuts and Planes, Axes, Guides
* Pro:
  + Download the STL from the Extension Warehouse (<http://extensions.sketchup.com/>):
    - Sign in [chris.d.odom@gmail.com](mailto:chris.d.odom@gmail.com) (usual internet pass)
    - Window >> Extension Warehouse
    - Search for SketchUp STL; click on STL
    - Install button

Hints

* Know your measurements first, then design the objects!
* Draw objects on paper first, with proper measurements!
* To get dimensions window open after creation of object, click on tape measure, draw along the length of one dimension, change the dimension in the dimension field. Thanks Anthony (and Scotty)!
* Short cut keys!
* Work in mm
* orbit often
* look for faces with different colors, which indicate an inside-out face. Try right-click then reverse face.
* save constantly
* Save files name with good description and your name!
* new numbered version saves every 30 min
* To make a 3D letter that is fully controllable: 3D Text >> Filled, Extruded no more than -2.0 (**negative** 2.0) >> place it EXACTLY where you want it >> explode it with right click >> push down >> re-group. Thanks Anthony Delgado
* Circle: make circle >> before doing anything else, enter size of circle in measurement box, then enter “100s” into measurement box to make, for example, 100 sided circle.
* move along axes one at a time:
* To constrain moves along a particular axis, highlight object >> click on object >> press up/down arrow to move along z-axis, right arrow for red axis, left arrow for green axis.
* To move object to a particular plane: triple-click object to select all >> select Move >> click on desired plane of object >> lock in axis (up/left/right arrow buttons) >> then click on desired plane you wish to move to.
* Use Select Tool to see inside your objects. Very useful when editing! Can move and rotate the section plane like any other plane. Erase it when done. See <http://www.youtube.com/watch?v=ZiMA1IAn8HU&safe=active> for nice tutorial.
* To place one object on another:
  + View >> Face Style >> X-Ray
  + Select Object
  + Select move tool
  + Click on point on object you’d like to place on the other object
  + Click on face/edge/point on 2nd object you’d like to move
* Join as solids with outer shell. will need to make group first.
* Use the dimension tool to show dimensions!
* Say you want to have n-number of shapes pushed/pulled the same amount. Here’s how:
  + Create your shapes
  + Pull one object the correct amount
  + Double-click on the other objects and they will be pulled the same amount.
  + Even if you re-push/pull, double-clicking will move others to the same thickness!