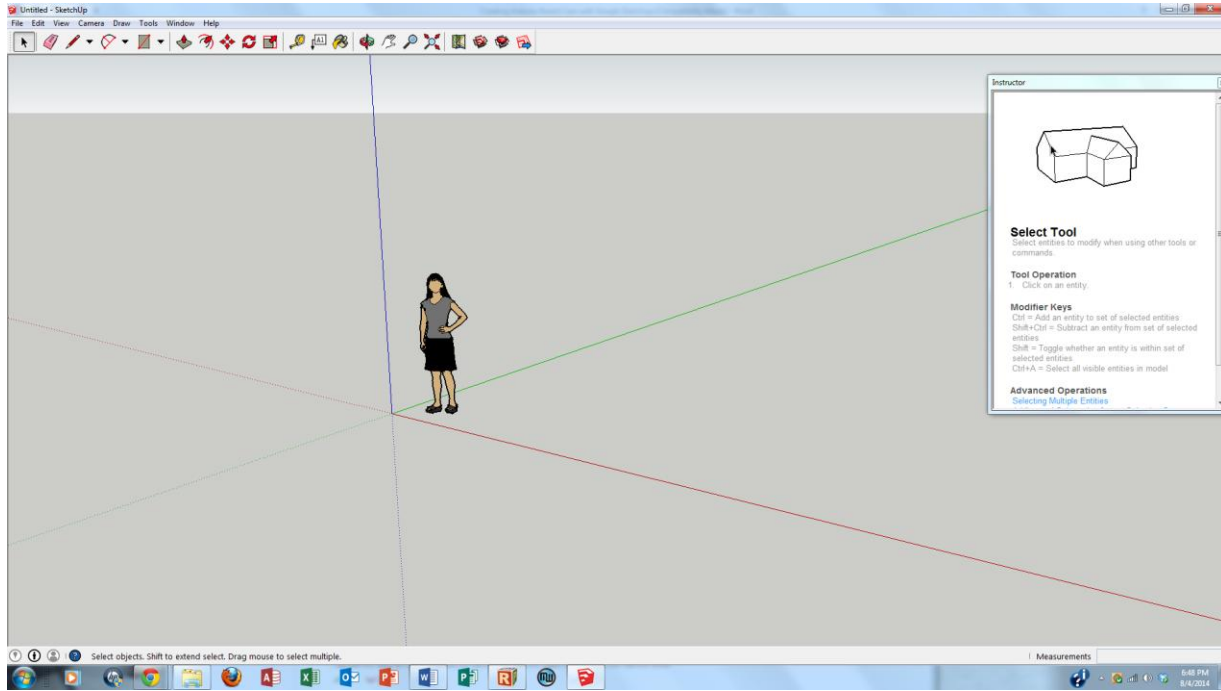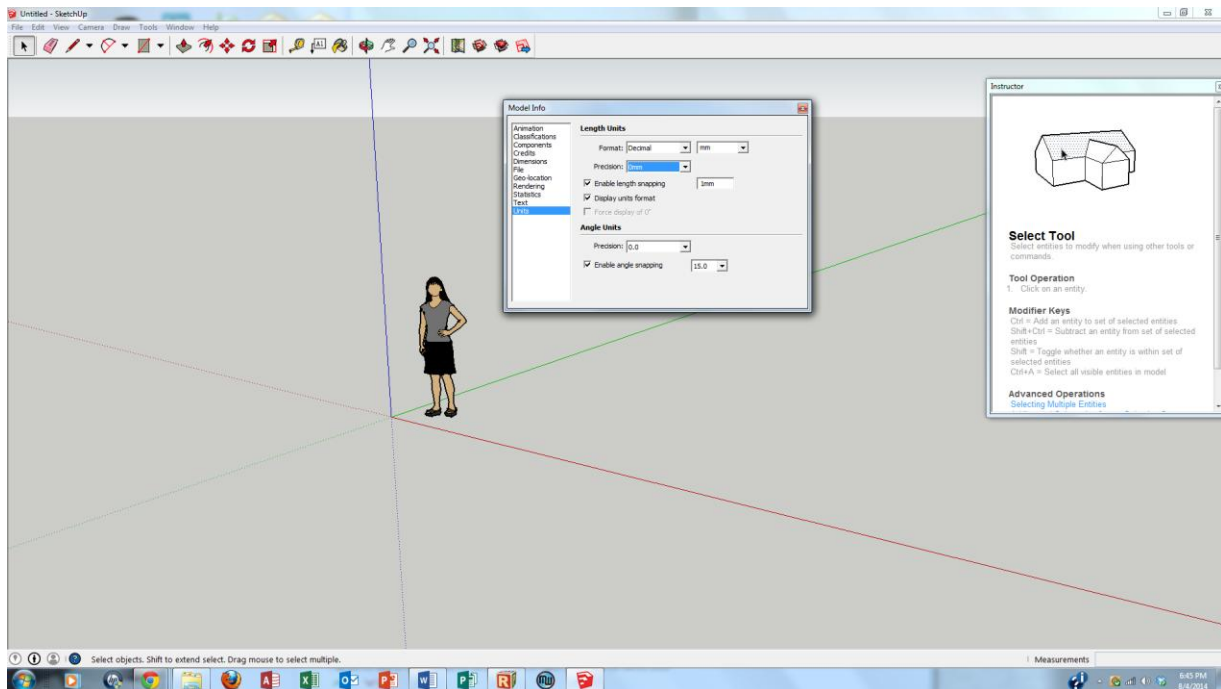# Creating Arduino Board Case with Google Sketchup
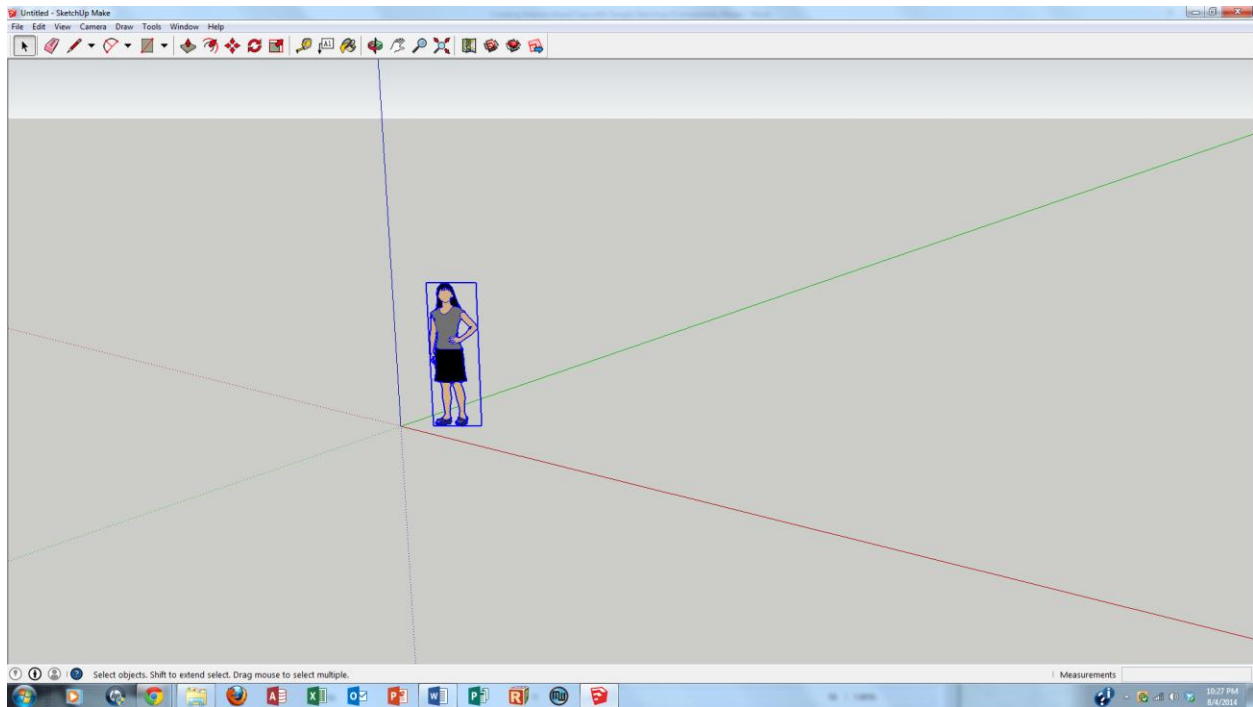
Open up Sketchup Make. Do not select "3D Printing" for your template (that option will only provide you with the smaller Makerbot print area).
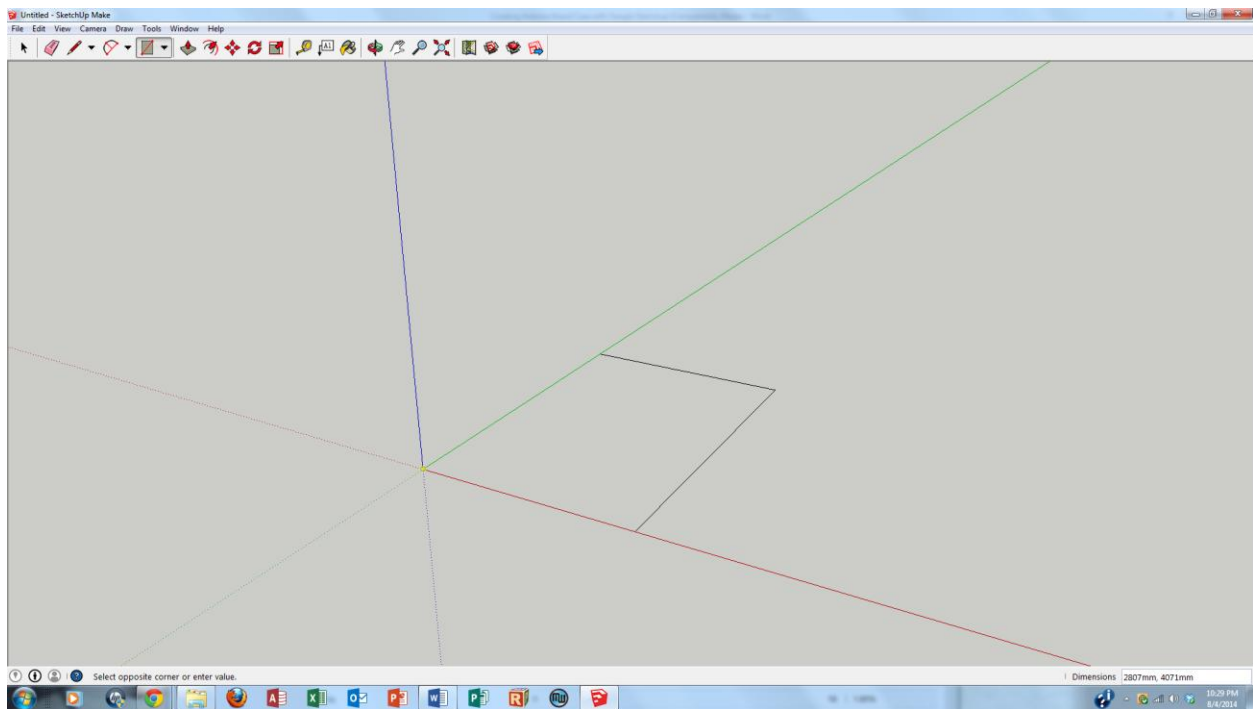

Navigate to Window>Model Info>Units. Select "mm" from the dropdown menu.

Delete this person here by selecting her (or him) and pressing "delete."

Navigate to Draw>Shapes>Rectangle to create the base for your box. Start your base at the origin (intersection of the X, Y, and Z axis).

Type 54, 76 and then press return to create the base. **Zoom in** by scrolling the center button or navigating to Camera>Zoom to make the object easier to see (54mm is only about 2 inches).
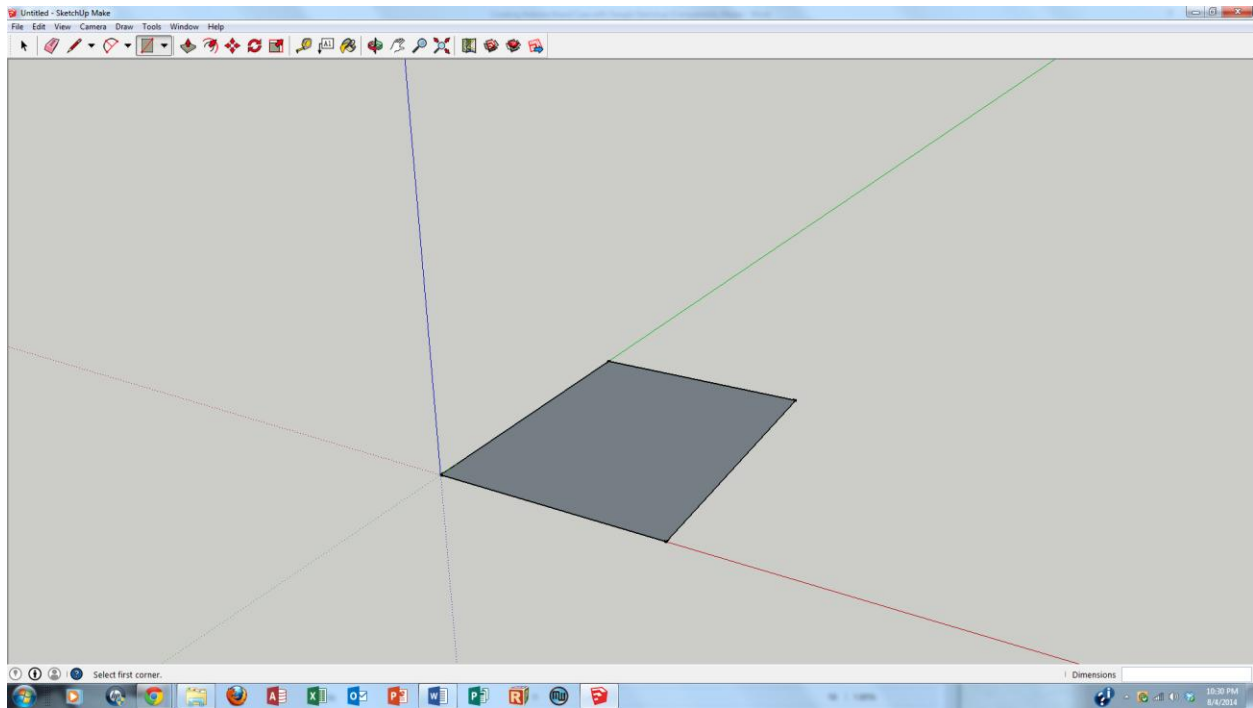

Dimension your rectangle by navigating to Tools>Dimensions and then by selecting the lines you are measuring. You may rotate the model by pressing and holding the center mouse button or by navigating to Camera>Orbit.
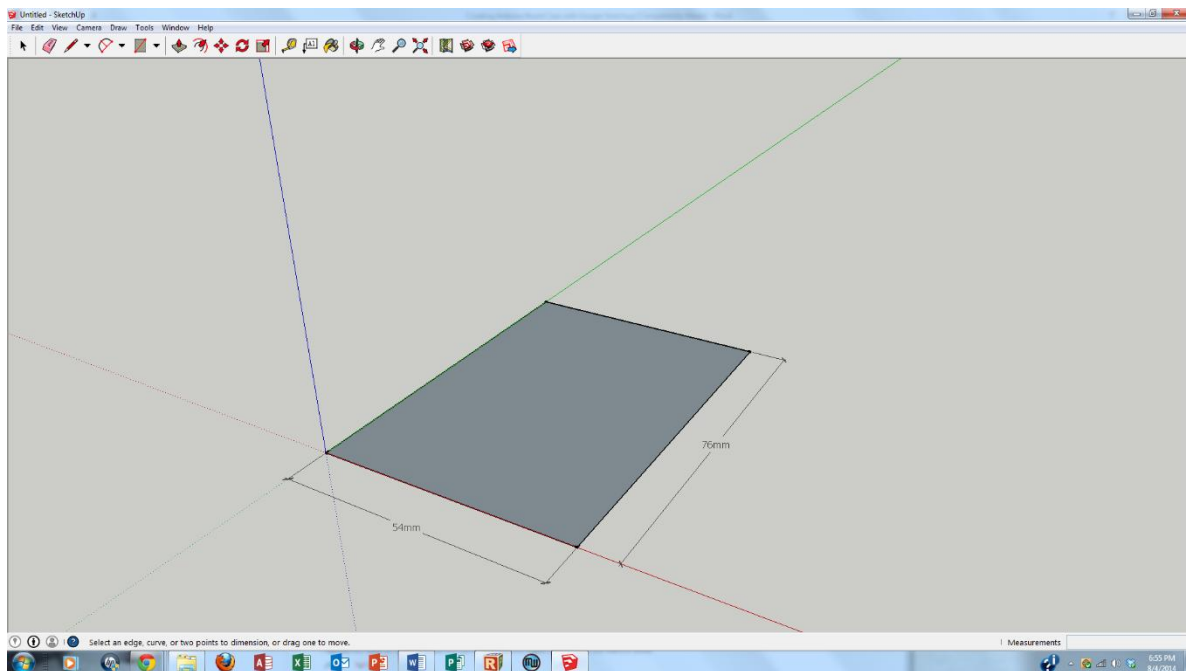
Select the rectangle and navigate to Tools>Push/Pull to pull the rectangle up by 40 mm to build a 3d object. Congratulations, you have just created a printable, 3D object!
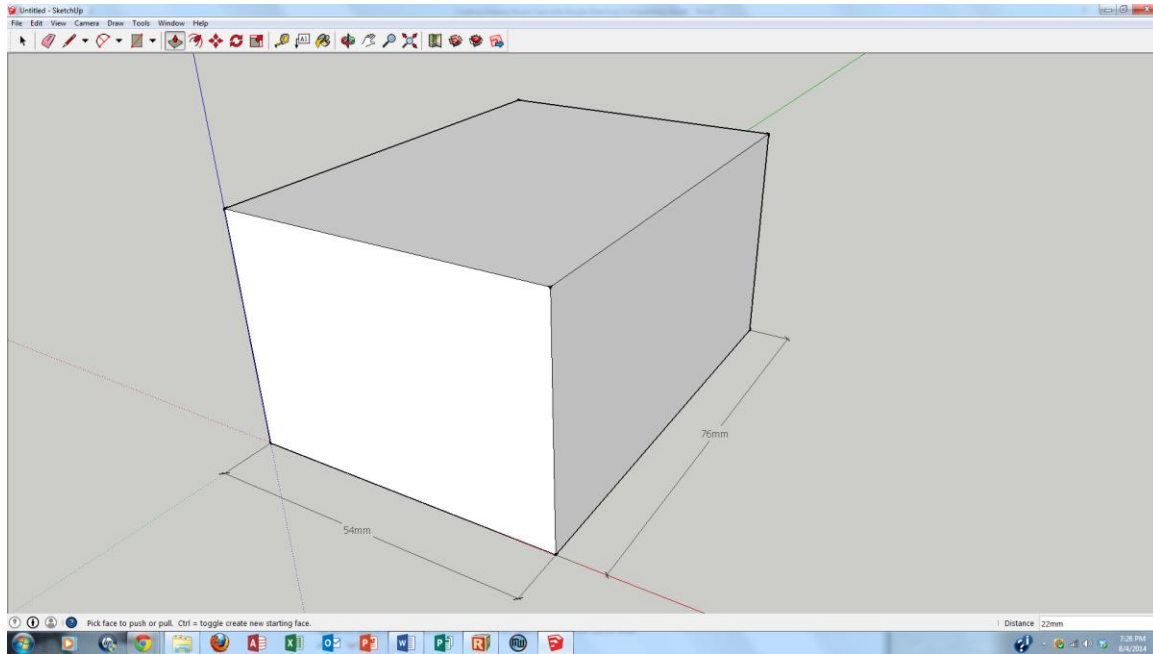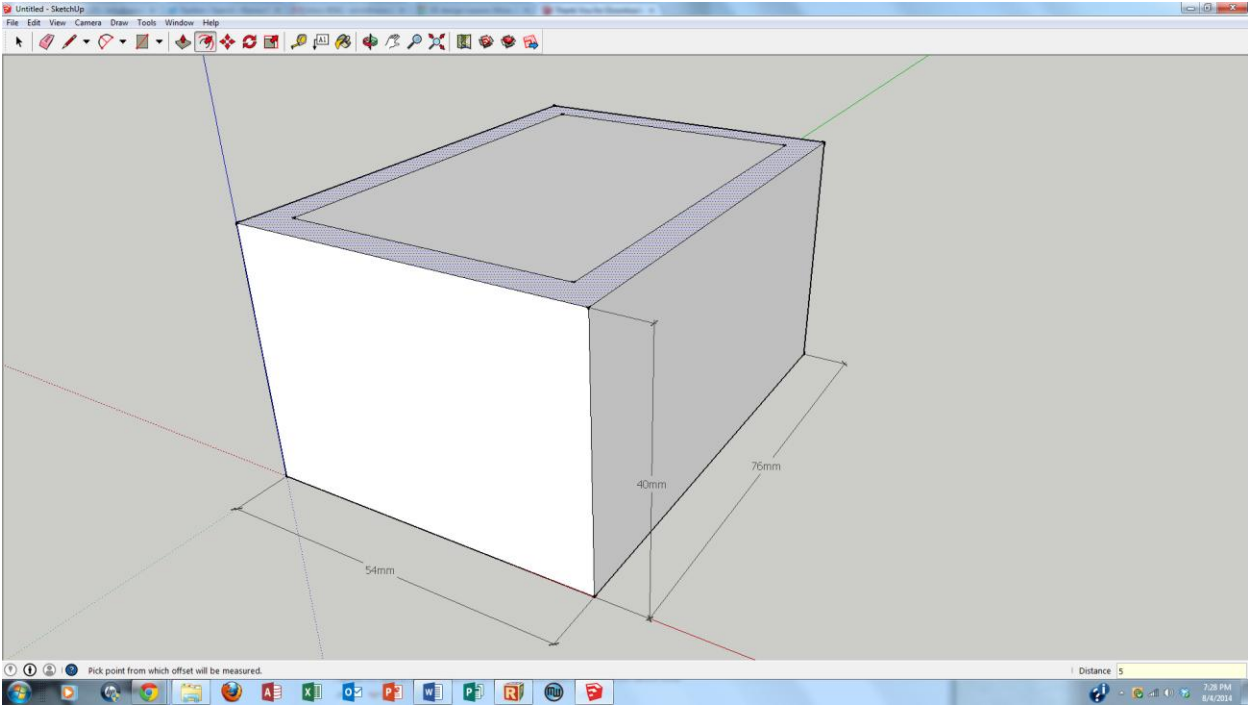

Dimension the vertical component of the Body (Tools>Dimensions).
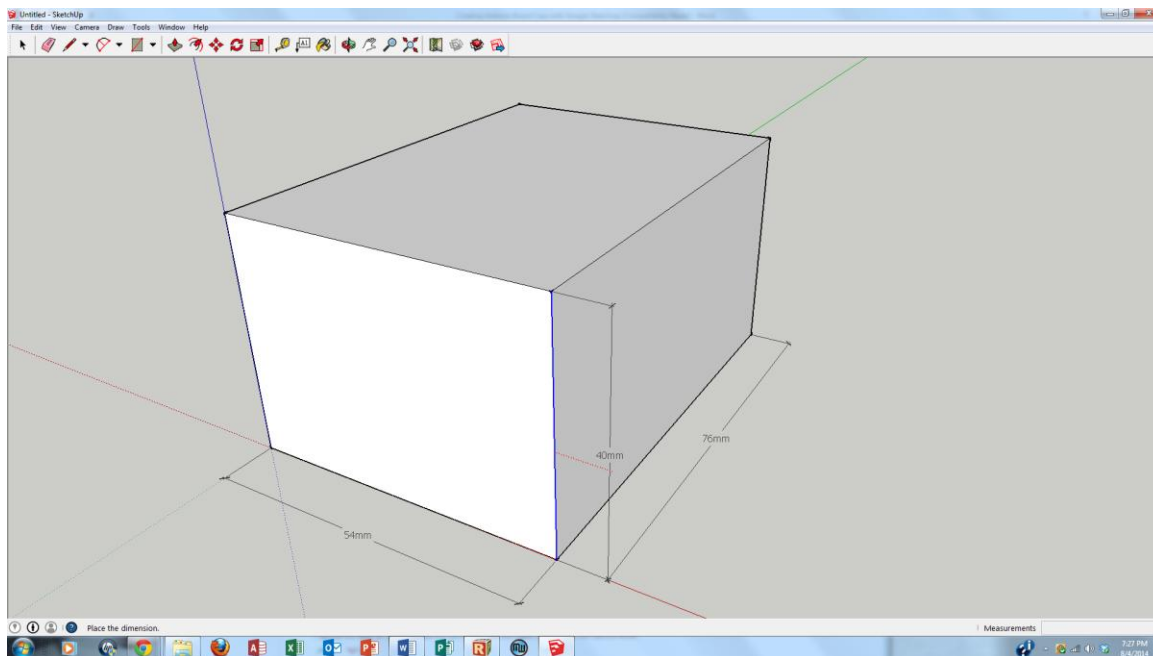
Now we are going to make an opening in the Body. The easiest way to create the opening is to create an offset and then extrude. First, select Tools>Offset and then click on a line on the top of the Body.
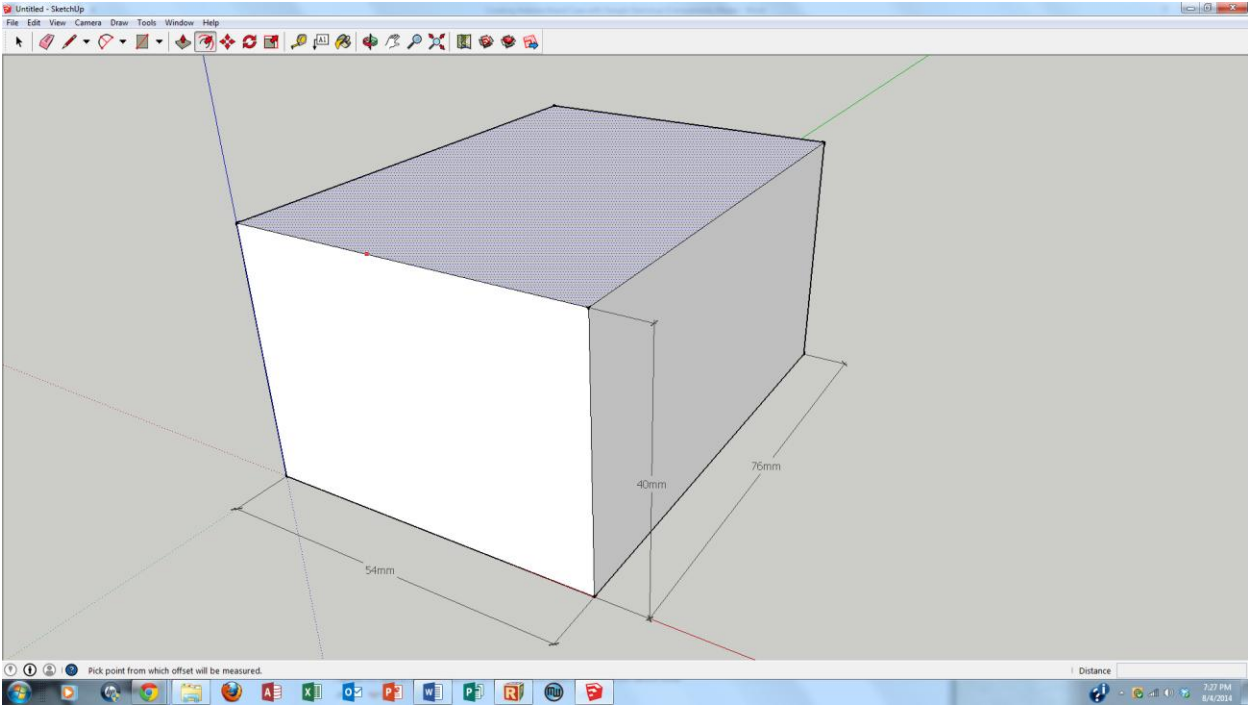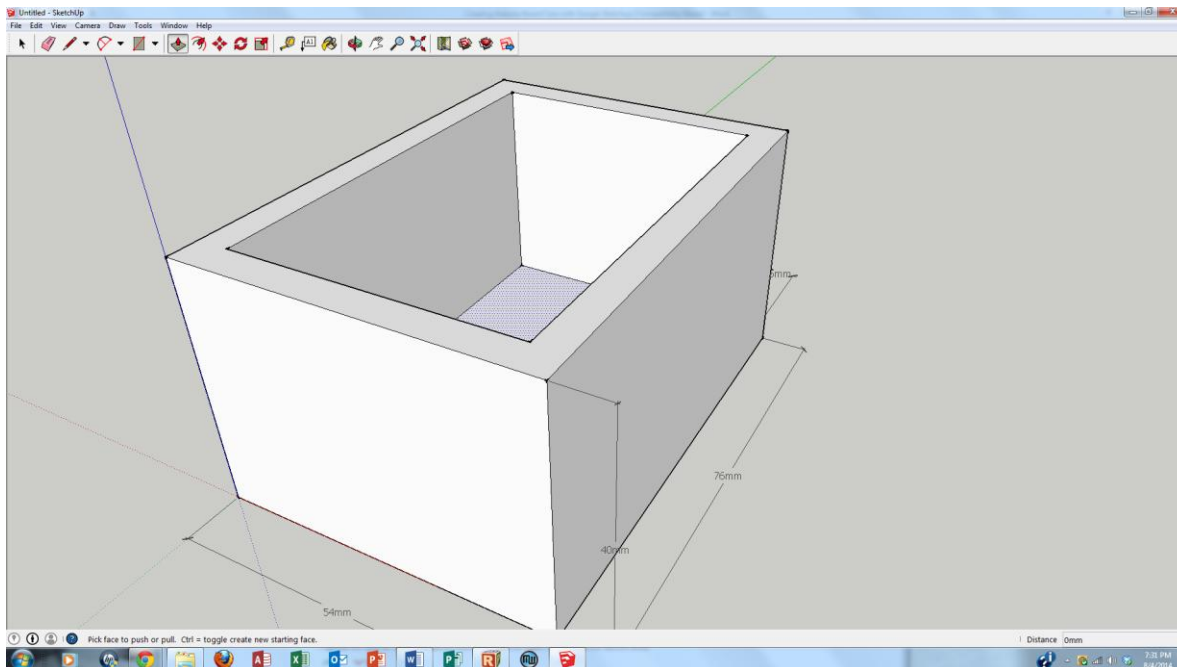

Move the mouse inside the Body to create an inner, "offset" line (specify 5mm to create 5mm thick walls).

Dimension the offset (Tools>Dimensions).
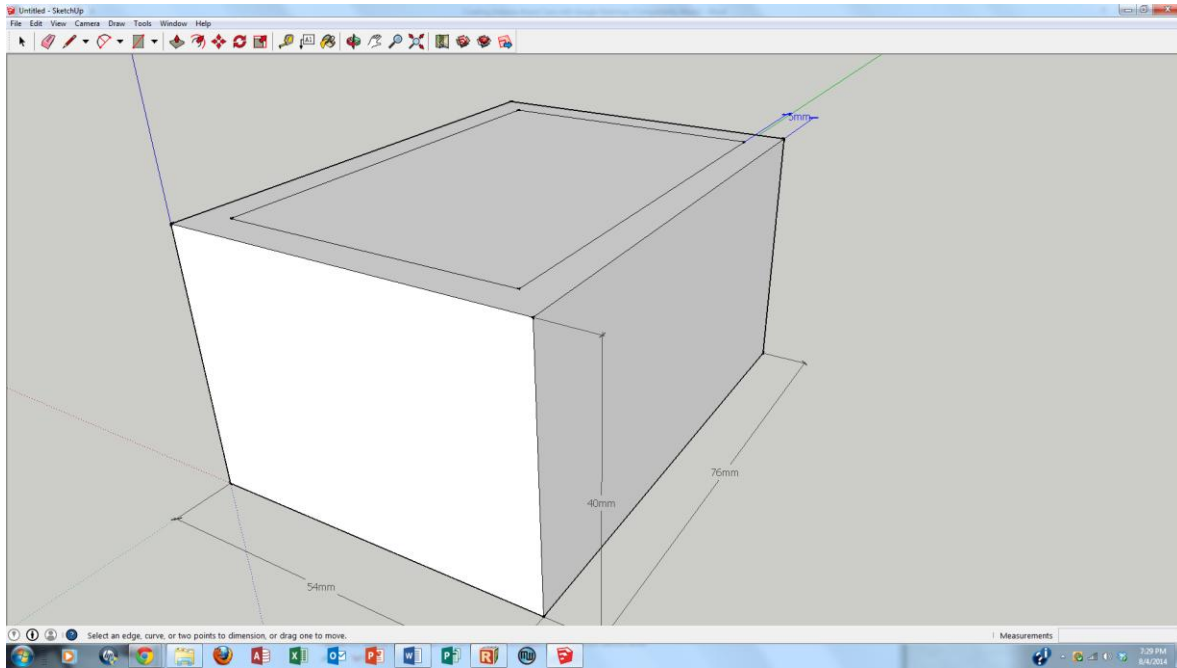
Create a cavity on the Body to retain the Arduino board. Use the Push/Pull tool to push the inner rectangle 35mm (to leave a 5mm thick floor). Dimension the depth as well.

With a proper Body, we need to place openings in the Body for power (9V) and signal (USB). Let's first create a rectangular box for a USB opening, sized 13mmx13mm, by navigating to Draw>Shapes>Rectangle. Place the rectangle on the front face of the Body and type in 13, 13 (and then click return) to size it correctly. Dimension the rectangle.
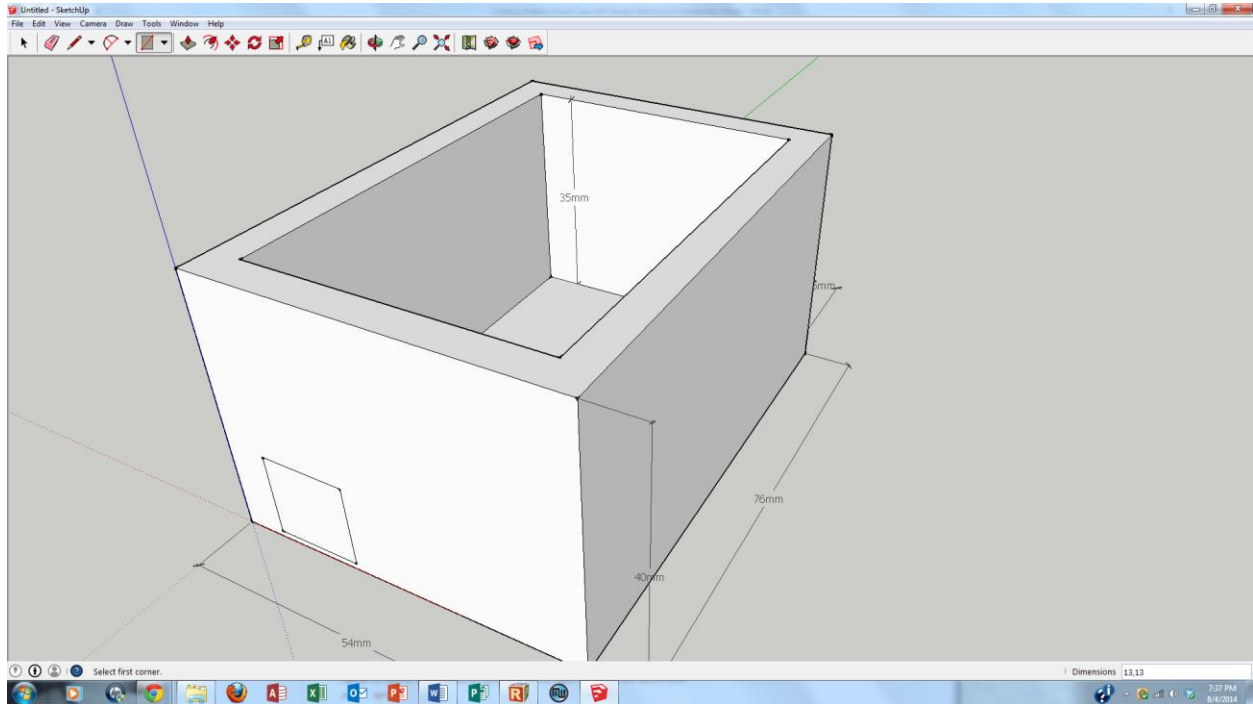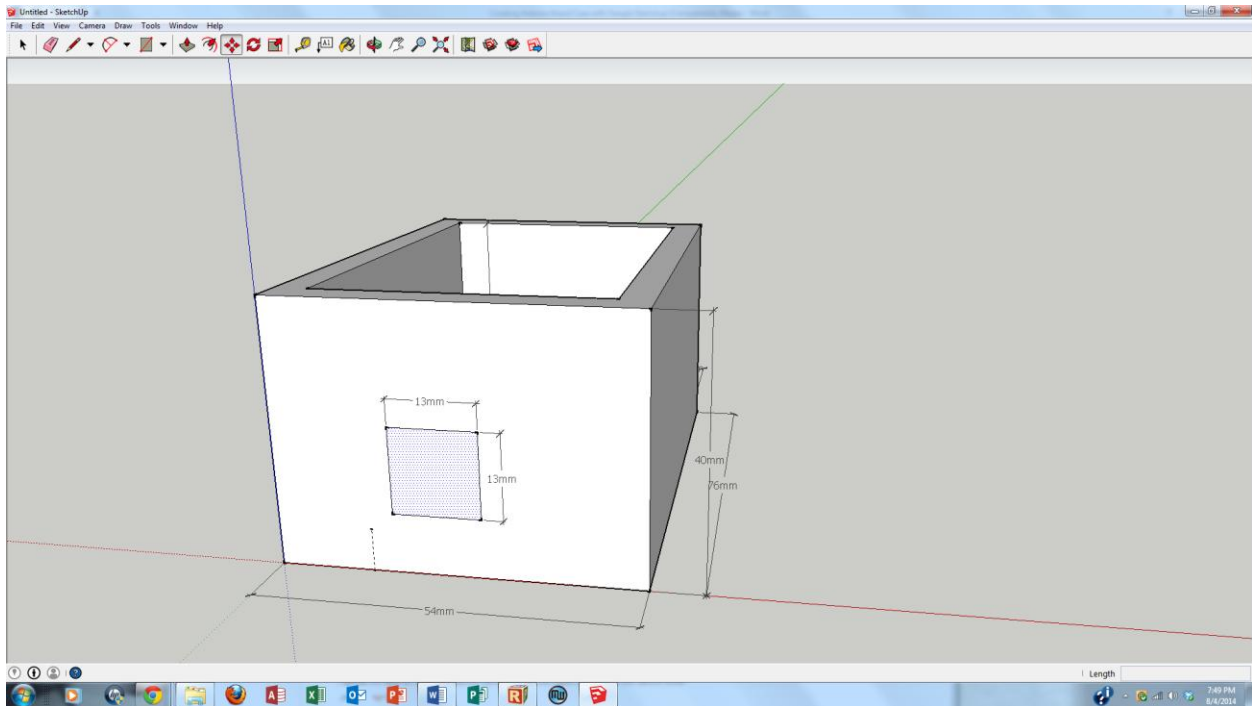

We need to place the rectangle in the correct spot for the USB opening. Navigate to Tools>Tape Measure and measure 14mm from the origin along the X axis (left to right).
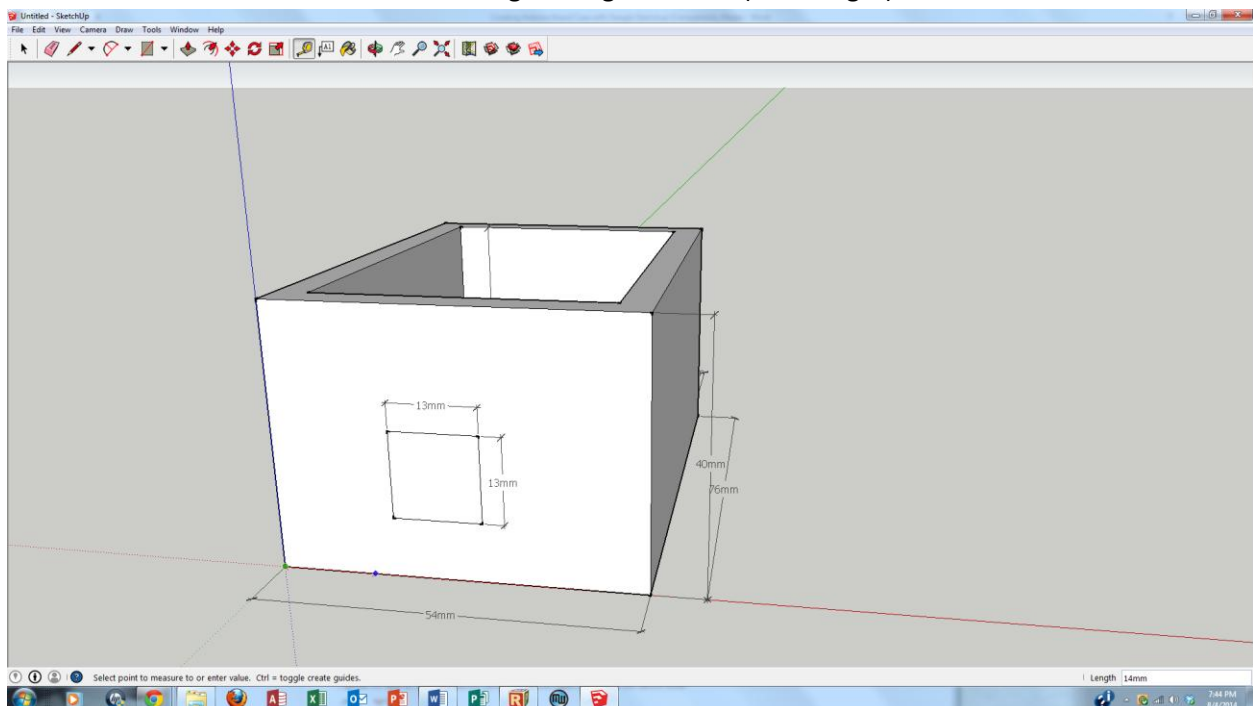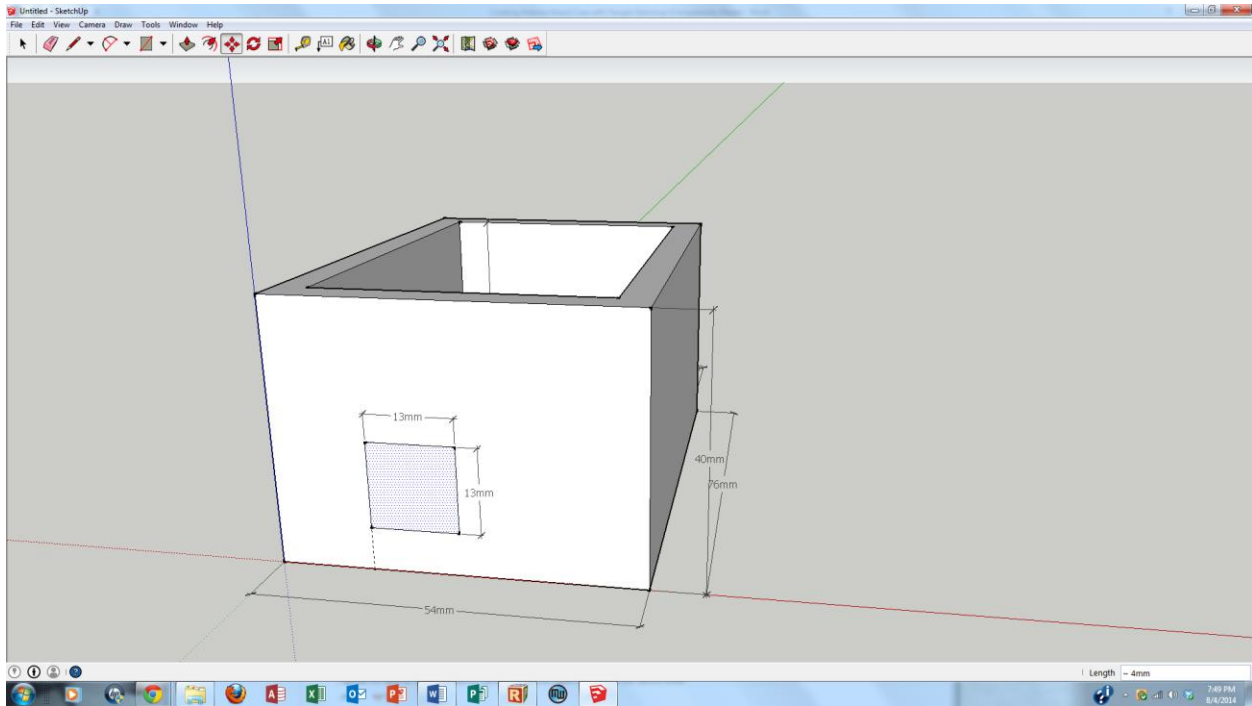
Use the Tape Measure and make another point 6.5mm up from the prior point.
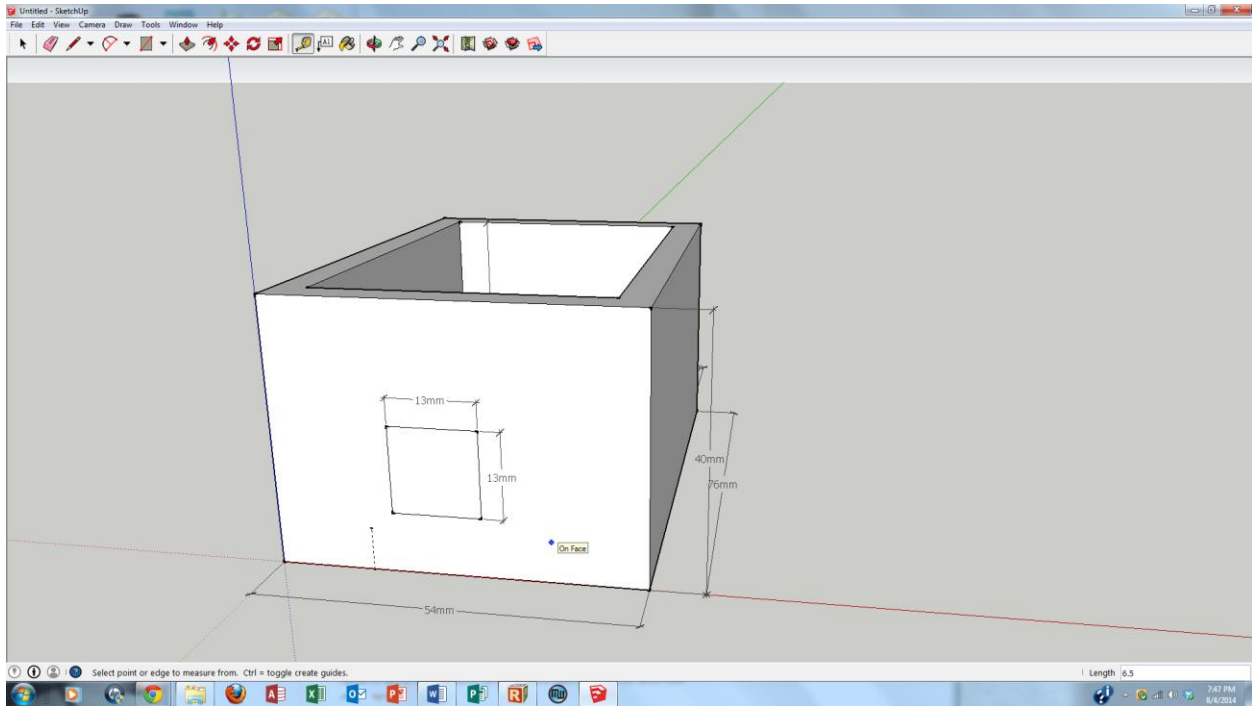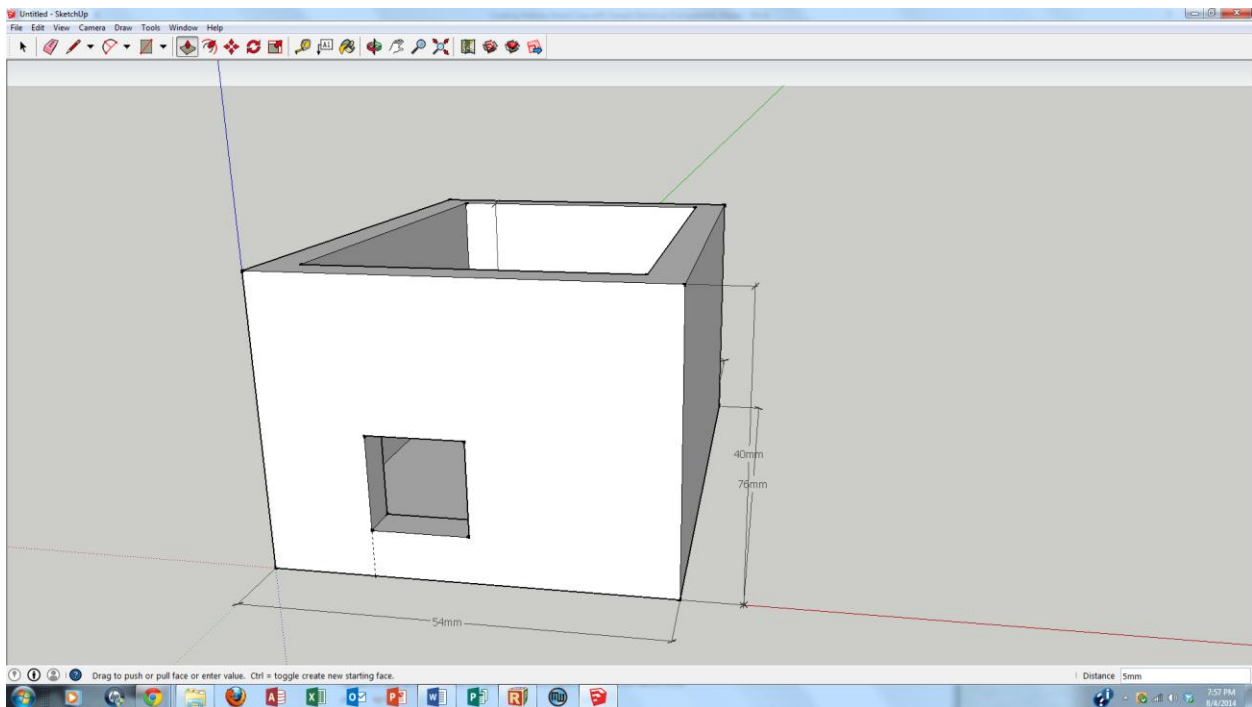

Select the 13mm x 13mm box.

Grab the bottom left corner of the box and drag it to the point just created.

Let's create the opening for the USB port. Use the Push/Pull tool to push the rectangle in by 5mm to create an opening.
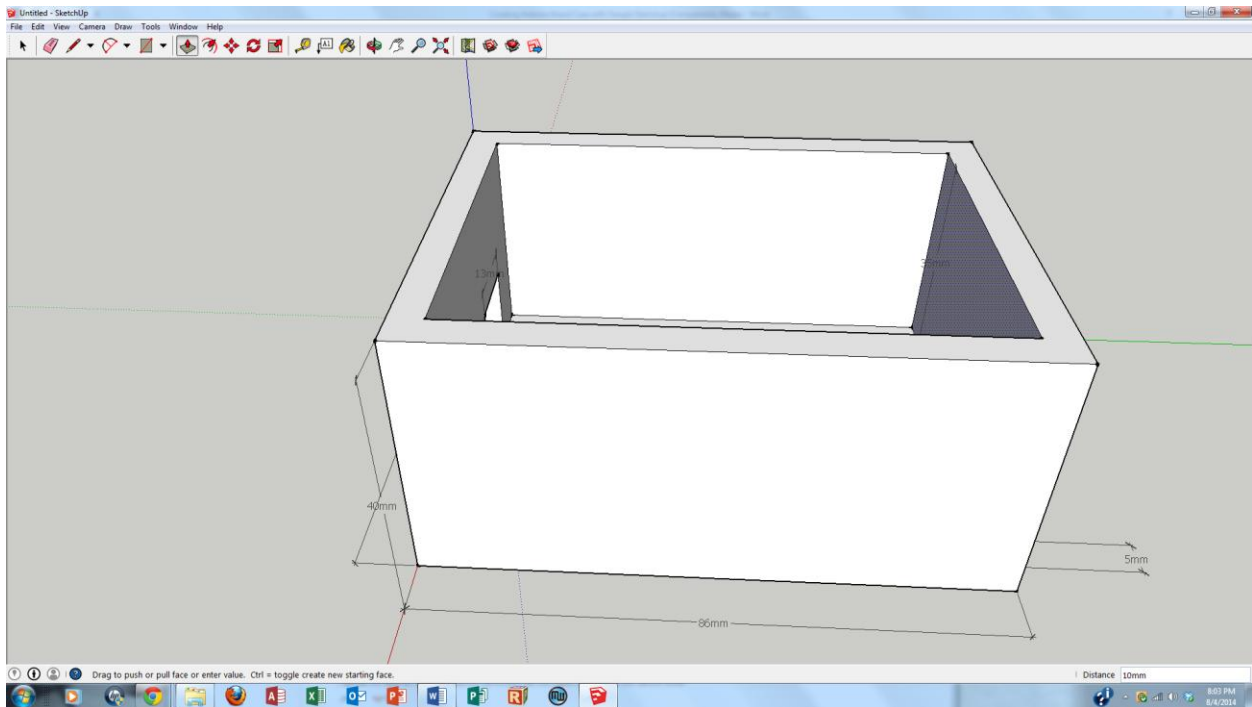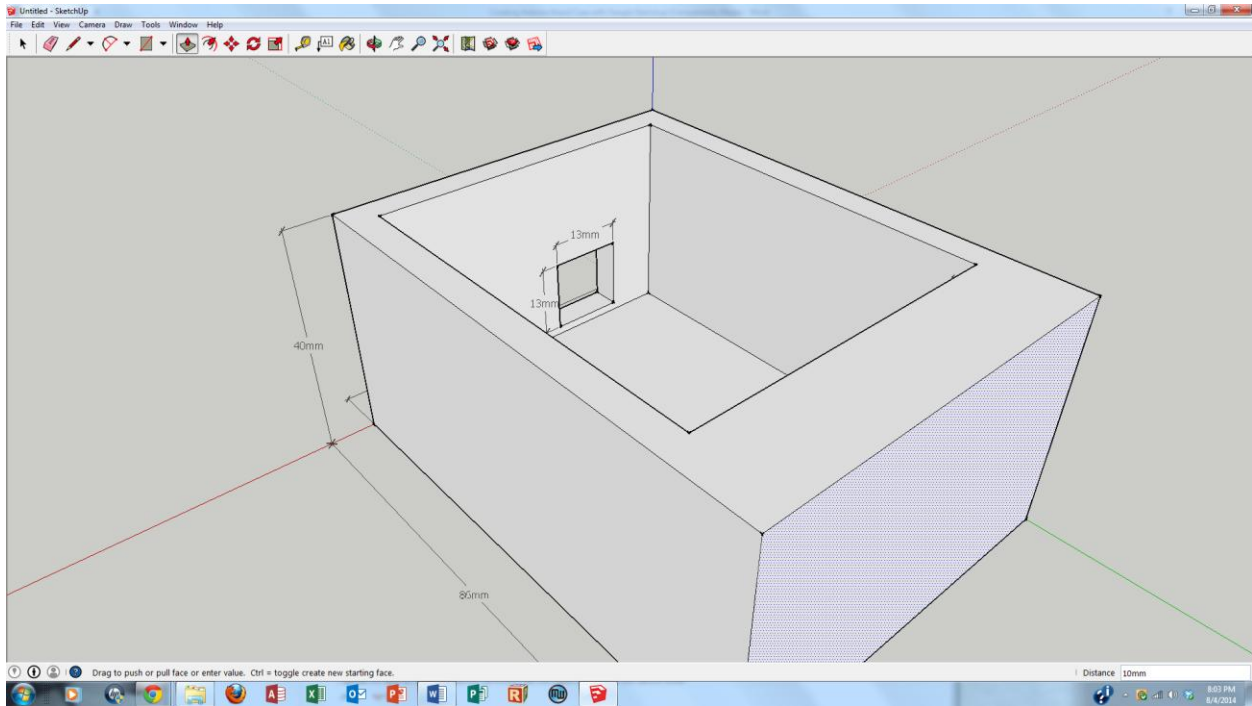
OH NO!!! Realizing that our Body is not sized correctly (it needed to be 64mm wide and 86mm long), let's start to correct the model by using the Push/Pull tool to pull the right wall out by 10mm.
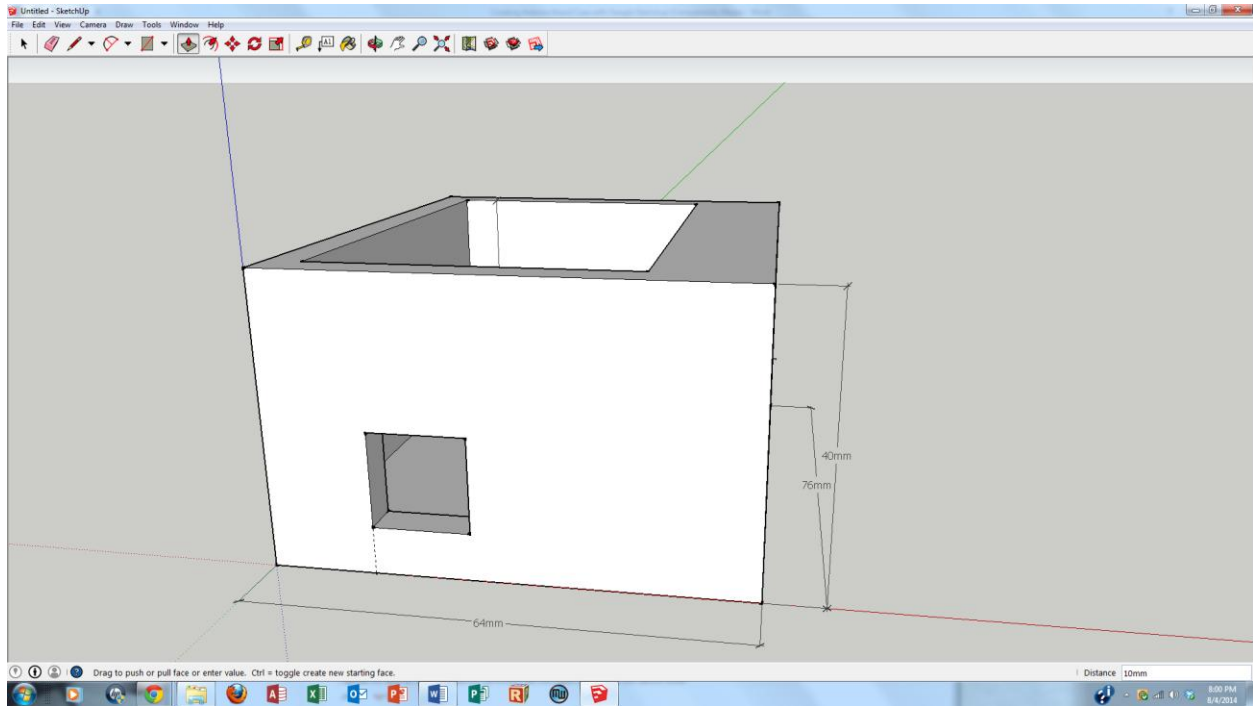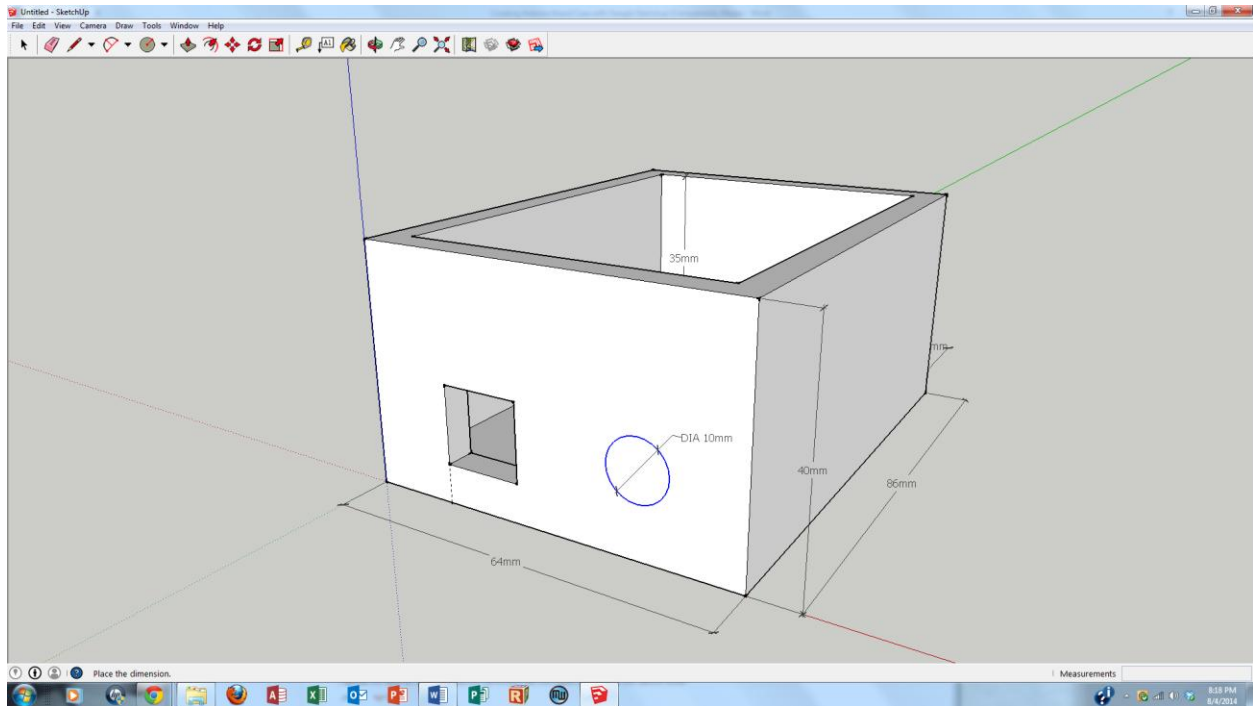

Push the inner right side wall in by 10mm to restore the correct 5mm wall thickness.
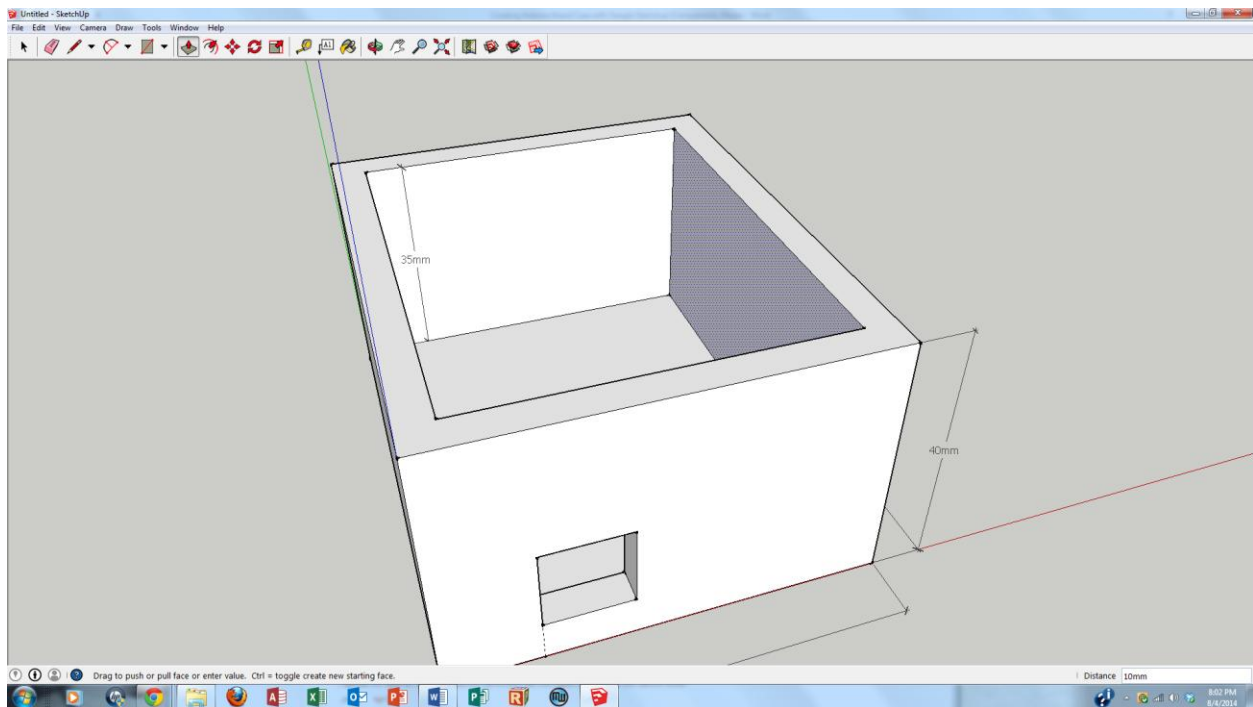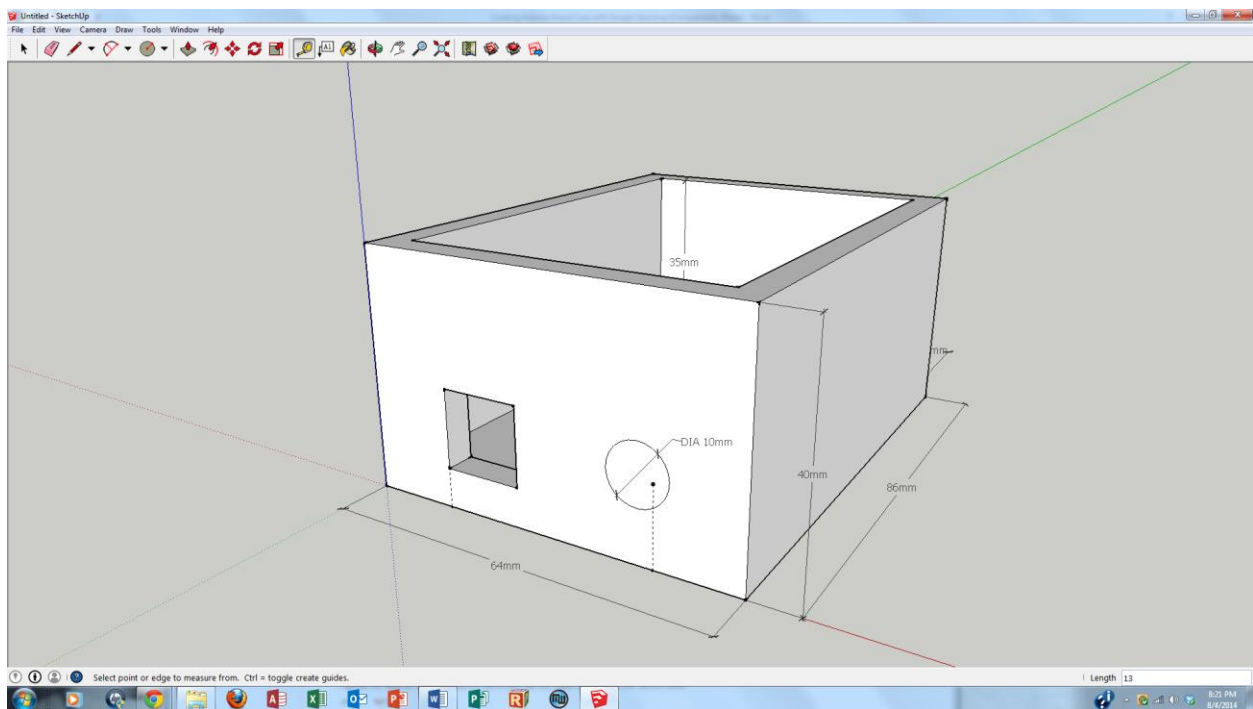
Do the same for the rear wall and rear inner wall (10mm for each).

It's time to draw the circular surface for the 9V power hole. Navigate to Draw>Shapes>Circle and draw a circle on the front surface of the Body. Set the radius to 5mm by typing in "5" and dimension the circle accordingly.
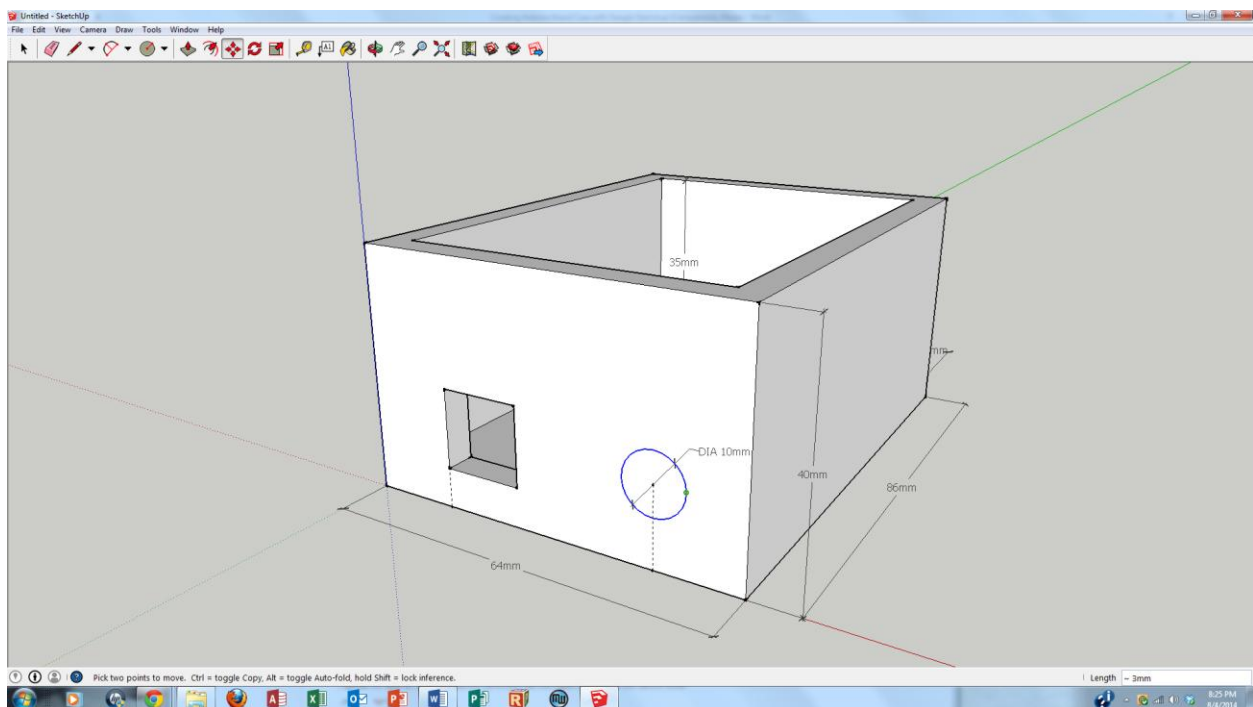

Use the Tape Measure to place a guide point 50mm along the X axis and 13mm along the Z axis.
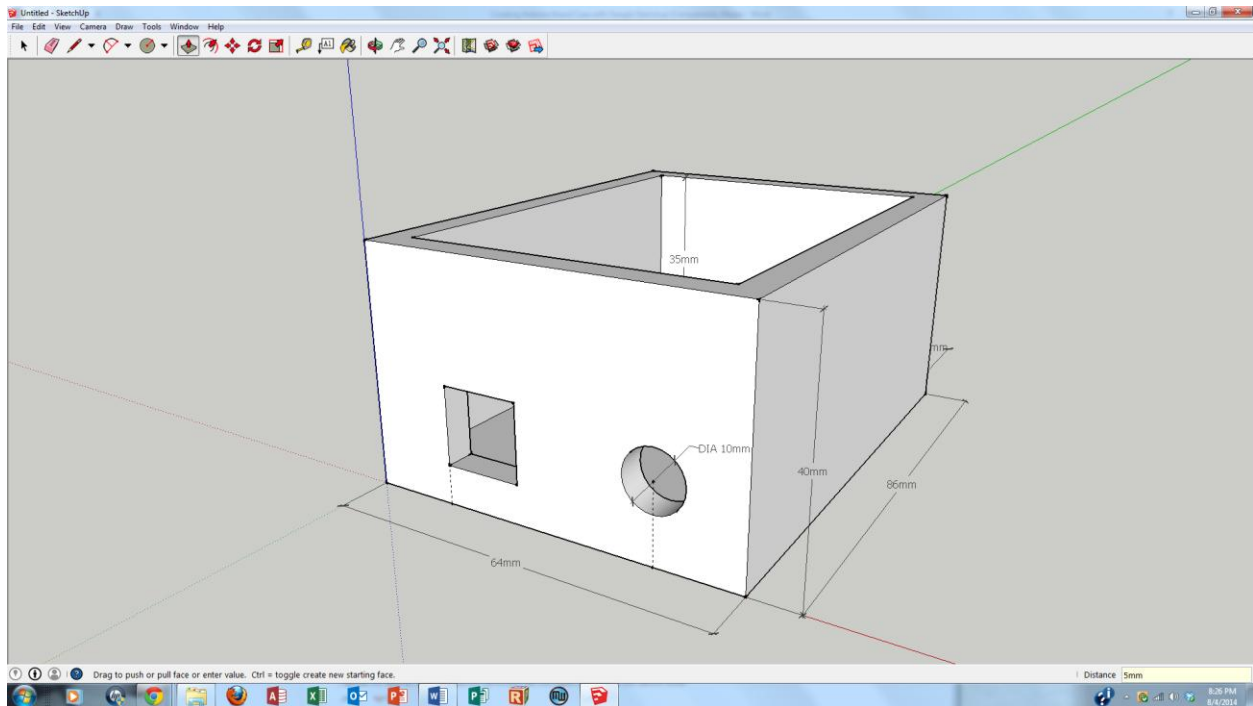
Select the circle with your mouse so that the diameter turns blue.
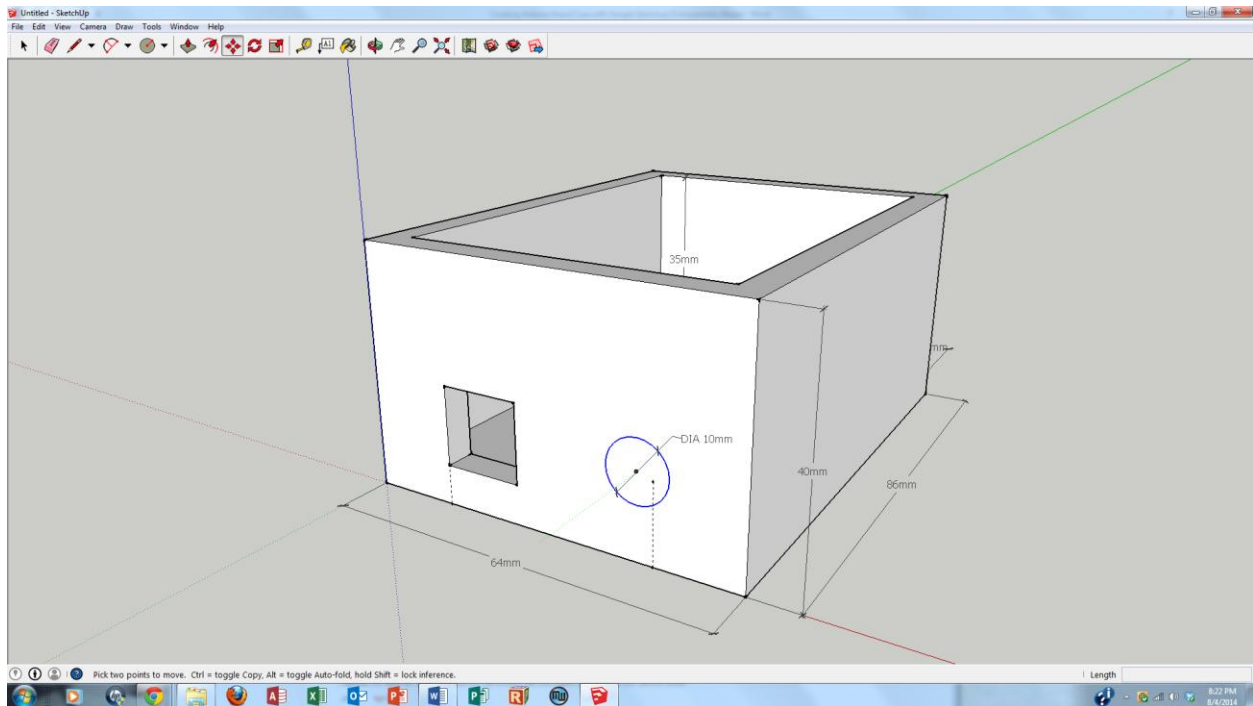
Navigate to Tools>Move and then mouse over the circle until the words "Center" appear. Click the circle and move until the center is aligned with the Guide Point.

Use the Push/Pull tool to extrude 5mm through the circle to create an opening.


Measuring the Arduino Uno board again, we learn that the solder on the bottom of the board was not accounted for. Therefore we need to raise both the USB and power holes by 3mm. To do this, we must first look at the Body head on. Navigate to Camera>Standard Views>Front.
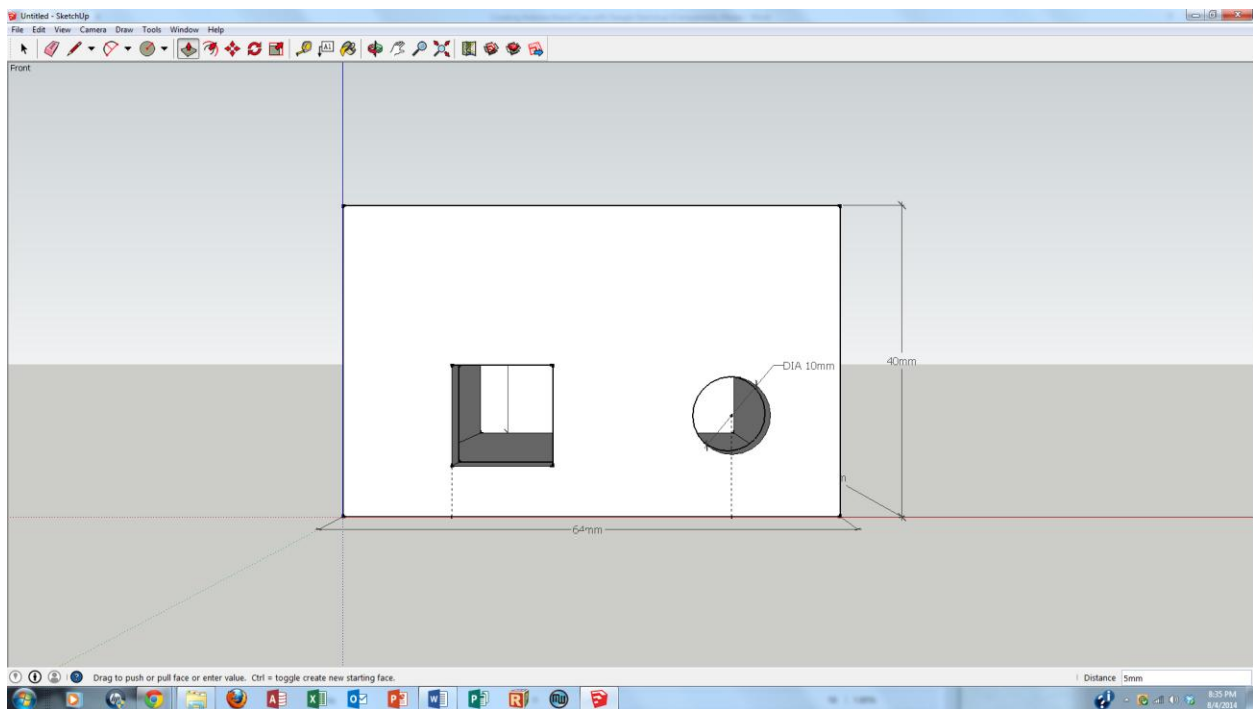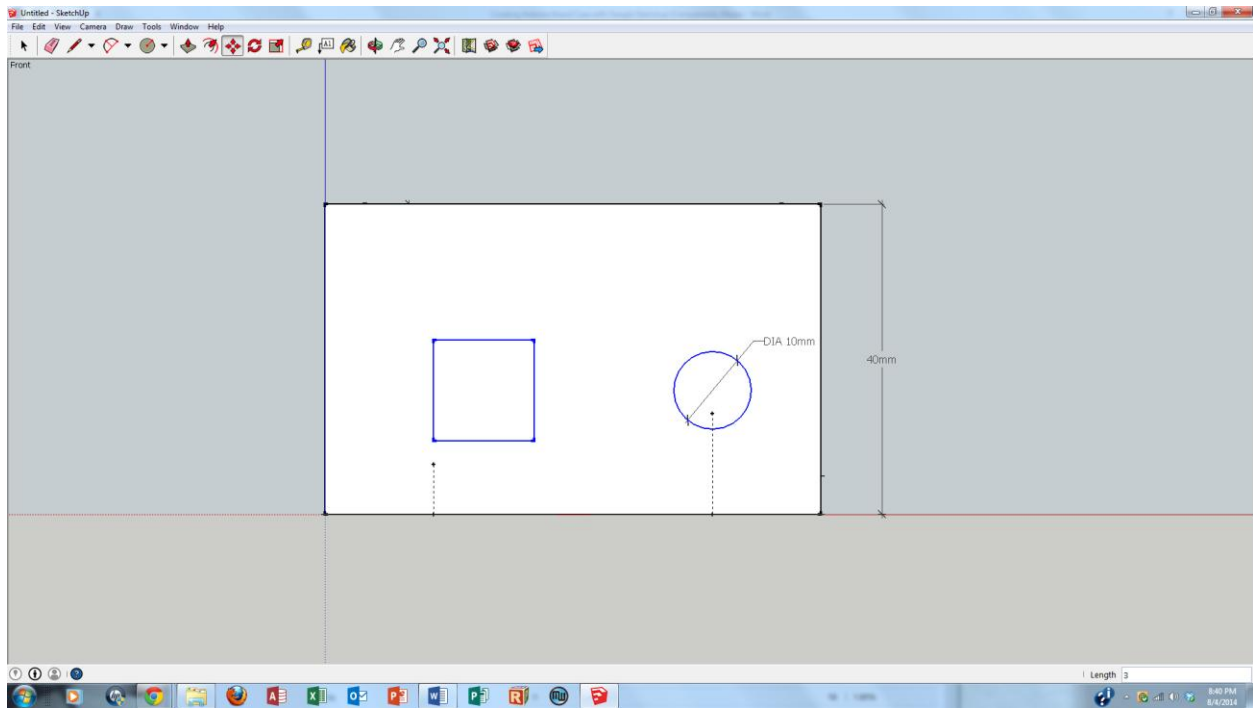
Notice however that the view is a perspective view. In order to get the precise, planar view we need, navigate to Camera>Parallel Projection.
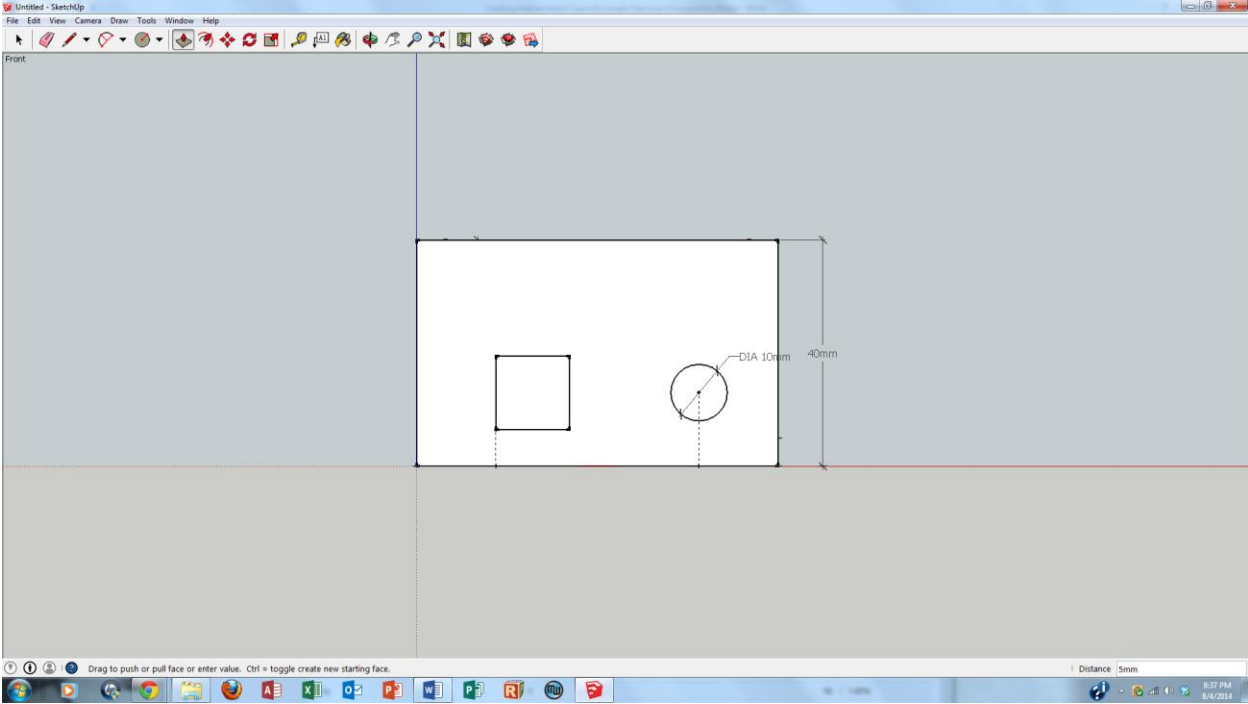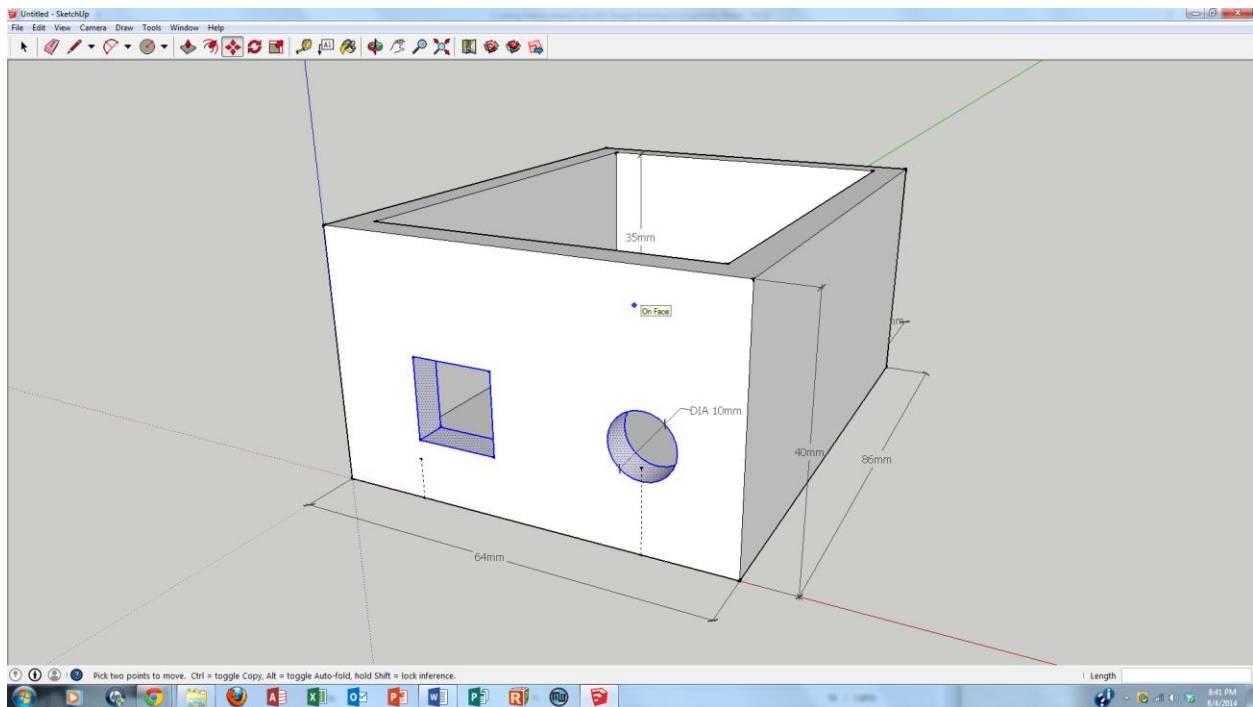

Select the rectangular and circular openings **only**.
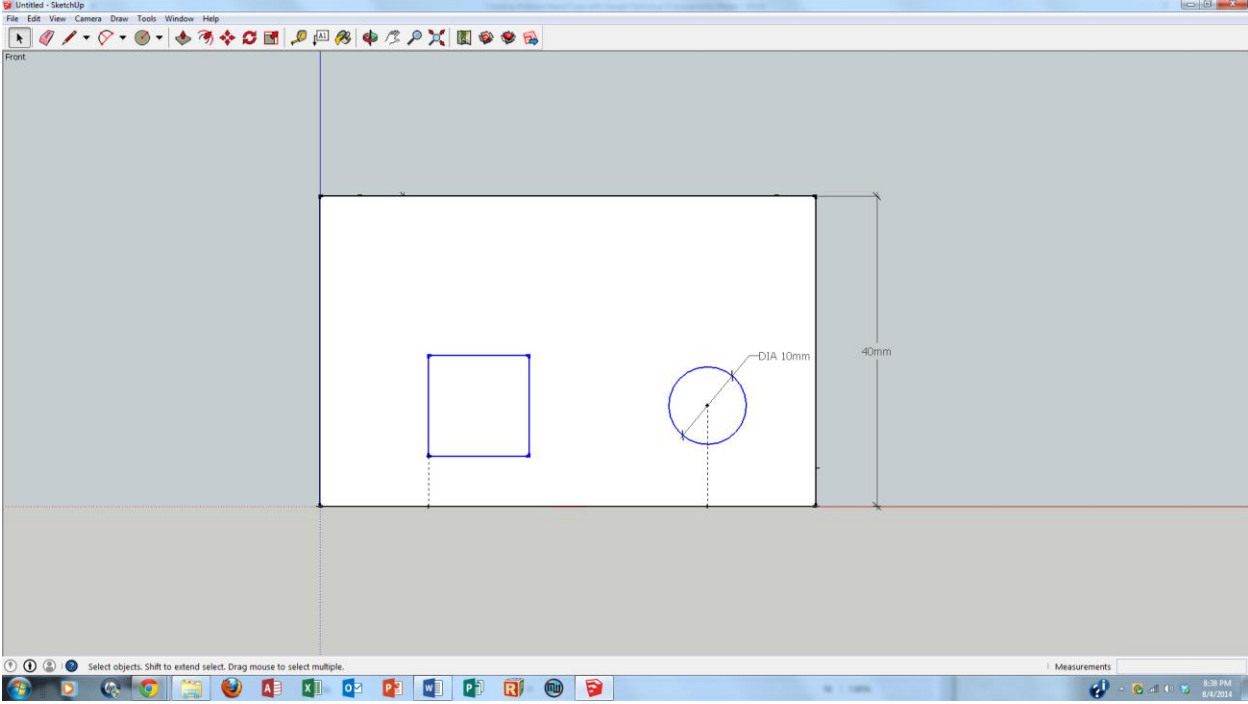
Navigate to Tools>Move and move the openings up. Type in "3" to move them each 3mm along the Z axis.

Navigate to Camera>Perspective to get back to the perspective view and use Orbit to rotate the model.

It's time to place screw holes in the Body for retaining the Arduino board. View the Body from the top by navigating to Camera>Standard Views>Top.
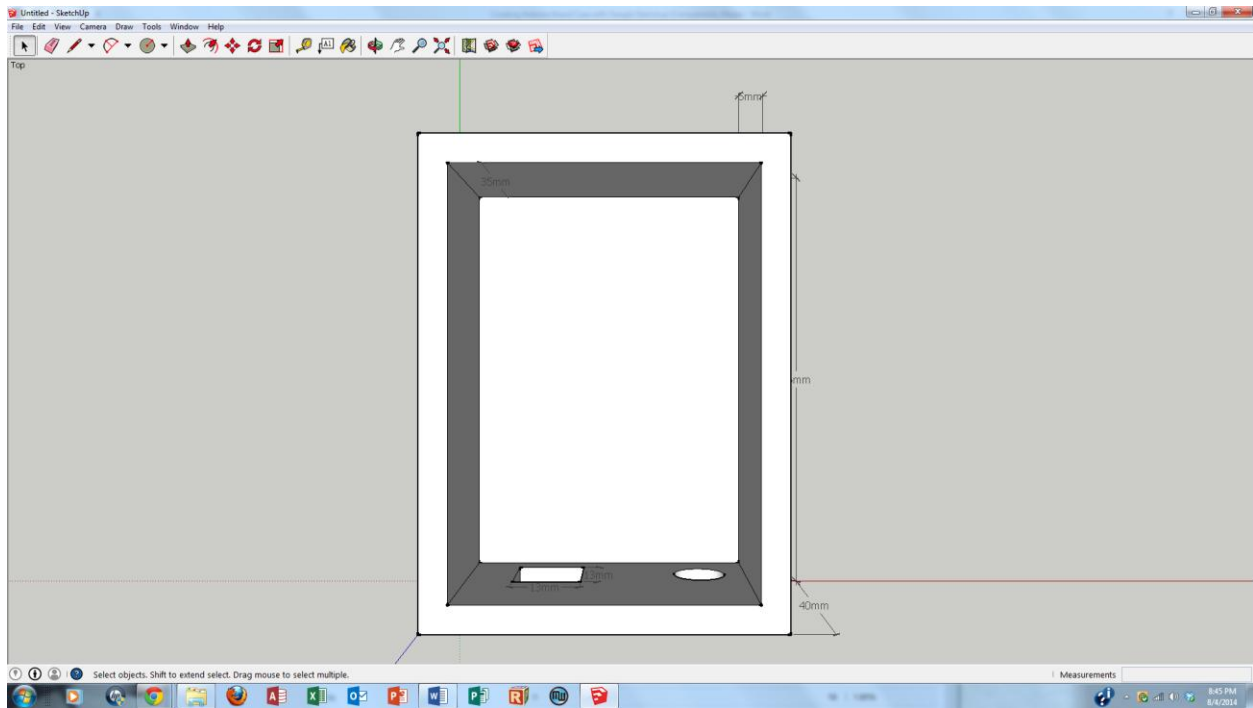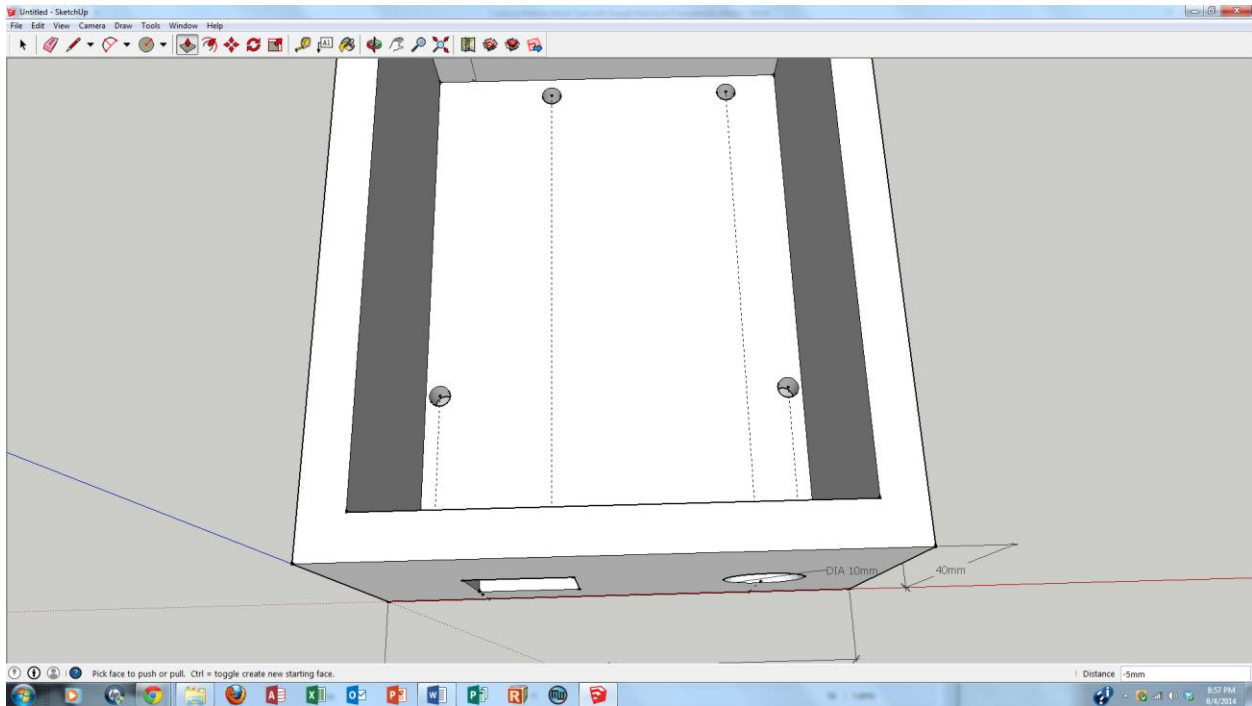

From the bottom inside left corner, use the Tape Measure to place guide points at the following X/Y coordinates: (A) 2x,23y, (B) 52x,23y, (C) 18x,73y, (D) 46x,73y.
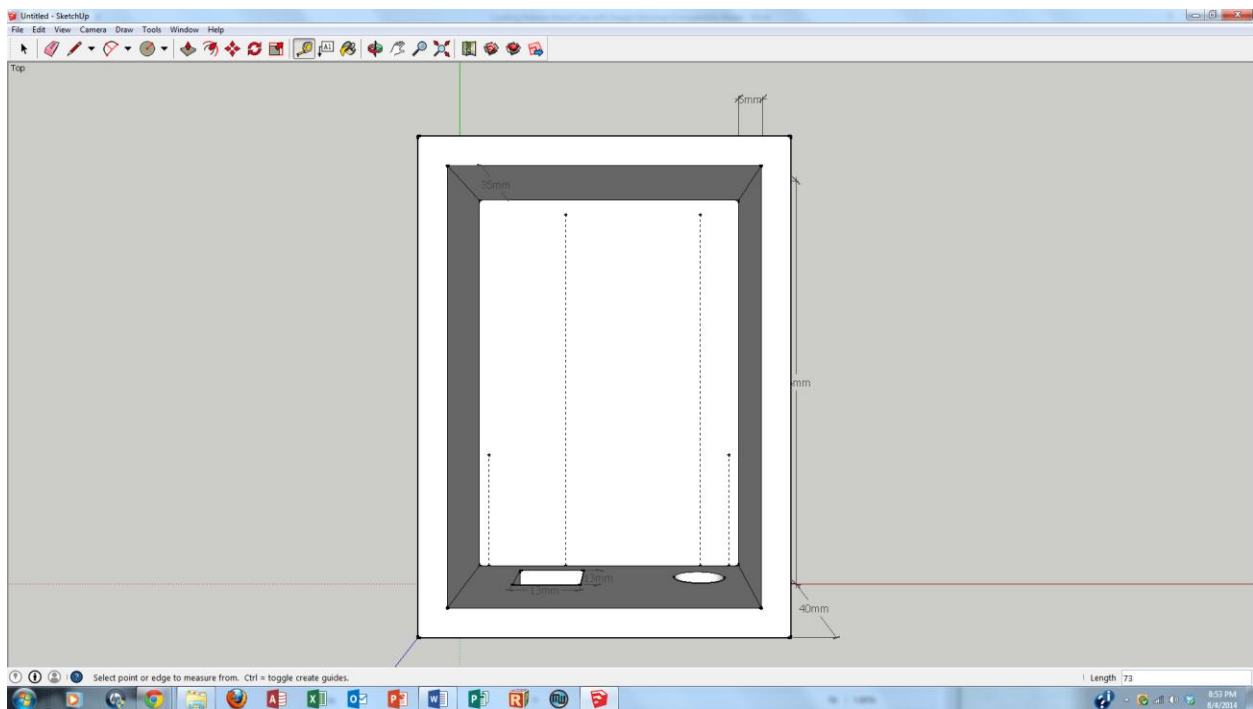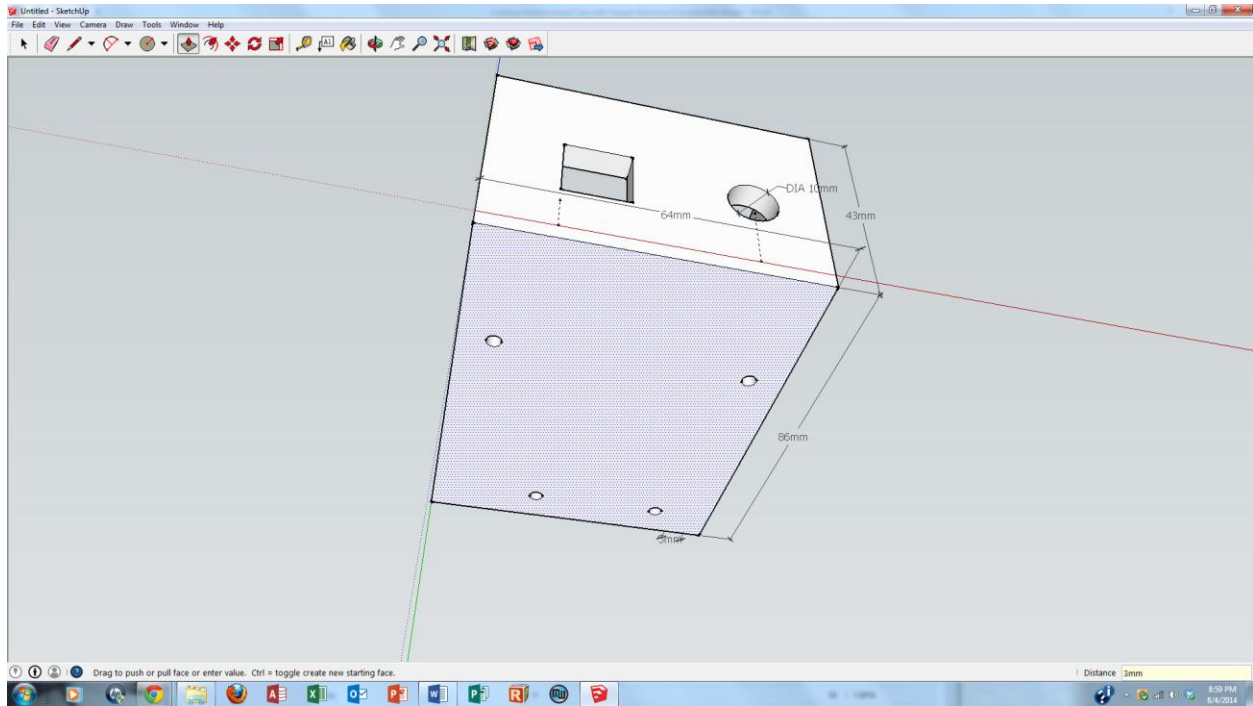
Navigate to Draw>Circle to place circles at each guide point. Use 1.5mm for the radius.
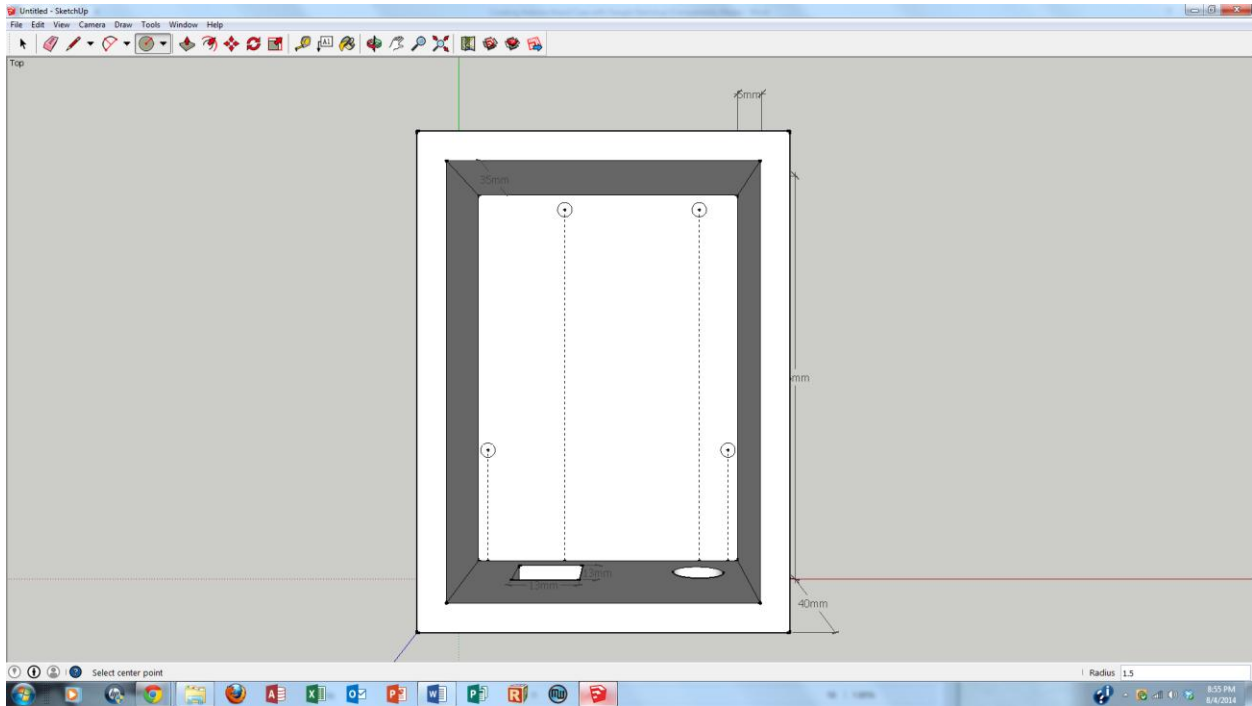
Use the Push/Pull tool to push each circle through the floor of the Body (5mm).

Because our M3x10mm bolts may extend too far through the Body, let's use the Push/Pull tool to pull down (and thicken) the base of the Body by 3mm. Note that the height of the Body is now 43mm.


The Body needs to retain the Top (or vice-versa) in some manner. The simplest way to create a retaining mechanism is to create a lip protruding from the top of the Body. Start by navigating to Tools>Offset and offsetting the top of the Body by 2.5mm.
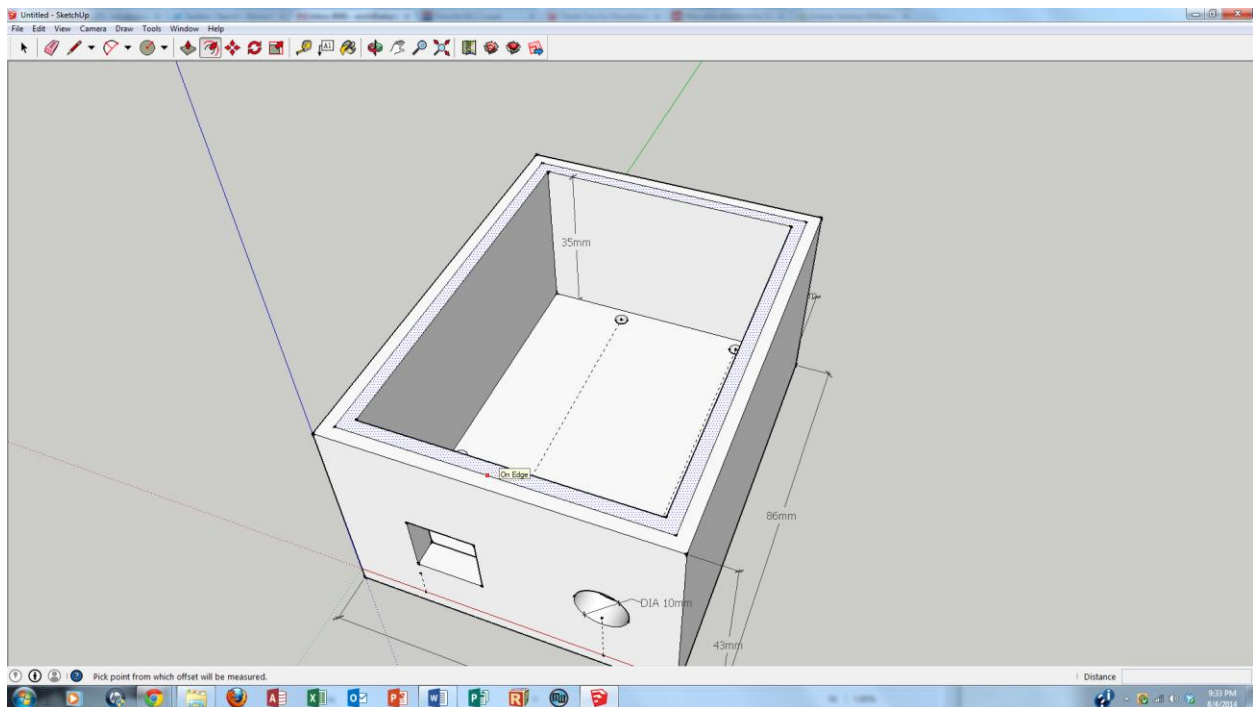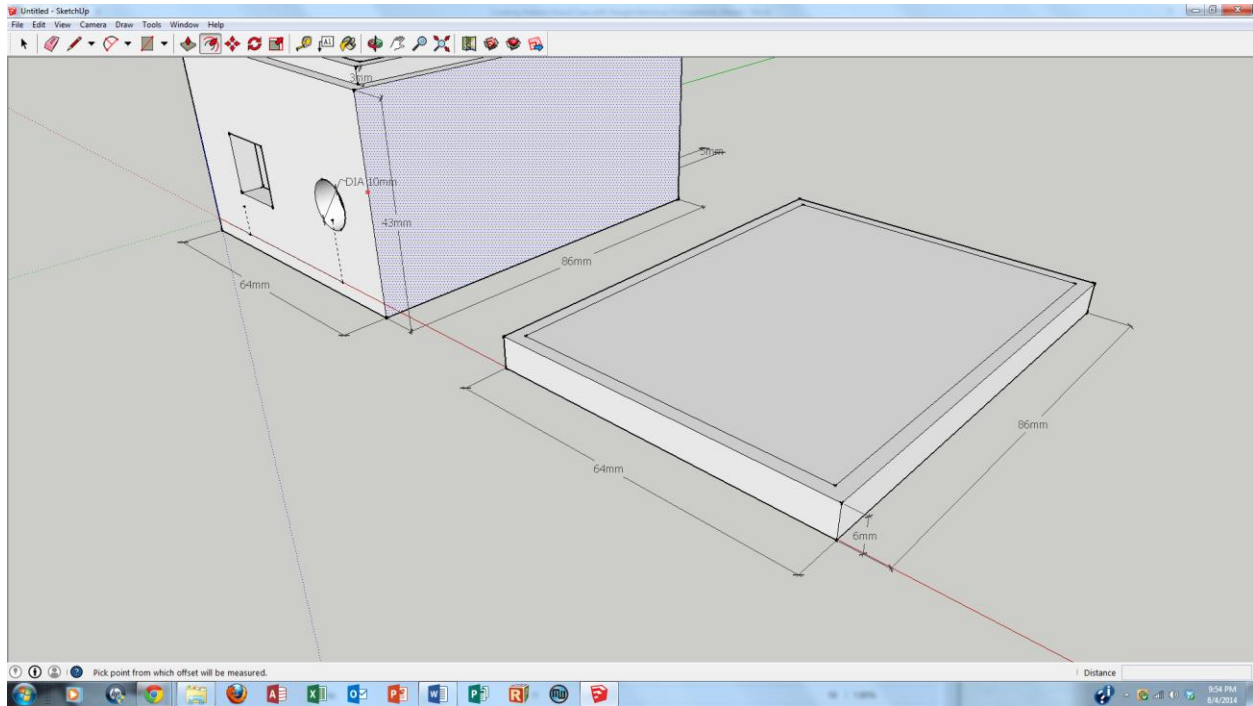
Select the inner rectangle and use the Push/Pull tool to pull the surface up 3mm and dimension accordingly.
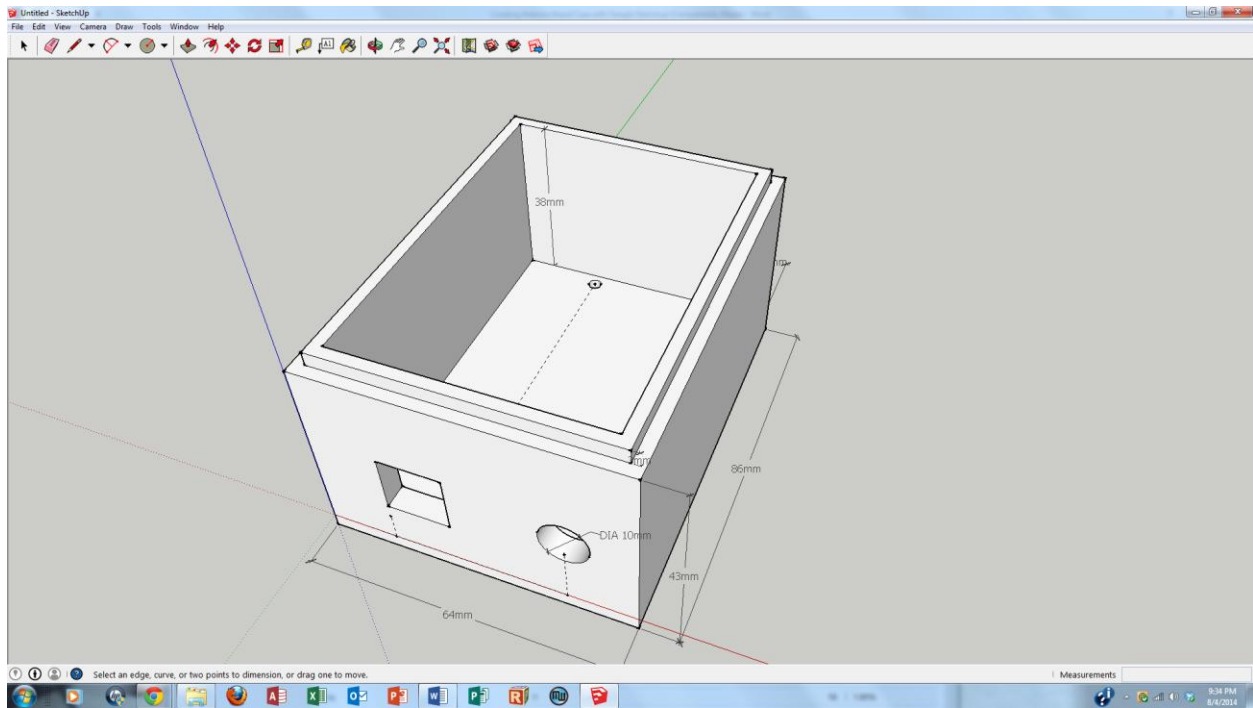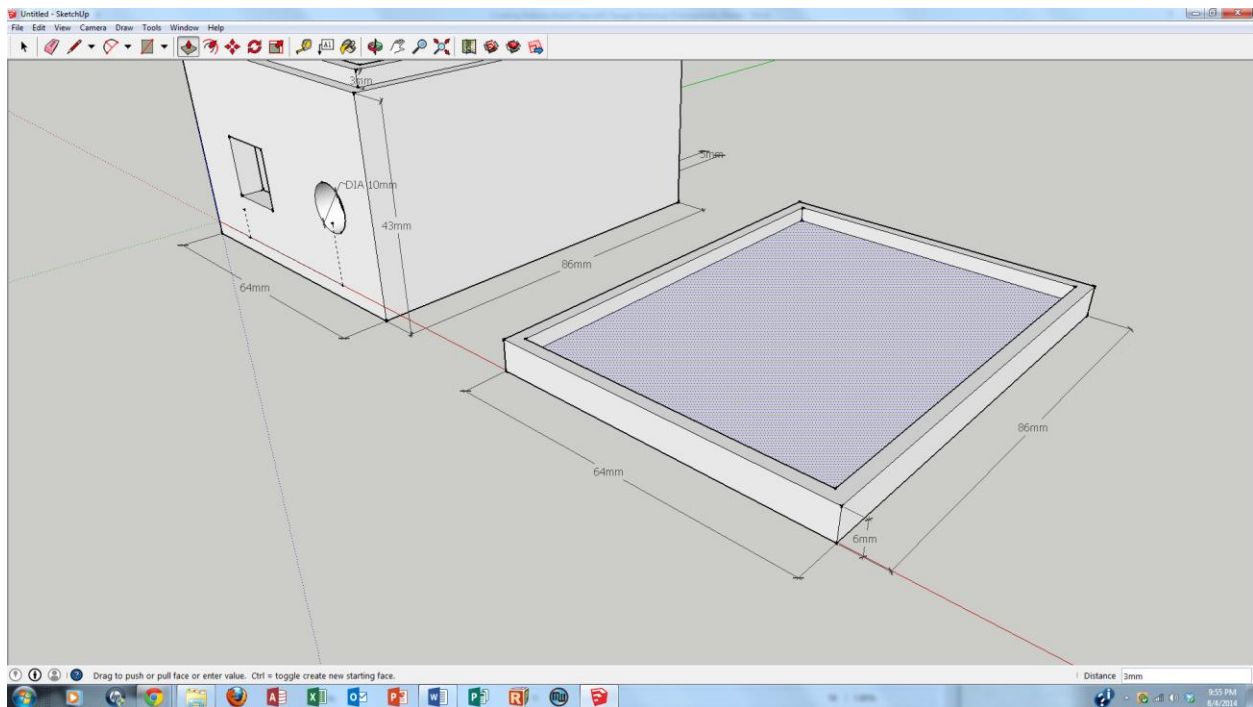

With the Body of the Arduino box complete, it's time to build the Top. Start by drawing a 64mm x 86mm rectangle and extruding it up 6mm.
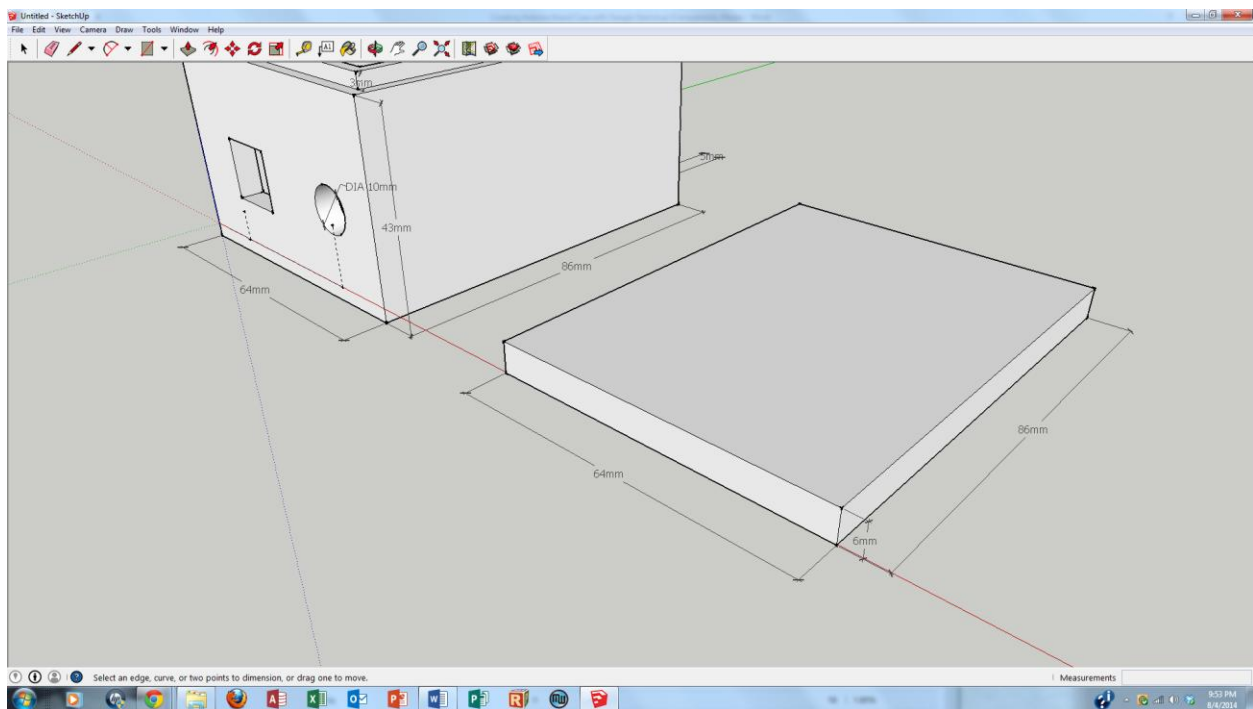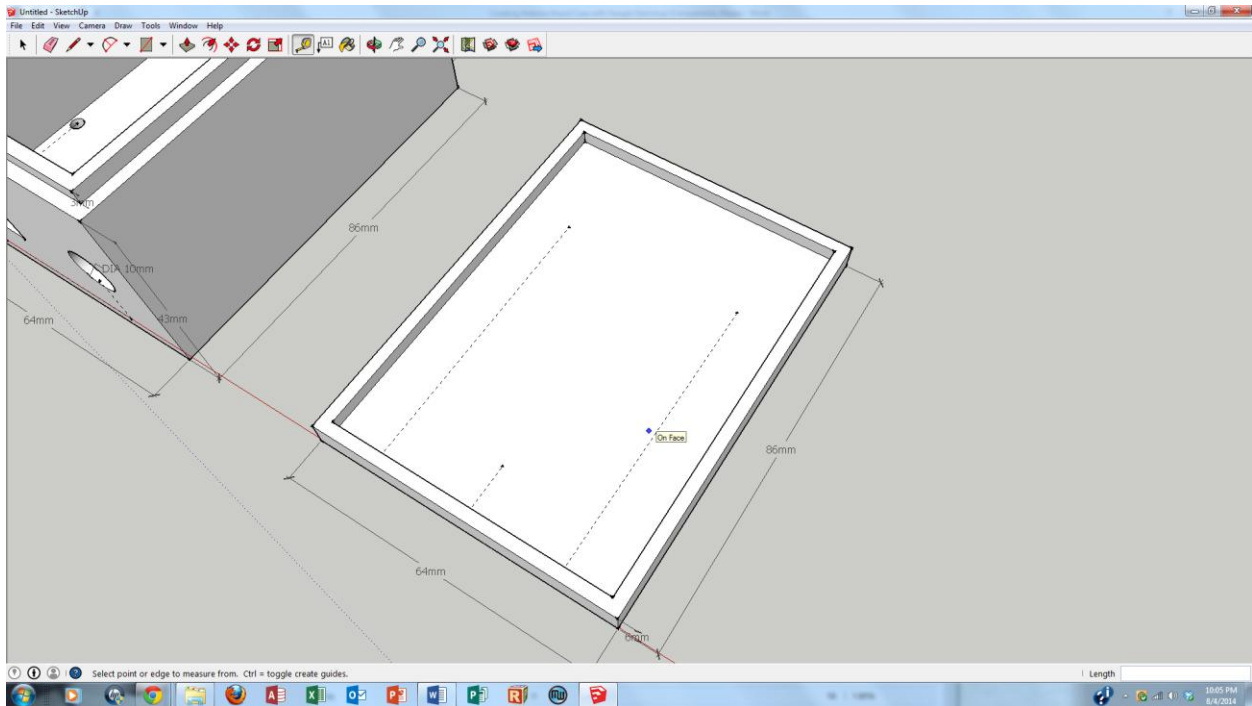
Create a negative of the top of the Body by using the Offset tool to offset the top surface of the Cover by 2.5mm.


Use the Push/Pull tool to create a 3mm cavity in the Top.

Openings must be provided in the Top for housing switches and LEDs. Three openings will be made, one rectangular, and two circular. The holes will be located as follows: (A) 29.5x, 10y, (B) 10x, 60y, (C), 49x, 60y.
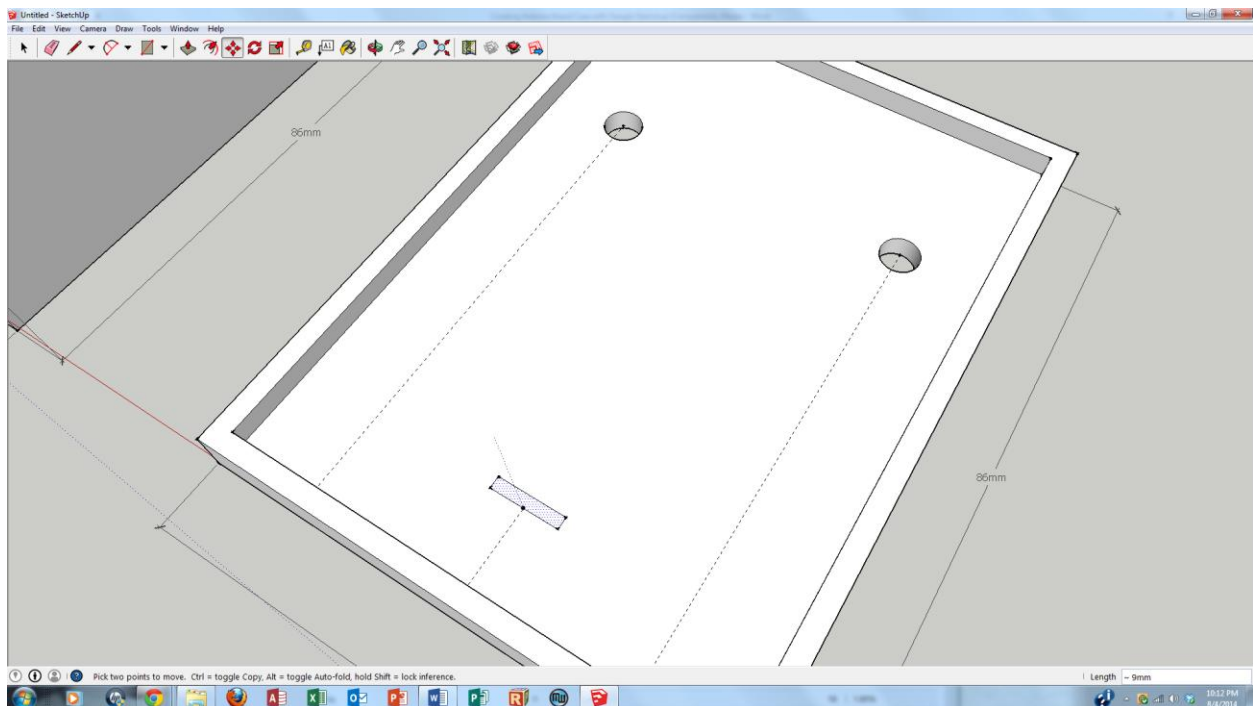

The circles will each have 2.5mm radii and will be extruded 3mm to create holes (when creating a circle, start the circle at the respective guide point).
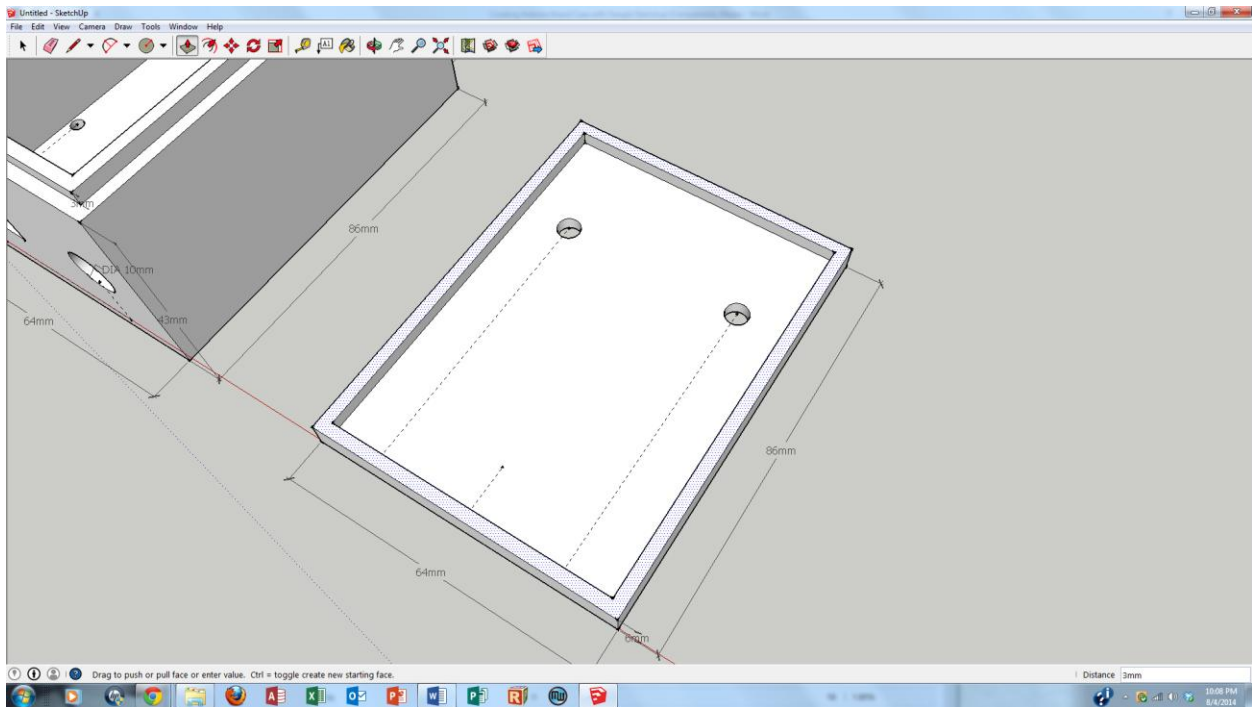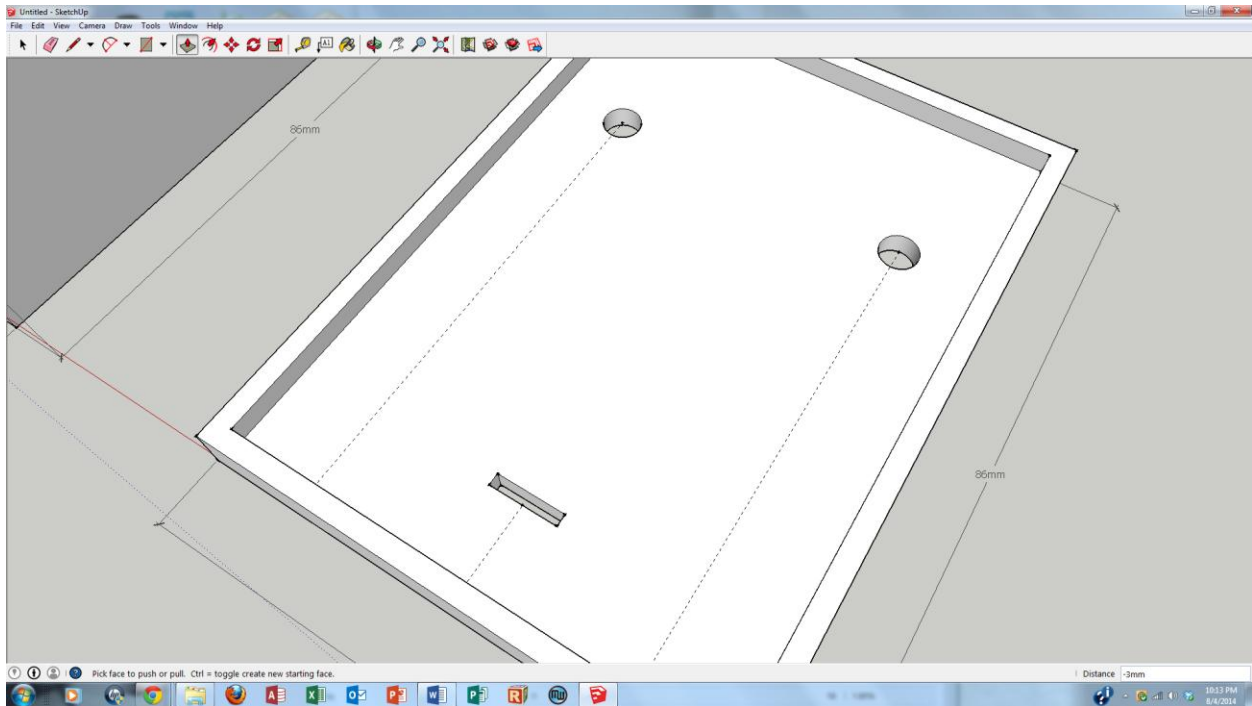
The rectangular hole will be 8.5mm x 1.5 mm.
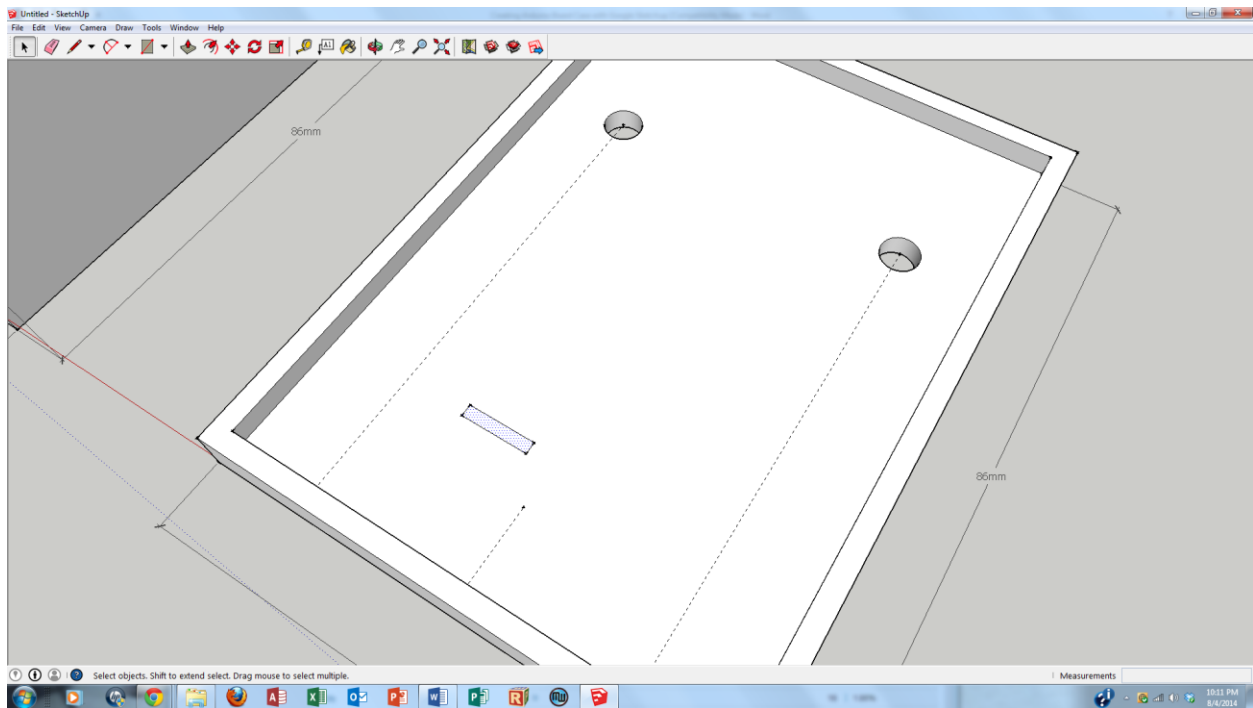
Move the rectangle by grabbing the center of the lower line and aligning it with the Guide Point.

Extrude 3mm to create the hole for the sensor.

Now that both objects have been created, it is best to make them "Components" so that they tend to be stable and easy to put into position (without accidentally being edited). This is also helpful for dual color prints. To make an object a component, **triple click** on the object to select **every part** of the object.
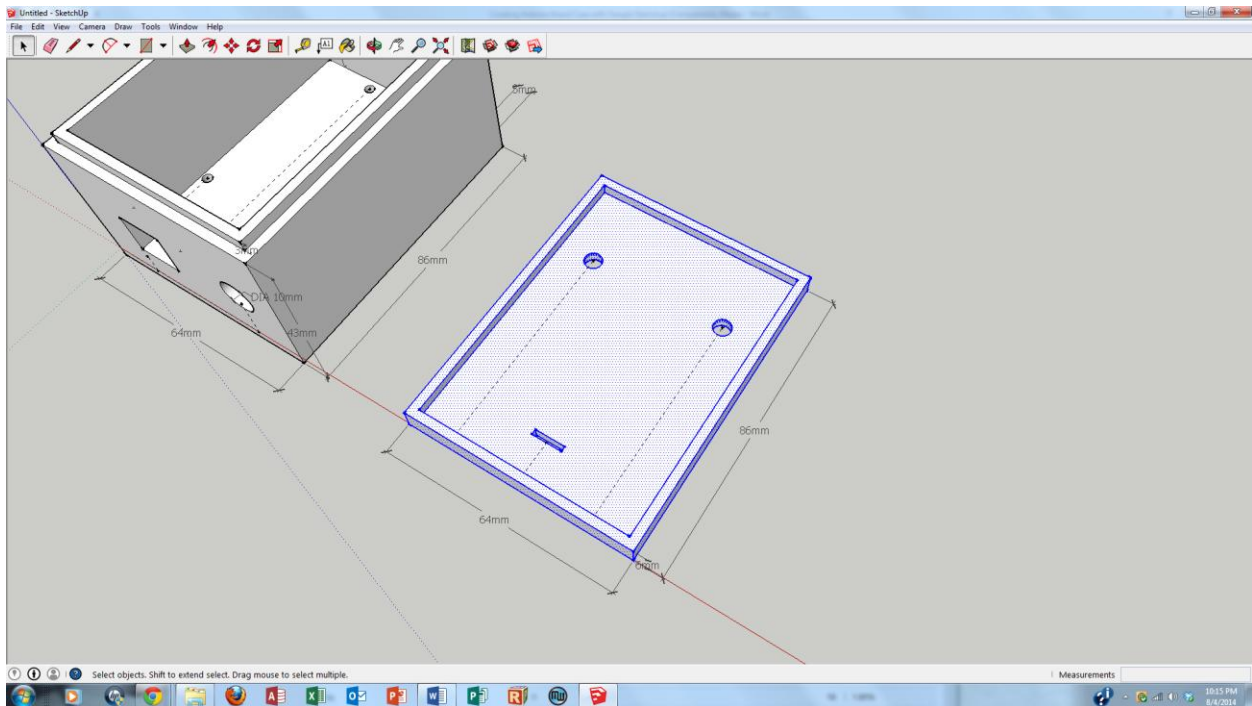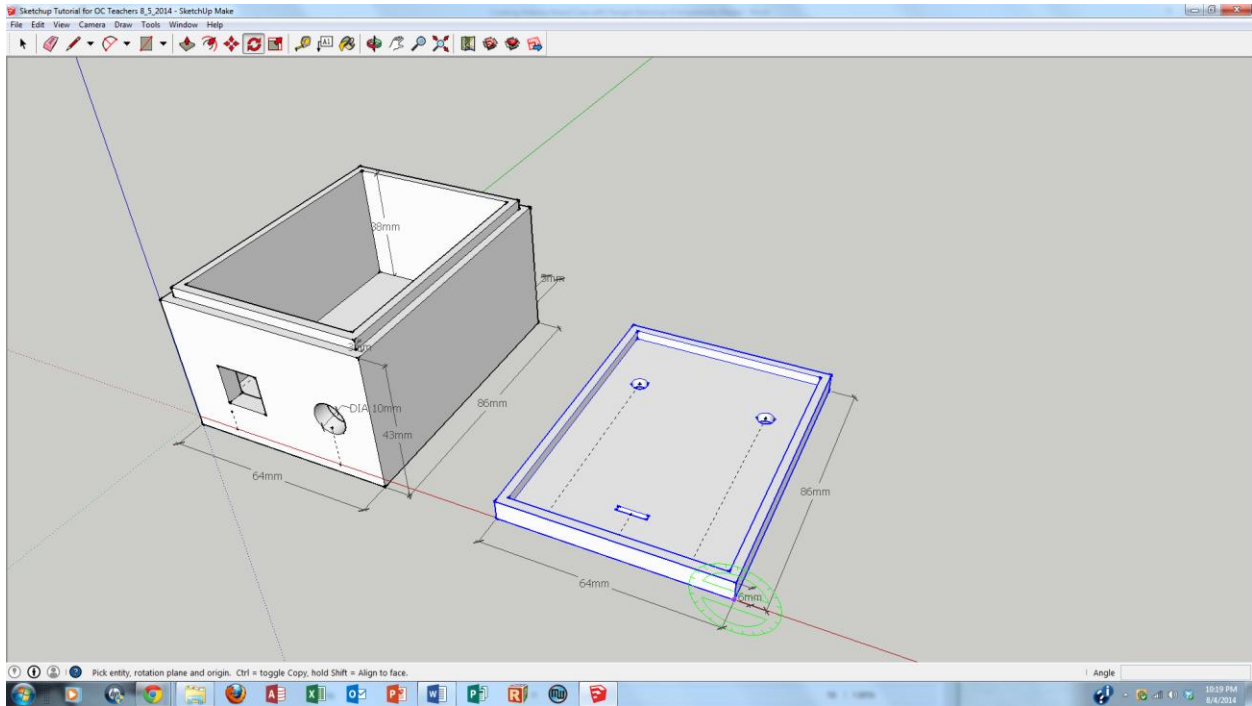
Right click on the object and select "Make Component." Name your component at this time (such as "Top").
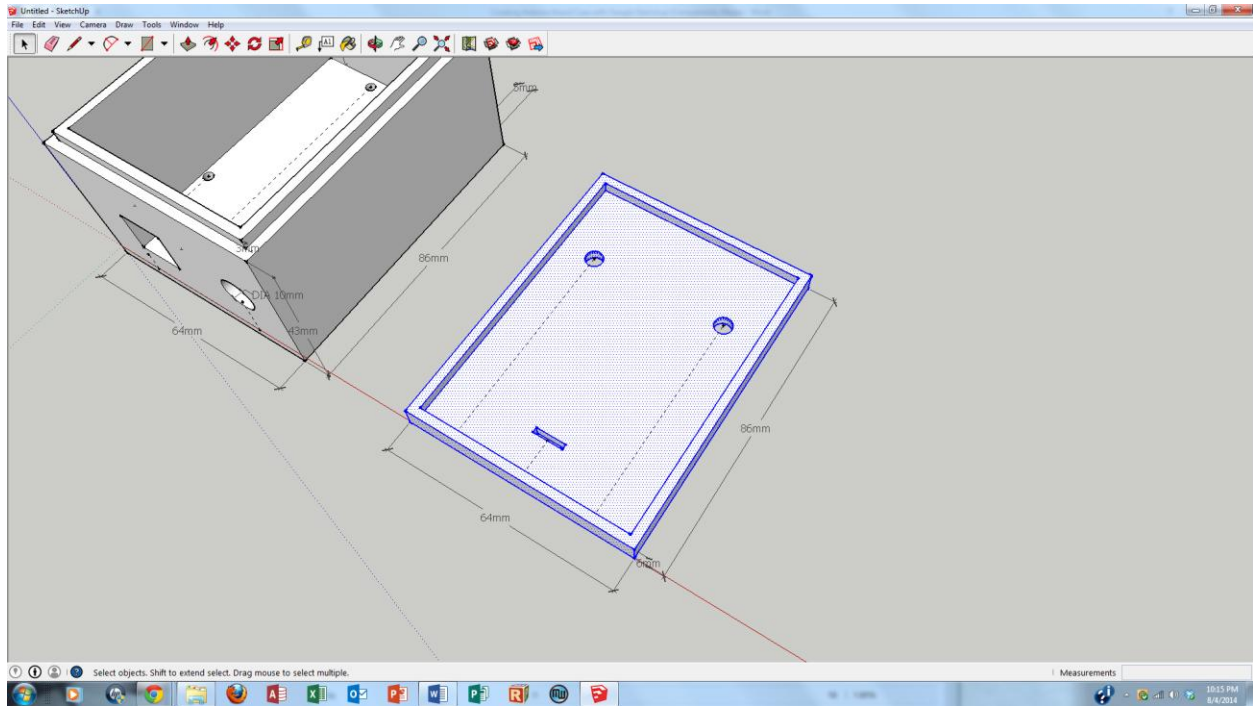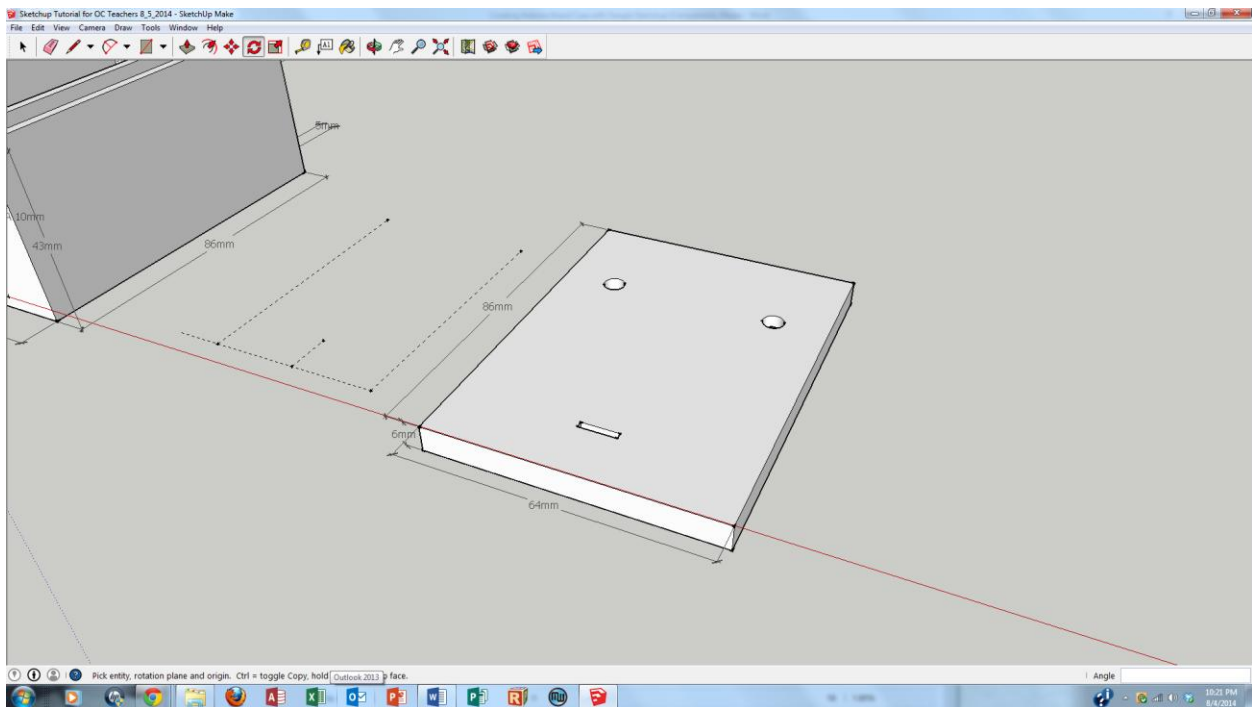

Repeat for the Body of the box.
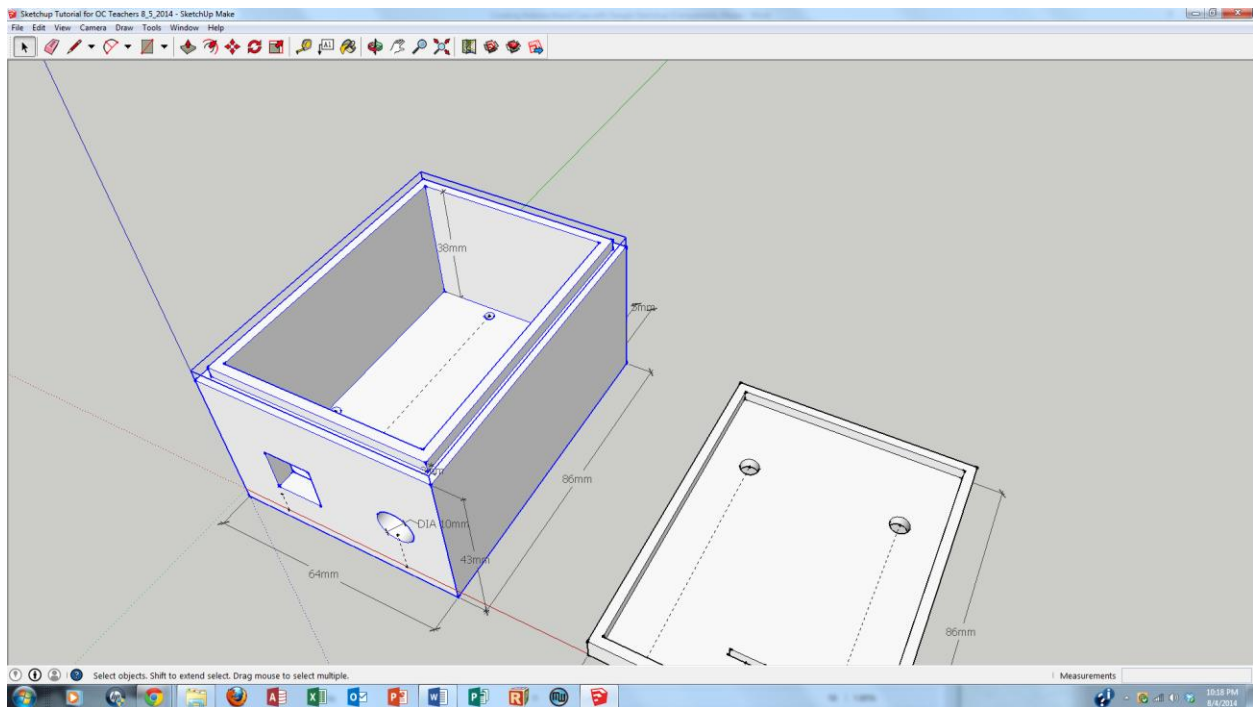
Now the objects can be combined without worry that they will accidentally connect. Navigate to Tools>Rotate and select the bottom right corner of the Top.

Select the bottom left corner of the Top and rotate the Top 180 degrees (type "180" to be precise).

Use the Move button to grab a corner of the Top and place it onto the correct mating surface of the Body. Your Arduino box is complete!