



Design out the box

Time 60-90 mins approx

Level of difficulty ★★★★★

By the end of this tutorial you will be able to...

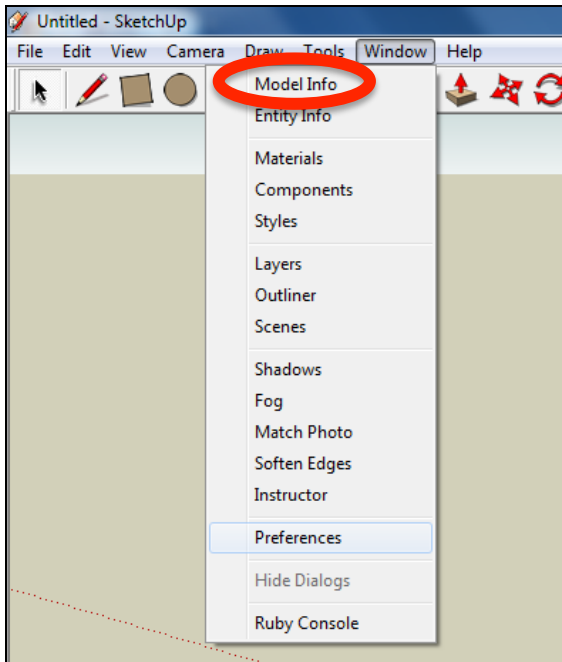
- Link basic shapes
- Use the Arc tool
- Use the Follow Me tool to produce a rounded edge
- Use construction lines/points
- Colour/render your finished toy boat

Skills to be used in this project...

Basic Skills	New and Higher Skills
Zoom tool	Construction lines and points
Orbit tool	Tape Measure tool
Pan tool	Arc tool
Line tool	Follow Me tool
Rectangle tool	Loading new toolbars
Circle tool	Paint Bucket tool
Eraser tool	
Push/Pull tool	

Basic skills are those required to do very basic drawings and are detailed as part of this presentation.

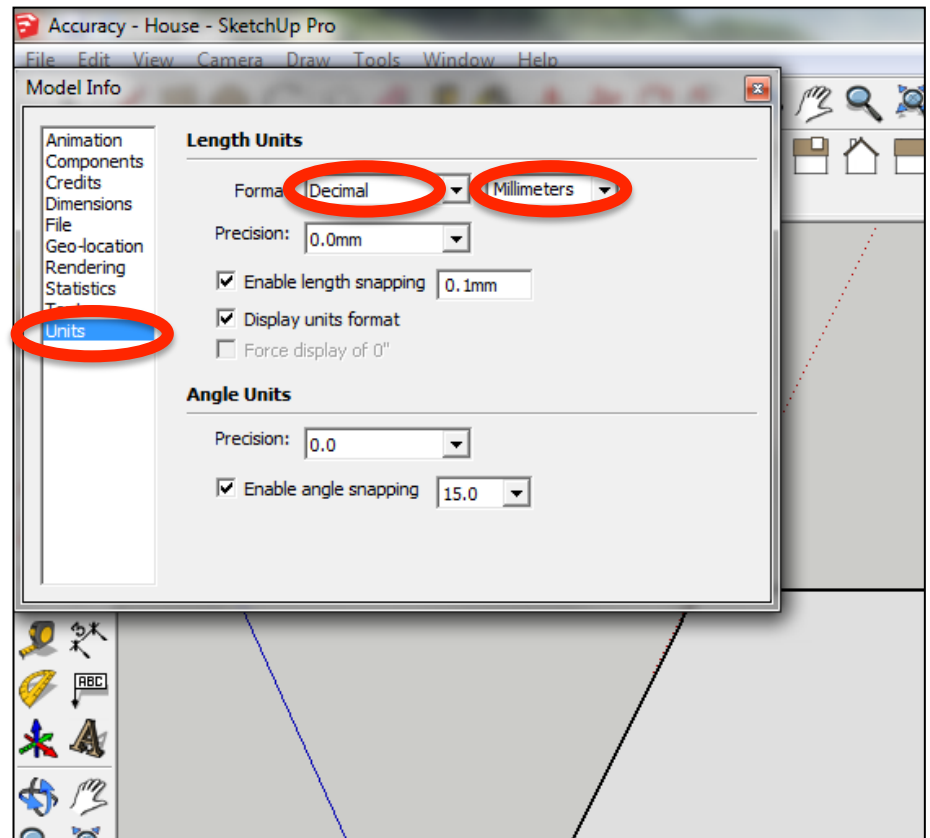
New and higher skills may be new to the novice and are the focus for learning in this presentation.



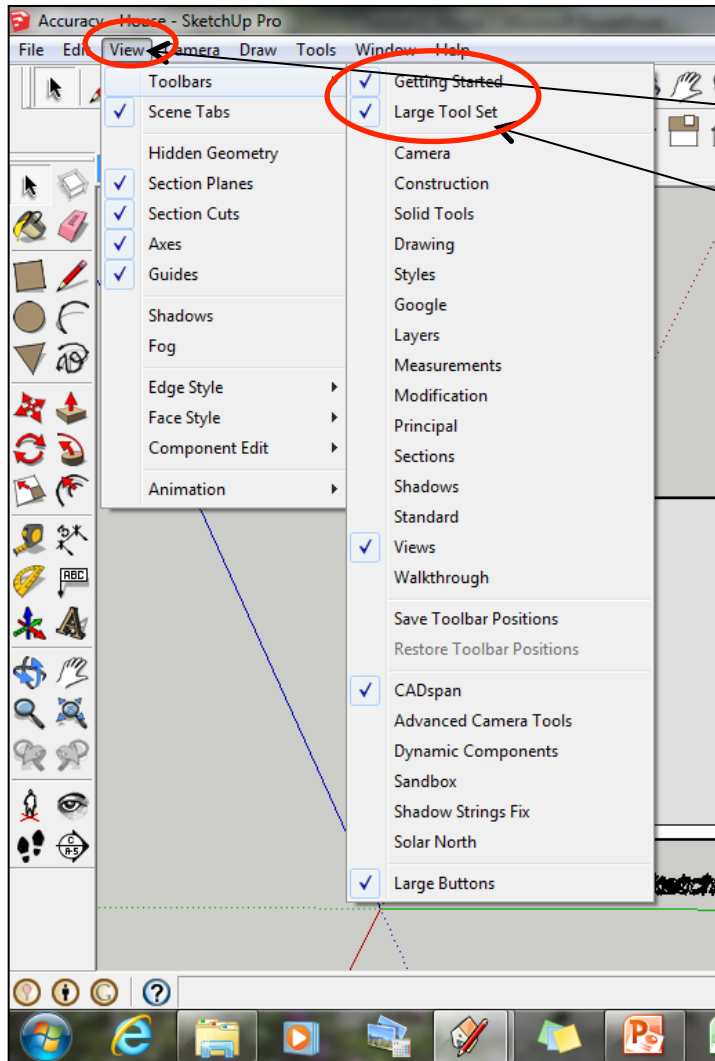
1. Open the sketch up drawing. Once you have opened SketchUp, go to **Window** and select **Model Info**

2. Select **Units** and choose **Decimal Millimetres**. We are using this template because we are doing a product design.

Note: It is often necessary to start a new file to use the new template. Go to **File** then **New**.



3. Now select the **View** then **toolbars** and ensure **Getting Started** and **Large Tool Set** are ticked



3a Select **View**

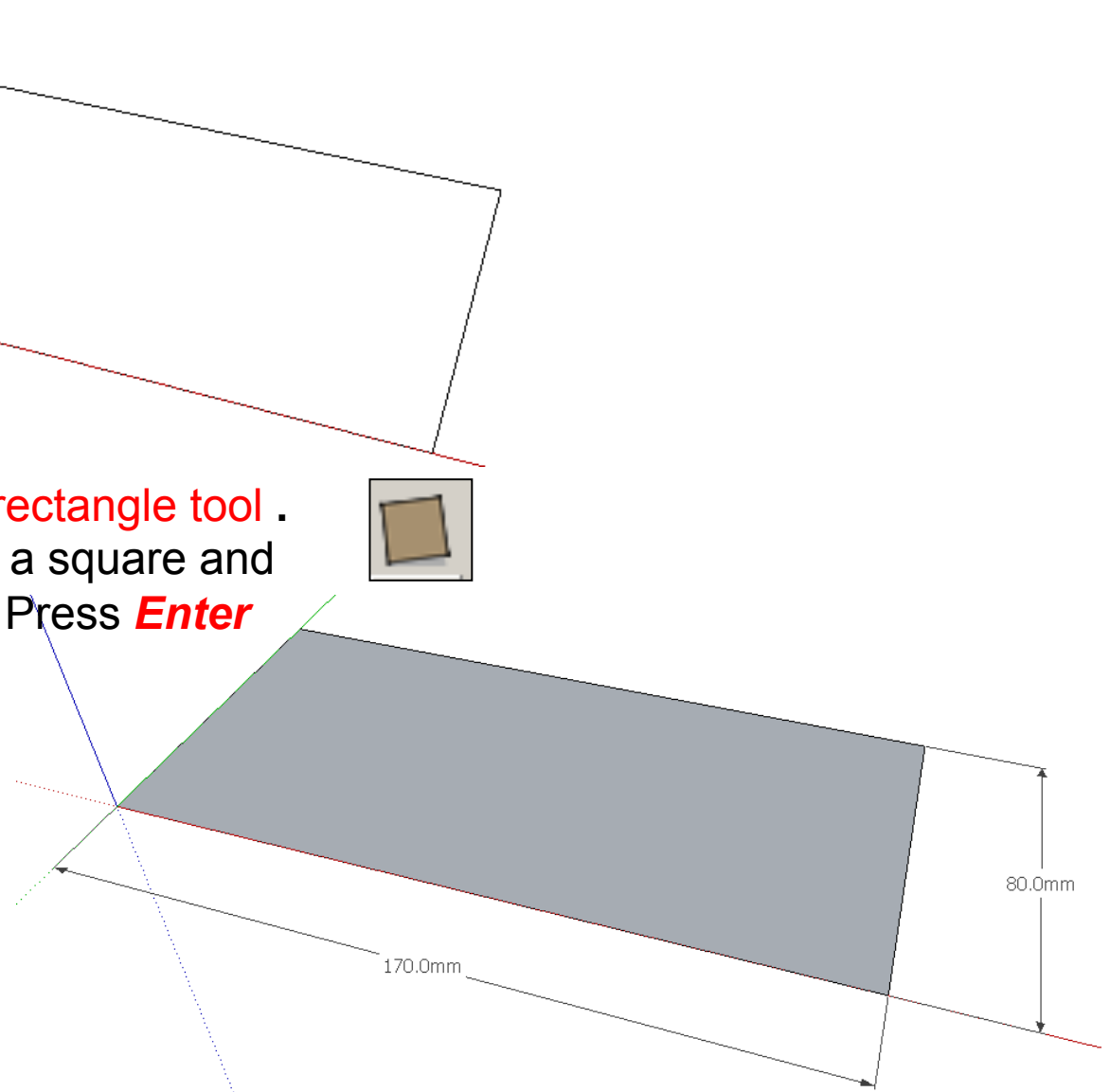
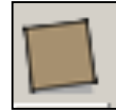
3b Tick Getting Started

3c Tick Large Tool Set

Note: this will place a tool bar across the top (**getting started**) and the side (**Large Tool Set**)

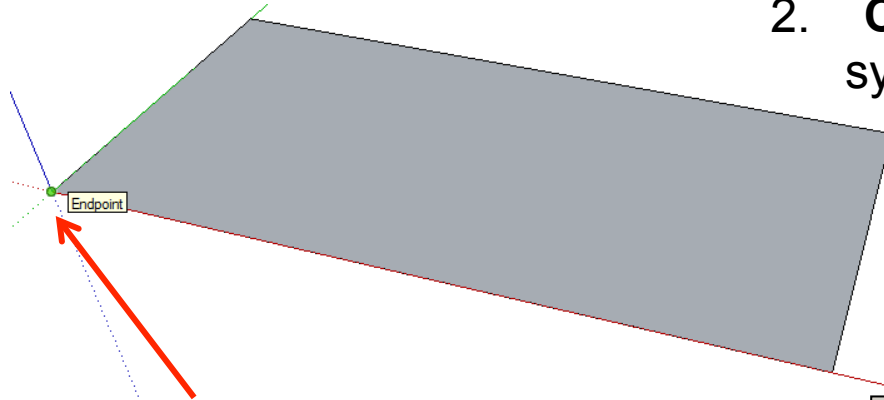


1. **Click** on the **rectangle tool** . Start drawing a square and type **170, 80**. Press **Enter**

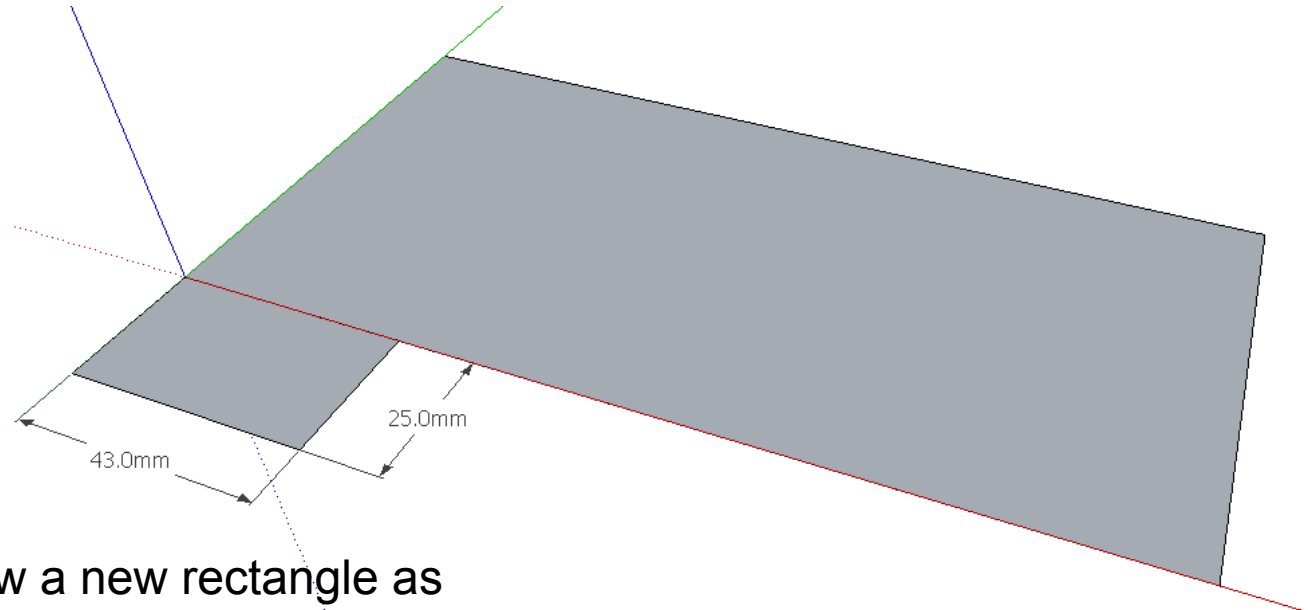
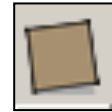




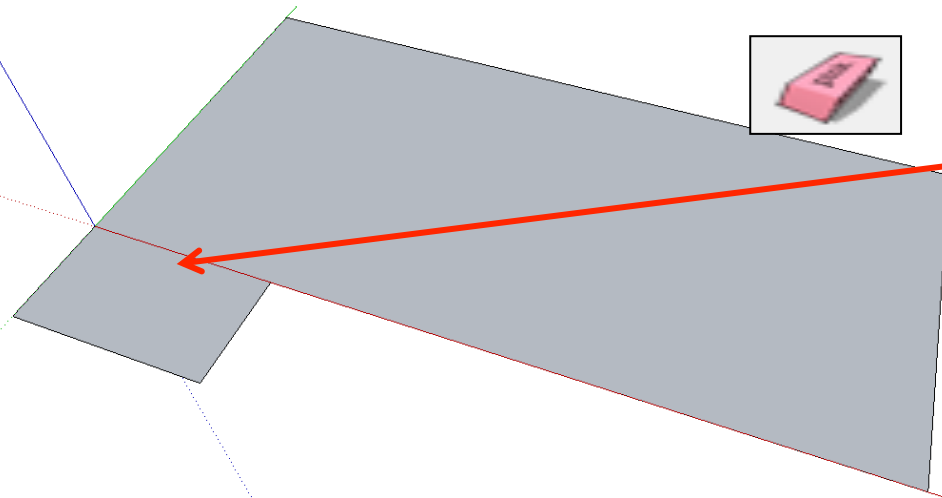
2. Click on the **zoom extents** symbol.



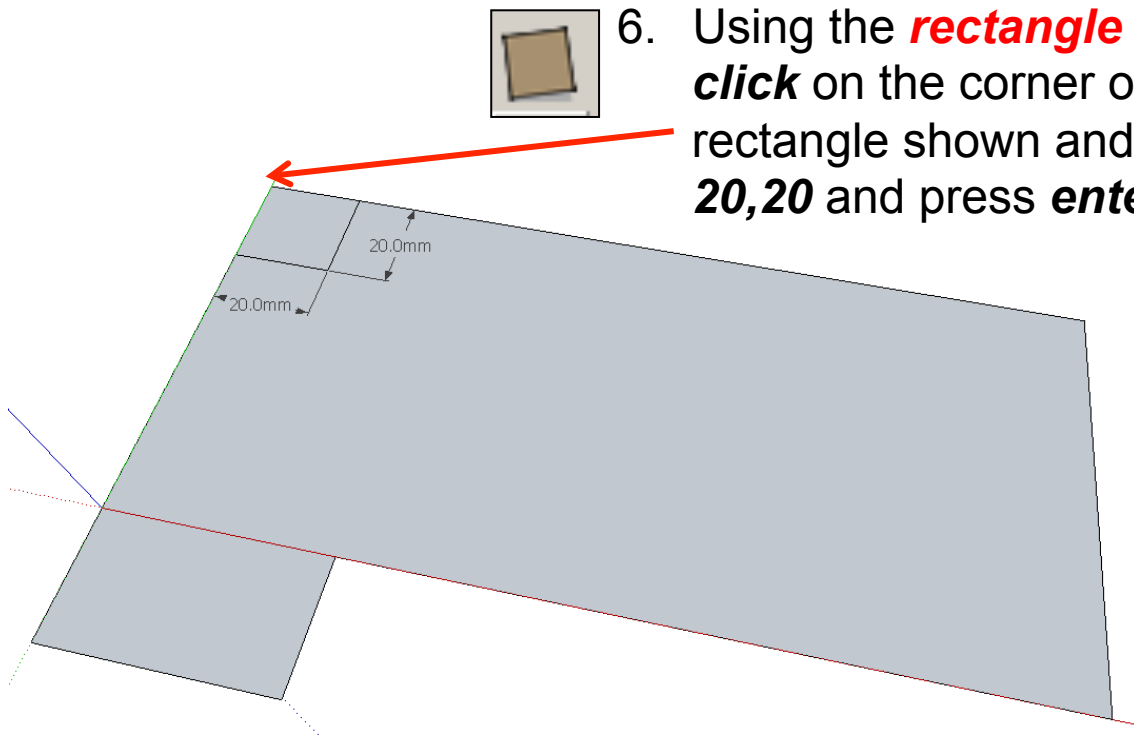
3. Using the **rectangle tool** click on the corner of the rectangle you have just drawn.



4. Draw a new rectangle as shown and type **43, 25** and press **enter**



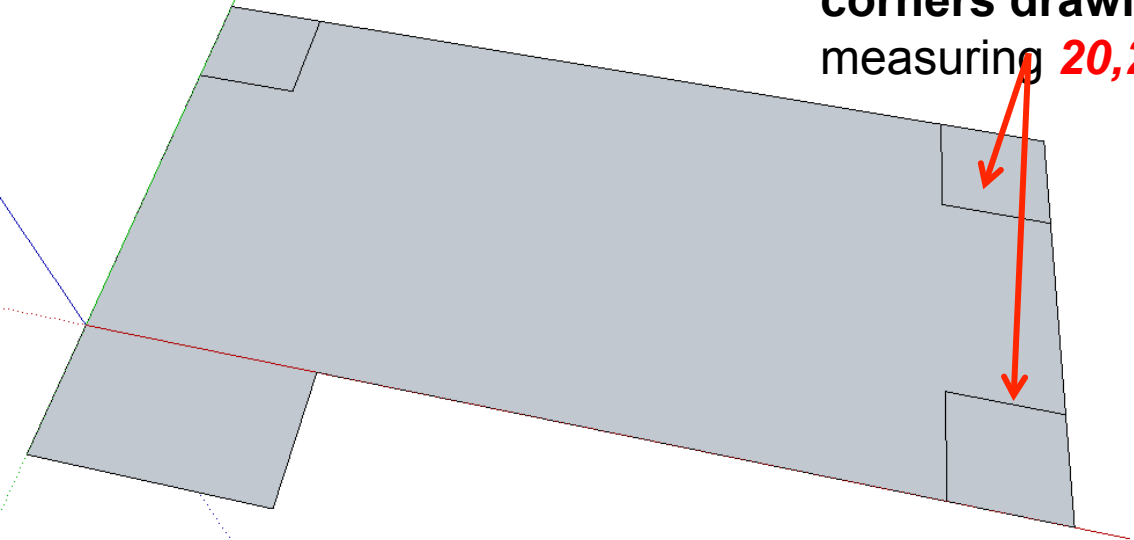
5. Use the **rubber tool** to erase the line separating the two rectangles to leave one shape



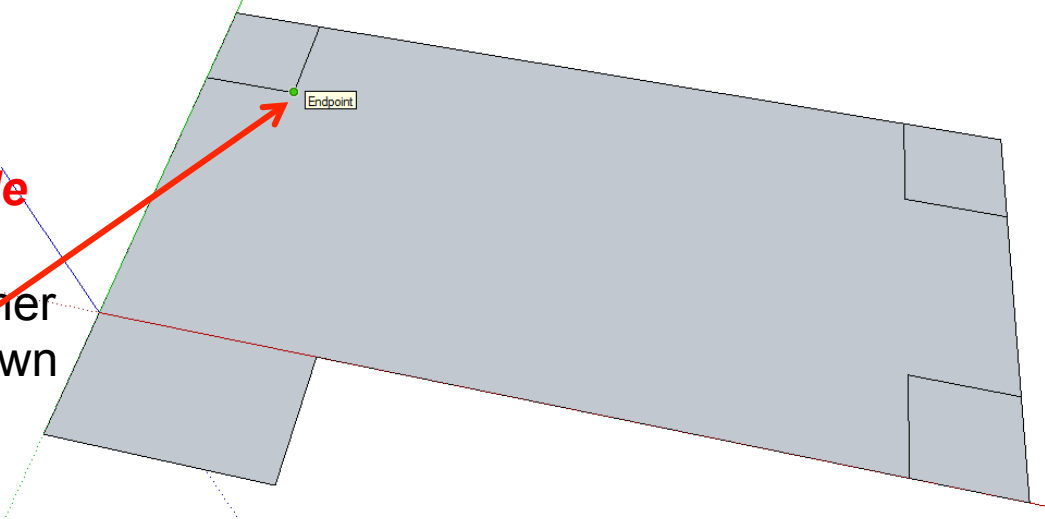
6. Using the **rectangle tool click** on the corner of the rectangle shown and type in **20,20** and press **enter**.

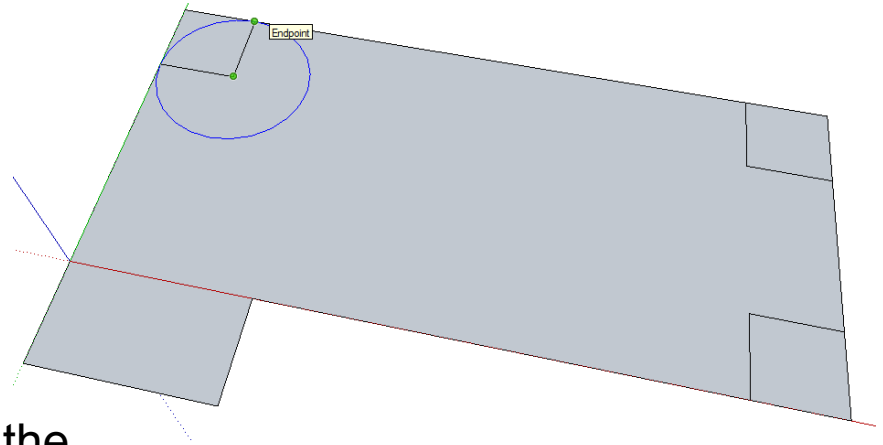
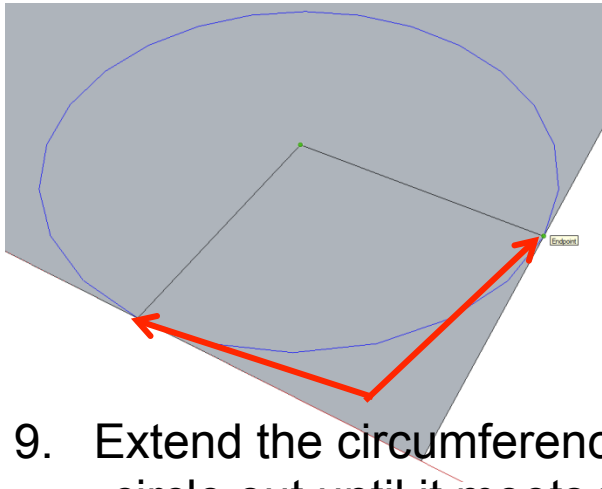


7. Repeat this on the other **two corners** drawing squares measuring **20,20**.



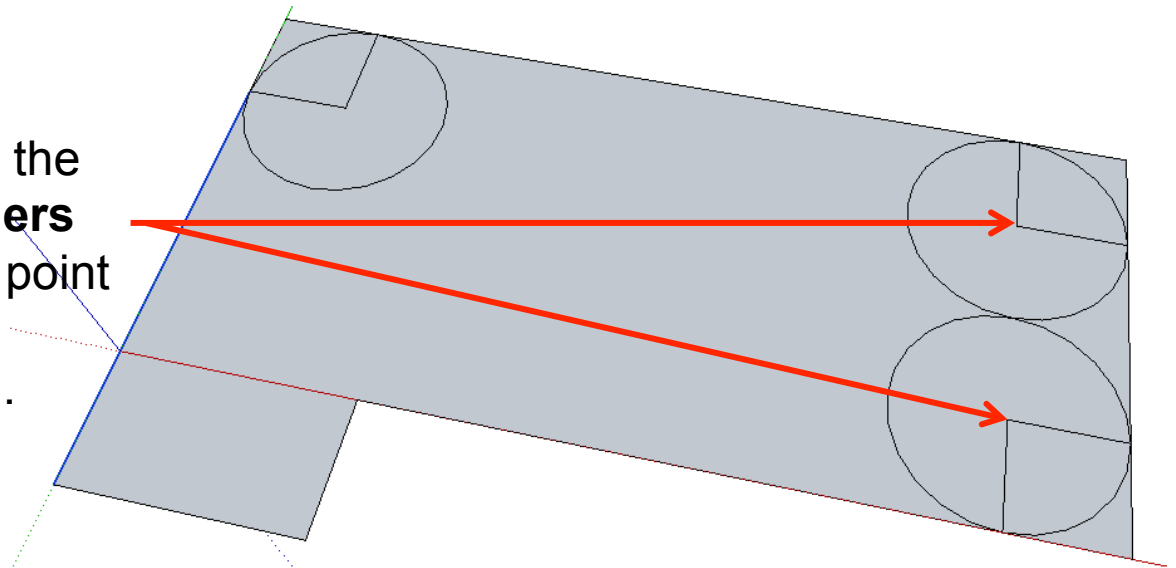
8. Click on the **circle tool**. Position the centre on the corner of the square shown above





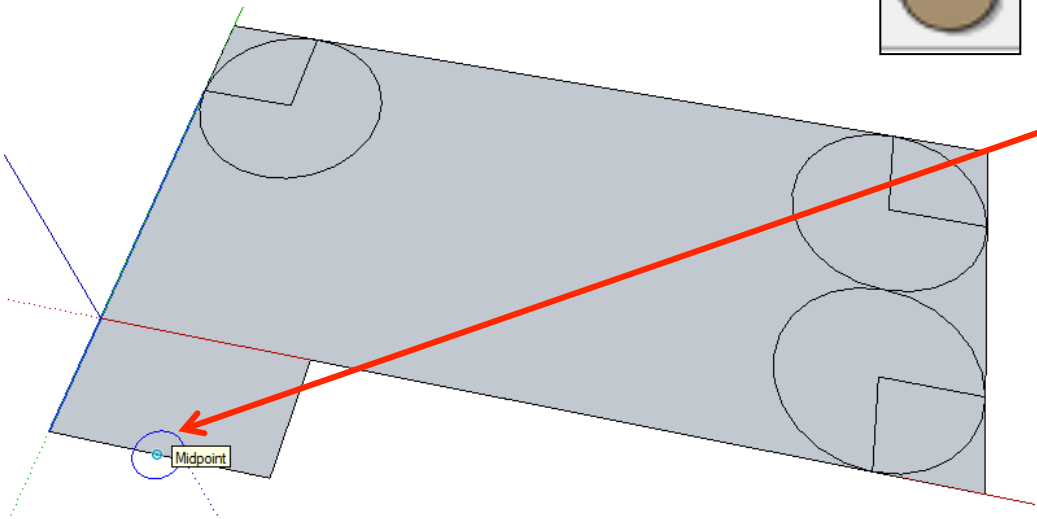
9. Extend the circumference of the circle out until it meets the either corner shown. It will say ***endpoint***

10. **Repeat** this on the other **two corners** with the centre point starting on the squares shown.

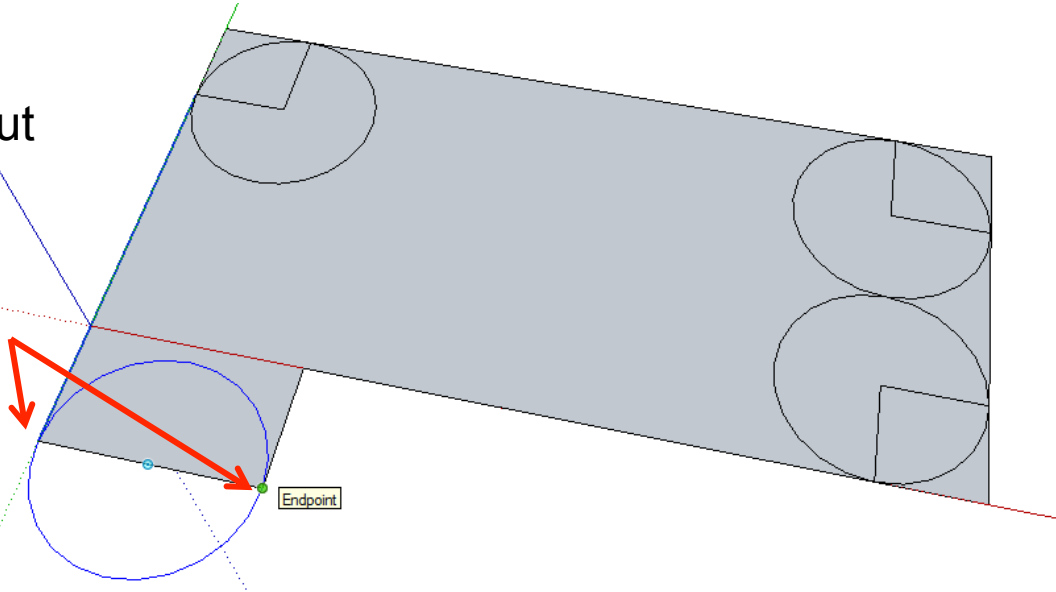




11. **Click** on the **circle tool**. Position the centre on the corner of the midpoint of the line shown above

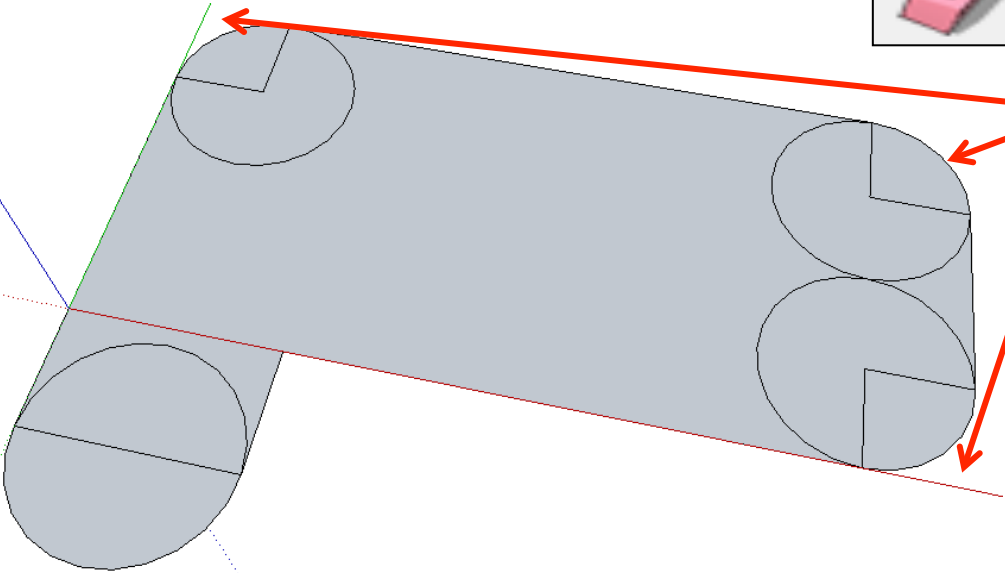


12. **Extend** the **circle** out until the edge (**circumference**) touches one of the two **endpoints** shown

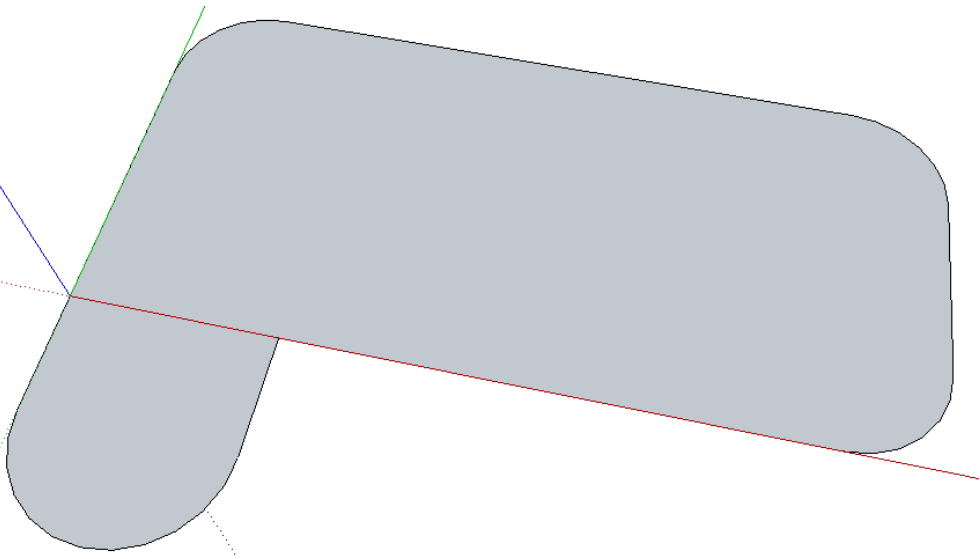


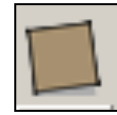
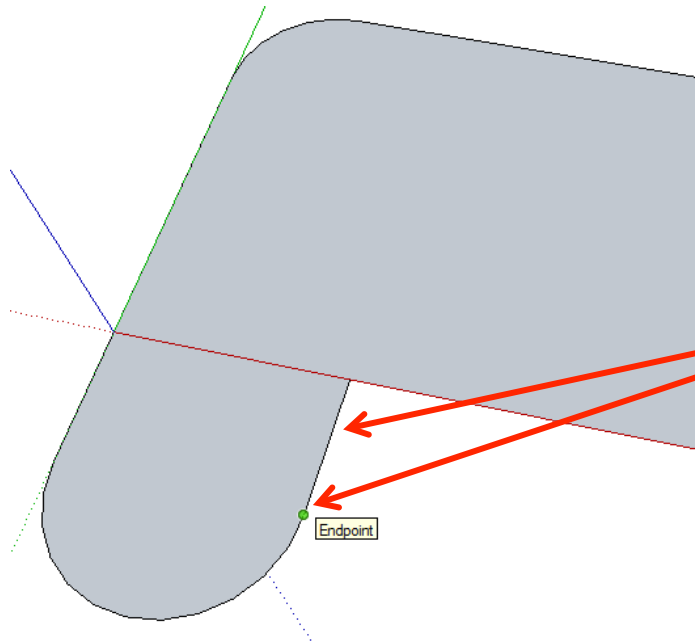


13. Use the **rubber tool** to erase the edges of the shape



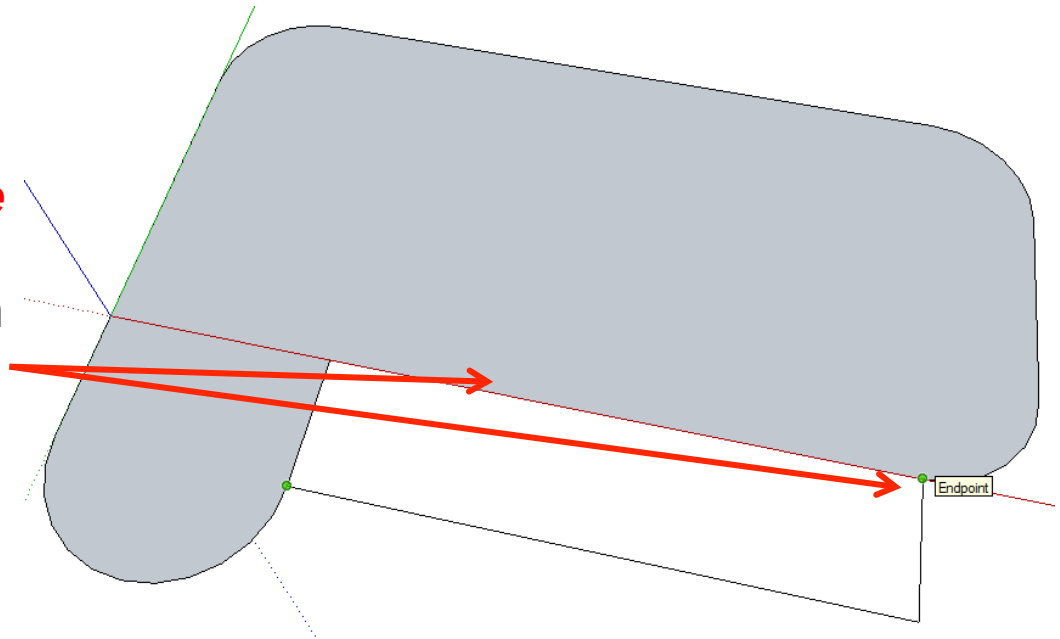
14. Use the **rubber tool** to erase the inside lines so you are left with the base of the camera

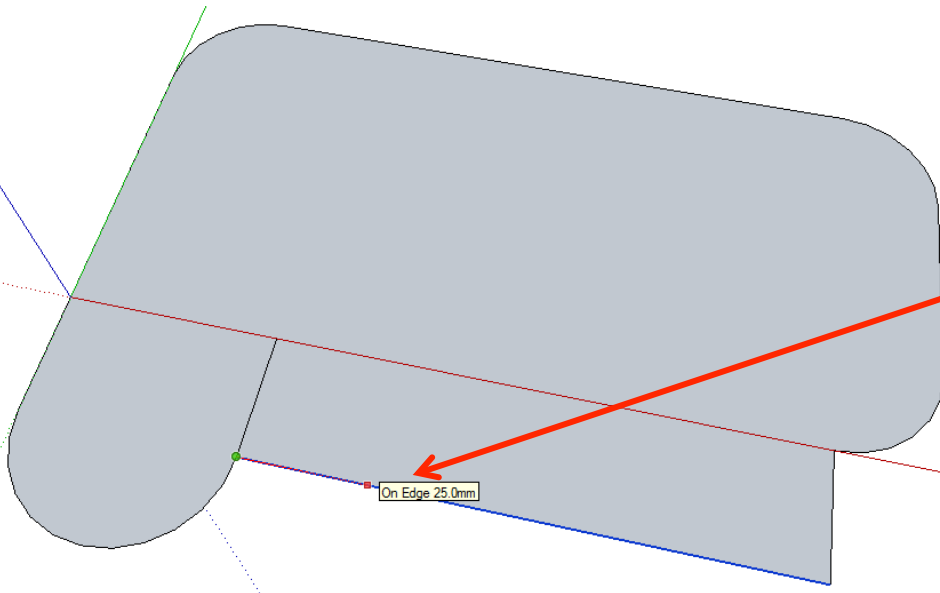




15. Using the **rectangle tool** *move it* along the handle line shown until it says **endpoint**. Start to draw the rectangle

16. Using the **rectangle tool** *move it* along the front line shown until it says **endpoint**. Click to complete the rectangle

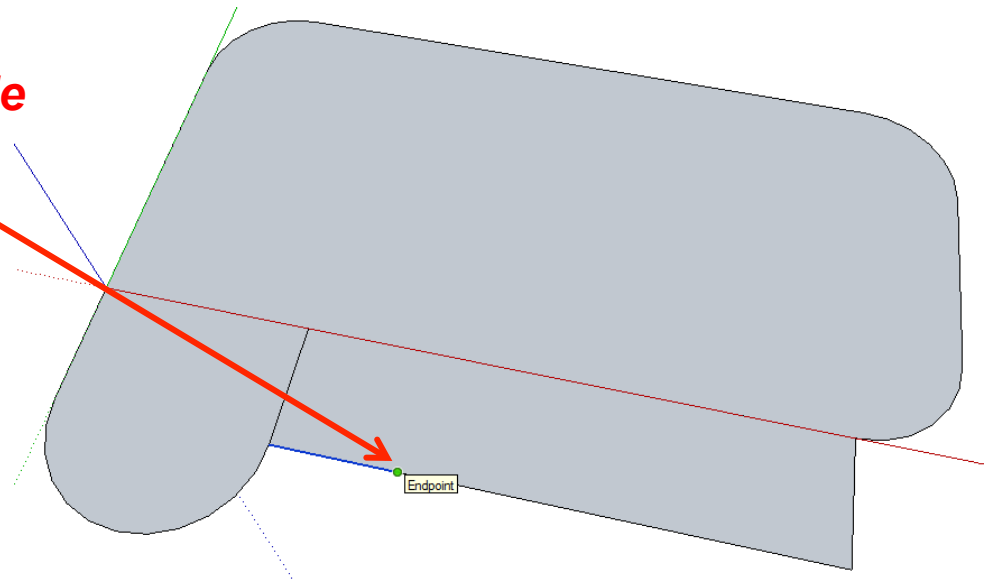


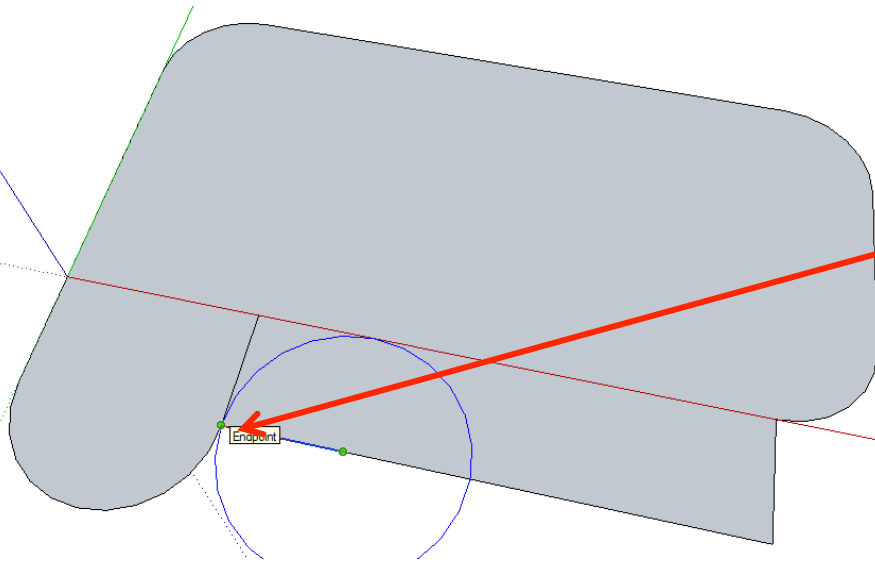


17. Using the **pencil tool** start on the **endpoint shown**. Move the pencil along the line and **type in 25** and **press enter**



18. **Click** on the **circle tool**. Position the centre on the corner of the endpoint of the pencil line you have just drawn shown opposite.

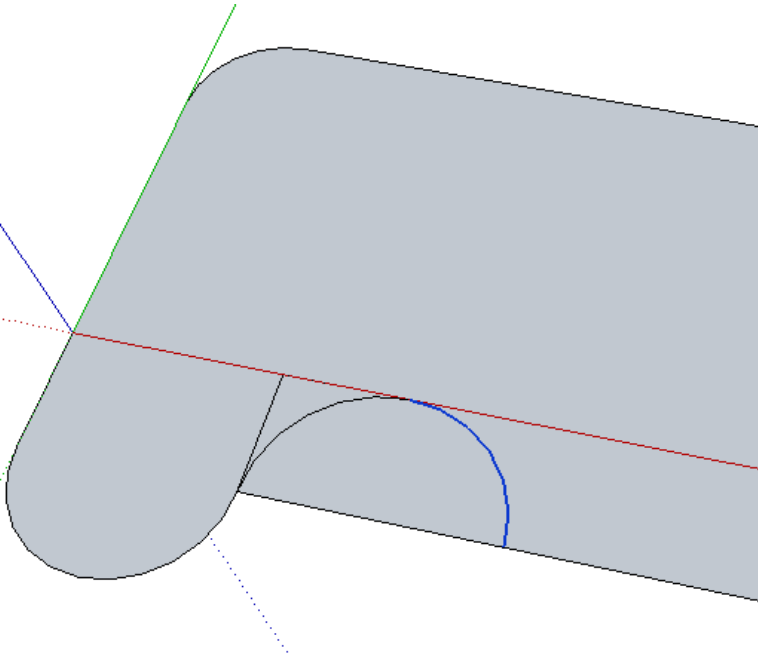




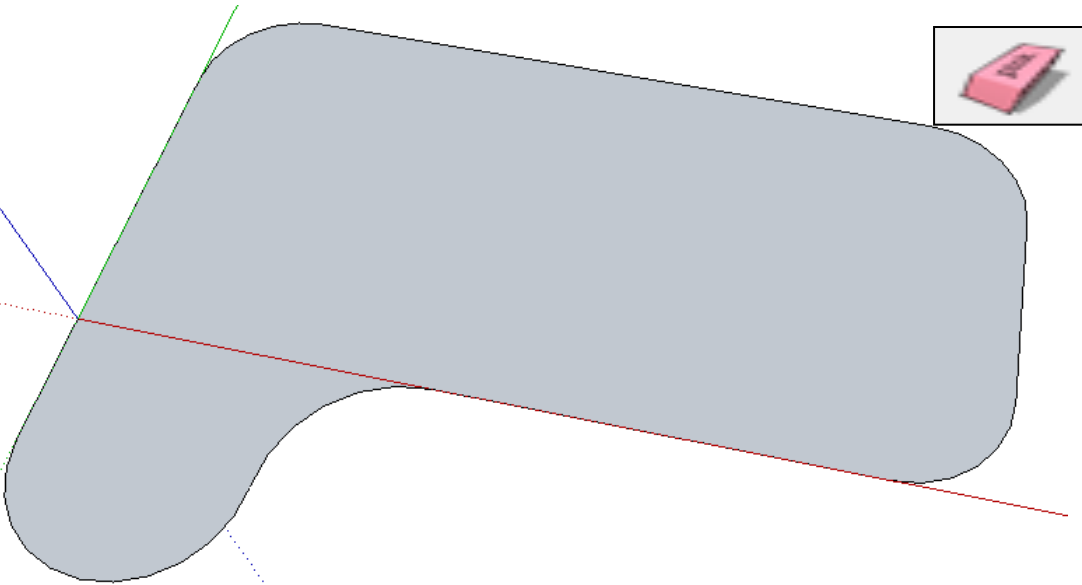
19. **Using the *circle tool***. Pull the circle circumference outwards. Make sure the circumference touches the endpoint shown.



20. Use the ***rubber tool*** to erase the bottom half of the circle



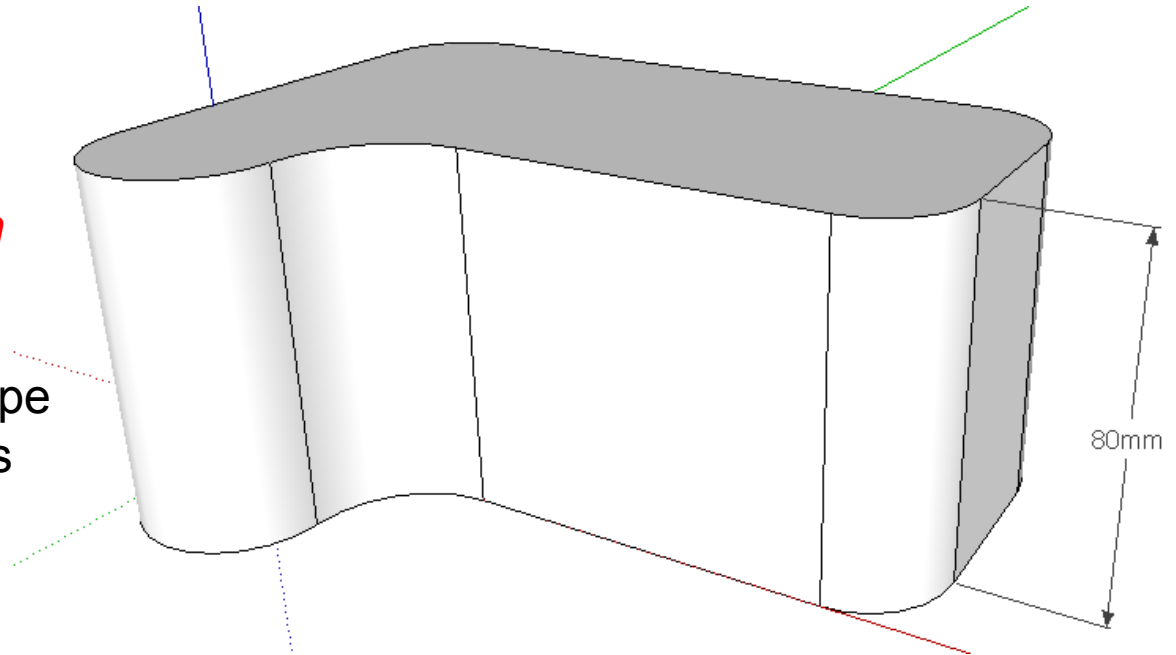
21. Use the **Select *tool*** and click on the right hand arc of the circle. It should now be ***highlighted in blue***.

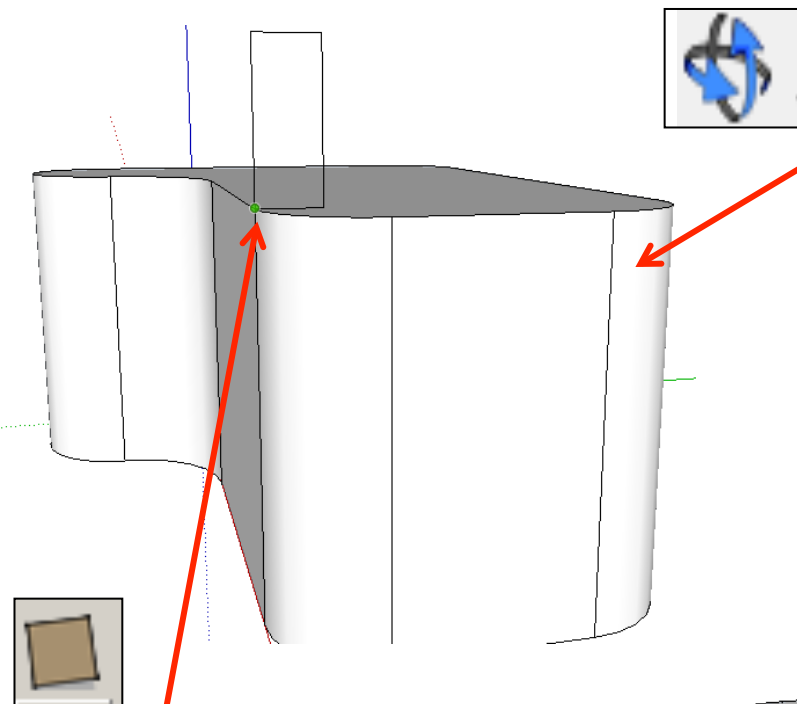


22. Use the **rubber tool** to erase the lines shown to be left with the shape shown.



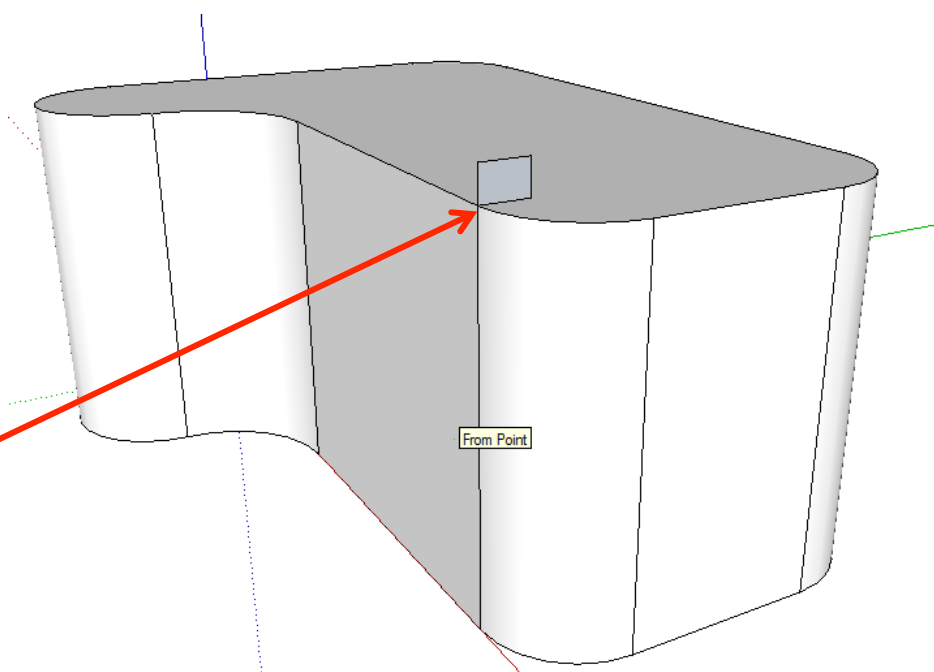
23. Use the **push pull tool** to raise the camea up. Type **'80'** and press **enter**.

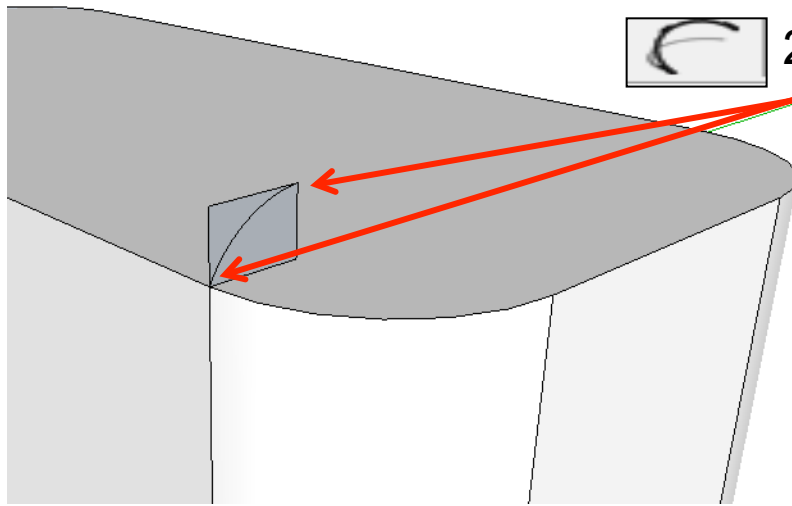




24. Use the **orbit tool** to position the camera as shown.

25. Using the **rectangle tool** move it along the edge as shown until it says **on edge**. Start to draw the rectangle so its vertically upwards as shown. Type **7,7** and press **enter**.

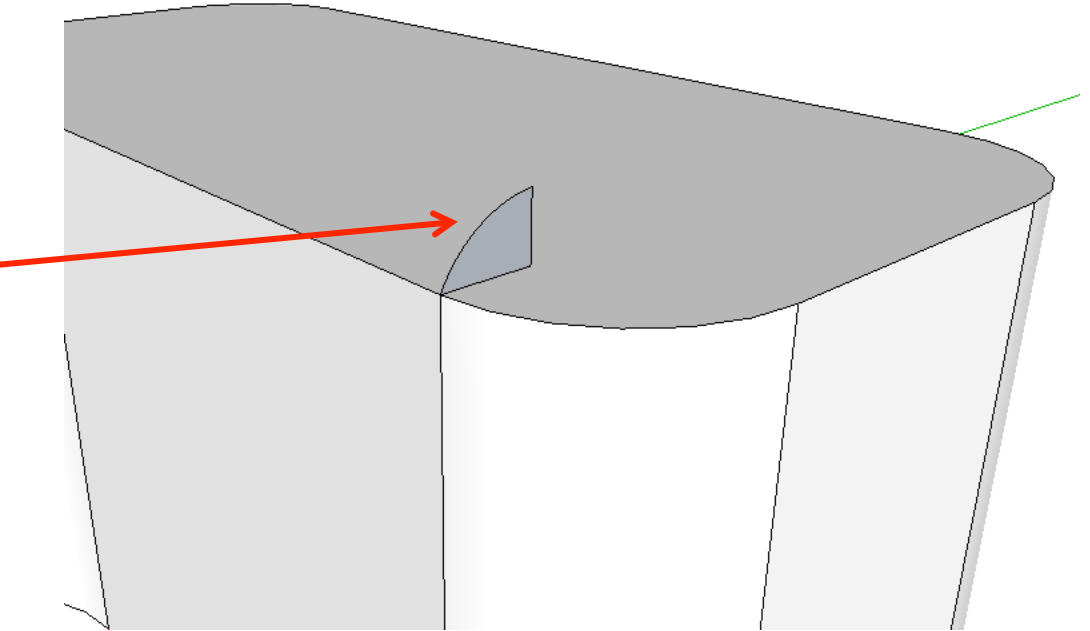


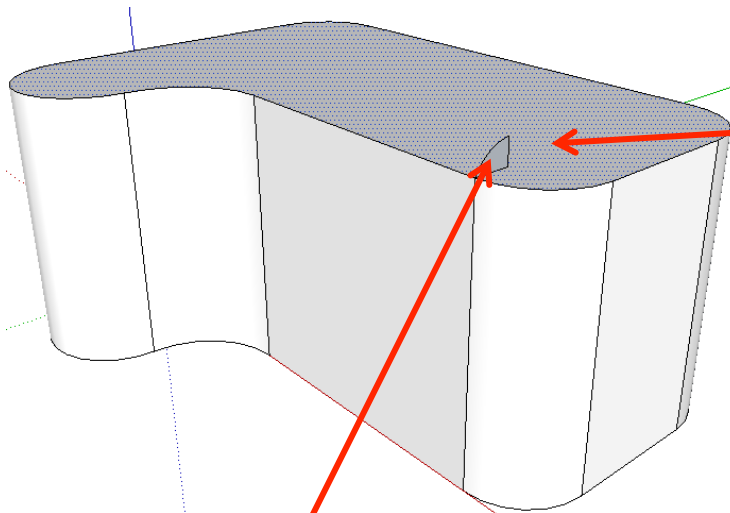


26. Use the **arc tool** to draw an arc from the two points shown.



27. Use the **rubber tool** to erase the lines shown to be left with the shape shown.

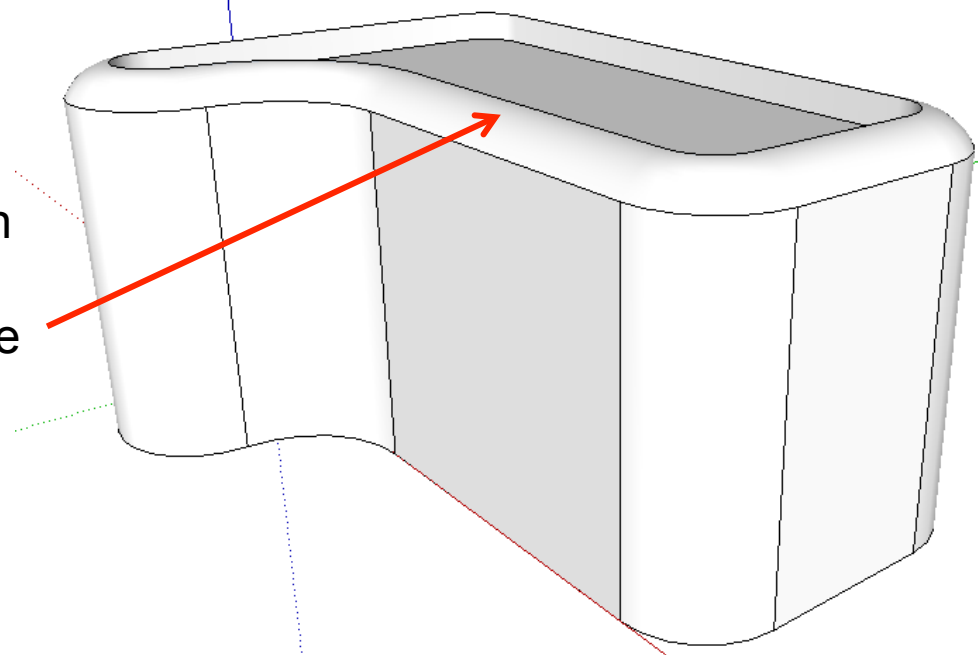


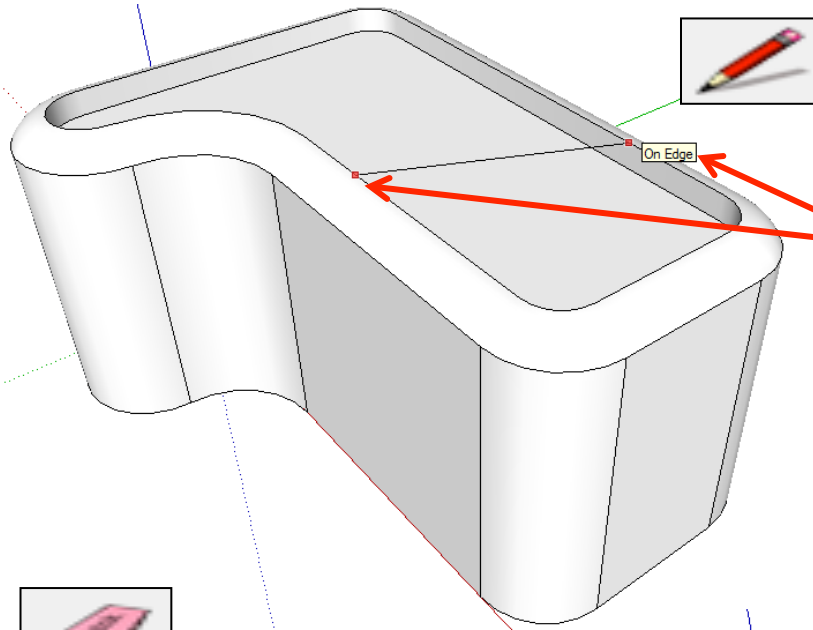


28. Use the Select **tool** and click on the top of the camera. It should now be **highlighted in blue dots**.



29. Select the **follow me tool** and click on the **shape** on the top. You should have drawn the shape shown opposite.....

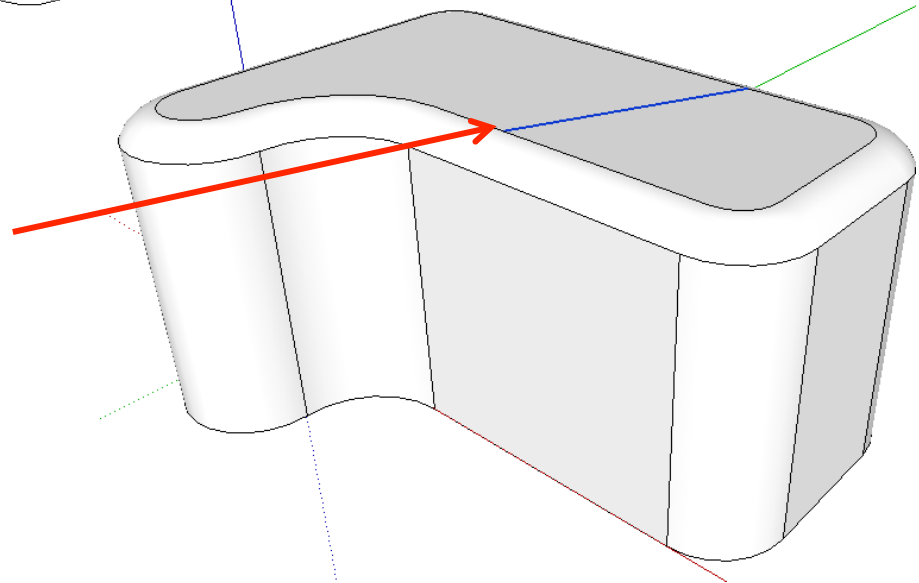


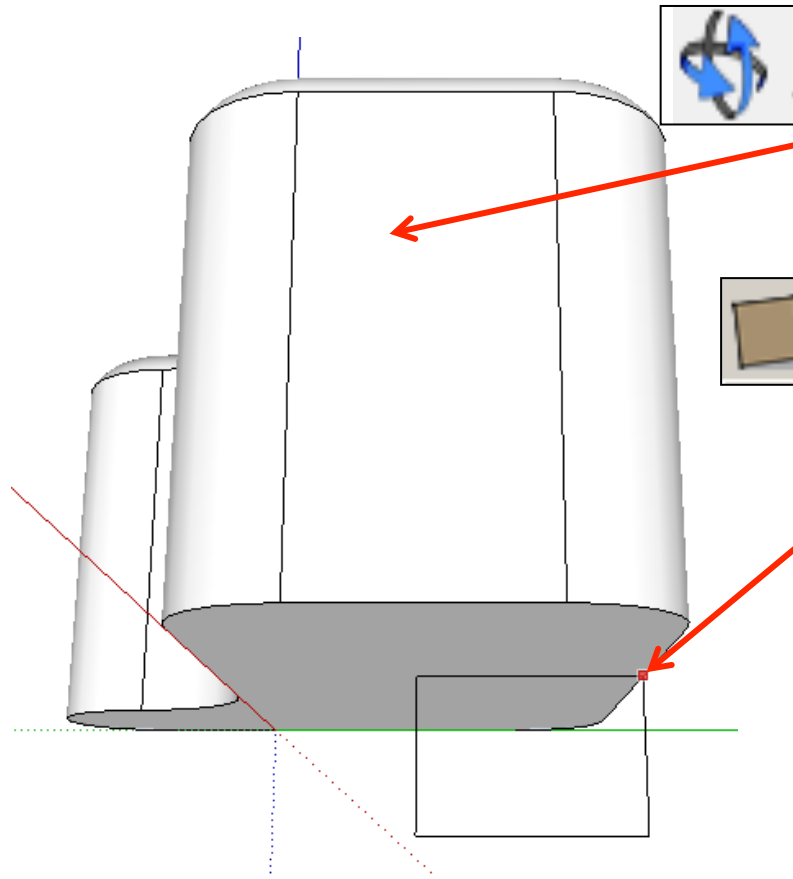


30. Select the **pencil tool** and click on the **top of the shape shown**. It will say **on edge**. Draw a line shown to the opposite side. It will say **on edge** and fill the top piece.

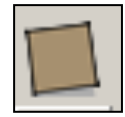


31. Use the **rubber tool** to erase the line shown in blue to be left with the camera body shape.





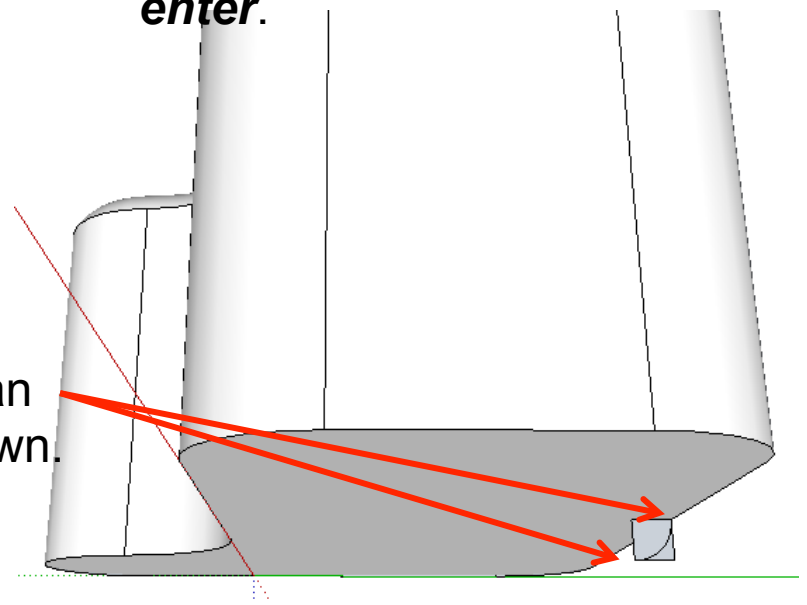
32. Use the **orbit tool** to position the camera as shown.

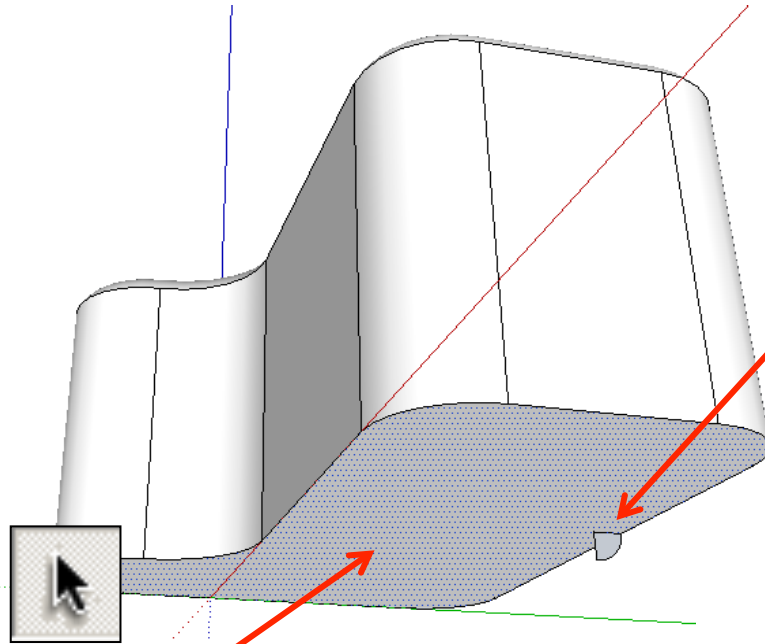


33. Using the **rectangle tool** *move it* along the edge as shown until it says **on edge**. Start to draw the rectangle so its vertically downwards as shown. Type **7,7** and press **enter**.



34. Use the **arc tool** to draw an arc from the two points shown.



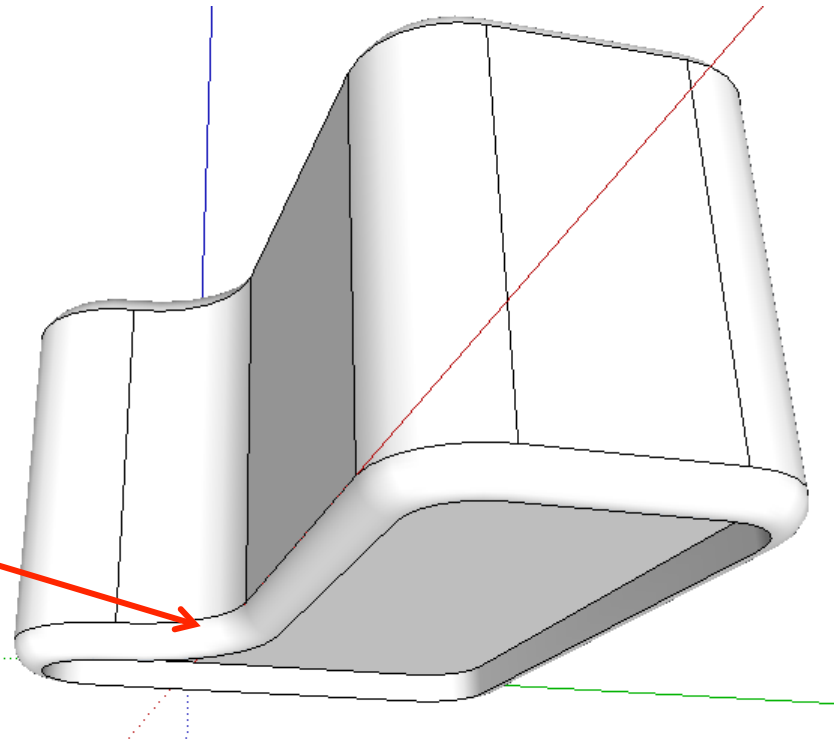


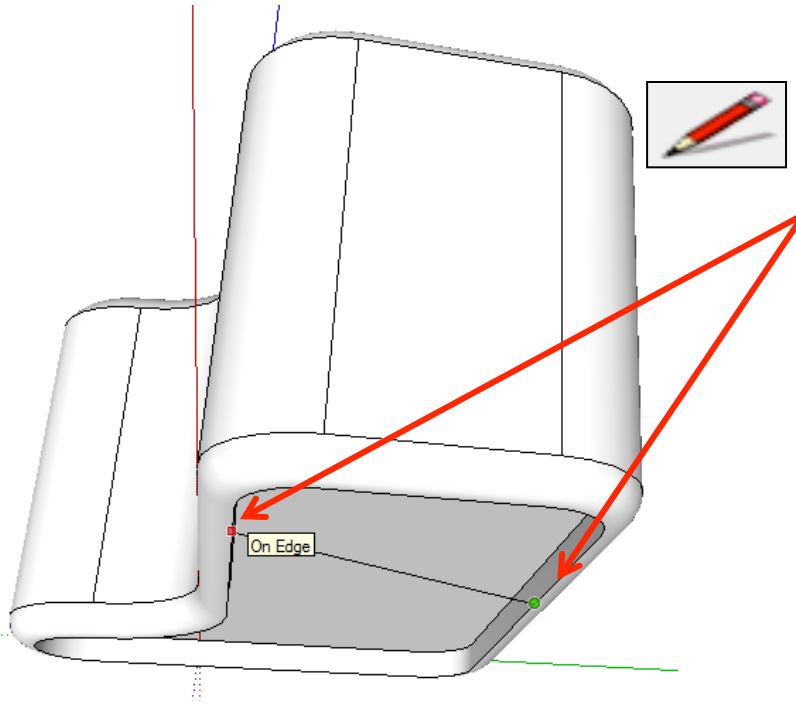
35. Use the **rubber tool** to erase the lines shown to be left with the shape shown.

36. Use the Select **tool** and click on the bottom of the camera. It should now be **highlighted in blue dots**.



37. Select the **follow me tool** and click on the **shape** on the bottom. You should have drawn the shape shown opposite.....

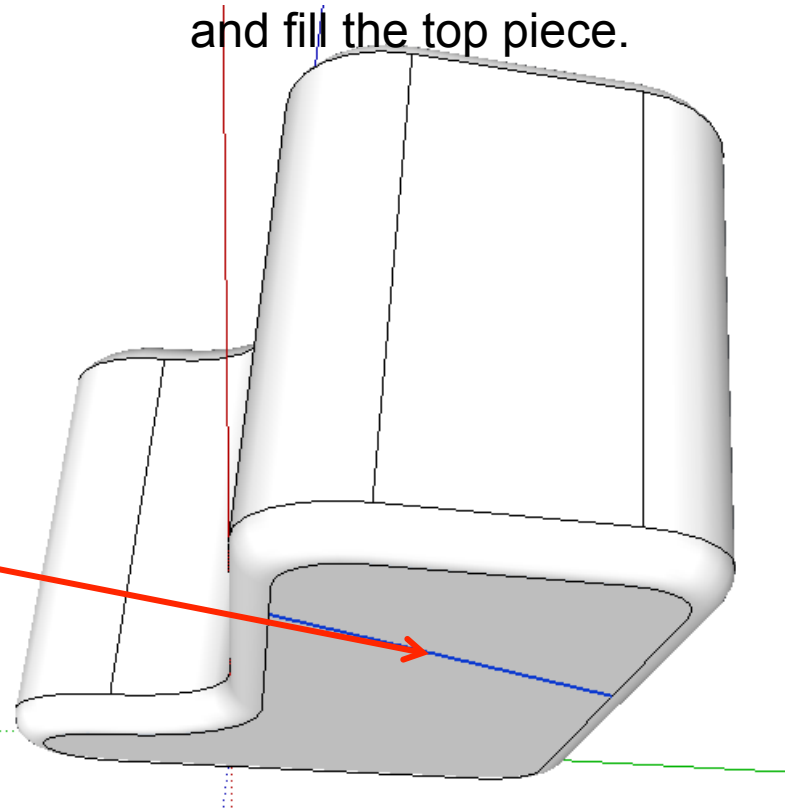


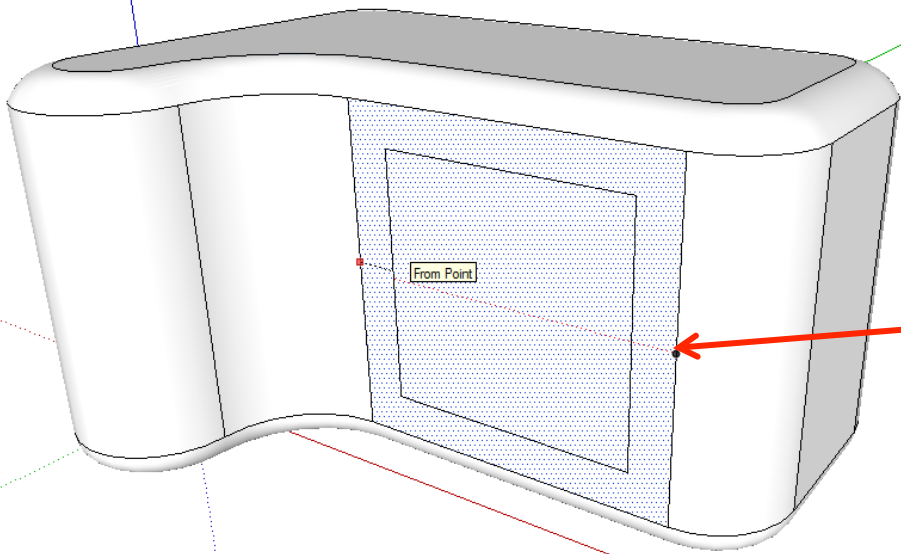


38. Select the **pencil tool** and click on the **top of the shape shown**. It will say **on edge**. Draw a line shown to the opposite side. It will say **on edge** and fill the top piece.



39. Use the **rubber tool** to erase the line shown in blue to be left with the camera body shape.

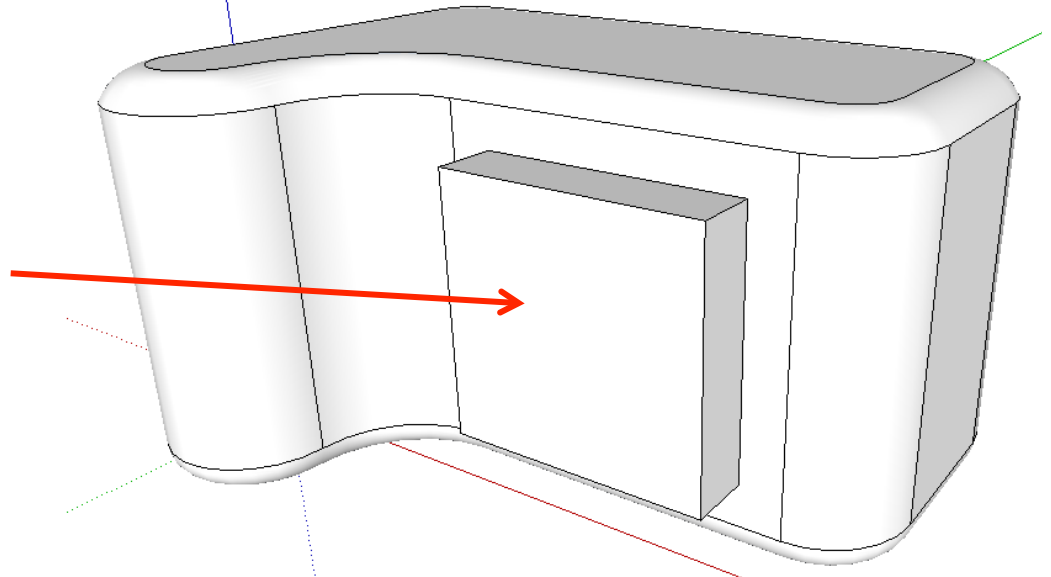


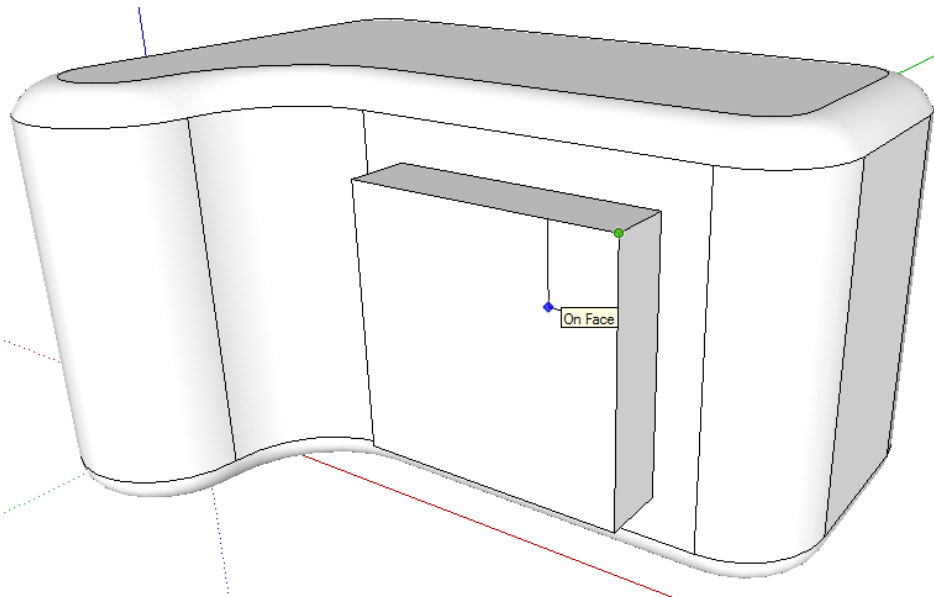


40. Use the **contour tool** to pull in a square from the edge shown. Type in **15** and press **enter**



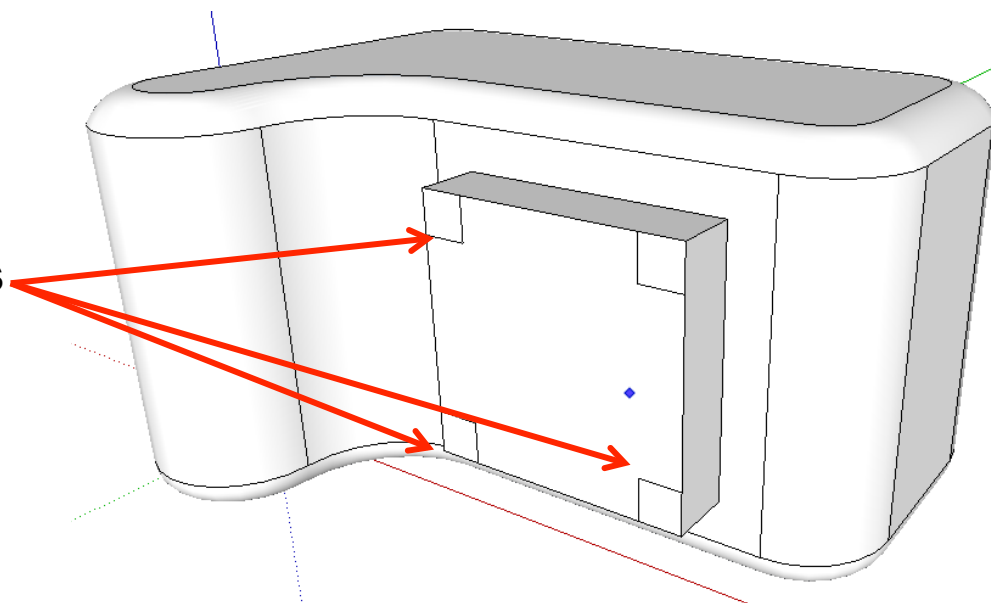
41. Use the **push pull tool** to pull the square out. Type '**15**' and press **enter**.

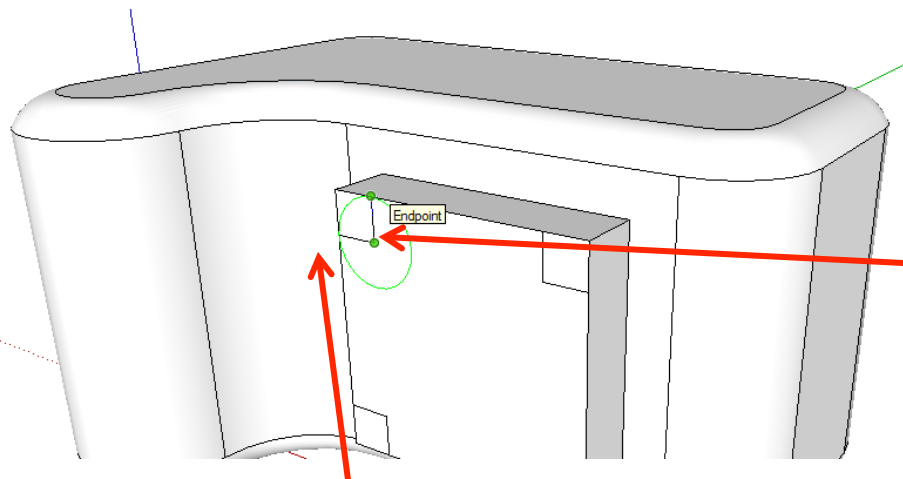




42. Using the **rectangle tool** click on the corner of the rectangle shown. Pull in towards the centre of the square and type in **15,15** and press **enter**.

43. Repeat this on the other **three corners** drawing squares measuring **15,15**.

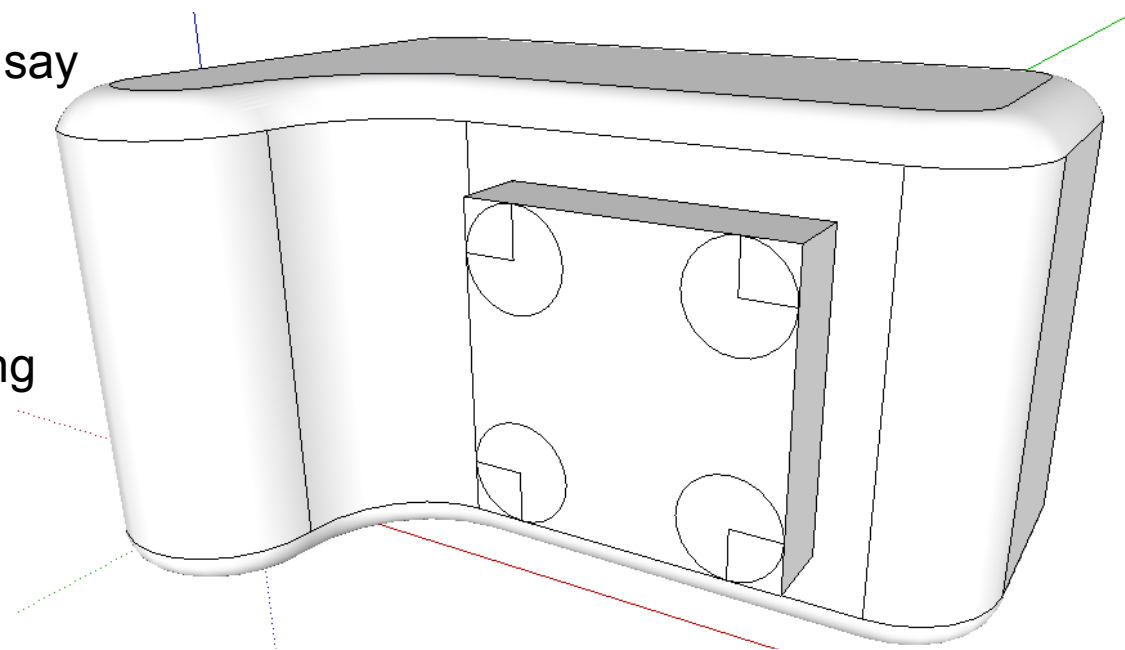


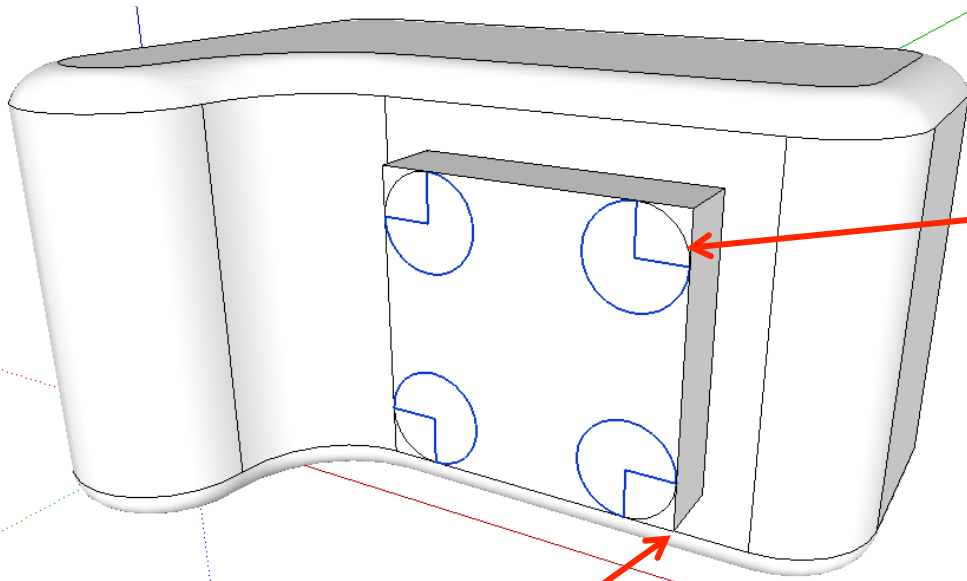


44. **Click** on the **circle tool**. Position the centre on the corner of the square shown opposite

45. Extend the circumference of the circle out until it meets the either corner shown. It will say **endpoint**

46. **Repeat** this on the other **three corners**. To be left with drawing shown

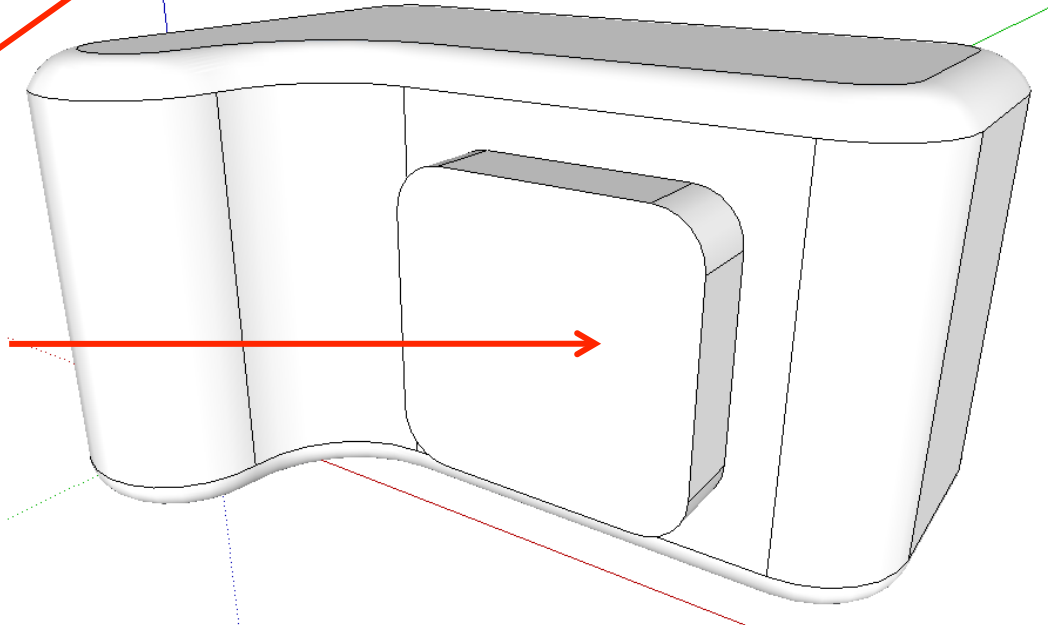


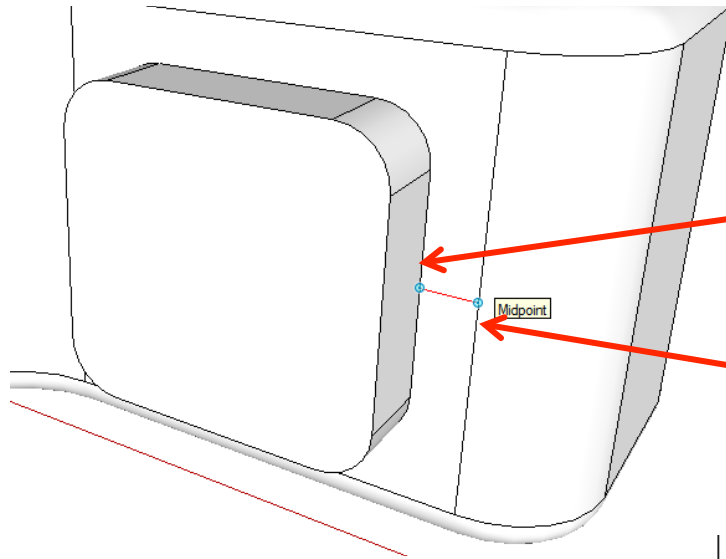


47. Use the **rubber tool** to erase the lines highlighted in blue.



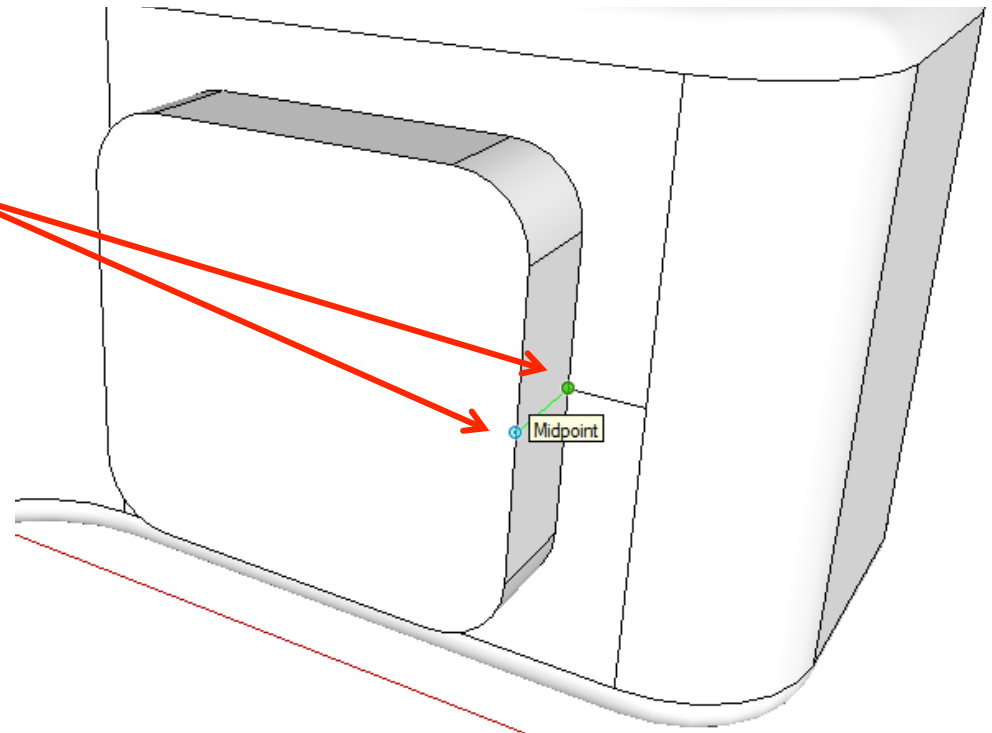
48. Use the **push pull tool** to push the edges of the shape back to be left with the drawing opposite.

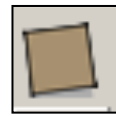
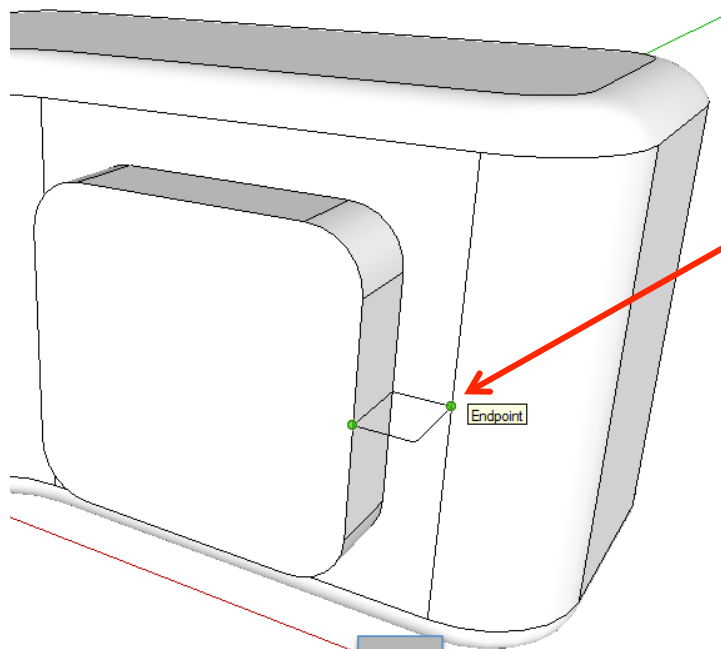




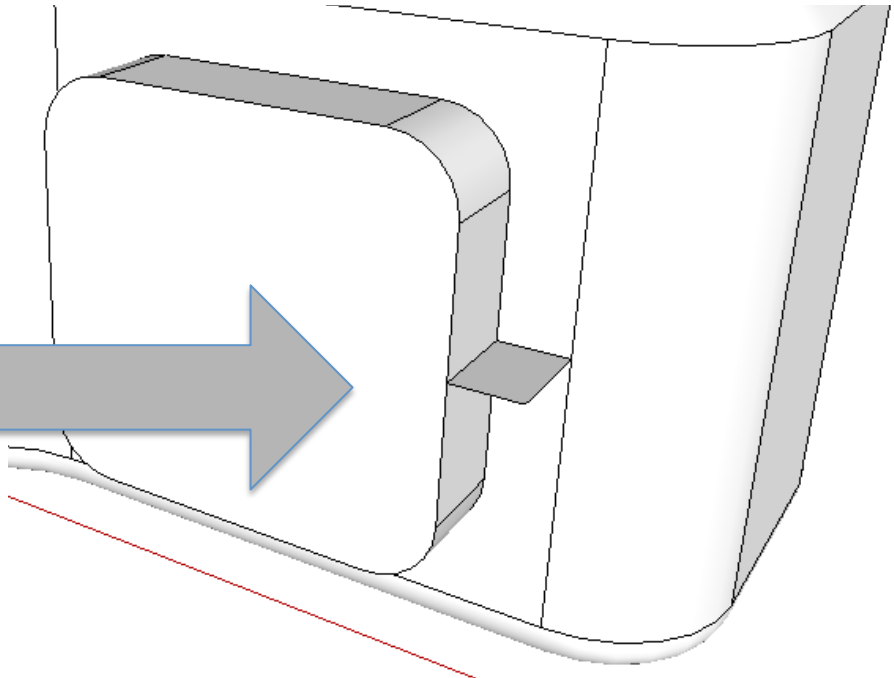
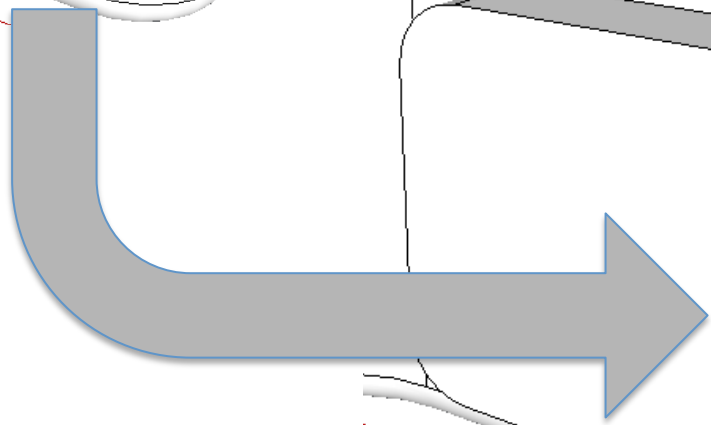
49. Using the **pencil tool** start on the **midpoint of the edge shown**. Draw a line out along the **red axis** until it touches the next line that will also say midpoint

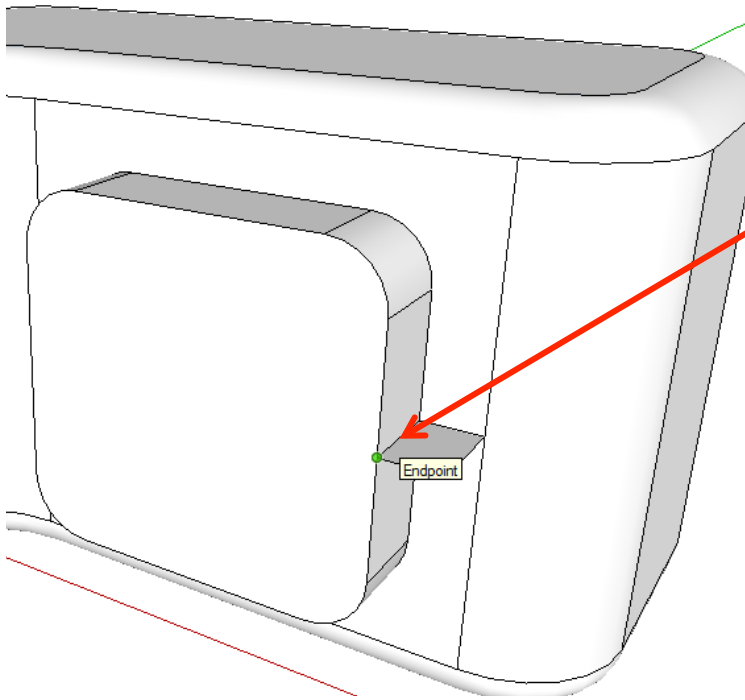
50. Using the **pencil tool** start on the **end of the pencil line you have just drawn**. Draw a line out along the **green axis** until it touches the next line that will say midpoint





51. Using the **rectangle tool** **click** on the endpoints of the two lines you have just drawn.

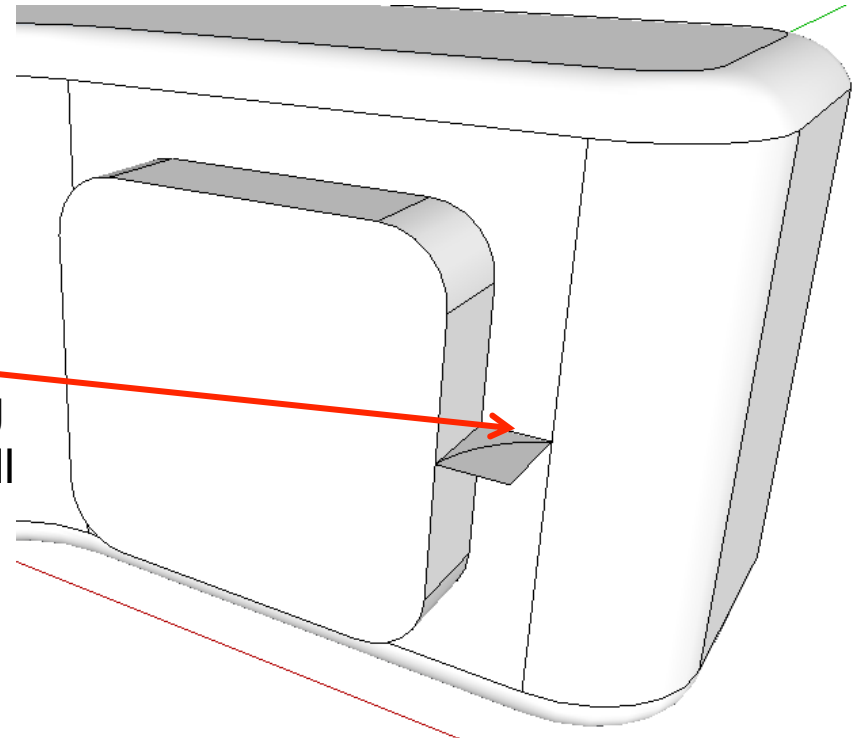


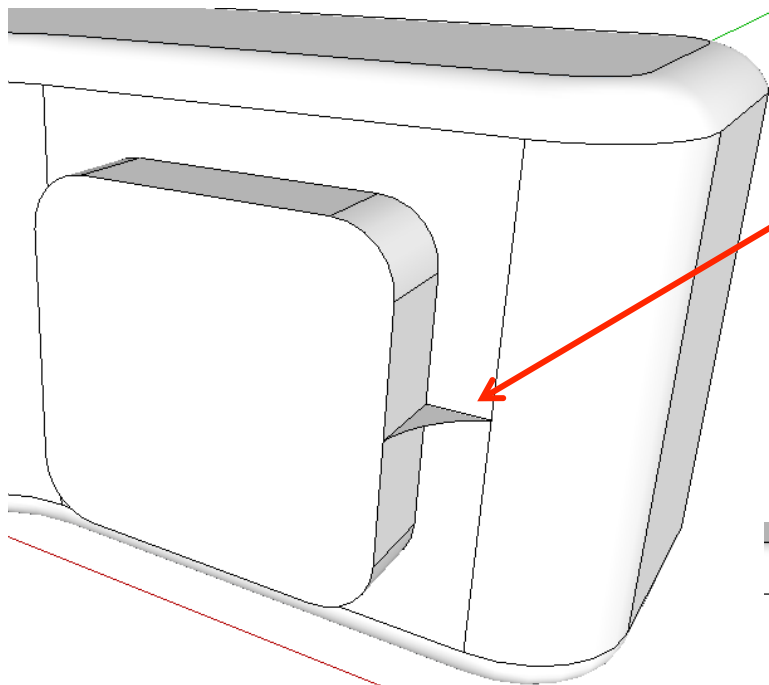


52. Use the **arc tool** to draw an arc starting at the point shown. It will say **endpoint**.



53. Use the **arc tool** to complete the arc ending at the point shown. It will say **endpoint**.

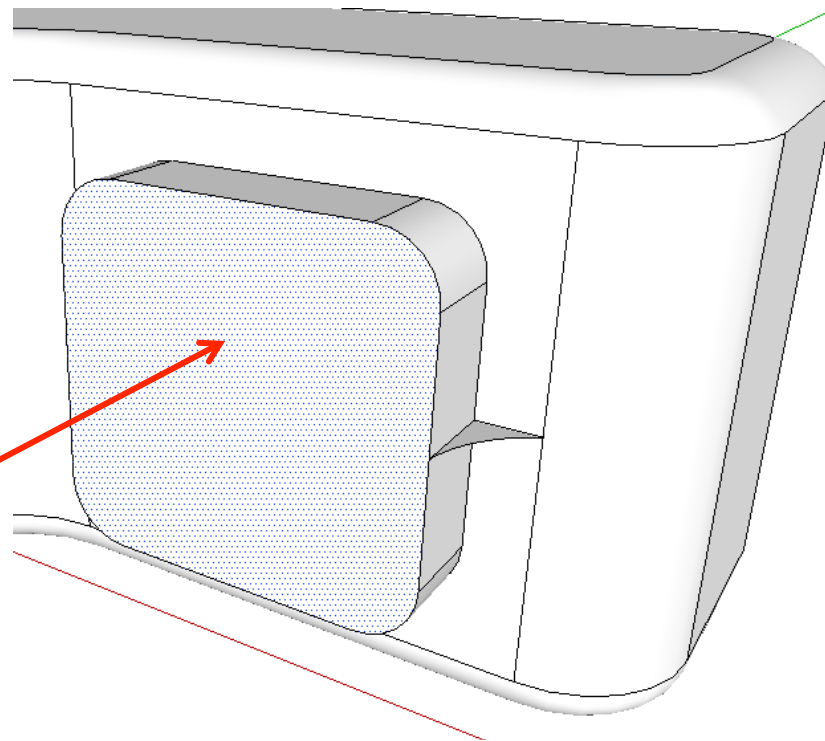


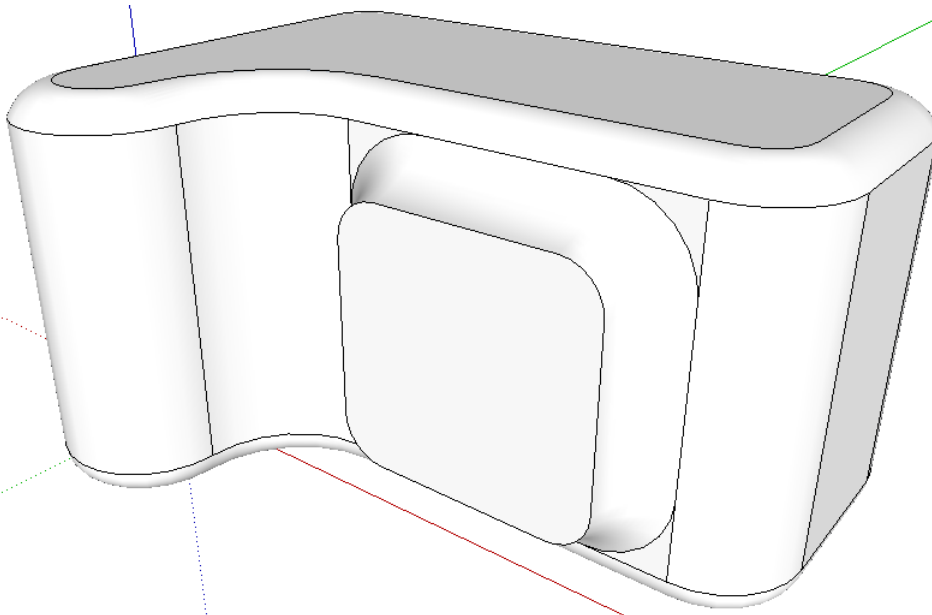


54. Use the **rubber tool** to erase the lines shown to be left with the shape shown.



55. Use the Select **tool** and click on the bottom of the camera. It should now be **highlighted in blue dots**.

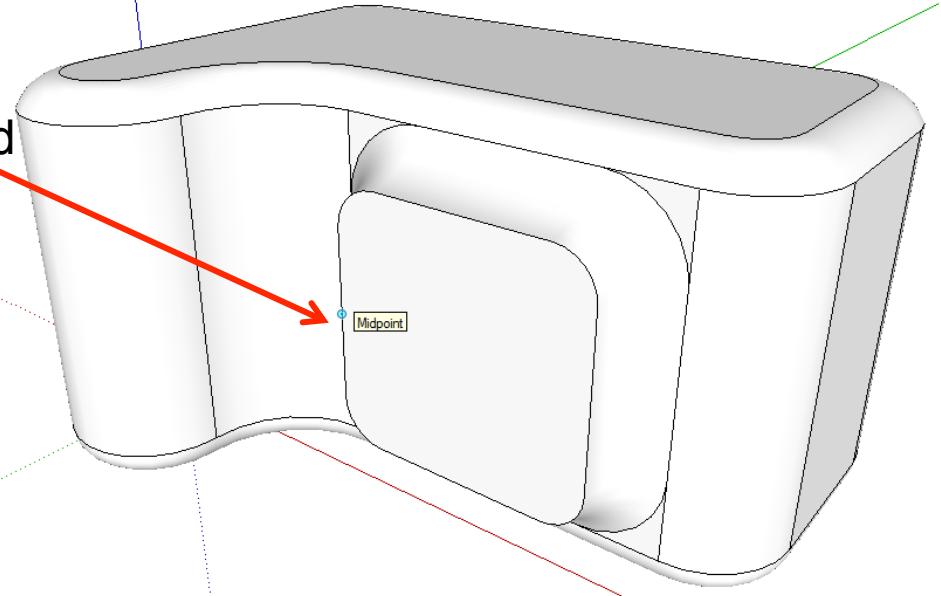


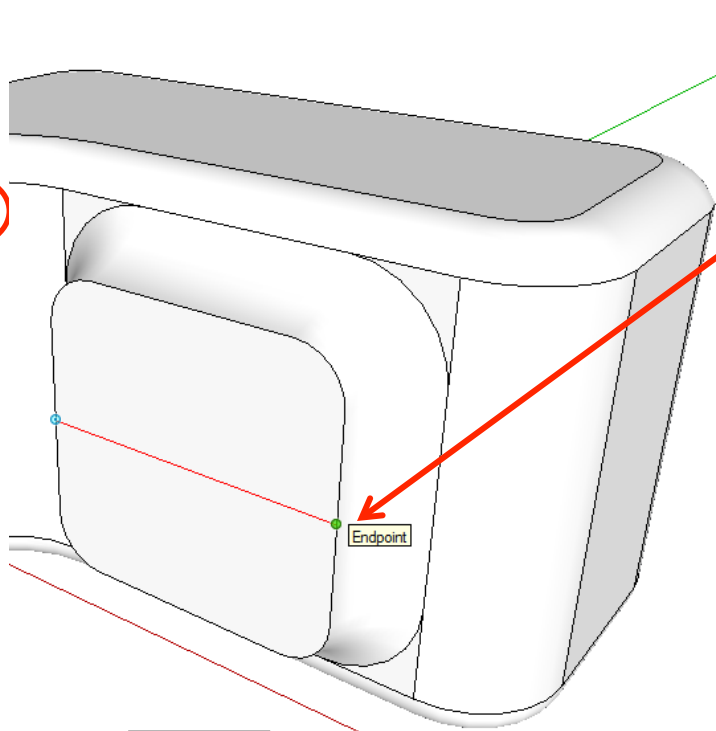


56. Select the ***follow me tool*** and click on the ***shape*** on the side. You should have drawn the shape shown opposite.....



57. Select the ***pencil tool*** and click on the ***edge of the shape shown***. Move it along the edge until it says ***midpoint***.

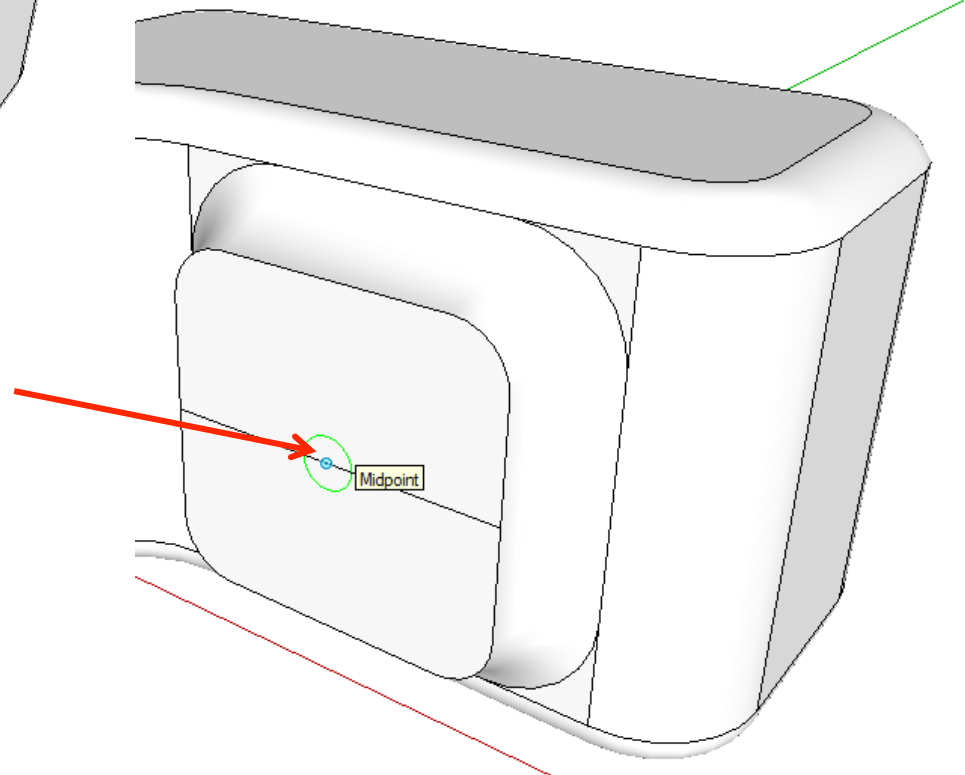


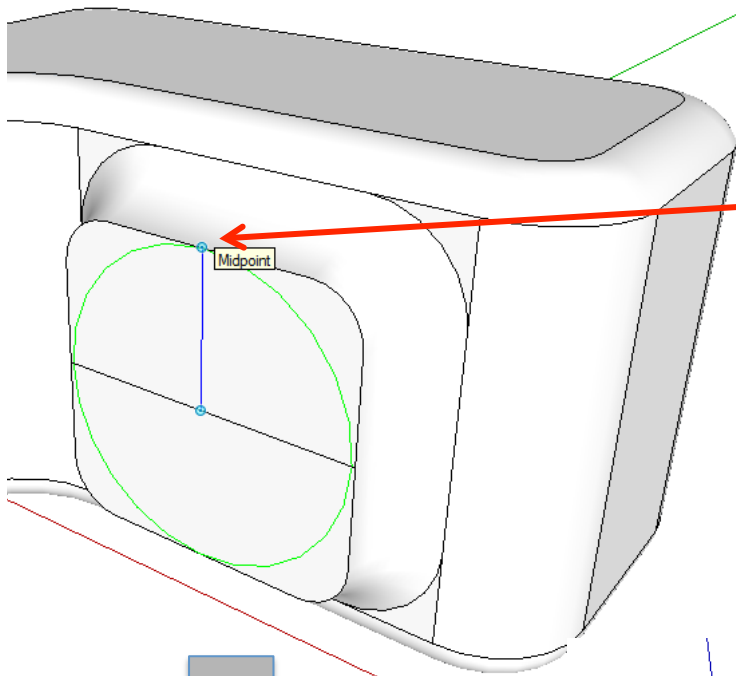


58. Draw a line shown to the opposite side. It will say ***endpoint***.

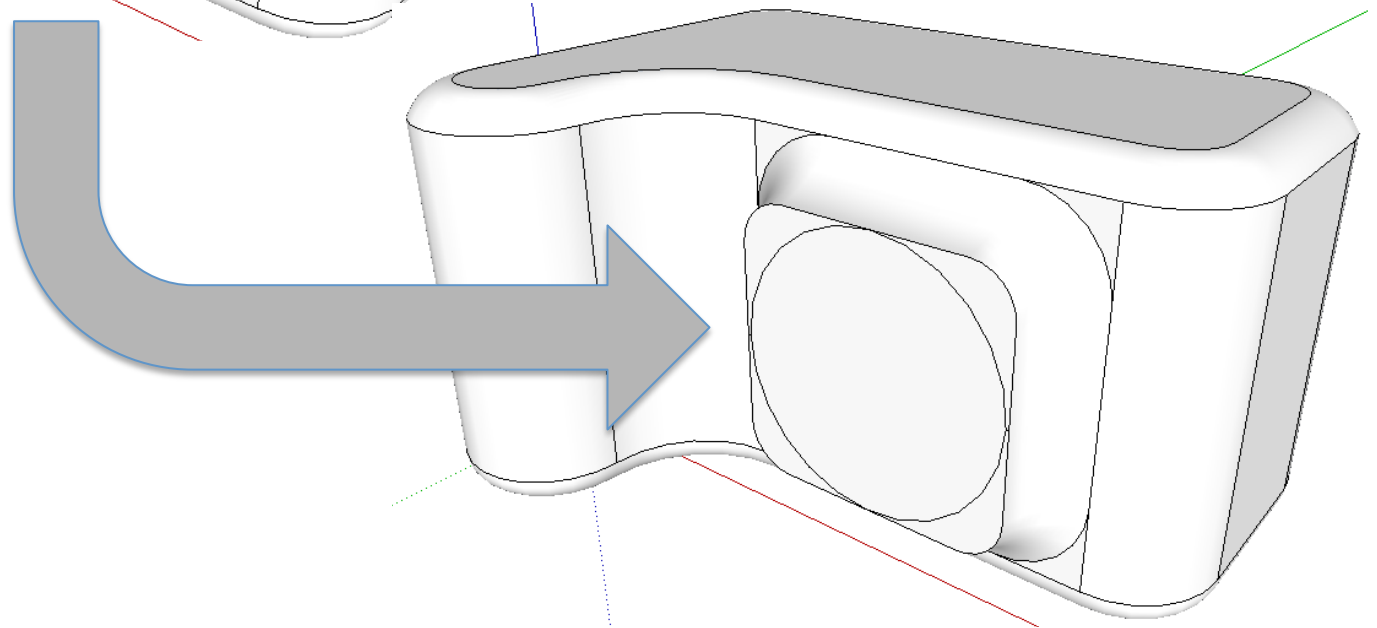


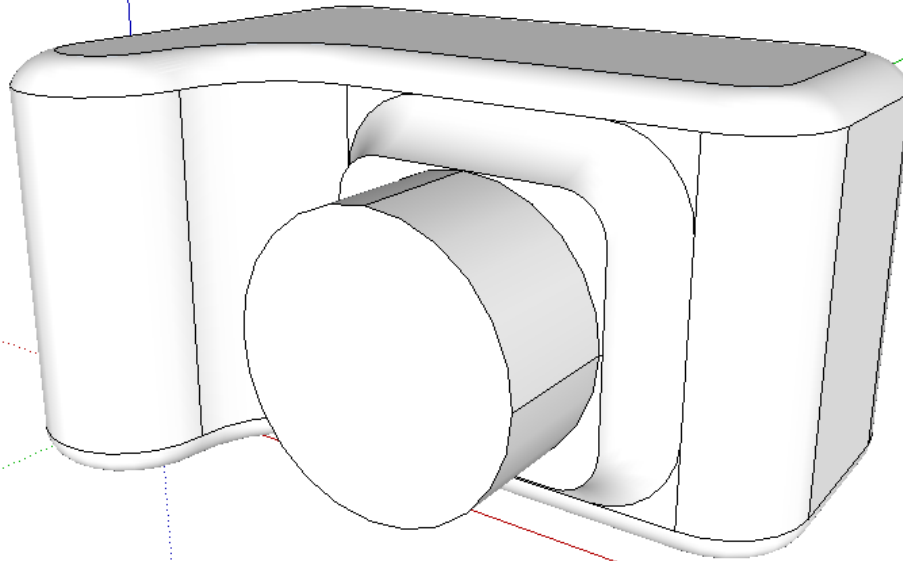
59. ***Click*** on the ***circle tool***. Position the centre on the midpoint of the last line you have just drawn.





60. **Pull** the **circle tool** **outwards** until it touches the midpoint shown opposite.

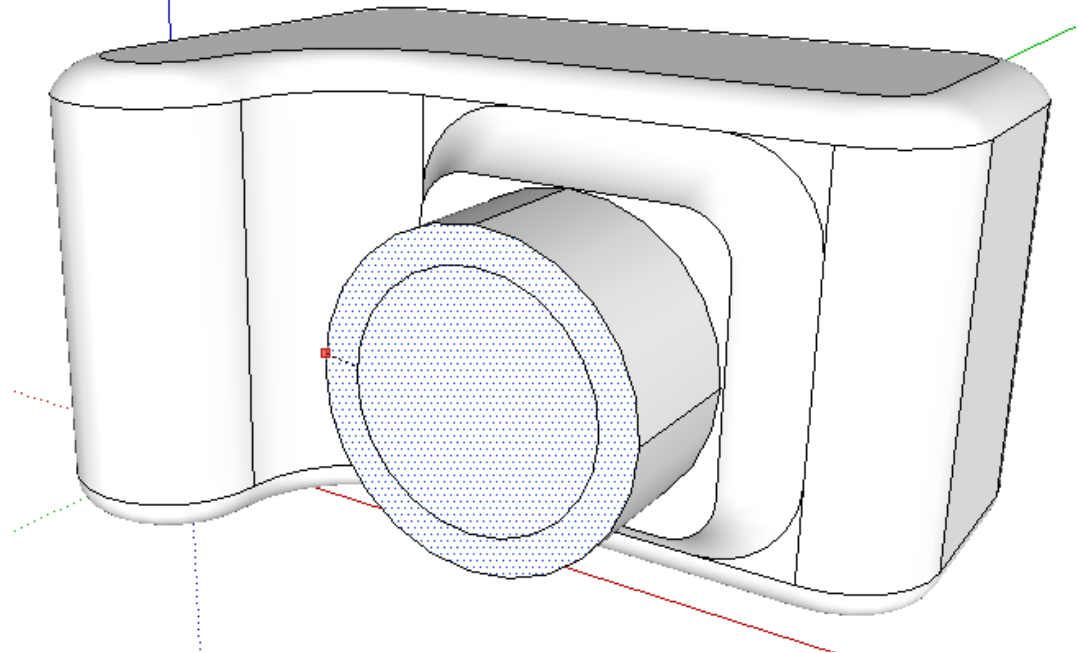


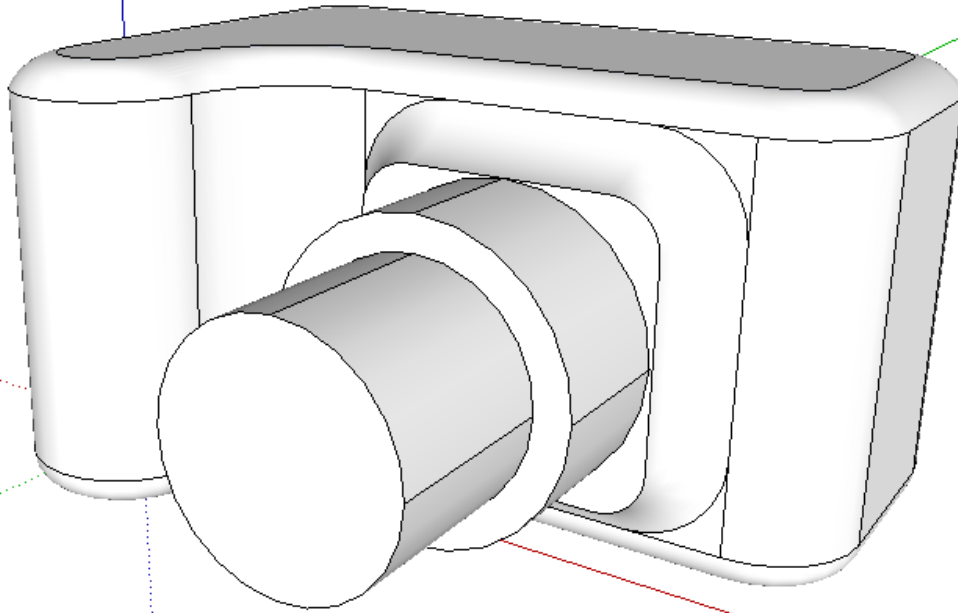


61. Use the **push pull tool** to pull the camera lens out. The length is up to you.



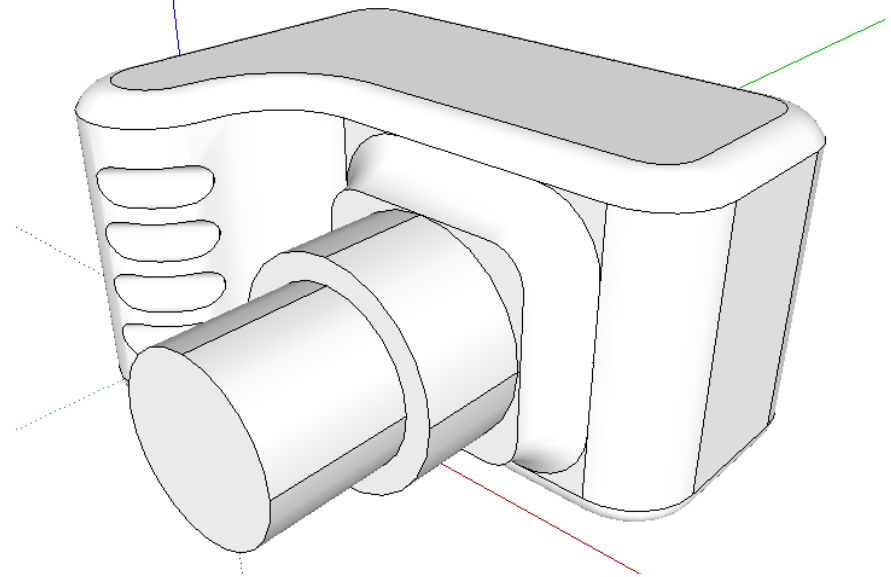
62. Use the **contour tool** to draw a contour shown. Again size is up to you.

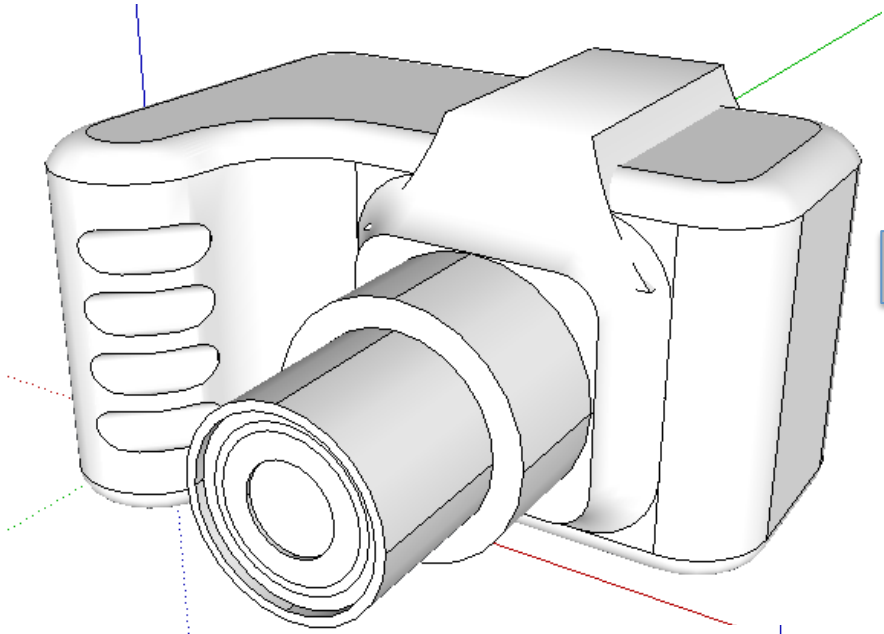




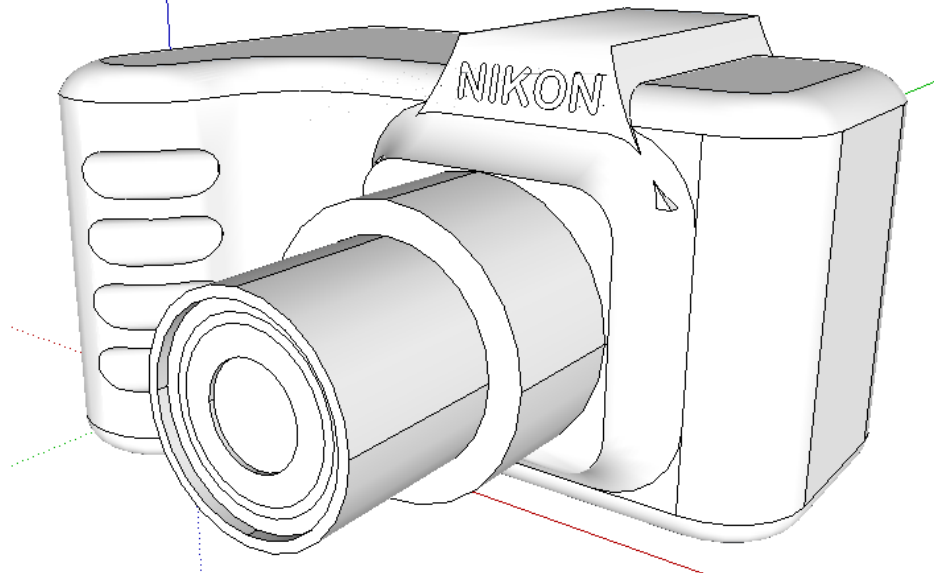
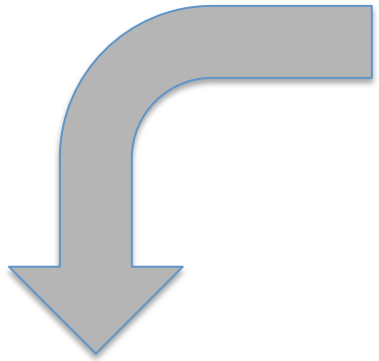
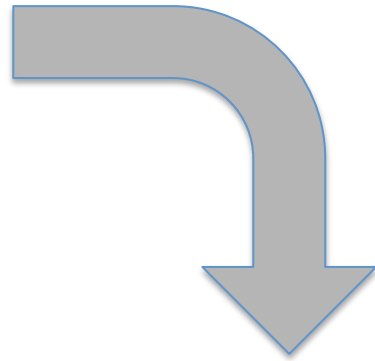
63. Use the **push pull tool** to pull the camera lens out. The length is up to you.

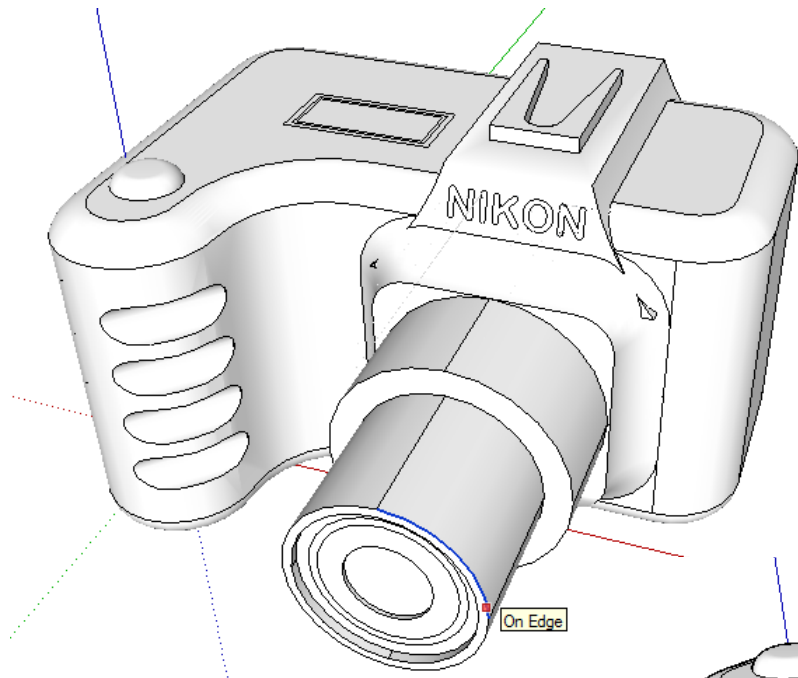
64. Use your own skills to add more details



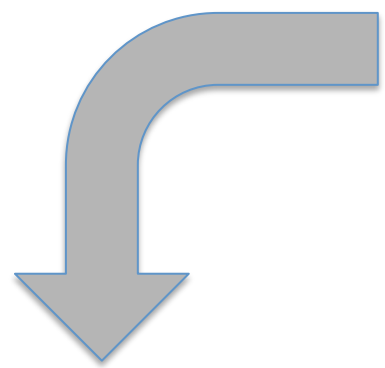
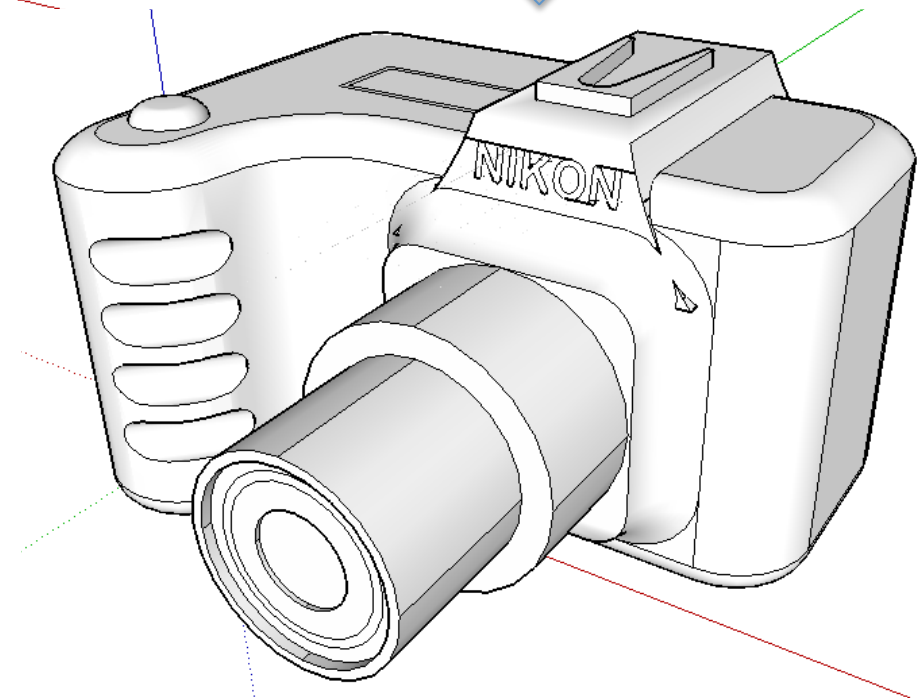
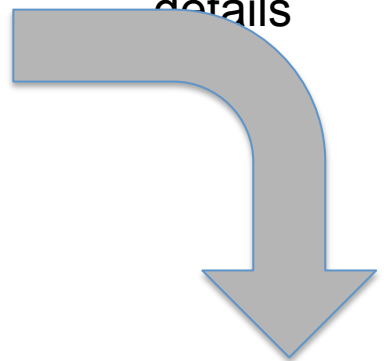


65. Use your own skills
to add more
details





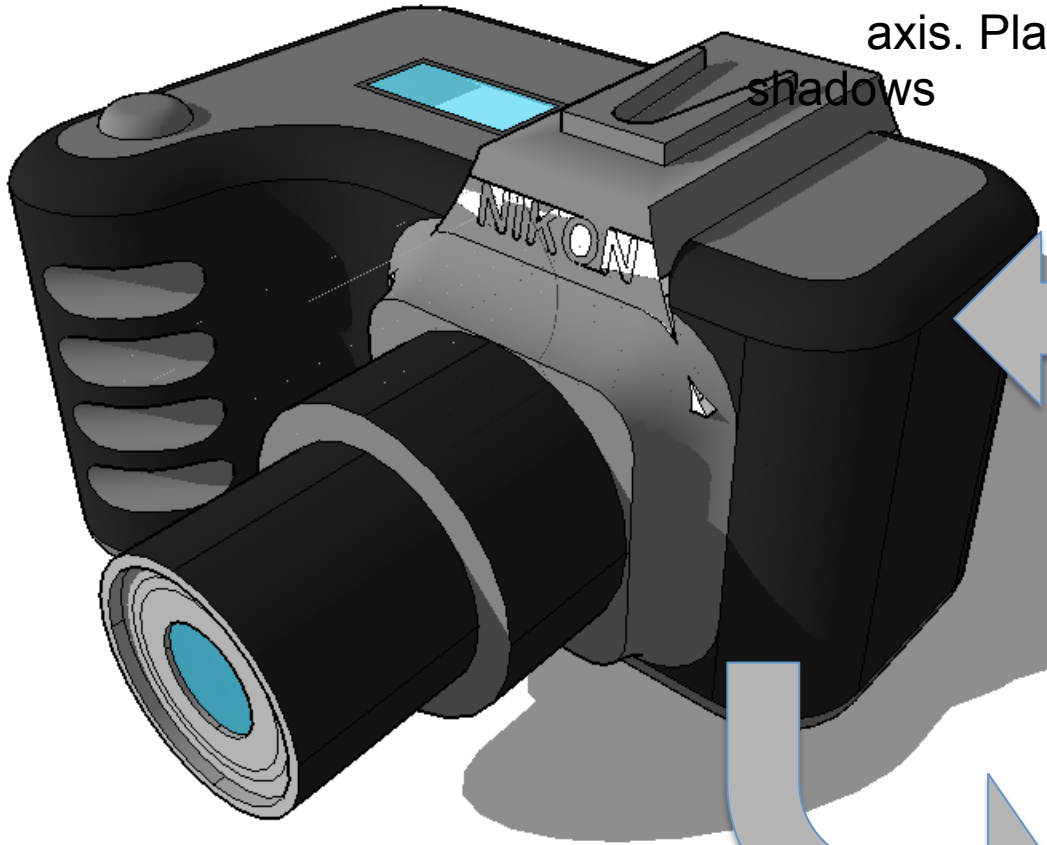
66. Use your own skills
to add more
details





67. Click **View – toolbars** and un-tick

axis. Place a tick next to shadows



Tasks:

- Put other details on the camera such as a charging socket, flash, new buttons and features, etc.
- Experiment with colours and materials for rendering.

Extension

- Design your own SLR camera and its relevant detail.....

