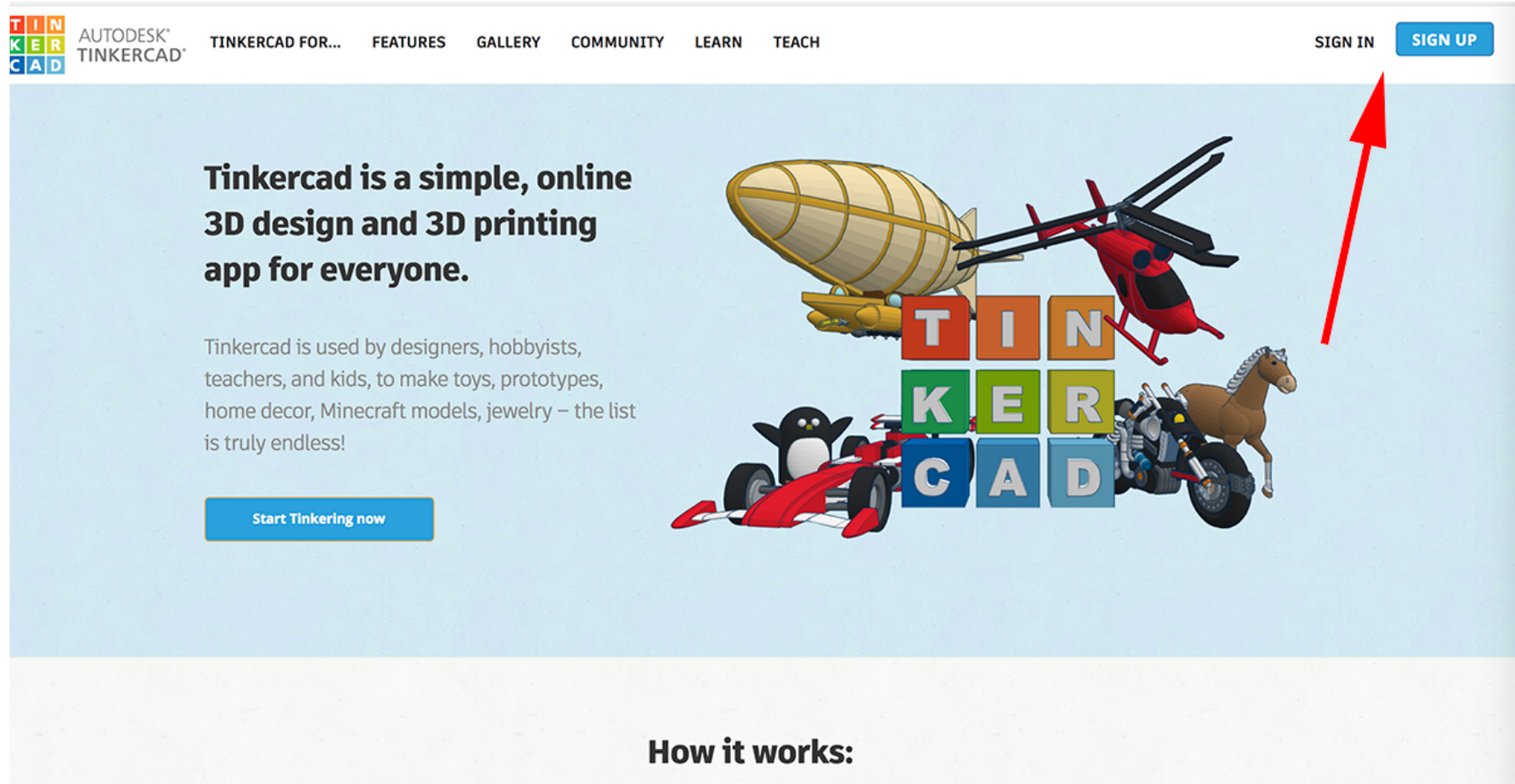
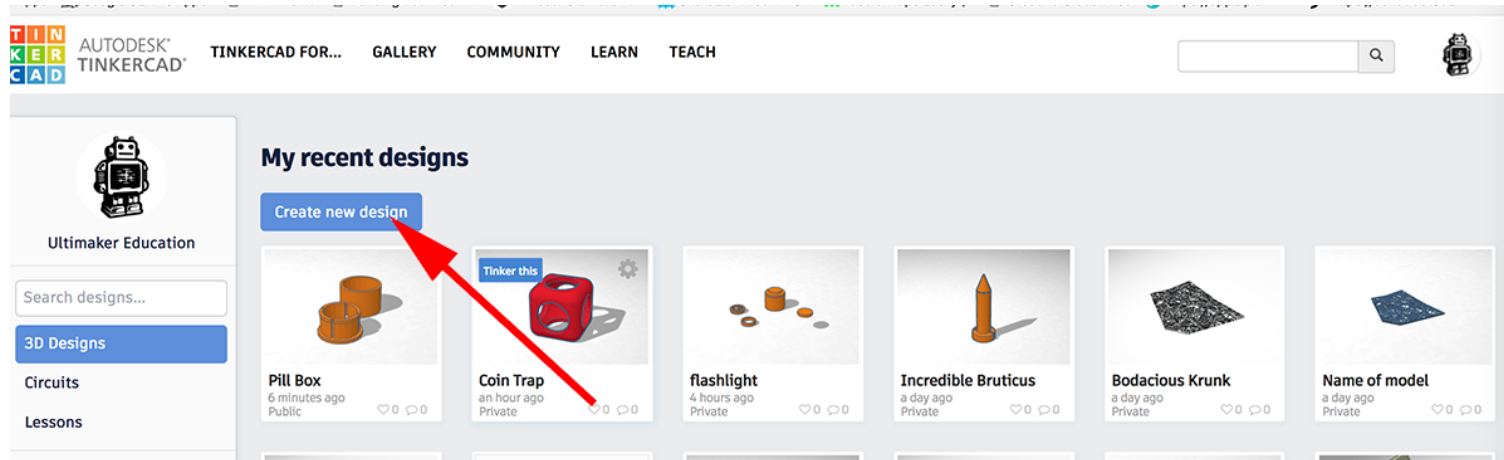


Tinkercad Flashlight Walkthrough

1. Open a webgl-enabled browser like Chrome or Safari. Navigate to <https://www.tinkercad.com>. Sign up or sign in:

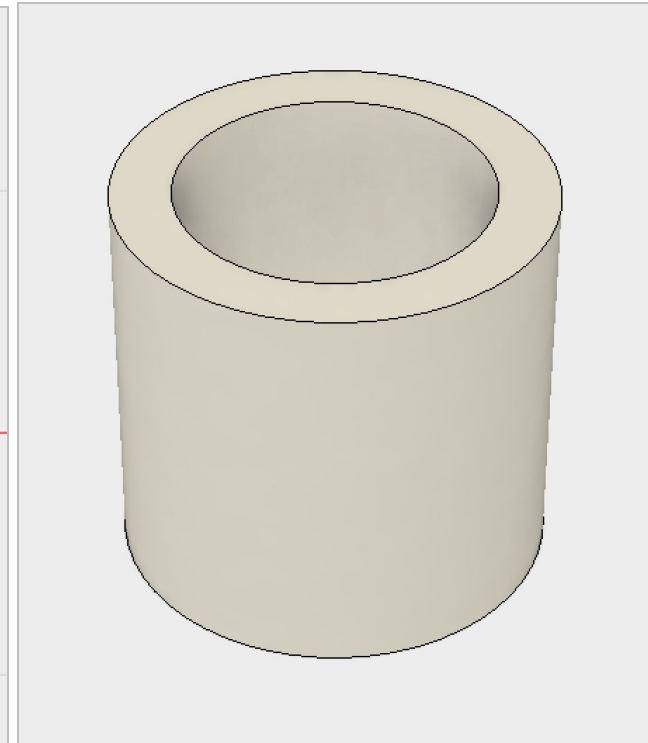
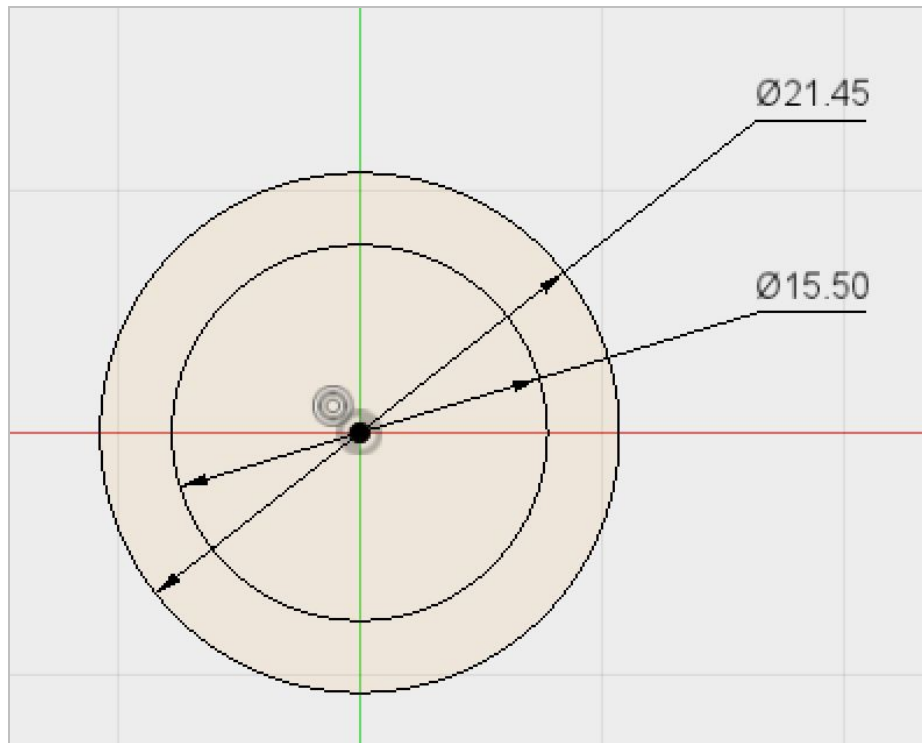


2. Create a new design:

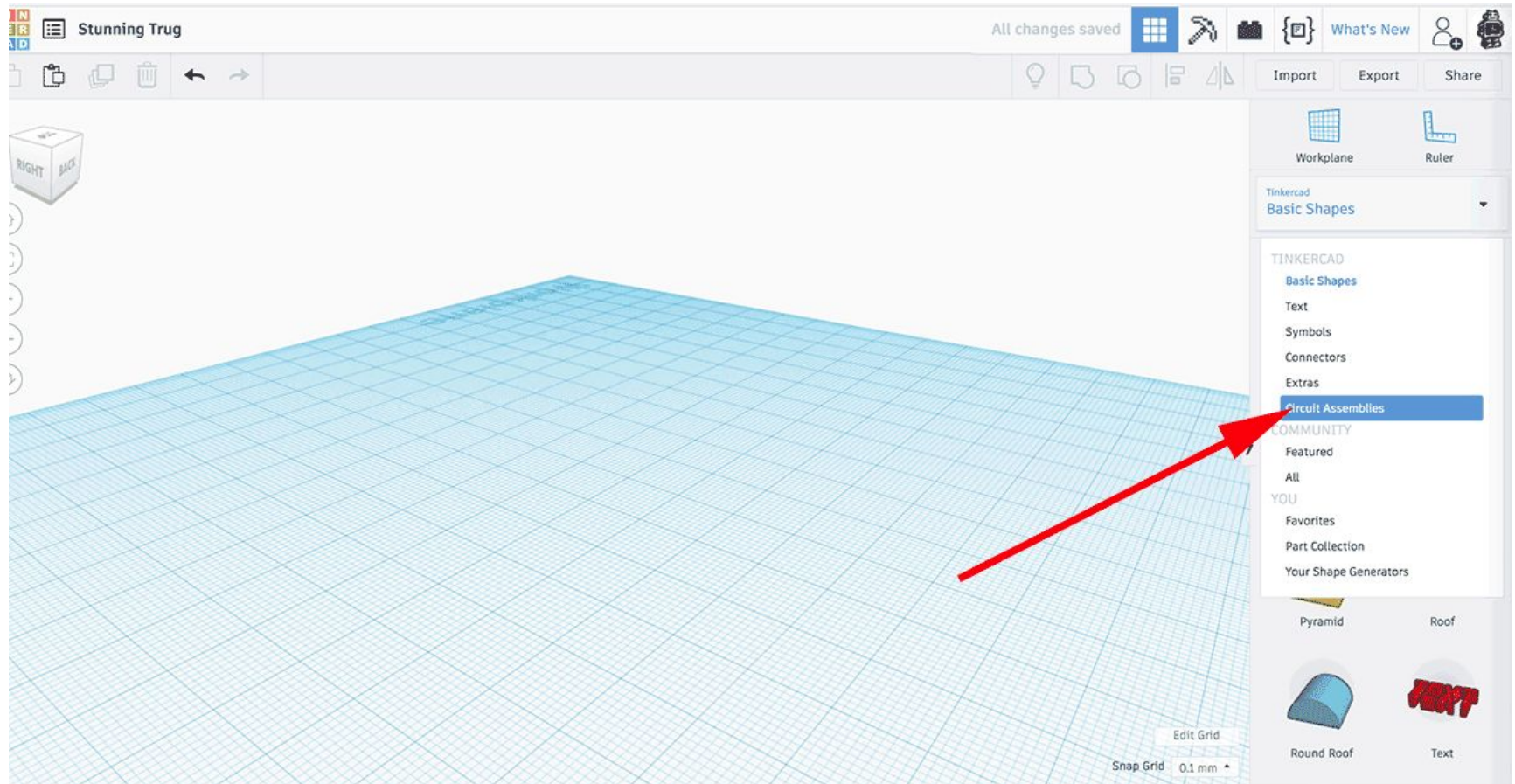


3. Things to keep in mind :

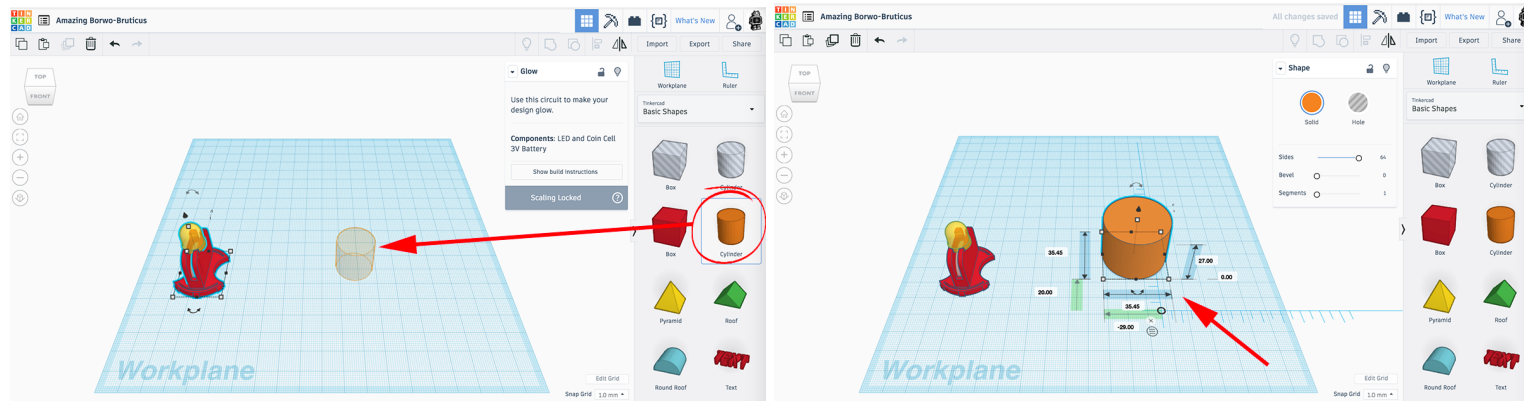
- The diameter of the PVC tube is 21.45 mm.
- To create a tight fit, make your hole smooth and set the diameter to 21.70 mm.
- The Tinkercad coin cell holder has a diameter of 32.25 mm. You don't want quite as tight a fit (you could break the print if you apply too much force), so make the hole smooth and give it a diameter of 32.60mm
- Make sure you smooth every shape.



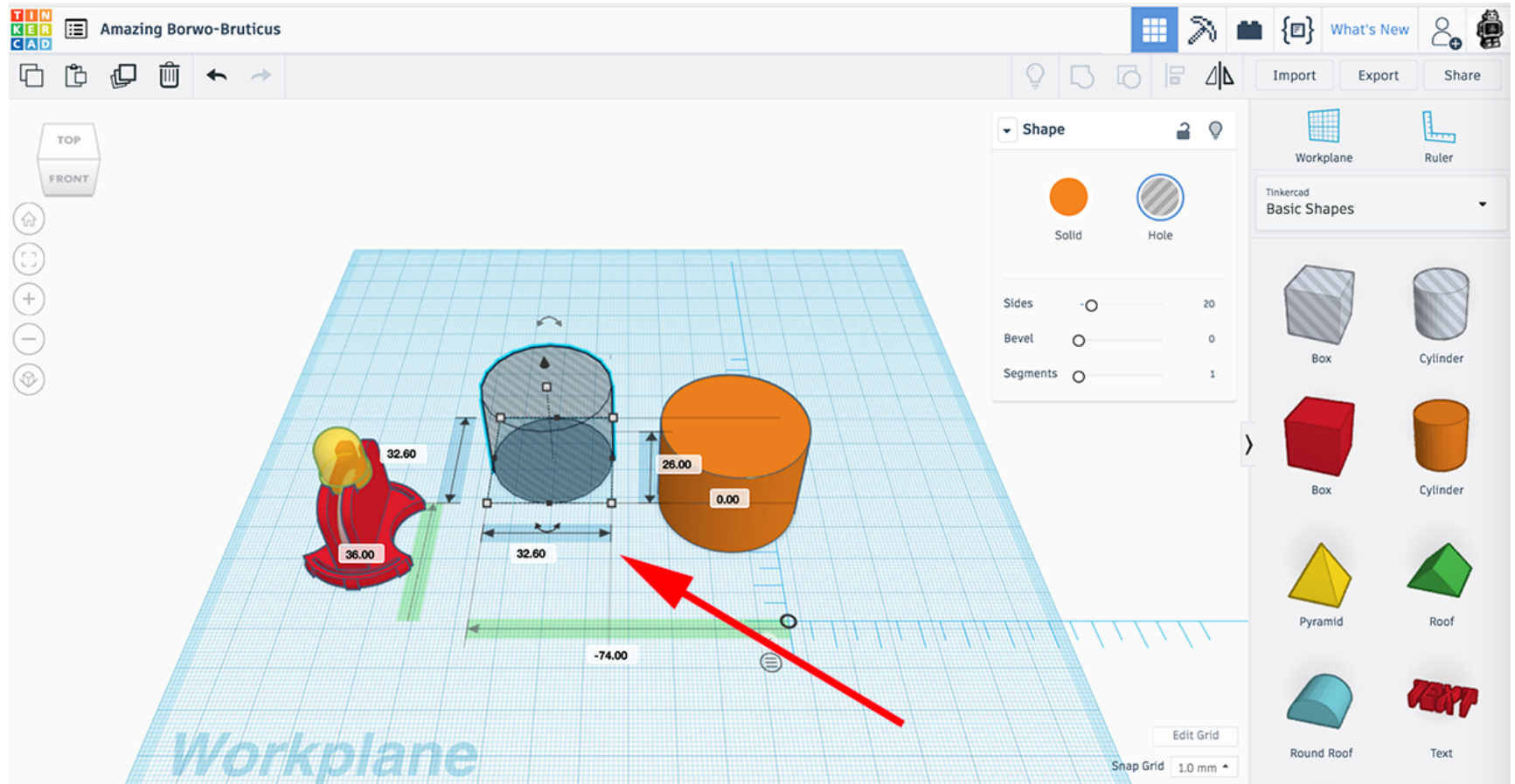
4. If you are pre printing the Tinkercad coin cell holders, skip this step, otherwise drag an instance of the Glow onto the workplane. Then reset the menu to Basic Shapes:



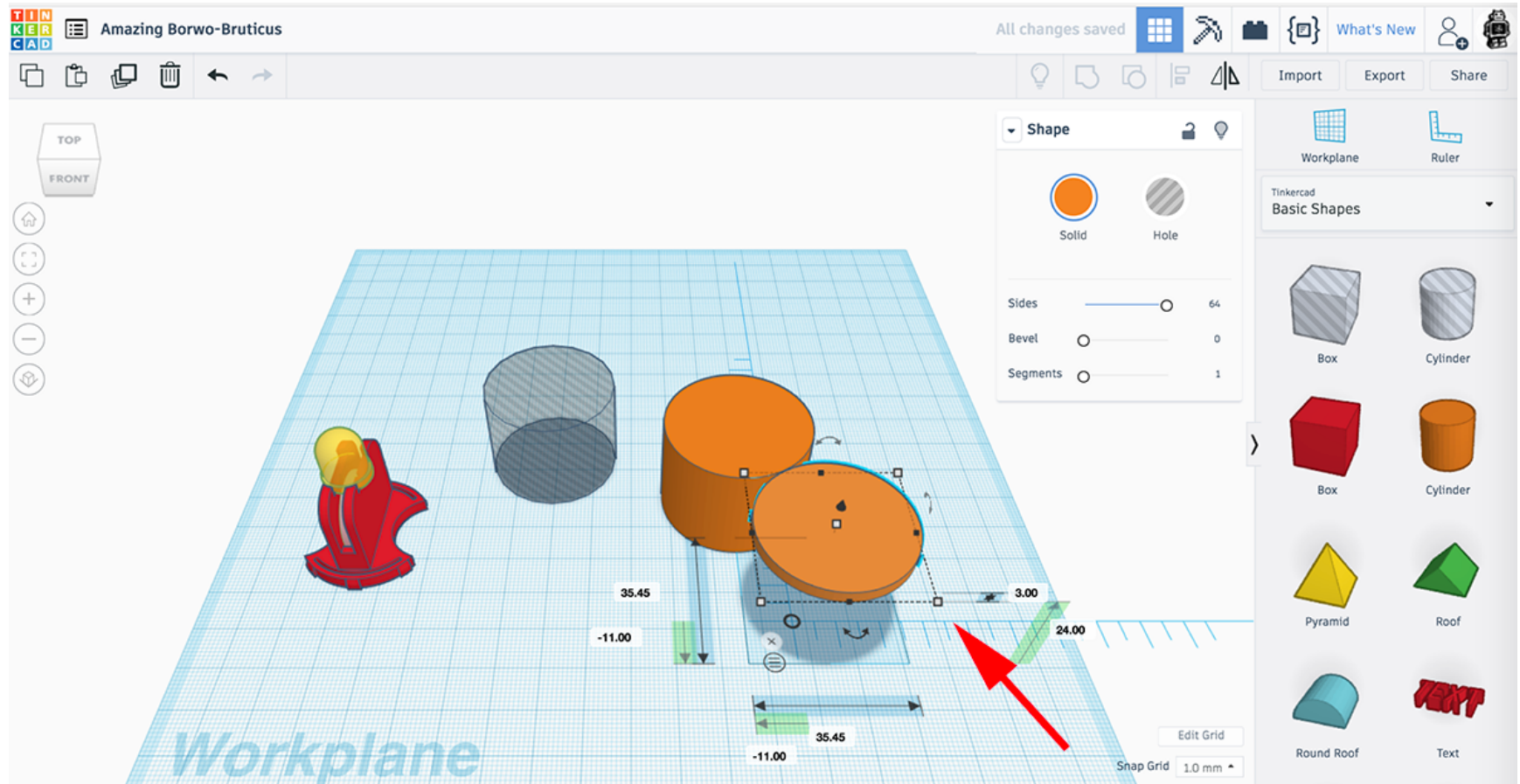
5. Create the base by creating 3 cylinders.
6. Make the first one: 35.45 mm x 35.45 mm x 27 mm. Make the cylinder smooth:



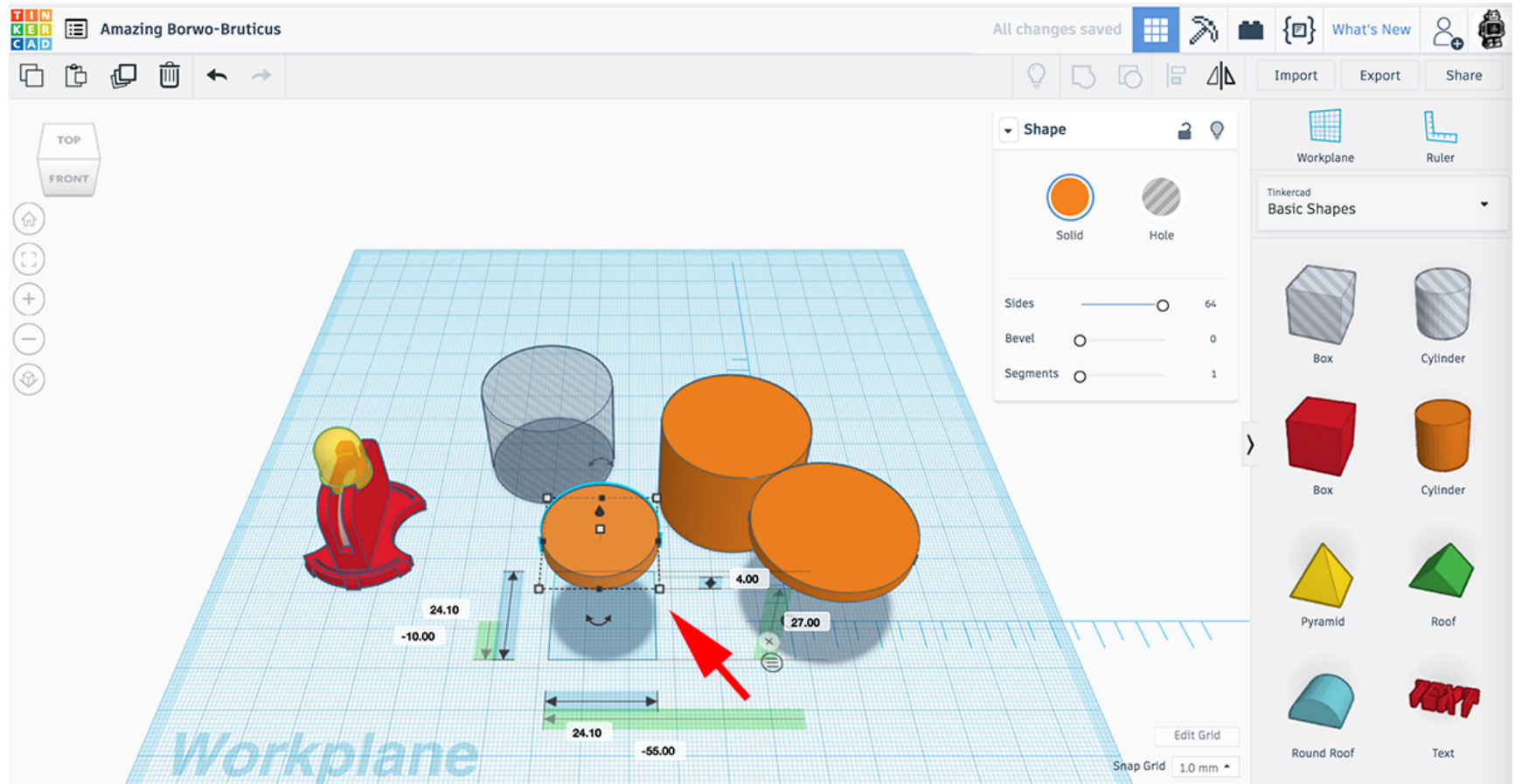
7. You want a wall thickness of 1.2mm so make the first hole 32.6 mm x 32.6 mm x 26 mm. Make the hole smooth:



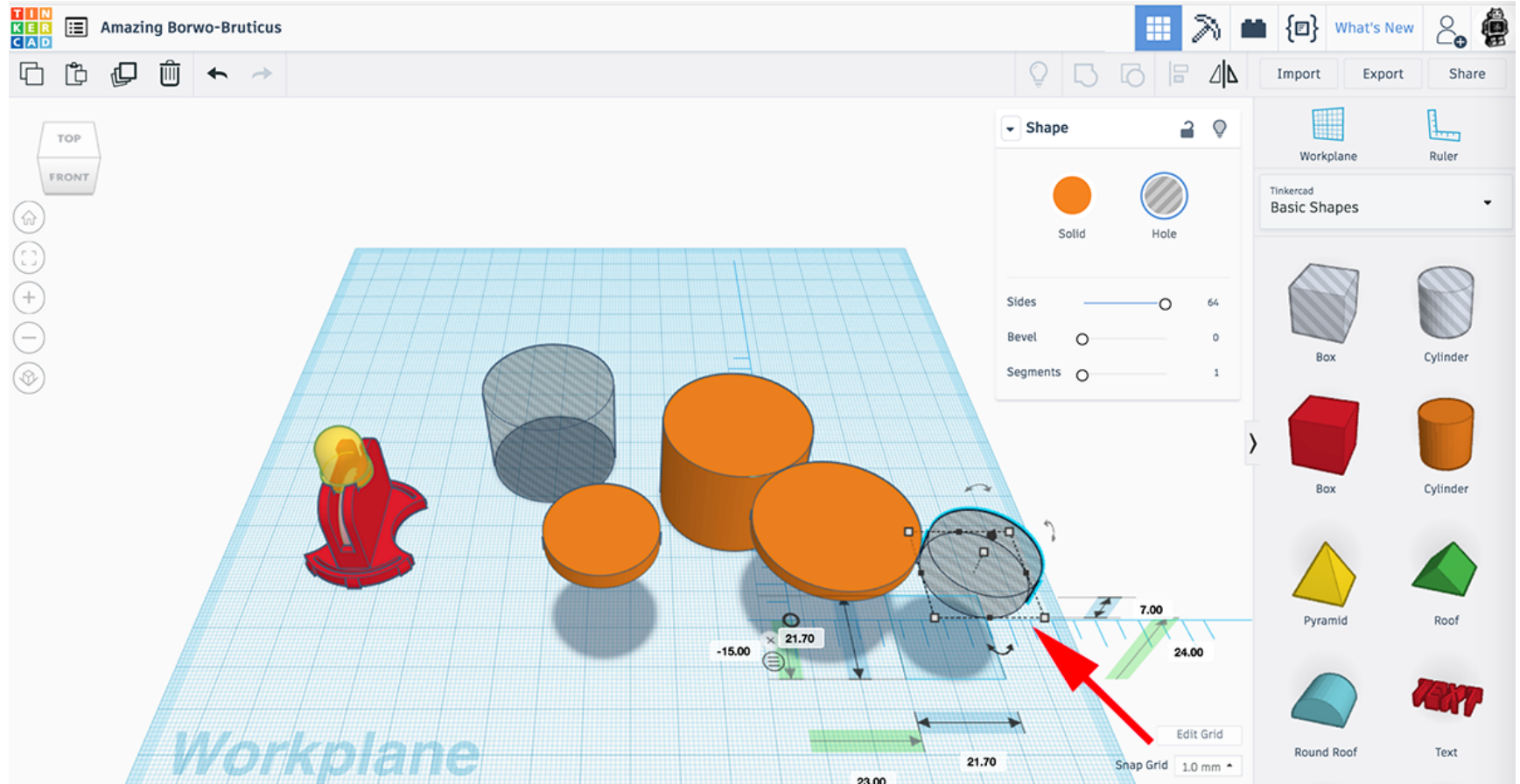
8. Drag an instance of a Cylinder onto the workplane and set it to 35.45 mm x 35.45 mm x 3 mm. Make the cylinder smooth. Raise this cylinder 24 mm up of the workplane:



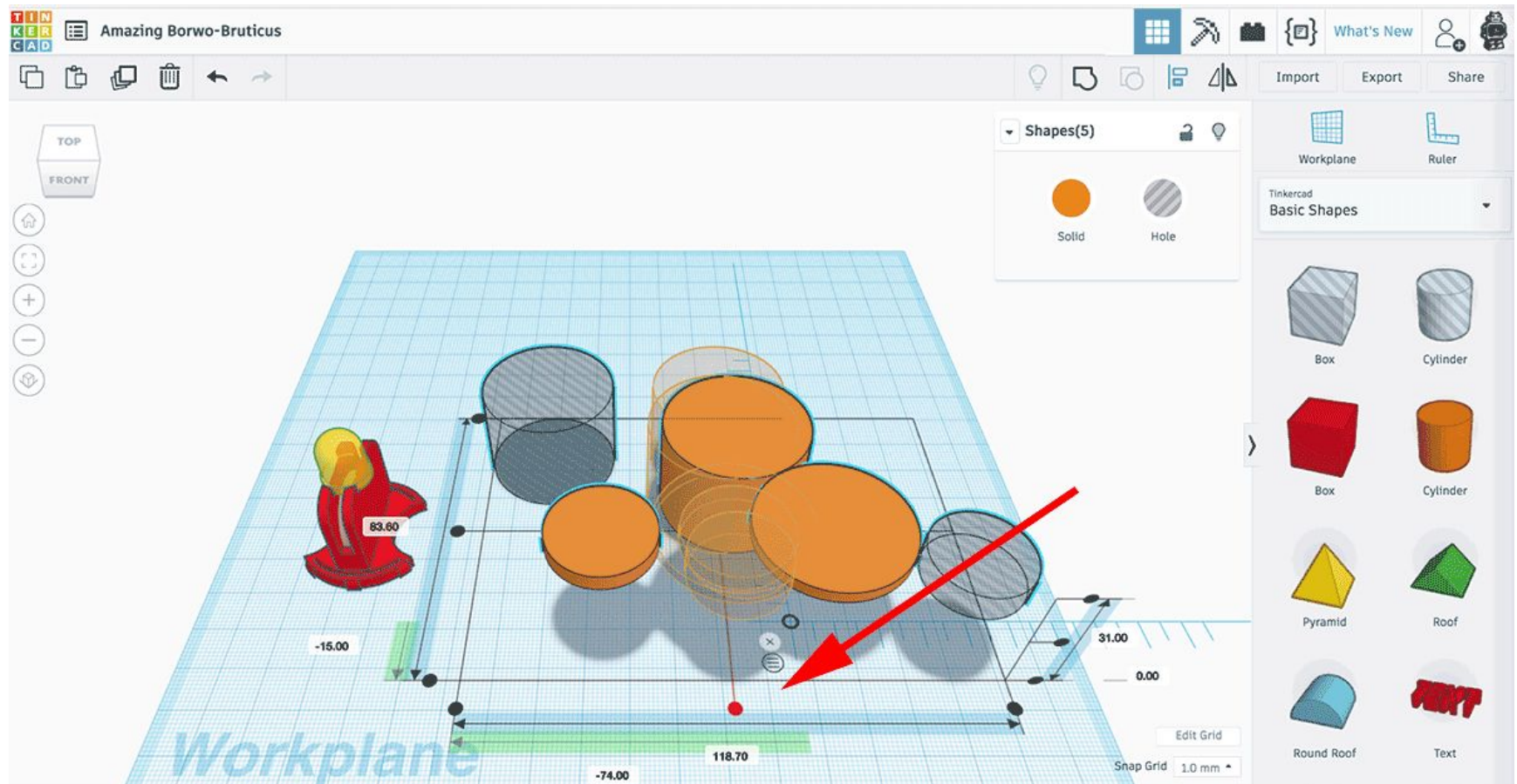
- Drag an instance of a Cylinder onto the workplane and set it to 24.1 mm x 24.1 mm x 4 mm. Make it smooth. Move it up 27 mm:



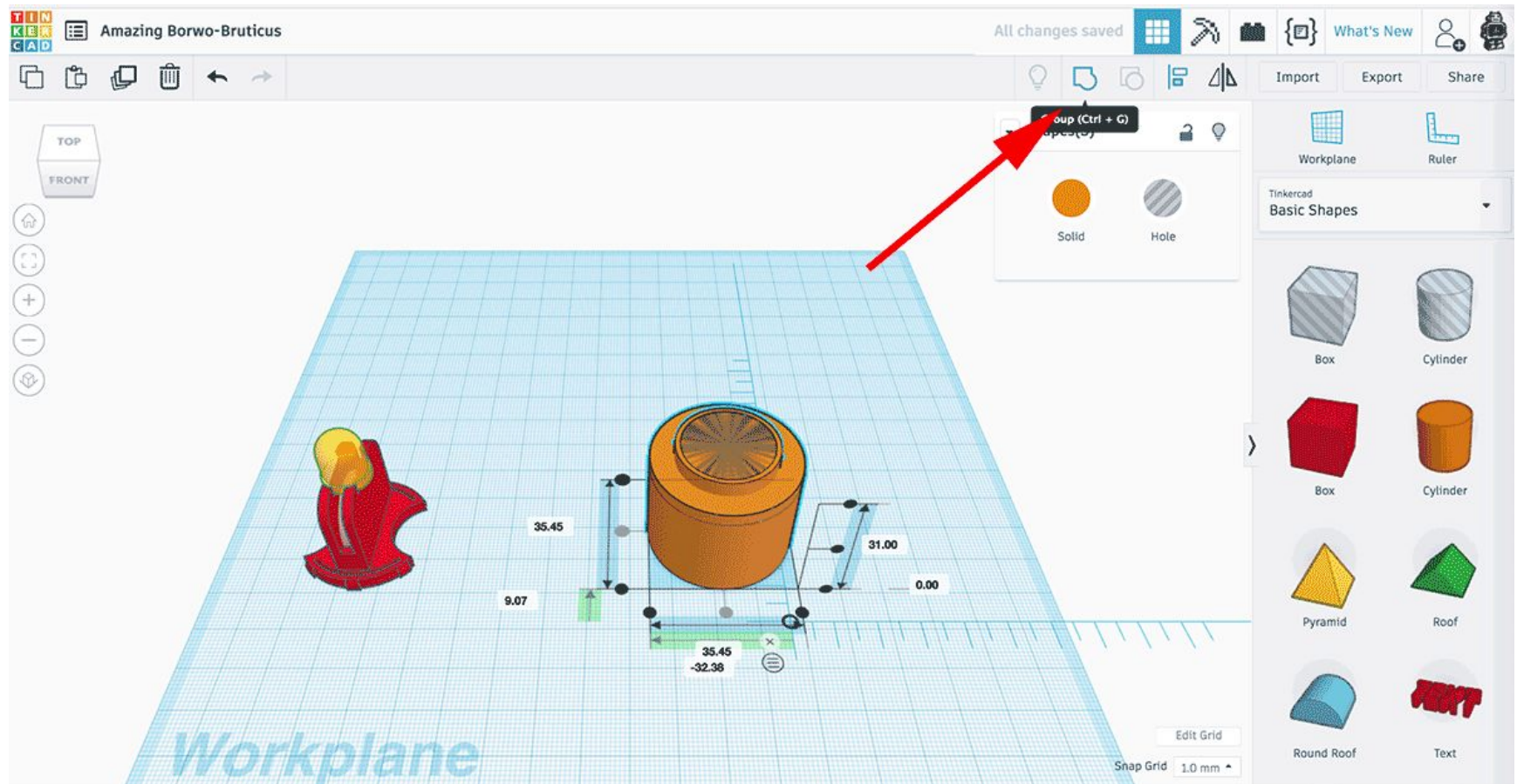
- Drag an instance of a Cylinder Hole and make it 21.7 mm x 21.7 mm x 7 mm, make it smooth, and raise it up 24 mm:



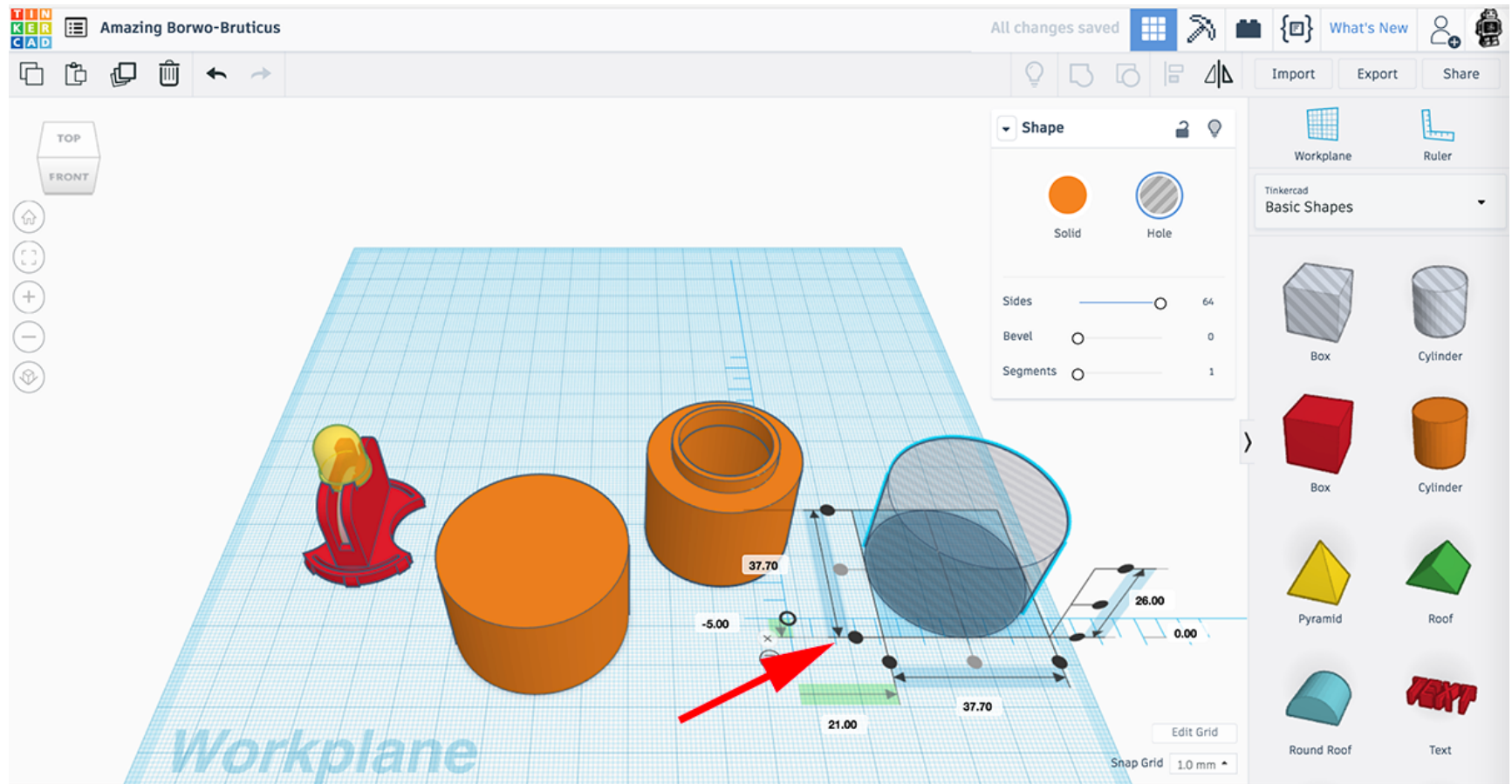
11. Align all the cylinders:



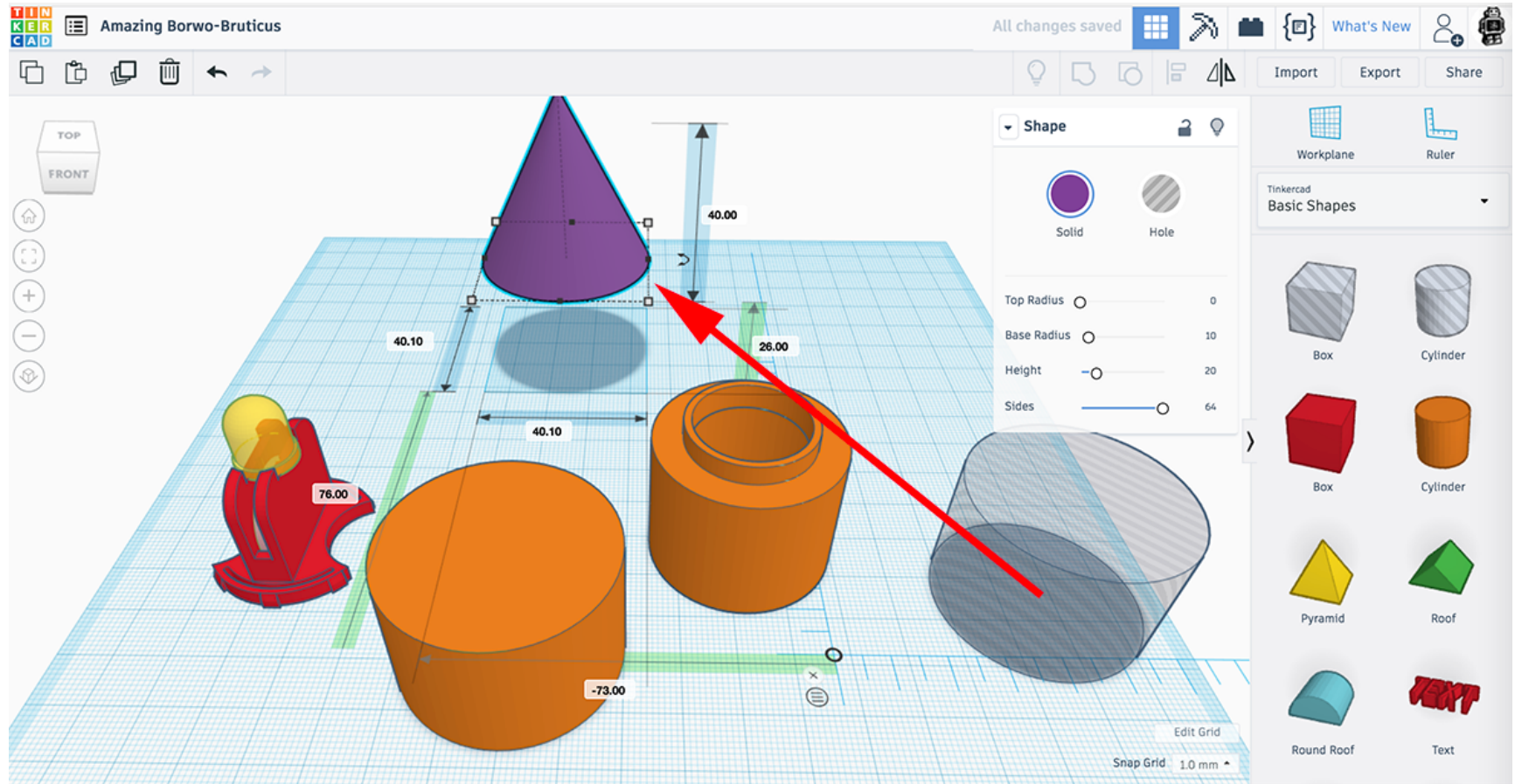
12. Group all the cylinders:



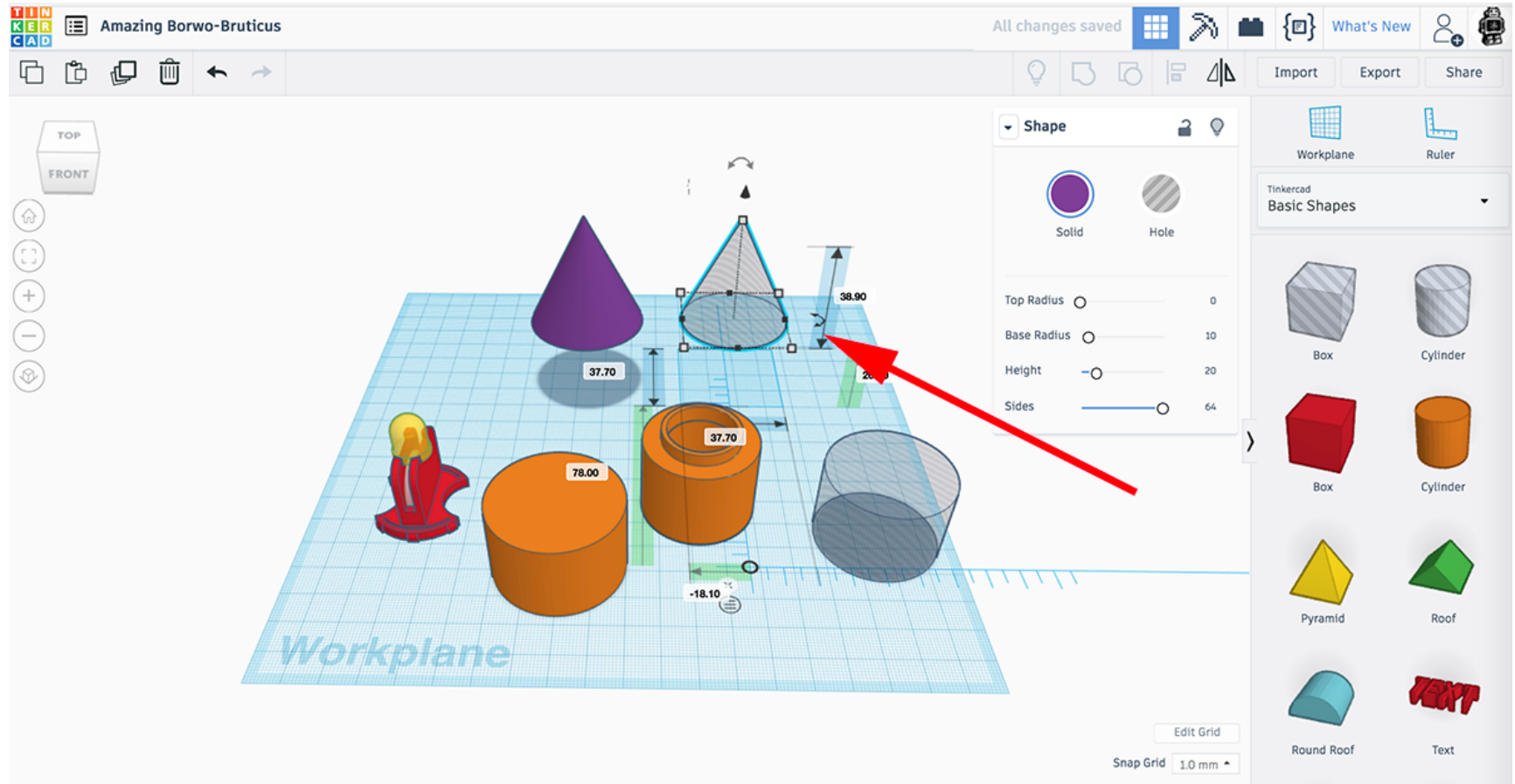
13. Create a top piece.
14. Drag an instance of the Cylinder to the workplane. Set the dimensions to 40.1 mm 40.1 mm x 26 mm cylinder. Make it smooth. Then drag an instance of the Cylinder Hole to the workplane. Set the dimensions to 37.7 mm x 37.7 mm x 26 mm. Make it smooth:



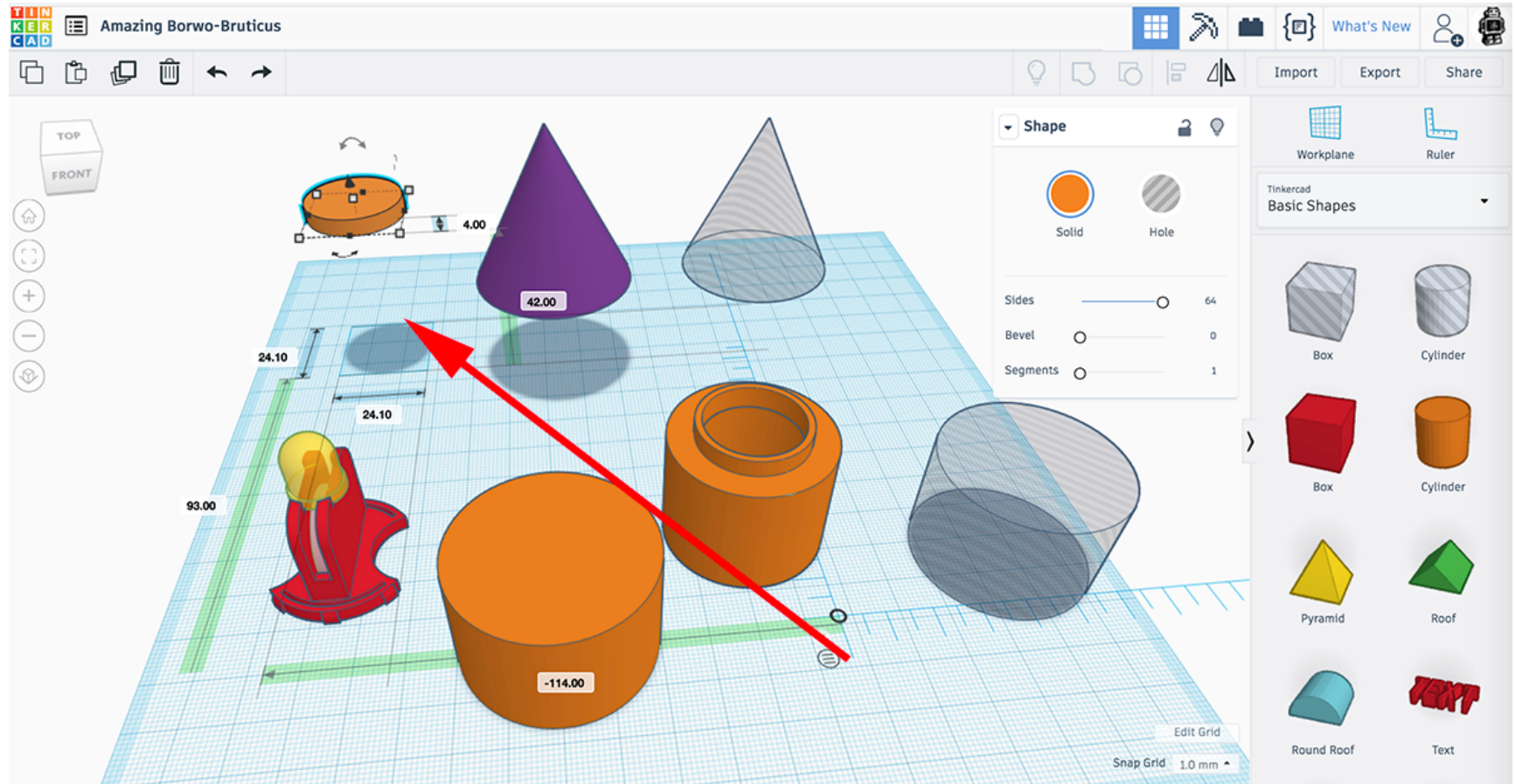
- Drag an instance of the Cone to the workplane. Set the dimensions to 40.10 mm 40.10 mm x 40 mm cone: Make it smooth by increasing sides. Raise it up 26 mm:



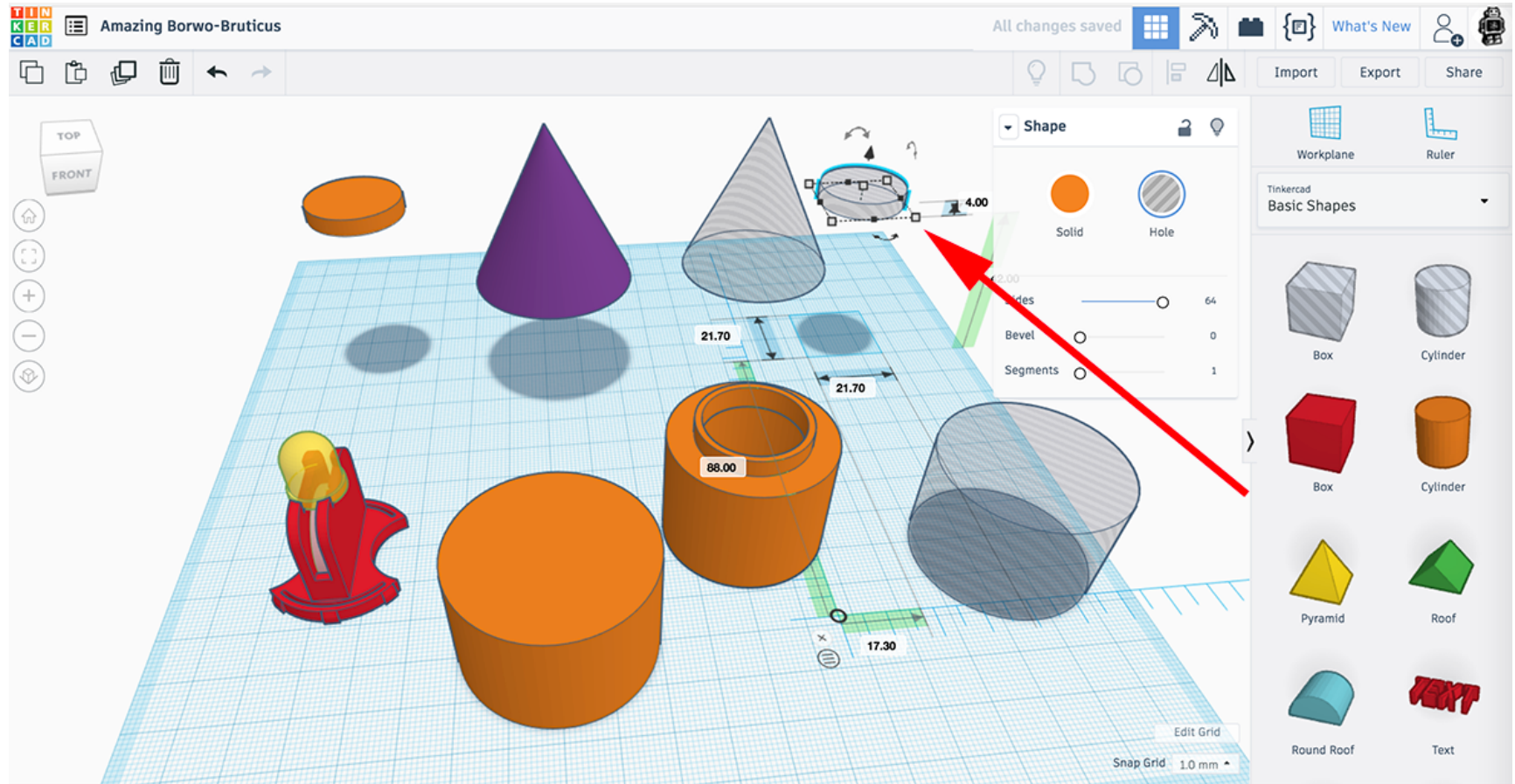
16. Make a copy of the cone and set the dimensions to 37.7 mm x 37.7 mm x 38.9 mm. Convert it to a hole:



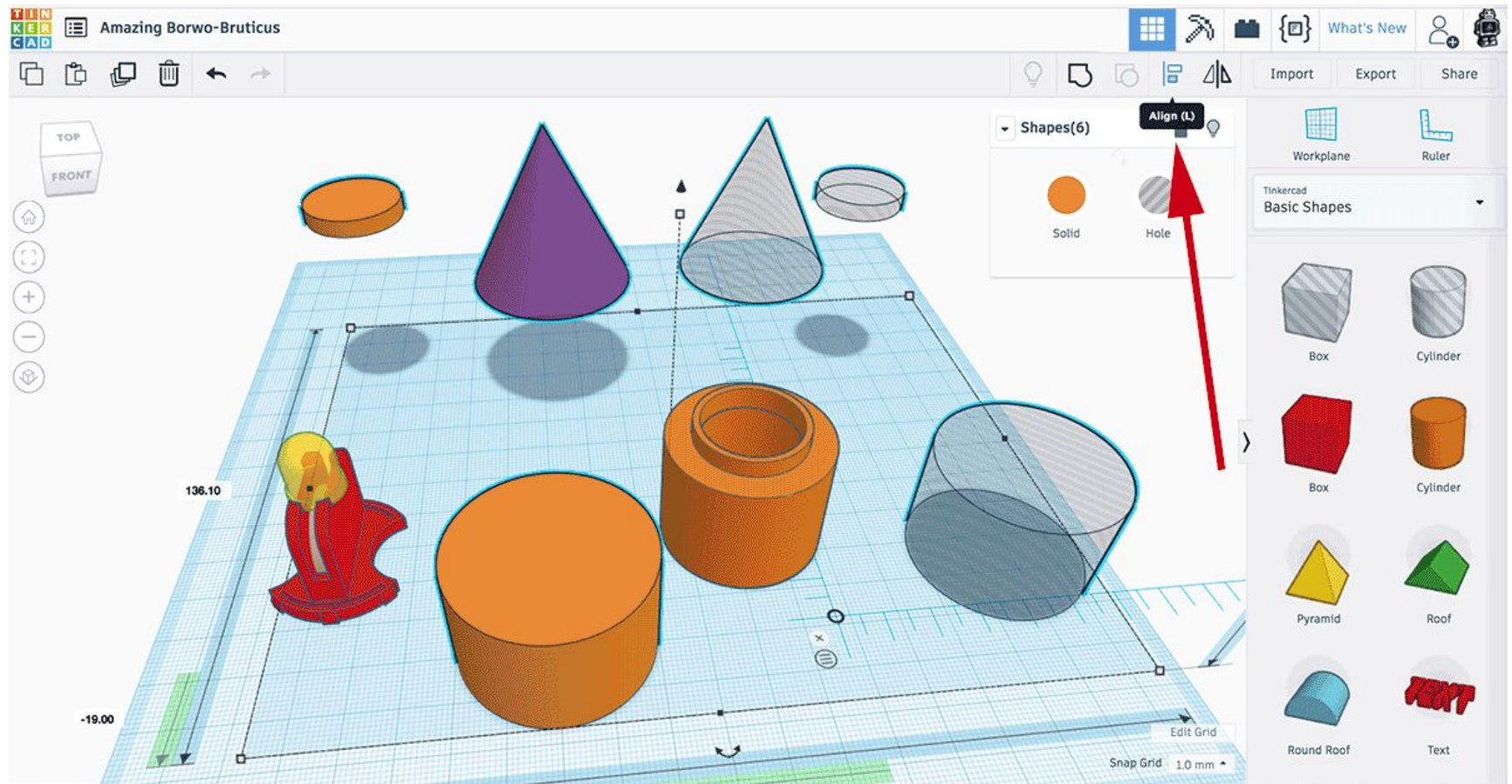
17. Drag an instance of the Cylinder to the workplane. Set the dimension to 24.1 mm x 24.1 mm x 4 mm. Make it smooth and raise it up 42mm:



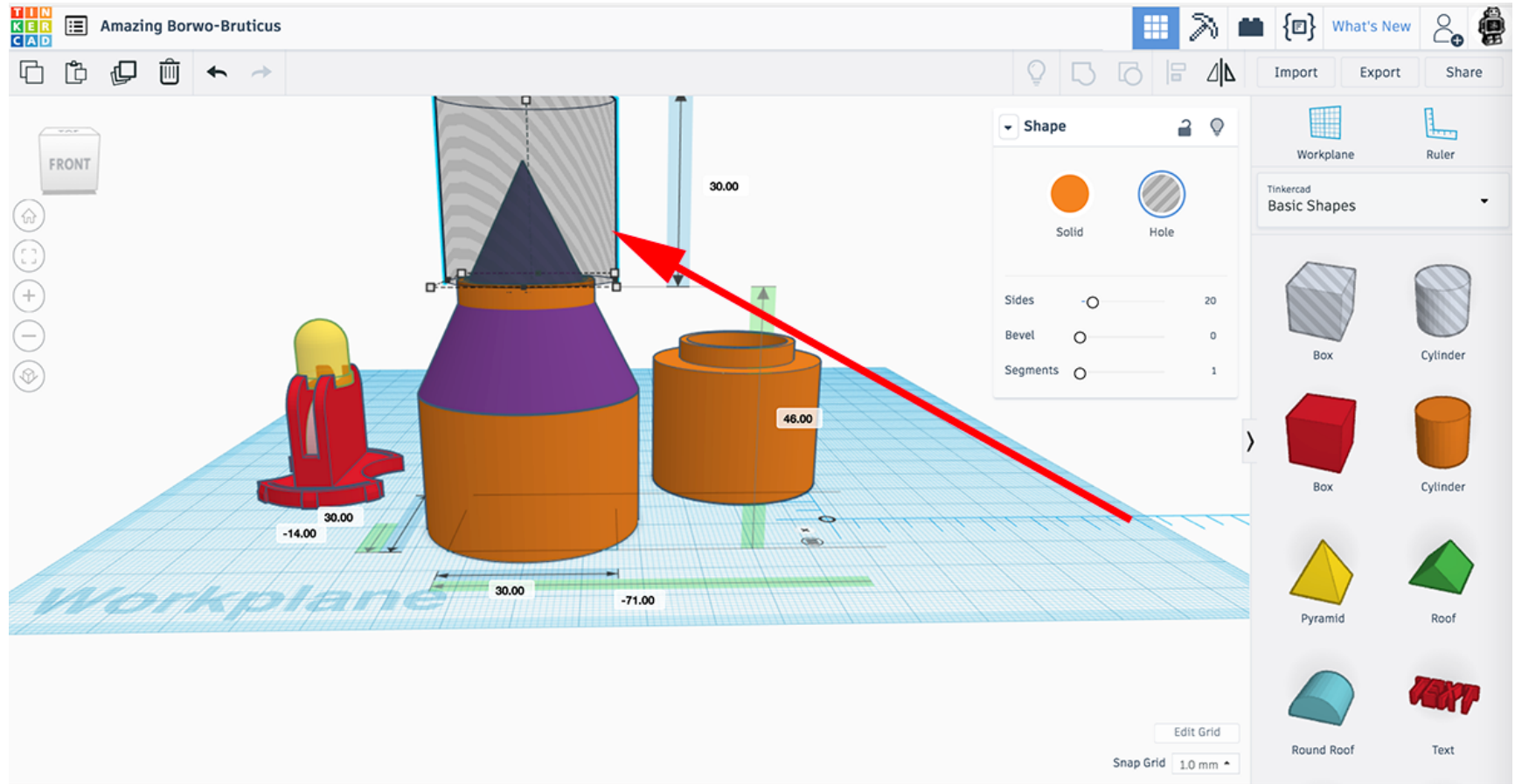
18. Drag an instance of the Cylinder Hole to the workplane. Set the dimension to 21.70 mm x 21.70 mm x 4mm. Make it smooth and raise it up 42 mm:



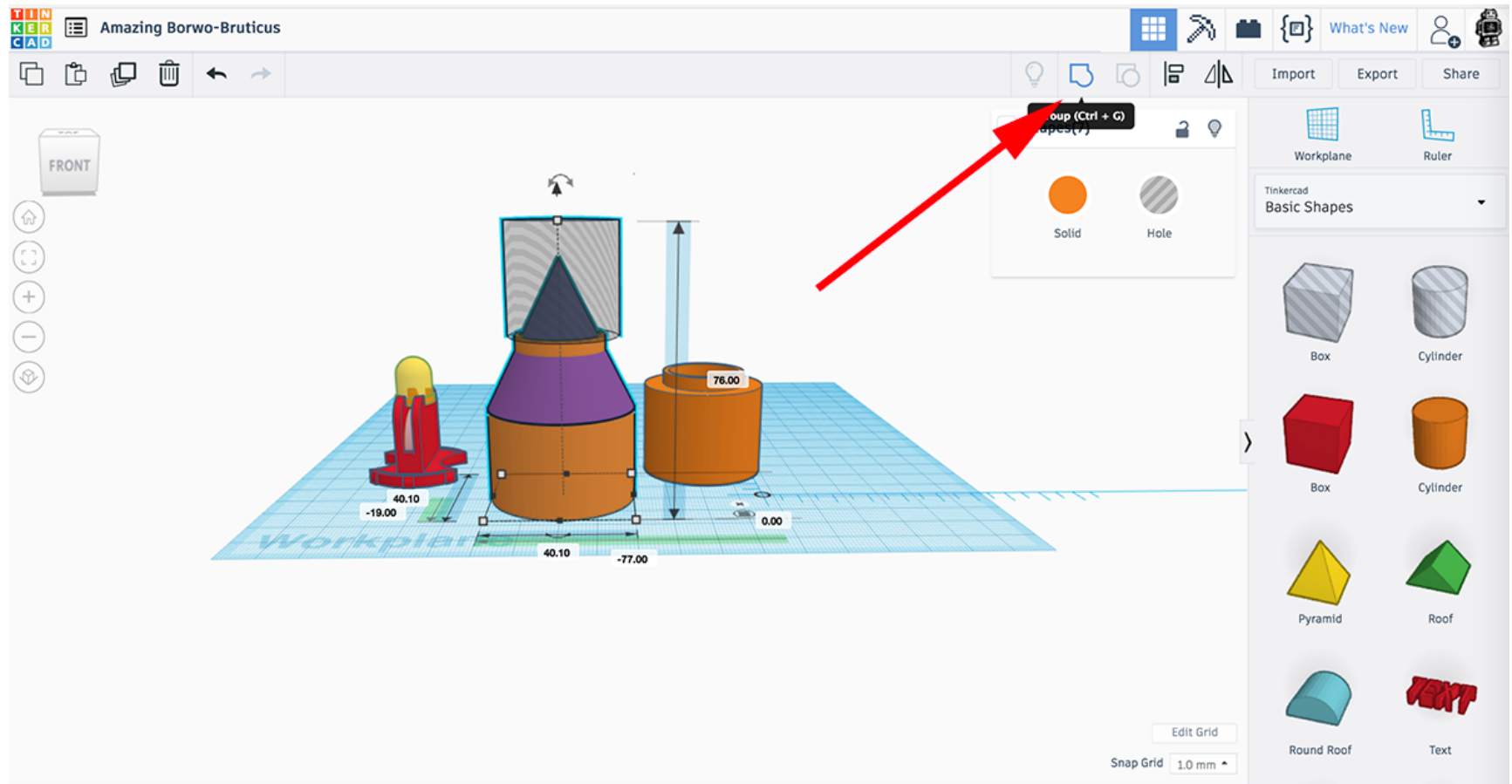
19. Align the objects:



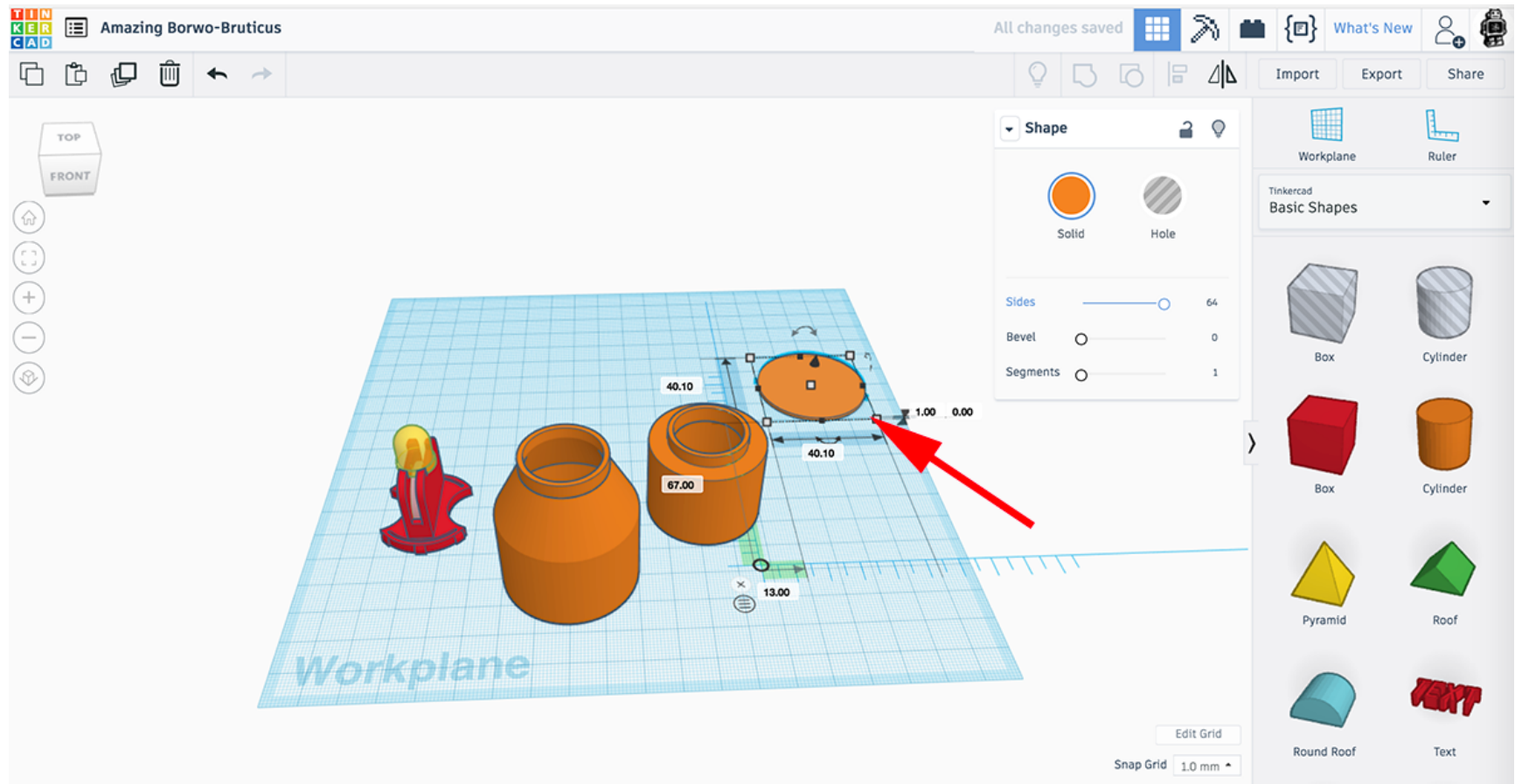
20. Drag an instance of a Cylinder Hole on to the workplane. Make it 30 mm x 30 mm x 30 mm and raise it 46 mm. Align it so that it would delete the top of the cone:



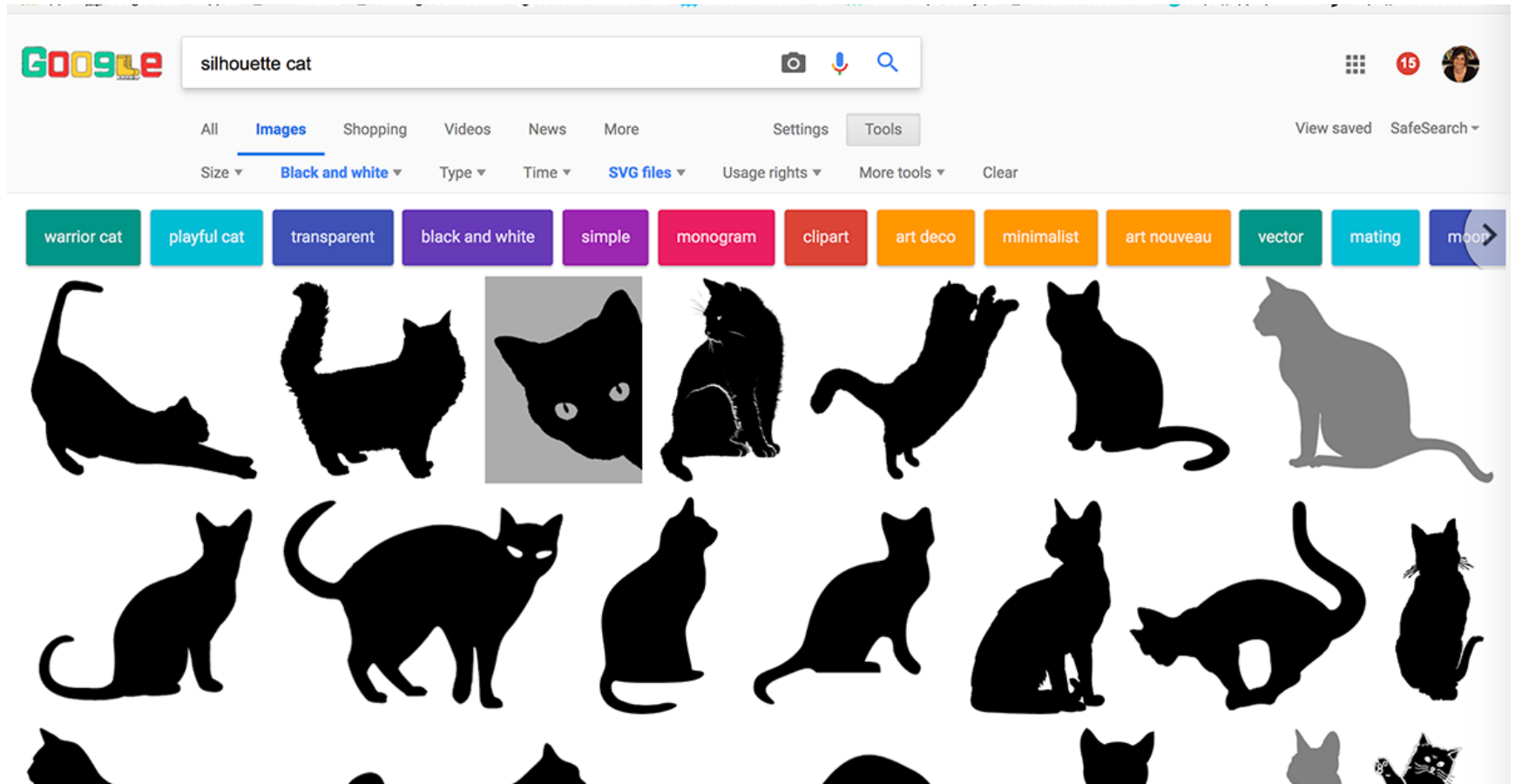
21. Group these objects together:



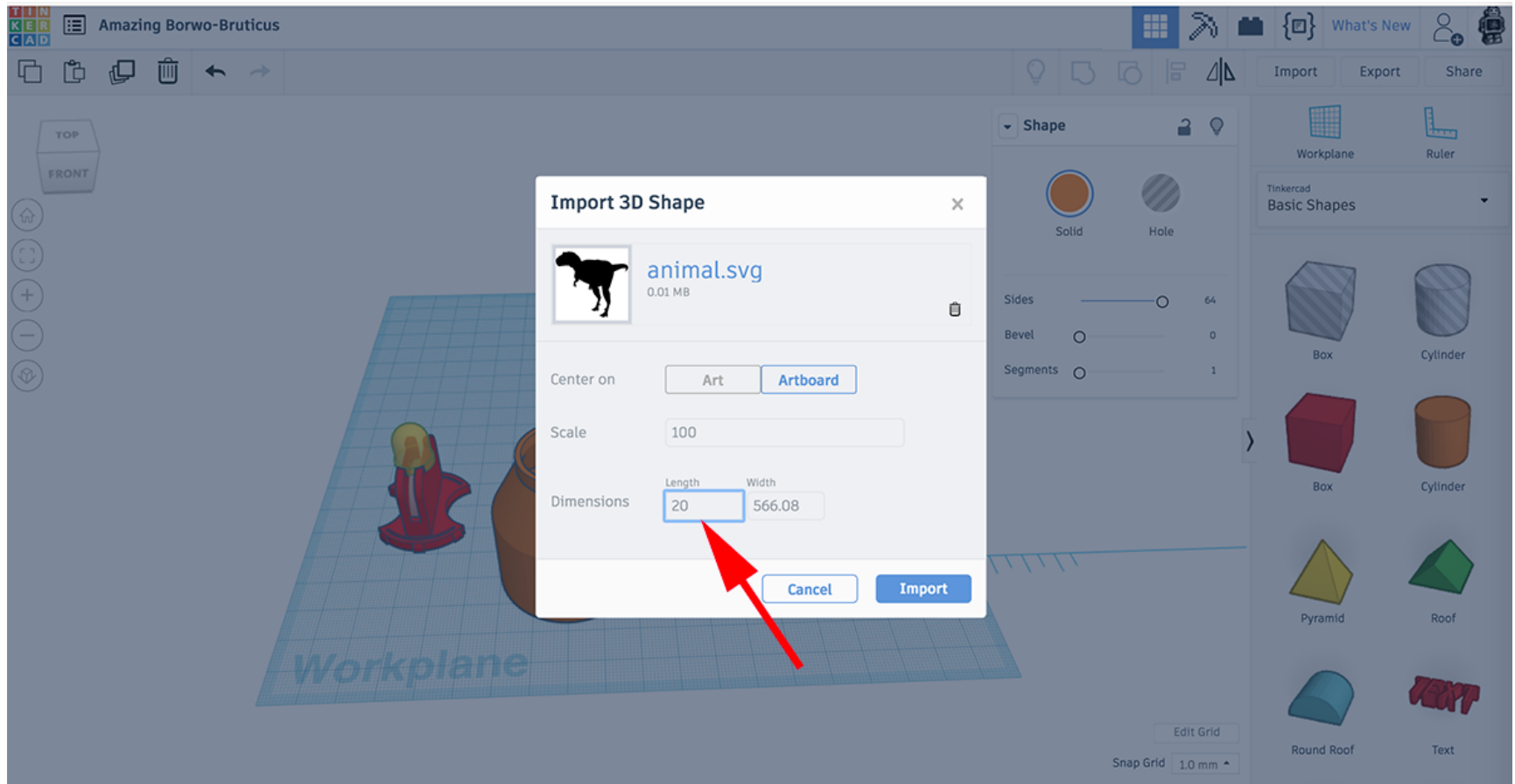
22. Create image discs to create shadow images on the wall.
23. Drag an instance of a Cylinder on to the workplane and set the dimensions to 40.1 mm x 40.1 mm x 1 mm. Make it smooth:



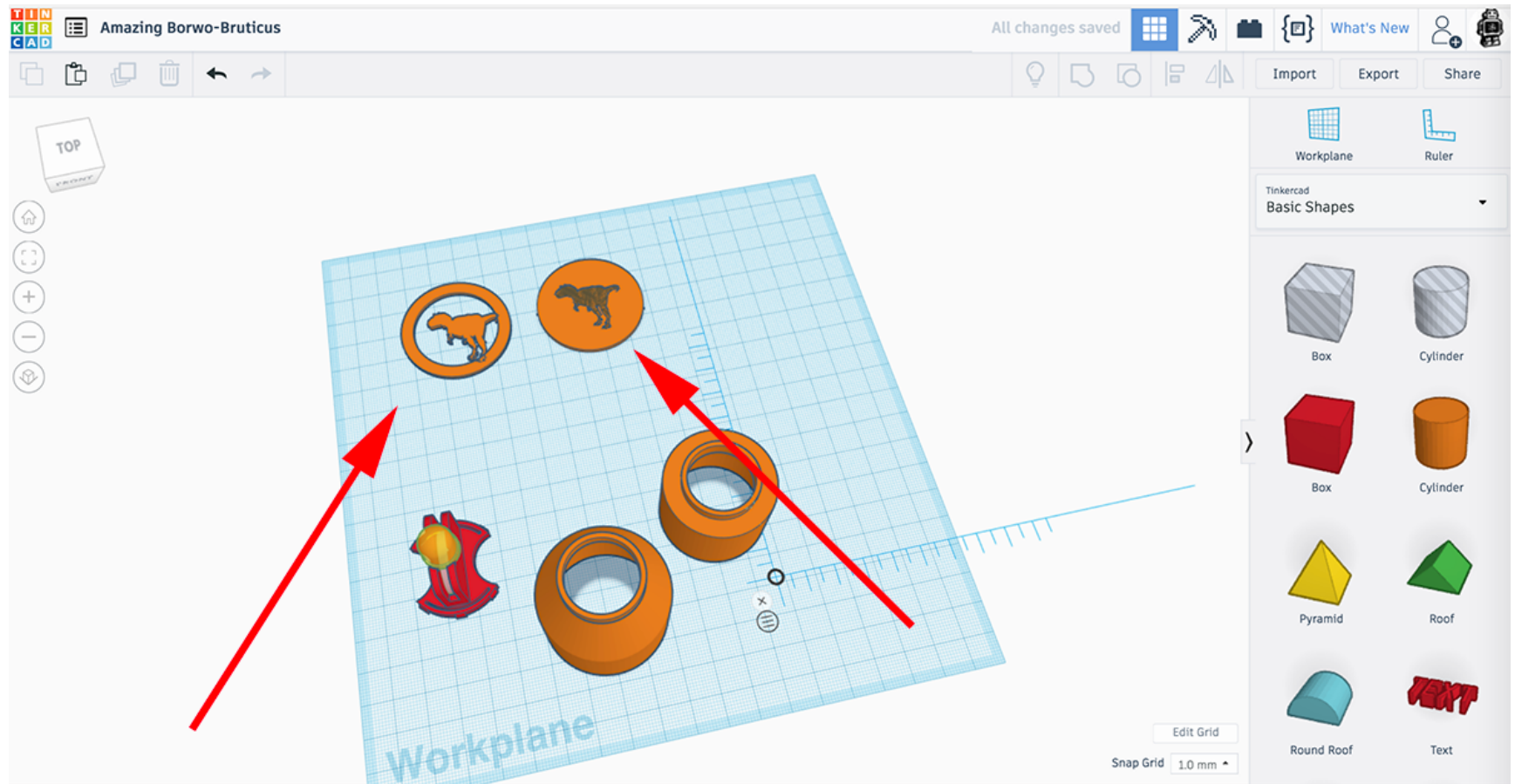
24. Find an SVG [online](#) or create your own. Save on your computer.



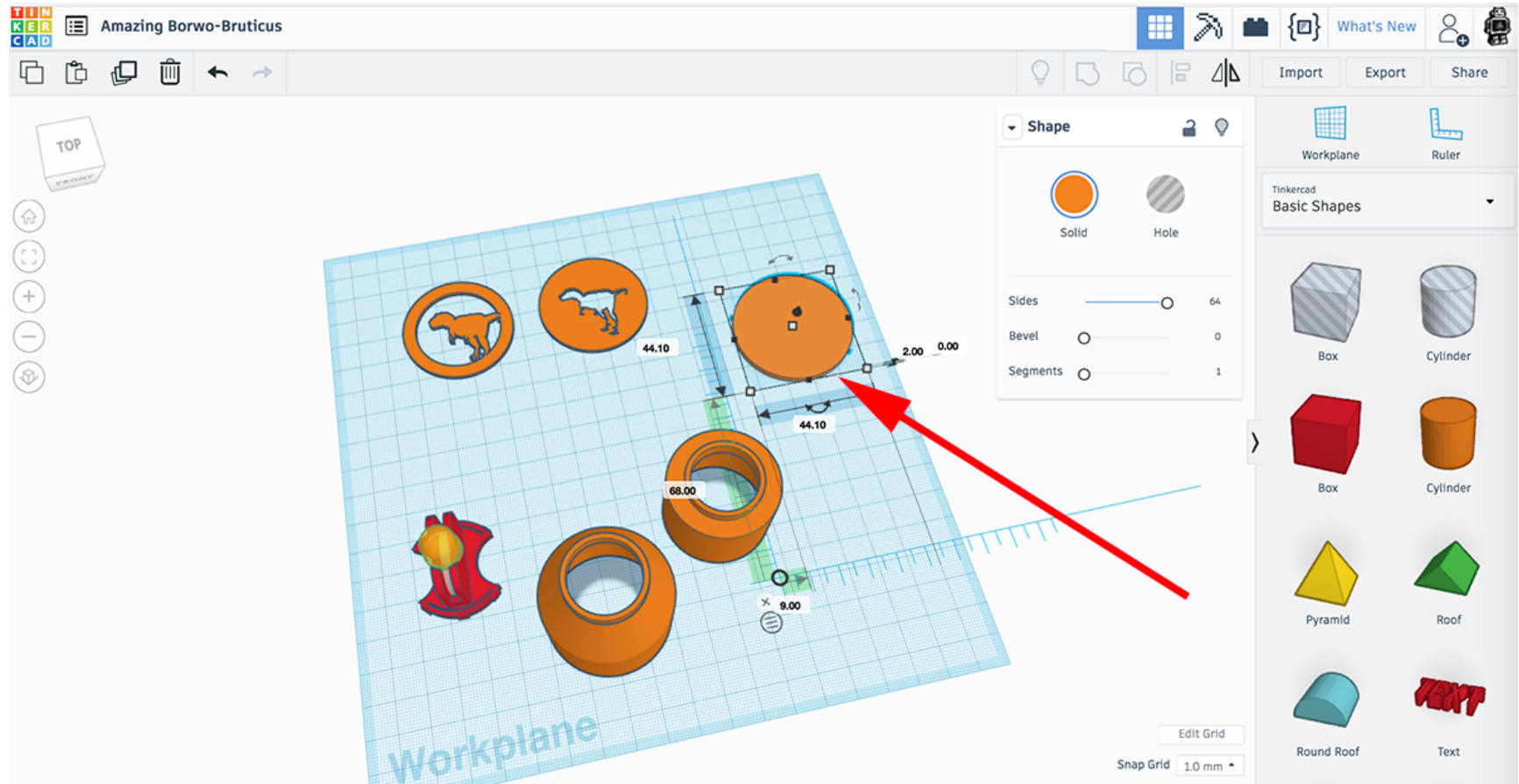
25. In Tinkercad click on the import button and set the width to 20 mm.



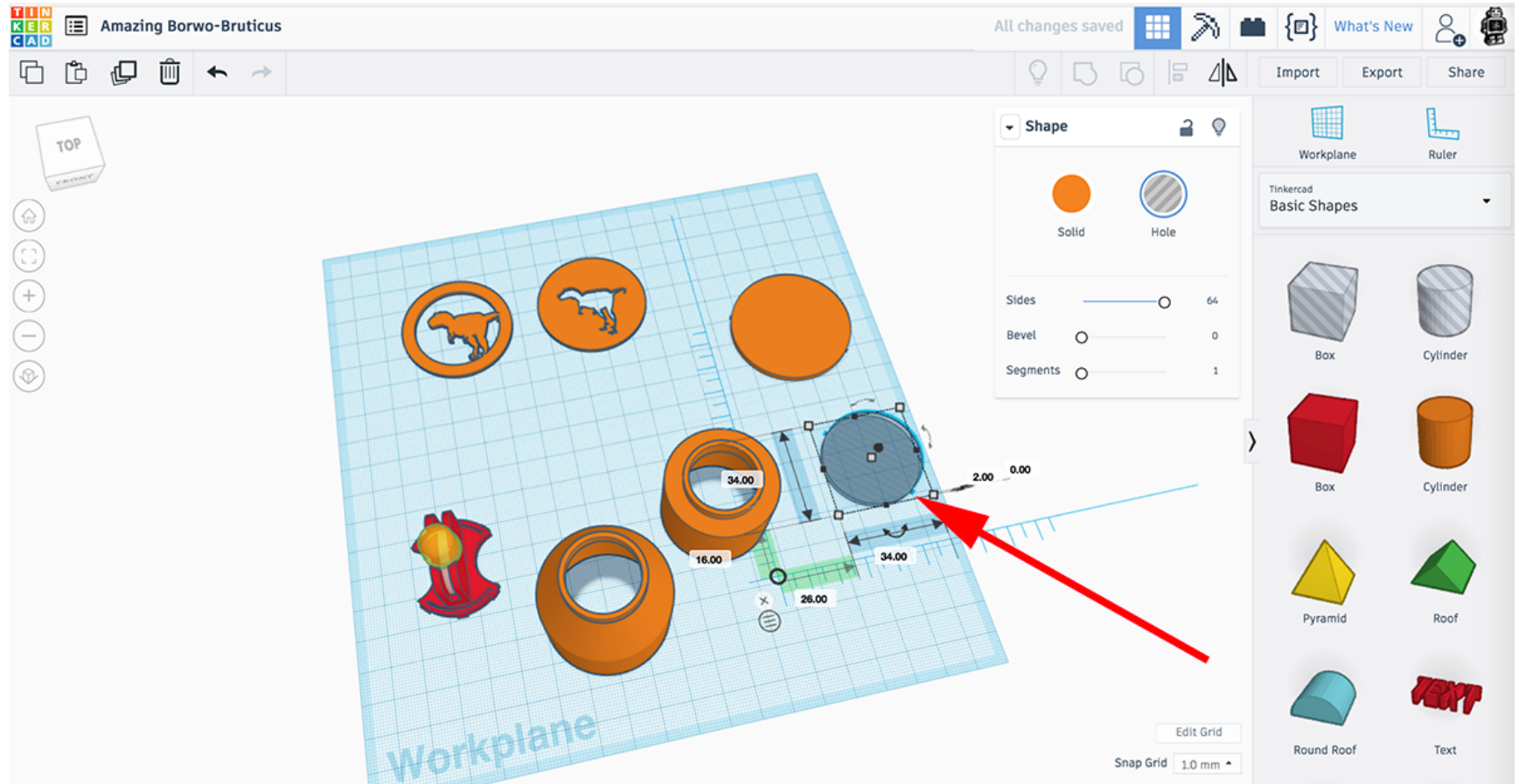
26. Use your object as hole or a positive and create a few discs that are no higher than 1 mm.



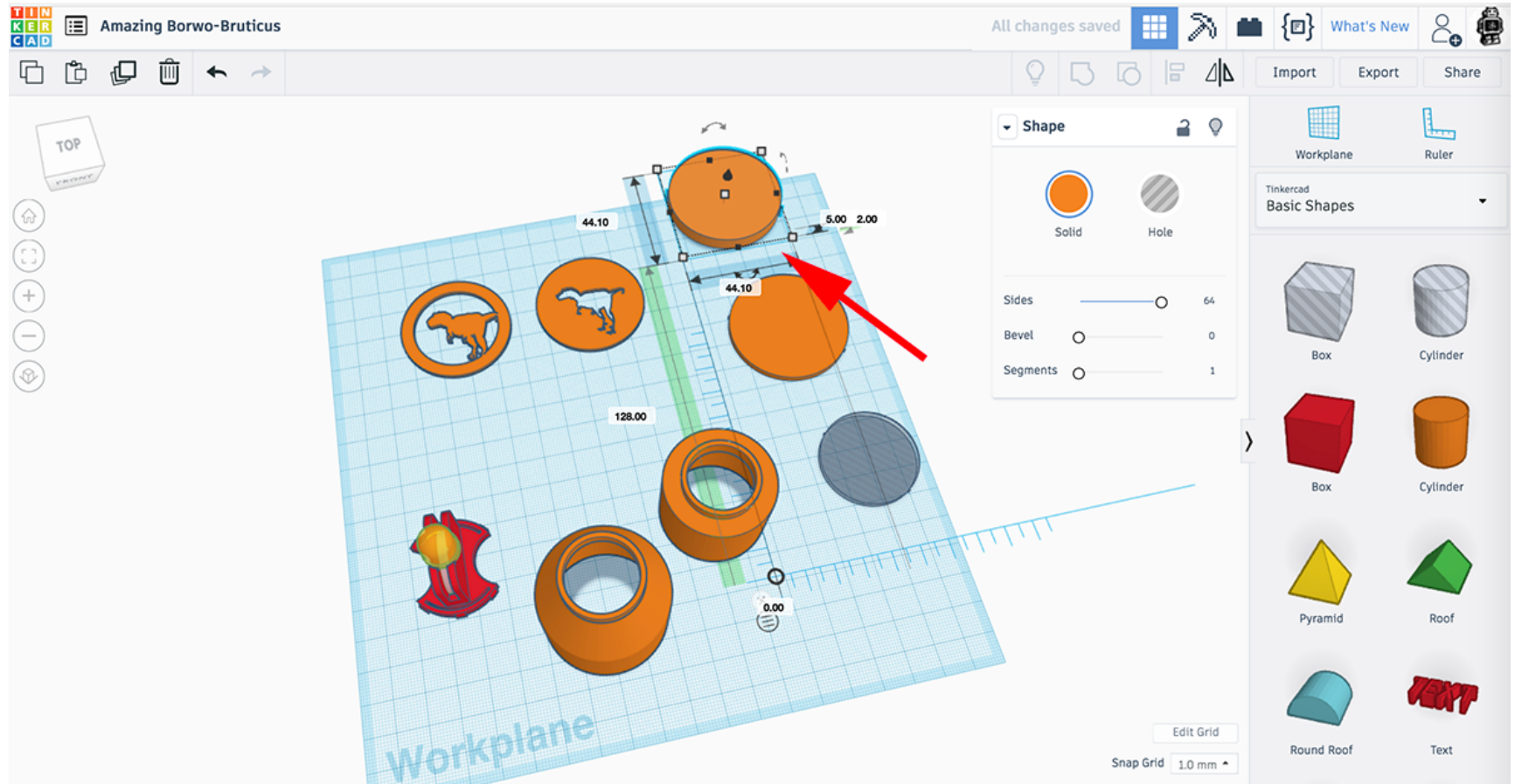
27. Now you need to create a cap to hold the disc in place. Drag an instance of a Cylinder on to the workplane and set the dimensions to 44.10 mm x 44.10 mm x 2 mm cylinder. Make it smooth:



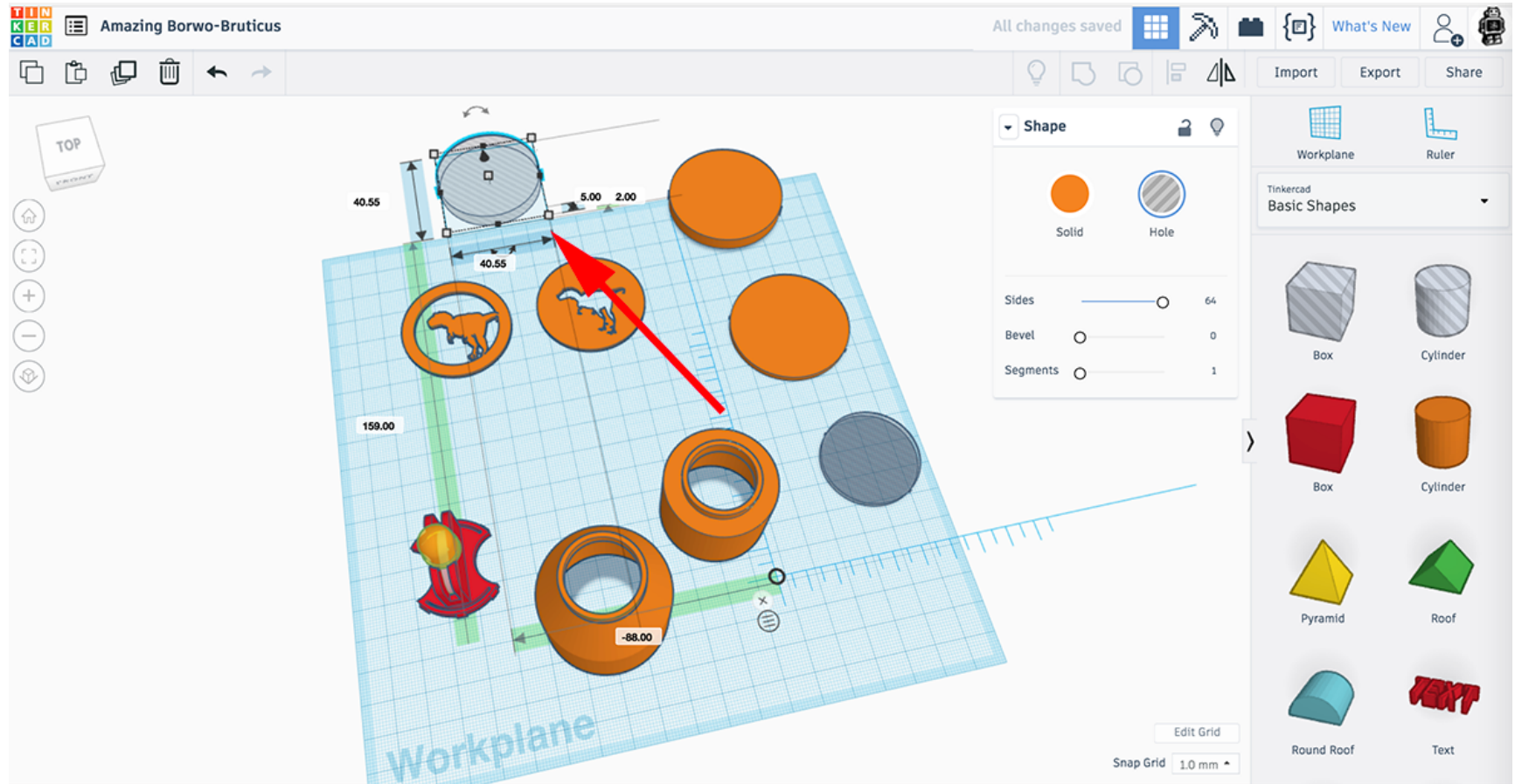
28. Drag an instance of a Cylinder Hole on to the workplane and set the dimensions to 34 mm x 34 mm x 2 mm. Make it smooth:



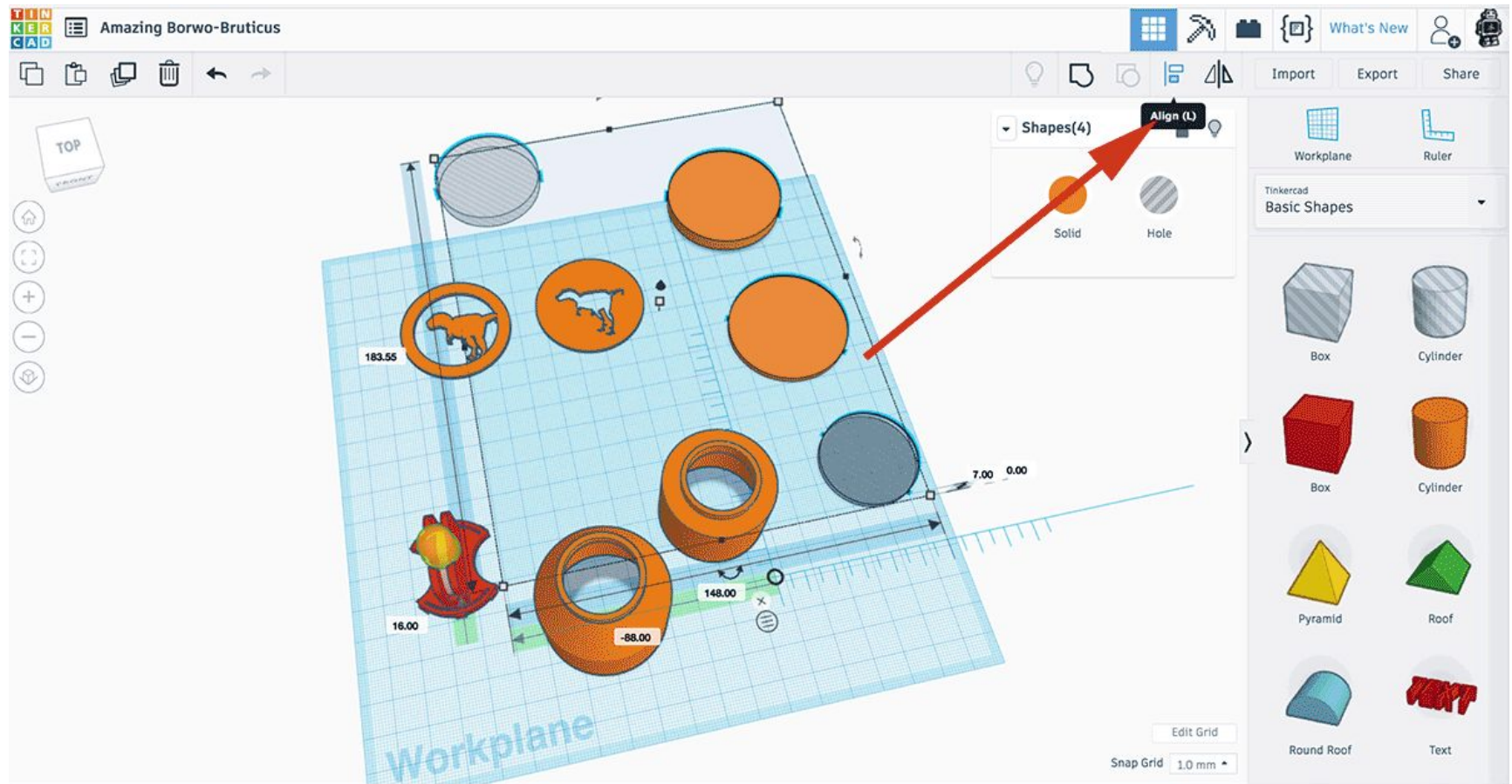
29. Drag an instance of a Cylinder on to the workplane and set the dimensions to 44.10 mm x 44.10 mm x 5 mm. Make it smooth and raise it up 2mm:



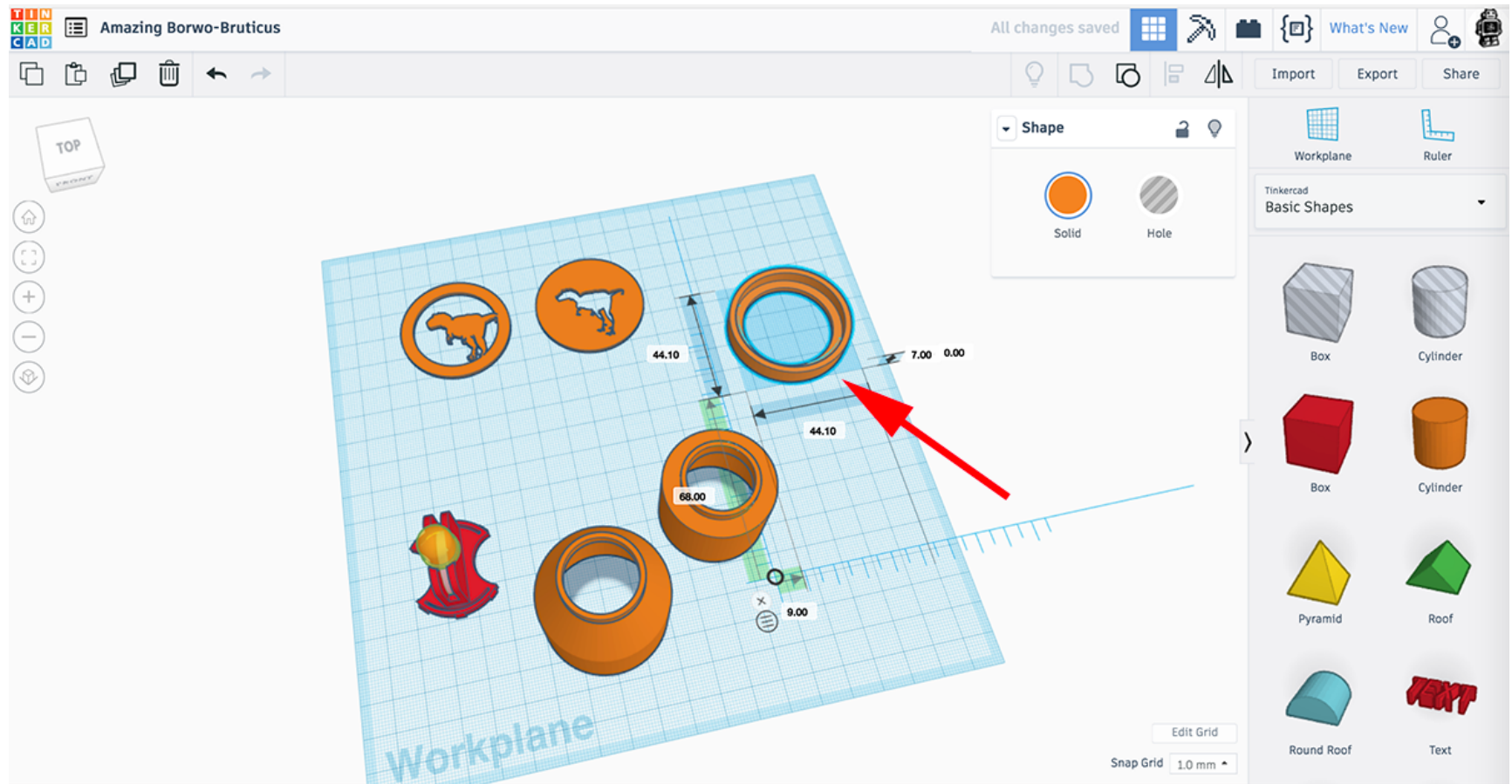
30. Drag an instance of a Cylinder Hole on to the workplane and set the dimensions to 40.55 mm x 40.55 mm x 5 mm. Make it smooth and raise it up 2mm:



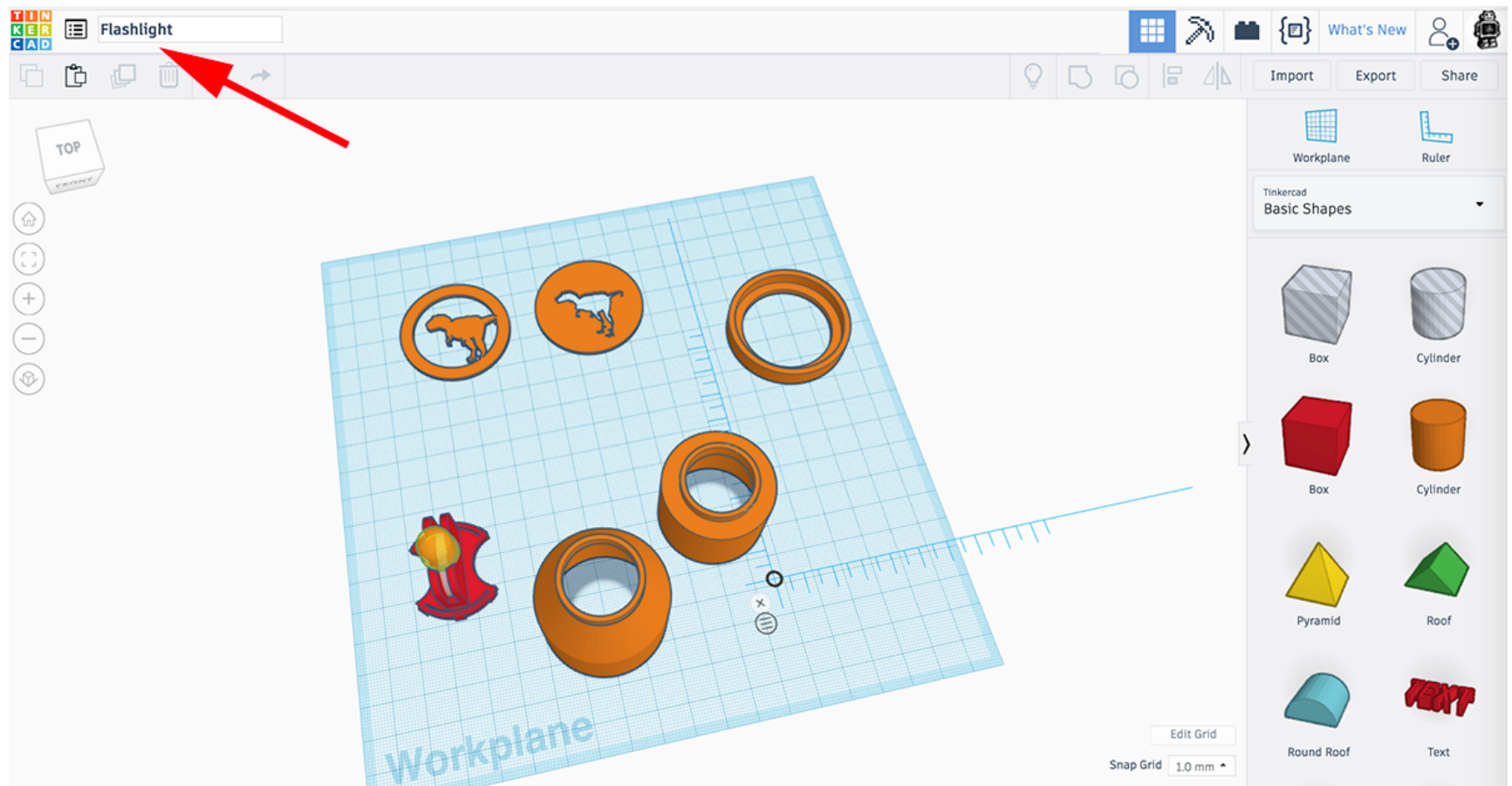
31. Align cylinders:



32. Group the cylinders:



33. Rename the model:



34. Export the parts separately.
35. Print.
36. Connect the parts together.
37. Play.
38. Brainstorm:
 - What would make this design better?
 - Does it need a switch?
 - Should there be an easier way to switch the discs?
39. Iterate.