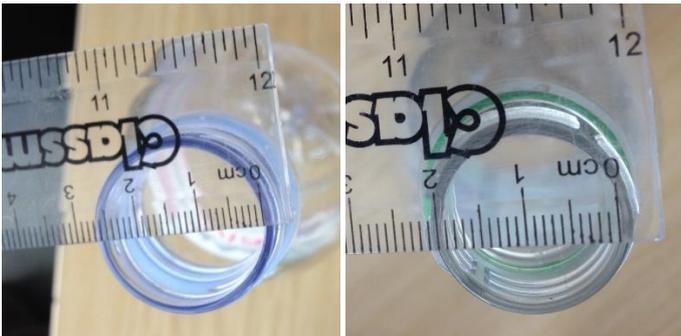




123D Design Tutorial: Straw bung

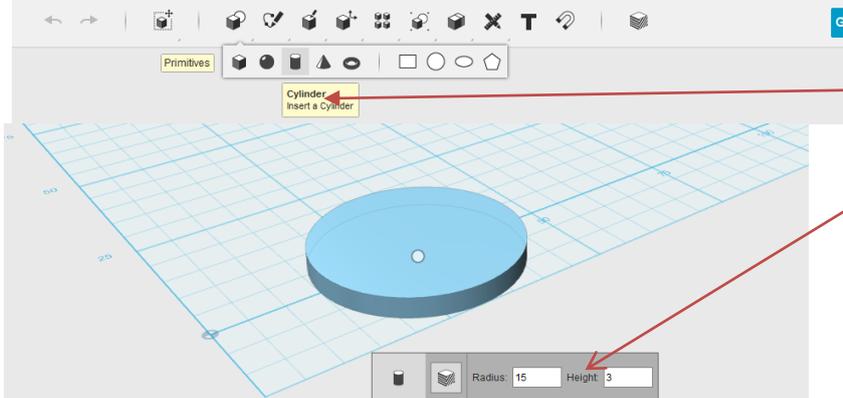
BEFORE YOU START:

Check the **diameters** of the tops of bottles you want to use your straw bung with – maximum 3 different bottles. For your largest bottle top diameter, make the disc diameter about 4mm larger so the disc sits above the bottle top. For the other 2, make the discs diameter about 2mm smaller so the bung will make your 3 discs on the straw bung the sizes of the inside diameter of your bottle tops.

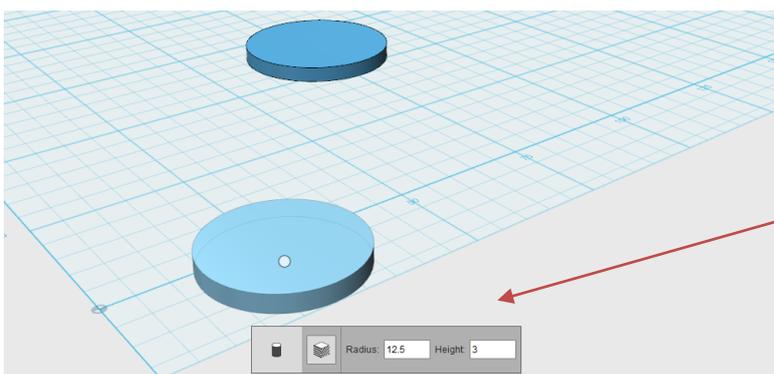


In this tutorial I have made a straw bung with 3 discs, diameters 30mm, 25mm and 20mm. Each disc is 3mm high.

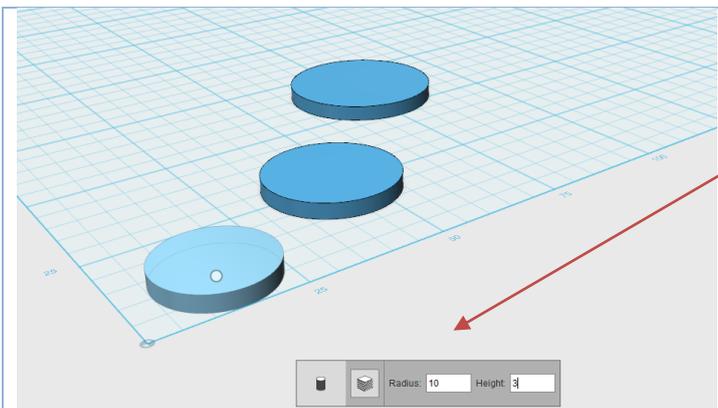
It is useful to watch the accompanying video tutorial before starting - follow this link.



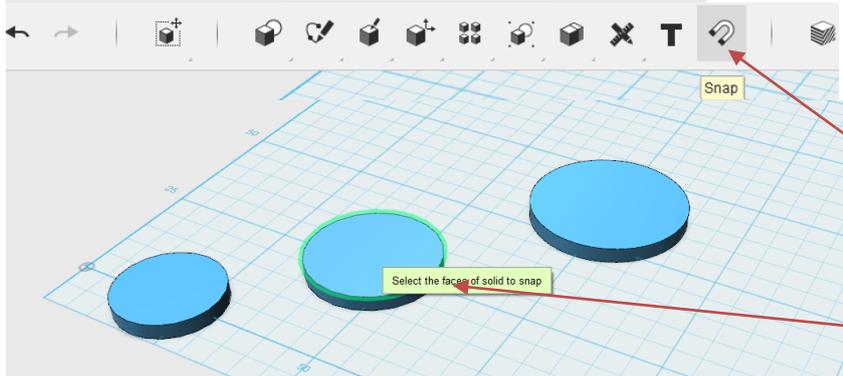
Use **Primitives Cylinder** tool to draw a cylinder with a radius of 15mm (= to a diameter of 30mm) and height 3mm. This will be the largest disc.



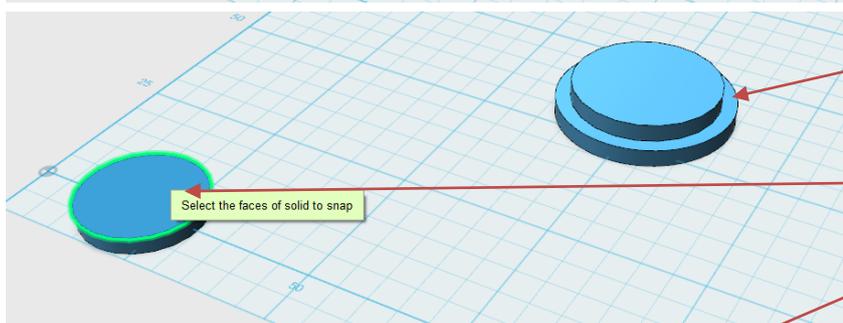
Use **Primitives Cylinder** tool again to draw a cylinder with a radius of 12.5mm (= to a diameter of 25mm) and height 3mm. This will be the middle disc.



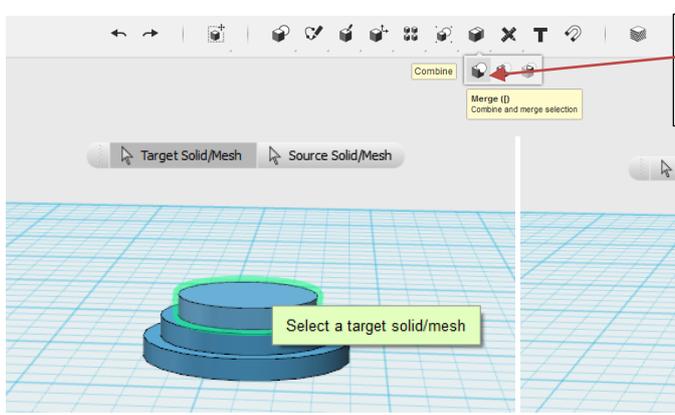
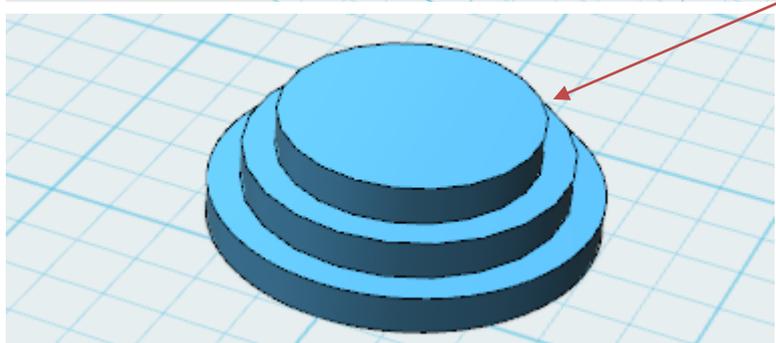
Use **Primitives Cylinder** tool again to draw a cylinder with a radius of 10mm (= to a diameter of 20mm) and height 3mm.
This will be the smallest disc.



Select **Snap** tool and click on the middle disc to select it then click on the largest disc to snap to it.

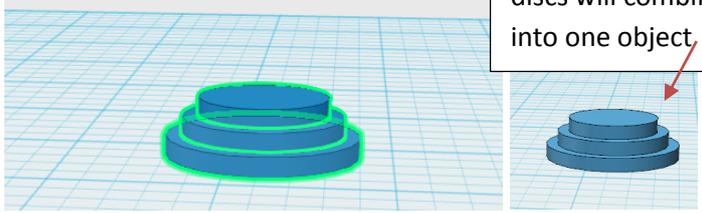


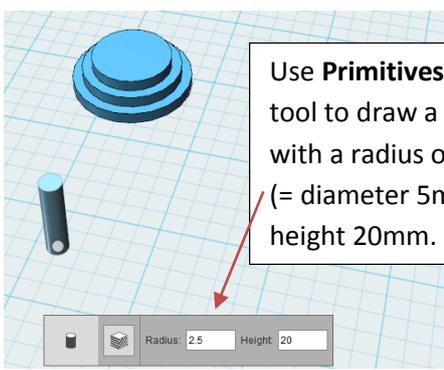
Select **Snap** again and click on the smallest disc to snap it to the others.



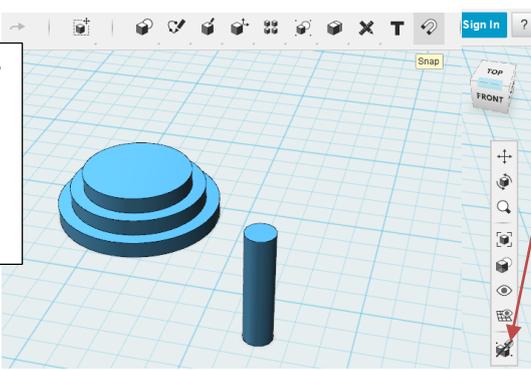
Select **Combine Merge** and select the top disc as Target Solid, then the other 2 as Source solid.

Press Enter and your discs will combine into one object.



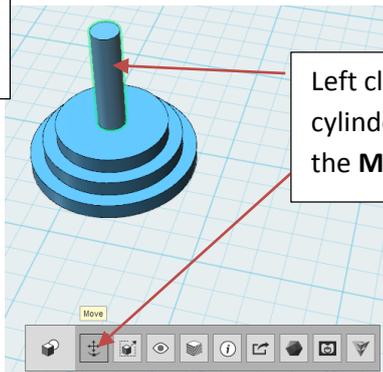
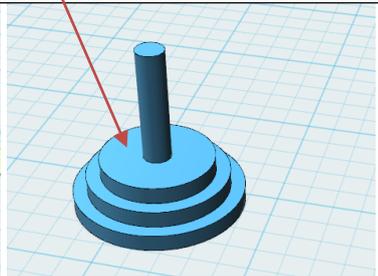
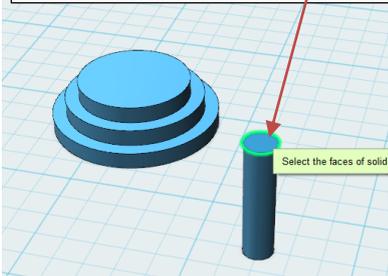


Use **Primitives Cylinder** tool to draw a cylinder with a radius of 2.5mm (= diameter 5mm) and height 20mm.



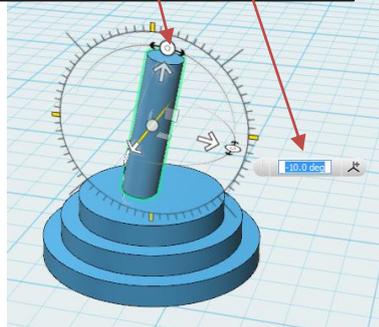
Ensure **Group Snapping** is clicked **OFF** – there should be a line through it like this.

Select **Snap** tool and click on the end face of the cylinder, then click on the cylinder stack – the objects snap together.

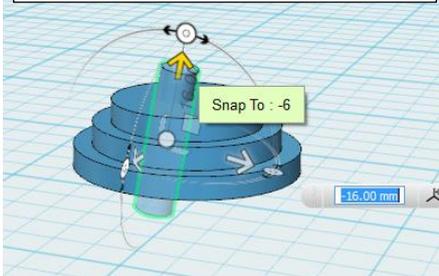


Left click on the cylinder then select the **Move Handle**

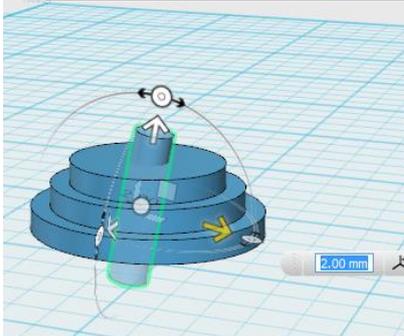
Use the handle to rotate the cylinder 10 deg



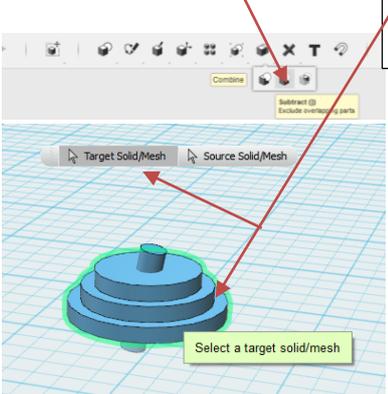
Use the handle to move the cylinder down so it goes right through the discs



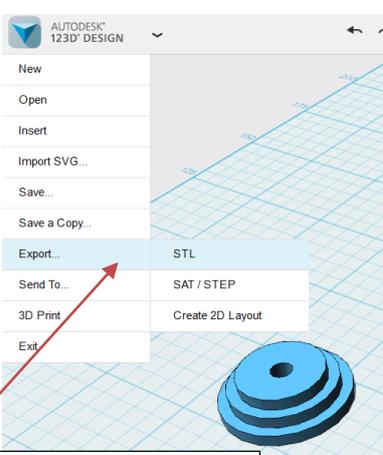
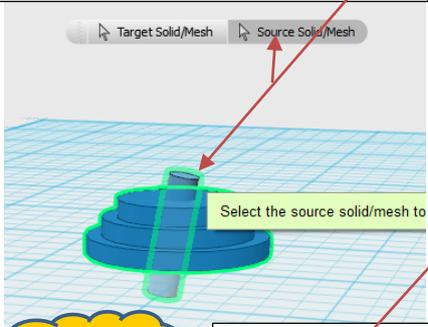
Then move it across 2mm



Select **Combine Subtract**



Select the disc stack as the **Target Solid** and the cylinder as the **Source Solid**. Press Enter to finish.



Export the STL file ready for 3D printing