## Using Volume to Quantify Waste

In this resource, you will explore how to use volume to find the amount of material contained in your 3-D composite figures.
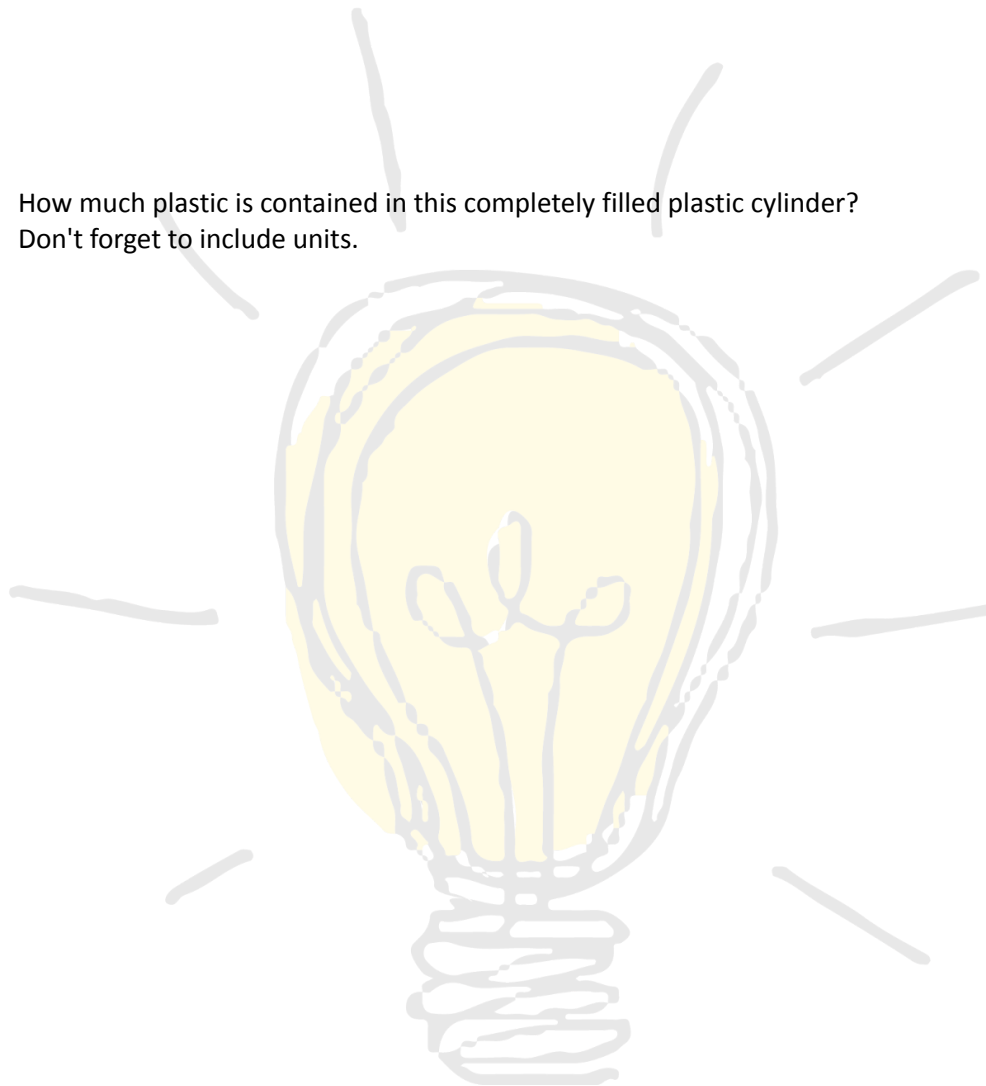
3-D Figures That Are Completely Filled In

Volume is a measure of the amount of space a 3-D object takes up or contains. For a 3-D figure that is completely filled in, like a filled in cylindrical pipe, the volume is also a measure of the amount of material contained in the figure. For example, **to find the amount of plastic contained in the following completely filled plastic cylinder, you would find the volume of the entire cylinder.** Let's quickly practice this process!

Figure 1: Filled-In Cylindrical Pipe

6 cm

15 cm
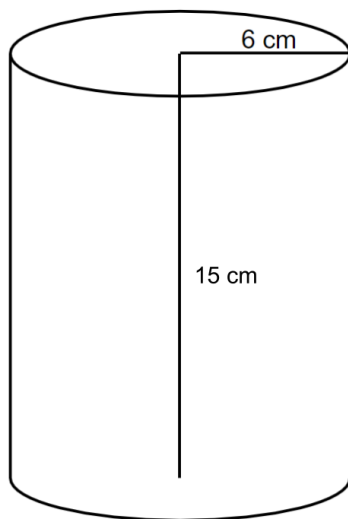
How much plastic is contained in this completely filled plastic cylinder? Don't forget to include units.

3-D Figures That Are Not Completely Filled In

Because the plastic cylinder above is completely filled in, its volume is equivalent to the amount of plastic it contains. However, for figures that are not completely filled in, more work is needed to calculate the amount of material contained in the figures. This is likely the case for most of the waste items in your 3-D composite figures.
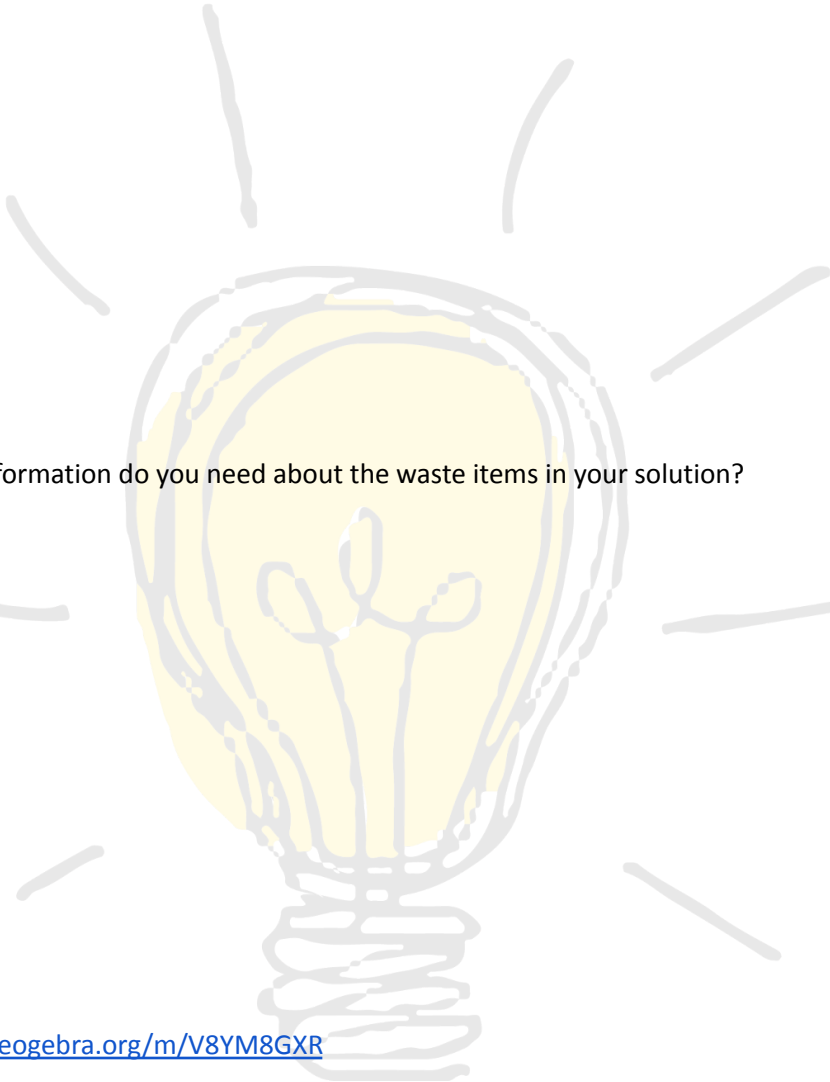
For example, the figure below shows a plastic pipe (a cylinder with a cylindrical hole in its center). Use Web Link - Washer Action -- GeoGebra Applet[1] to explore how to use volume to calculate the amount of plastic contained in the pipe.

Figure 2: Plastic Pipe

1.5 cm

6 cm

15 cm
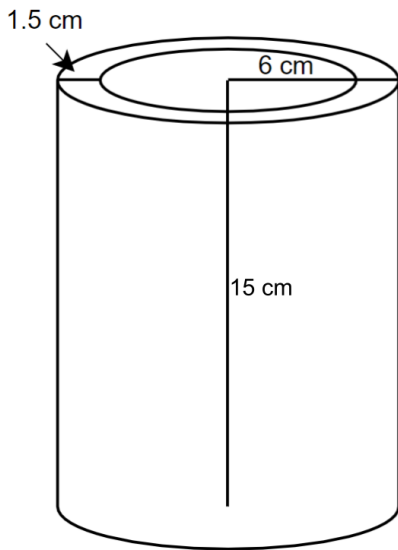
How much plastic is contained in this plastic pipe?
Don't forget to include units.

How can you apply this method to your solution? What information do you need about the waste items in your solution?

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