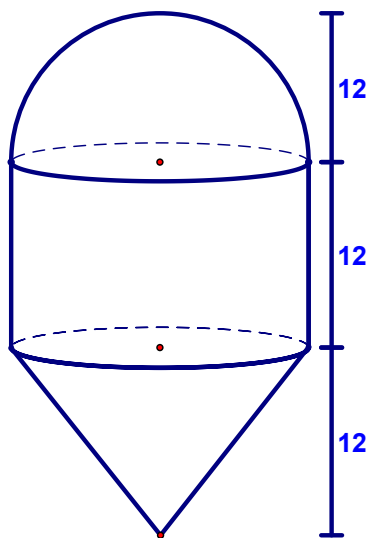




Volumes of Prisms & Pyramids - Lesson 12-4

Here's the warmup!

Determine the total surface area of the solid shown.

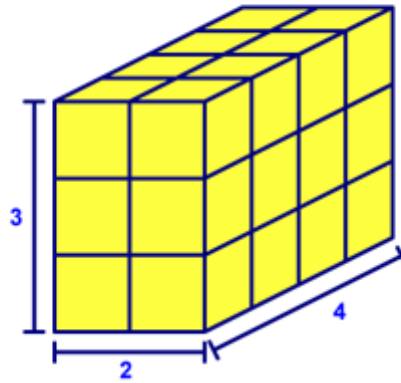


Today we're going to begin to discuss volume – here's a definition:

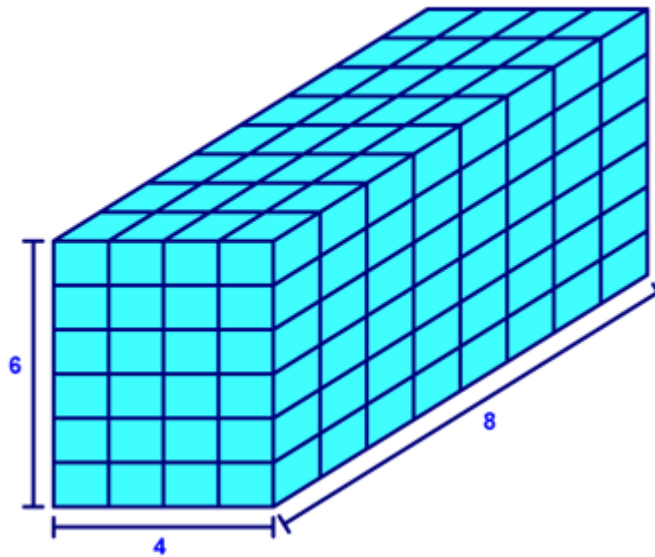
Volume is a measure of the amount of space in a solid.

Let's look at the following examples:

Find the volume of the right rectangular prism below (i.e., how many cubes measuring 1 cm on an edge will fit into the solid?).

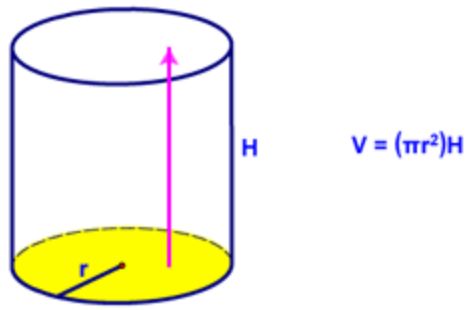


Find the volume of the right rectangular prism shown below.



Next, let's think about how we would find the volume of the cylinder shown below. We can determine it by finding the area of the base (a circle) and multiplying it by the height (the same technique we used for the prisms, right?):

How would we calculate the volume of the right cylinder below?



We can summarize this investigation with the following theorem and examples of using it:

Theorem 113

If **B** is the area of the base of a prism or a cylinder and **H** is the height of the solid, then the formula for the volume is $V=BH$.

Examples:

Triangular Prism: $V = BH = \left(\frac{1}{2}bh\right)H$

Regular Hexagonal Prism: $V = BH = \left(\frac{1}{2}asn\right)H$

Cylinder: $V = BH = (\pi r^2)H$

Finally, let's use this new theorem to solve the following example. When you're doing these problems, you should write out the formula. Remember that the B stands for the "area of the base" and the H stands for the "height of the solid."

What is the volume of the right triangular prism shown below?

