



What are the names of these 3-D shapes?

*Cylinders*



What 2-D shapes are needed to create them?



*Two circles and a rectangle.*

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# (Re)Introducing the Cylinder

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## Volume

What do we mean by the word volume?

The amount of space taken up by a 3-D object.

How can we calculate the volume of a cylinder?

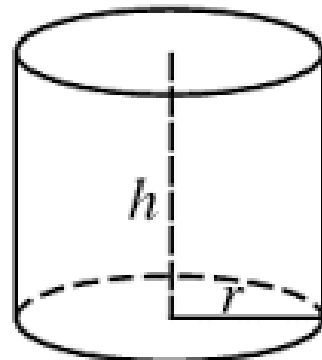
Think of it as a stack of circles.  
Volume = area of circle  $\times$  height

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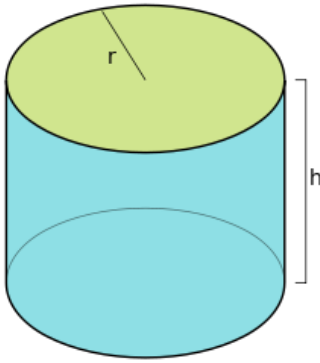
To calculate the volume we need to know the height of the cylinder and its radius.

$$\text{Volume}_{\text{cylinder}} = \pi r^2 h$$

The " $\pi r^2$ " represents the area of the circle and the " $h$ " represents the height of the stack of circles.



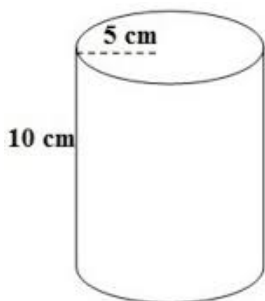
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**Example**

Find the volume of a cylinder that has a radius of 7cm and a height of 8cm.

$$\begin{aligned}\text{Volume} &= \pi r^2 h \\ &= 3.14 \times 7^2 \times 8 \\ &= 1230.88 \text{ cm}^3\end{aligned}$$

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Find the volume of this cylinder.

$$\begin{aligned}\text{Vol} &= \pi r^2 h \\ &= 3.14 \times 5^2 \times 10 \\ &= 785 \text{ cm}^3\end{aligned}$$

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Find the volume of a cylinder with radius of 2 cm and a height of 1 cm.

$$\begin{aligned}\text{Volume} &= \pi r^2 h \\ &= 3.14 \times 2^2 \times 1 \\ &= 12.56 \text{ cm}^3\end{aligned}$$

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Find the volume of a cylinder with height of 4 cm and a radius of 3 cm.

$$\begin{aligned}\text{Volume} &= \pi r^2 h \\ &= 3.14 \times 3^2 \times 4 \\ &= 113.04 \text{ cm}^3\end{aligned}$$

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