

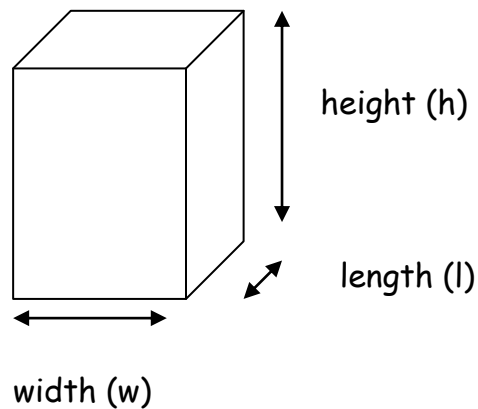
# fs4u

## Volume

### ‘How To’ Booklet 16

# Volume

## Volume of a box

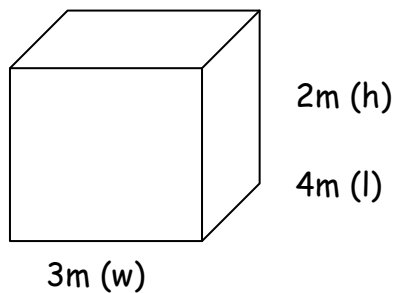


Volume = length  $\times$  width  $\times$  height

$$\text{Volume} = l \times w \times h$$

## Example

$$= 4\text{m} \times 3\text{m} \times 2\text{m}$$



$$V = l \times w \times h$$

$$V = 24 \text{ m}^3$$

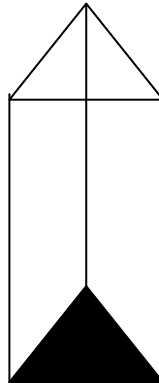
**NOTE:** all the measurements must be in the same units (in this case metres) and then the volume is measured in cubic metres written  $\text{m}^3$ .

## Exercise

	Length	Width	Height	Working	Volume
1	4m	3m	2m	$4\text{m} \times 3\text{m} \times 2\text{m}$	$24\text{m}^3$
2	5m	4m	3m		
3	6m	2m	1m		
4	8m	3m	2m		
5	7m	7m	7m		
6	Measure the length, width and height of your room in metres and find the volume. (This can be your classroom or bedroom)				

# Volume of a Prism

Volume = area of base  $\times$  height



height (h)

Area of base (A)

$$\text{Volume} = A \times h$$

**Note:** for revision of areas see workbook 15

## Example

If the length (height) of a prism is 10m and the Area of the base is  $24\text{m}^2$ .

**What is the volume?**

Volume = Area of base  $\times$  h

Volume =  $24\text{m}^2 \times 10\text{m} = 240\text{m}^3$

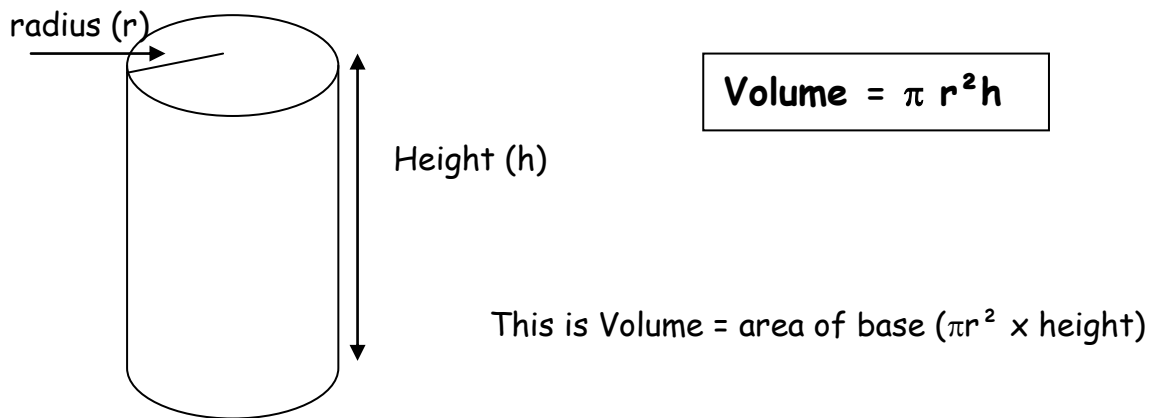
## Activity

Find the volumes of the following prisms given the base areas and heights. Copy and complete the table.

	Base Area	Height	Working	Volume
1	$24\text{m}^2$	10m	$24\text{m}^2 \times 10\text{m}$	$240\text{m}^3$
2	$8\text{m}^2$	5m		
3	$20\text{m}^2$	8m		
4	$100\text{m}^2$	6m		
5	$72\text{m}^2$	14m		
6	$6.3\text{m}^2$	1.7m		

# Volume of a Cylinder

Note: Revision of area of a circle is useful. This is in Workbook 13.



## Example

A tin of new potatoes has radius 4cm and height 12 cm.  
Find its volume (take  $\pi = 3.142$ )

$$\begin{aligned}\text{Volume} &= \pi r^2 h \text{ (Note: } 5^2 = 5 \times 5\text{)} \\ &= \pi \times 5^2 \times 12 \\ &= 3.142 \times 5 \times 5 \times 12 \\ \text{Volume} &= 942.6 \text{ cm}^2\end{aligned}$$

## Activity

Find the volume of the following cylinders to 2 decimal places. You will need a calculator, use the  $\pi$  button.

1	Radius 3cm - height 10cm
2	Radius 10cm - height 3cm
3	Radius 2.5cm - height 3.6cm
4	Diameter 8cm - height 6cm (Note Radius = $\frac{1}{2}$ of diameter)
5	Radius 6.3m - height 12.1m
6	Measure the height and diameter of 3 differently sized cans at home and calculate their volumes