

The volume of an object is the amount of space it occupies.

The volume of a container is the amount it will hold

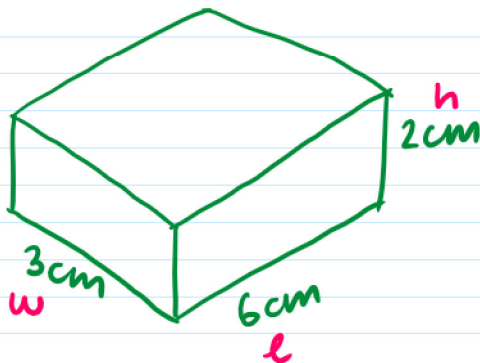
This is also called **capacity**.

Volume is measured in units cubed, because you are multiplying three values together, the length, width and the height

Volume of a rectangular solid

Formula :  $l \times w \times h = \text{units}^3$

Eg1) Find the volume of the rectangular box



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

Sub the values into the formula

Give your answer in  $\text{cm}^3$

Eg2) The **cube** has a side length of 4cm find the volume



$$\text{Volume} = l^3$$

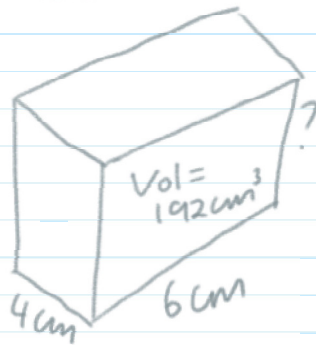
$$4 \times 4 \times 4 = 64 \text{cm}^3$$

Eg3) A rectangular box has a base length of 6cm and a width of 4cm. If the volume of the box is  $192\text{cm}^3$ . Find the height of the box?

- 1) Draw a sketch of the box, with the measurements.
- 2) Make an equation with the information given and the formula.

Solution:

Sketch



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

$$V = 192\text{cm}^3$$

$$l = 6\text{cm}$$

$$w = 4\text{cm}$$

$$h = ?$$

$$192\text{cm}^3 = 6 \times 4 \times h$$

$$\begin{array}{r|l} \div 24 & 192 = 24h \\ & 8 = h \end{array} \quad \left| \begin{array}{l} \\ \div 24 \end{array} \right.$$

Check your answer

$$6 \times 4 \times 8 = 192\text{cm}^3 \checkmark$$

Eg4) A cube has a volume of  $15.625\text{cm}^3$ . Find the length of its side?

Solution :

$$\text{Formula} = V = l^3$$

$$V = 15.625 \Rightarrow \text{Sub in to formula.}$$
$$l = ?$$

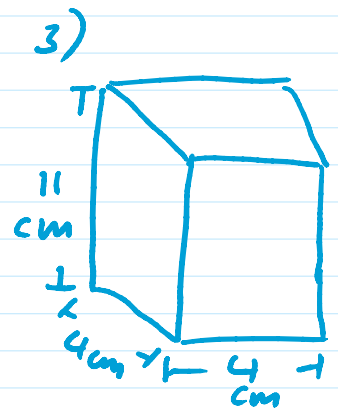
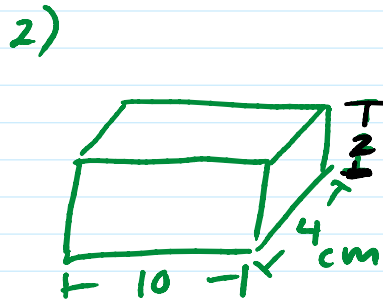
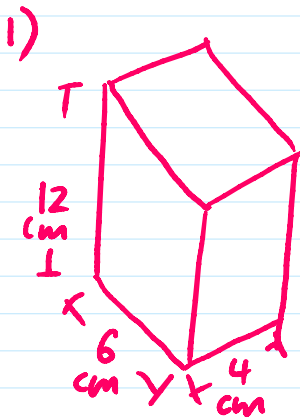
$$15.625 = l^3 \quad \text{"cube root"} \quad \sqrt[3]{\quad} \quad \text{both sides}$$

$$\sqrt[3]{15.625} = l$$

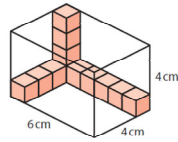
$$2.5 \text{ cm} = l$$

$$\text{Check answer } (2.5)^3 = 15.625 \quad \checkmark$$

Q1 Find the volume of the following



4. The diagram shows a rectangular box partly filled with cubes of side 1 cm. How many more of these cubes are required to fill the box?



$$l \times w \times h$$

$$6 \times 4 \times 4 = 96 \text{ cm}^3$$

$$\text{cube} = 1 \text{ cm}^3$$

$$\text{cubes} = 12 \text{ cubes}$$

$$96 - 12 = 84 \text{ cubes to fill the box}$$

## H/W

6. Each of the solid shapes below can be broken into two or more rectangular solids. The dotted lines indicate how the figures may be divided. Now find the total volume of each of these shapes:

