



**What you will learn**

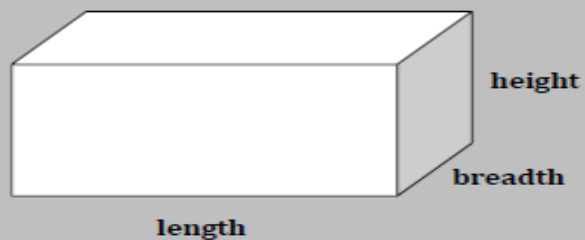
- How to find volume by counting cubes
- Calculate volume of cubes and cuboids (using numbers)
- Convert between  $\text{cm}^3$  and  $\text{m}^3$ .
- Work out surface area of cuboids
- Work out volume of prisms (including cylinders)

**Concept corner**

Volume is the amount of space occupied by 3-dimensional shape.

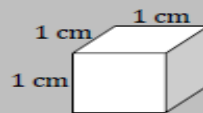
The formula for the volume of a cuboid is:

$$\text{Volume} = \text{length} \times \text{breadth} \times \text{height}$$



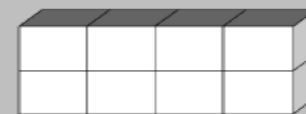
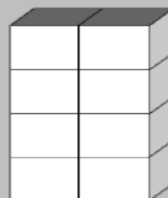
**Concept corner**

The volume of a centimetre cube is called **1 cubic centimetre**.

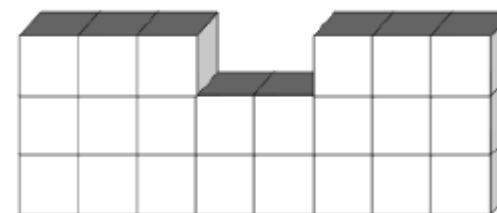
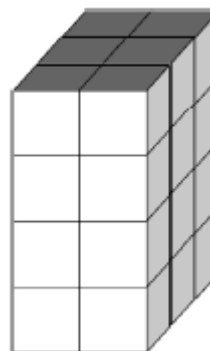


$$\begin{aligned} \text{Volume} &= 1 \text{ cm} \times 1 \text{ cm} \times 1 \text{ cm} \\ &= 1 \text{ cm}^3 \end{aligned}$$

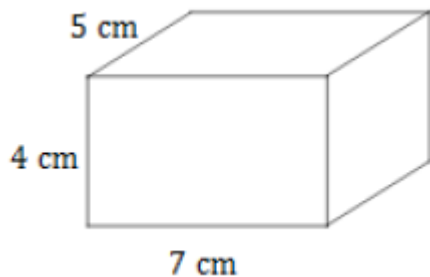
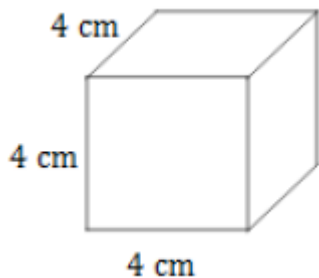
So the volume of each models is **8 cubic centimetres or  $8 \text{ cm}^3$** .



Find the volume of each shape.



Calculate the volumes of these cubes and cuboids.

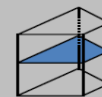
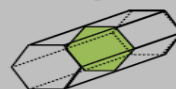


**Concept corner**

When you cut through a solid you see its **cross - section**.

A **prism** is a solid that has the same cross - section all the way through.

For example,



$$\text{Volume of a prism} = \text{area of the cross - section} \times \text{length}$$

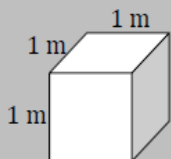


## Year 8 Summer 2 Unit 1—Surface Area and Volume of 3D Shapes

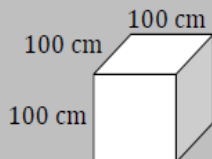


### Concept corner

The volume of a cube of sides 1 m is  $1 \text{ m}^3$ , which is equal to  $1\,000\,000 \text{ cm}^3$ .



$$\begin{aligned} \text{Volume} &= 1 \text{ m} \times 1 \text{ m} \times 1 \text{ m} \\ &= 1 \text{ m}^3 \end{aligned}$$



$$\begin{aligned} \text{Volume} &= 100 \text{ cm} \times 100 \text{ cm} \times 100 \text{ cm} \\ &= 1\,000\,000 \text{ cm}^3 \end{aligned}$$

Express  $2 \text{ m}^3$  in  $\text{cm}^3$

2 000  $\text{cm}^3$     20 000  $\text{cm}^3$     200 000  $\text{cm}^3$     2 000 000  $\text{cm}^3$

Express  $0.5 \text{ m}^3$  in  $\text{cm}^3$

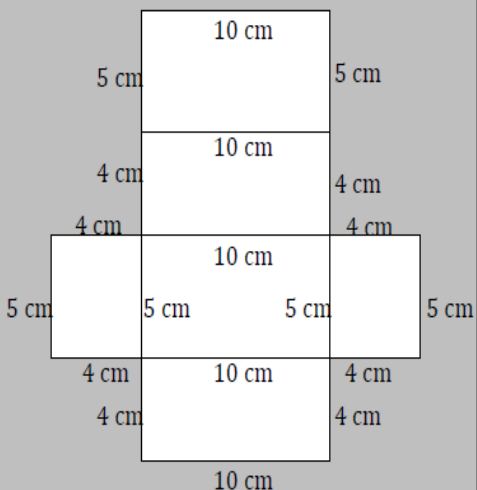
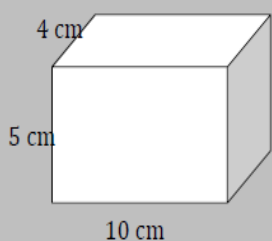
5 000  $\text{cm}^3$     50 000  $\text{cm}^3$     500 000  $\text{cm}^3$     5 000 000  $\text{cm}^3$

Express  $80\,000 \text{ cm}^3$  in  $\text{m}^3$

0.008  $\text{m}^3$     0.08  $\text{m}^3$     0.8  $\text{m}^3$     8  $\text{m}^3$

### Concept corner

To find the **surface area** of a cuboid find the area of the six rectangular faces and add the areas.

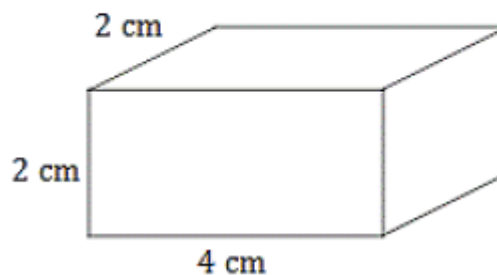


The surface area can also be found by finding the area of the net.

Calculate the surface area of this cuboid.

This is a cuboid.

Draw a net of the cuboid.



Calculate the area of the net.

What is the surface area of the cuboid?

**Answers to questions—see Mr CJ or your teacher for solutions**