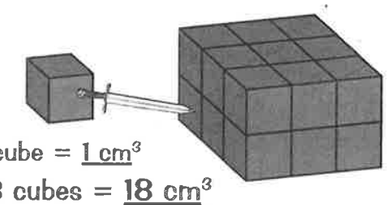
Volume

You Can Find Volume by Counting Cubes

The volume of a shape is the amount of space it takes up.

Say you've got a cuboid made up of cubes with sides of 1 cm.

The number of cubes is the same as the volume of your cuboid.



1 cube = 1 cm^3

18 cubes = 18 cm^3

Remember to count the cubes at the back.

Volume is measured in cm^3, m^3 etc. The little 3 means 'cubed'.

There's a Formula for Calculating Volume

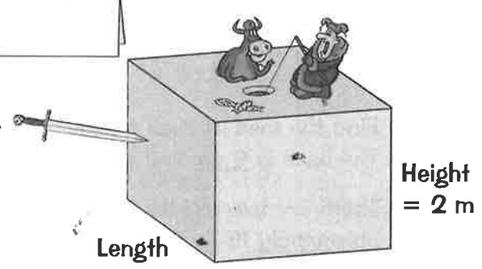
There's a quicker way of working out the volume of cubes and cuboids by measuring the lengths of the sides:

Volume of Cuboid = Length × Width × Height

V = L × W × H

It's the same formula for cubes too, but the length, width and height are all the same.

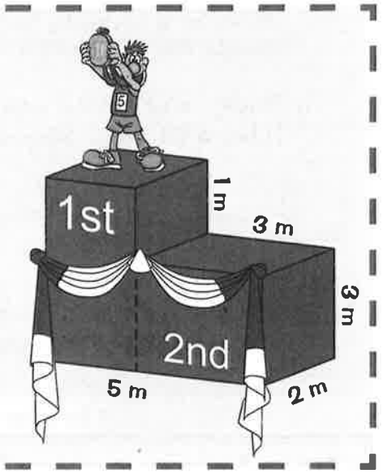
EXAMPLE: Find the volume of this cuboid.



Volume = length × width × height

= 3 × 5 × 2 = 30 m^3

EXAMPLE: Calculate the volume of this block.



The block can be split into two cuboids.
Work out the volume of each then add them together.

Volume of left-hand cuboid = 2 × 2 × 4 = 16 m^3

length = 5 − 3 height = 3 + 1

Volume of right-hand cuboid = 2 × 3 × 3 = 18 m^3

So the total volume = 16 + 18 = 34 m^3

"I can calculate the volumes of cubes and cuboids."

Worked Examples

1 Find the volume of a cuboid with length **8 cm**, width **6 cm** and height **2 cm**.

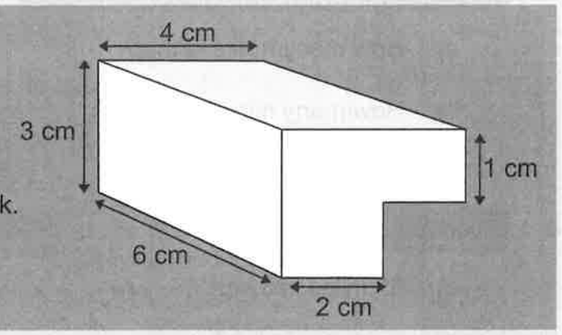
1) Find the volume of a cuboid by using the formula volume = length × width × height.
2) Replace 'length' with 8, 'width' with 6 and 'height' with 2. Then multiply.
3) Don't forget the units.

volume = length × width × height

8 × 6 × 2 = 96

96 cm^3

2 Louise carves a block out of wood. It is shown here. Work out the **volume** of the block.



Volume of large cuboid:
length × width × height
6 × 4 × 3 = 72 cm^2

Volume cut away:
length × width × height
6 × 2 × 2 = 24 cm^2

Total volume: 72 − 24 = 48 cm^3

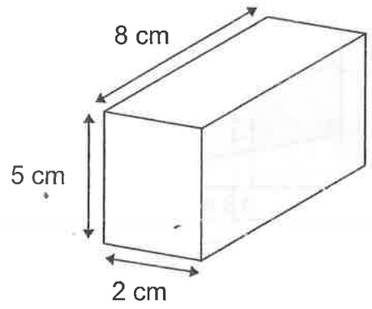
1) The block is made up of one large cuboid, with a smaller cuboid cut away.
2) Start by working out the total volume of the larger cuboid. The length is 6 cm, the width is 4 cm and the height is 3 cm.
3) Now work out the volume of the smaller cuboid cut away. The length is 6 cm, the width is 4 − 2 = 2 cm and the height is 3 − 1 = 2 cm.
4) Subtract the volume of the cut away cuboid from the total larger cuboid.
5) Don't forget the units.

What did you say? I couldn't hear you...

You'll need three measurements to find the volume of a cuboid — length, width and height. But you might have to do some simple maths to find out these first.

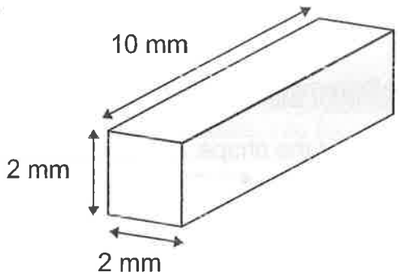
Volume

1 Find the volume of each cuboid below.



cm³

1 mark

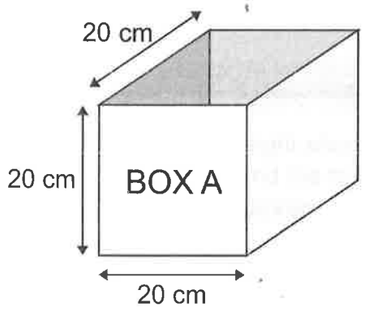


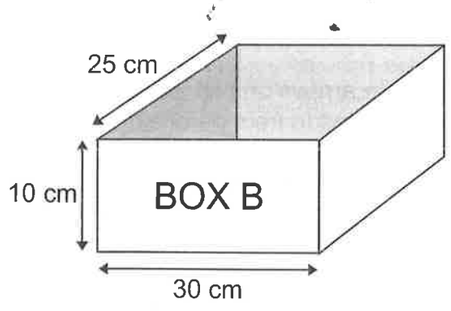
mm³

1 mark

2 Mario's roof is leaking. He decides to put a plastic box under the leak to collect the water.

Mario has two plastic boxes.





Which box will hold the most water? Show your working.

2 marks

Volume

3 Shabina is making a cuboid-shaped swimming pool.
Her pool will be 20 m long and 5 m wide, with a depth of 2 m.

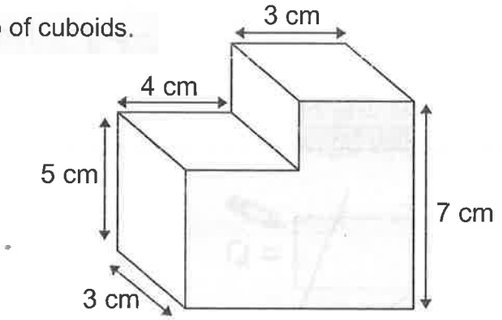
How many m^3 of water will be in her pool when it is filled to the top?

m^3

1 mark

4 The shape to the right is made up of cuboids.

Find its volume.

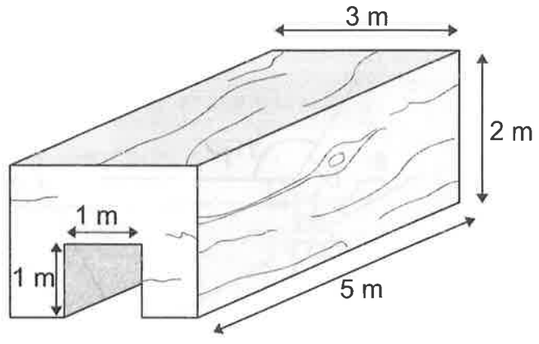


cm^3

2 marks

5 In a playground, a tunnel is made from a wooden cuboid, with a cuboid shaped hole all the way through.

Work out the volume of wood that makes up the tunnel.



m^3

2 marks

"I can calculate the volumes of cubes and cuboids."