Volume

- Understanding what volume is
- Knowing that a cubic centimetre is the volume of a cube that has edge length 1 cm
- Finding volumes by counting cubic centimetres
- Calculating the volume of a cuboid
- Calculating the volume of shapes made of cuboids

Keywords

You should know

explanation 1

You will need isometric dotted paper.

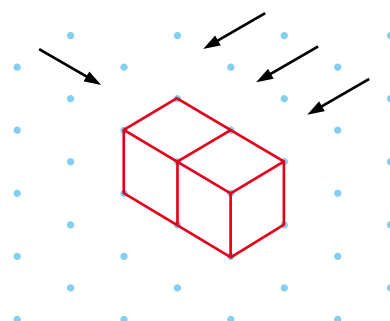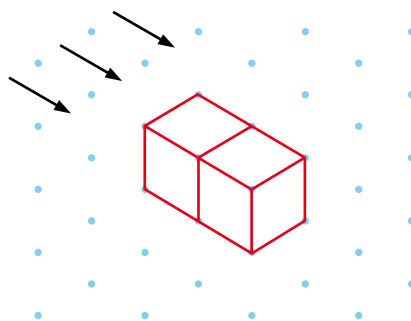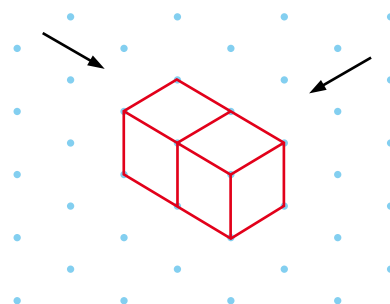**1** This diagram shows two cubes drawn on isometric dotty paper.

Copy the diagram and add two extra cubes where the arrows are pointing to make an L shape.

2 This diagram shows two cubes drawn on isometric dotty paper.

Copy the diagram and add three extra cubes where the arrows are pointing to make a T shape.

3 This diagram shows two cubes drawn on isometric dotty paper.

Copy the diagram and add four extra cubes where the arrows are pointing. This will make a 2-D representation of a cuboid 3 cubes long, 2 cubes wide and 1 cube high.

4 This diagram shows two cubes drawn on isometric dotty paper.

    a Copy this diagram and add extra cubes where the arrows are pointing. This will make a 2-D representation of a cuboid 2 cubes long, 2 cubes wide and 2 cubes high.

    b How many cubes can you see in your diagram?

    c How many cubes are in a cuboid 2 cubes long, 2 cubes wide and 2 cubes high?
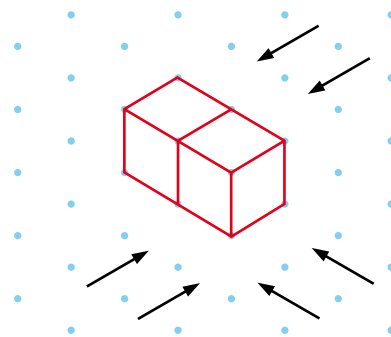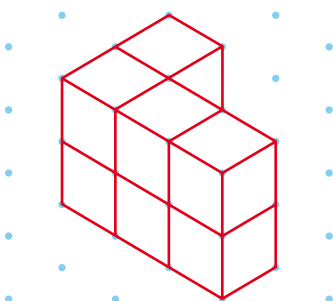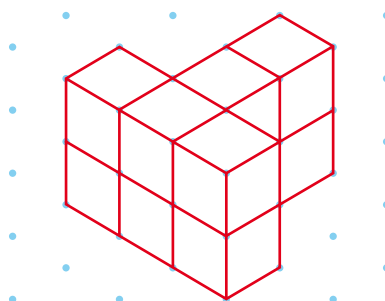
explanation 2

5 You will need at least twelve centimetre cubes.

    i Make the 3-D shapes shown in these diagrams.

    ii How many centimetre cubes did you need for each shape?
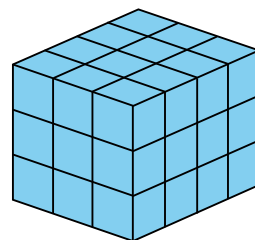
a

b

c

d

6 What is the volume of each shape in question **5**?

explanation 3

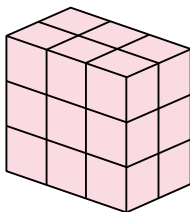**7** This cuboid is 4 cm long, 3 cm high and 3 cm wide.

Emma wanted to find the volume of the cuboid.

a How can Emma use the length and width
to work out how many cubes are in one layer?

b How can Emma then find how many cubes are
in the cuboid?

c What is the volume of the cuboid?

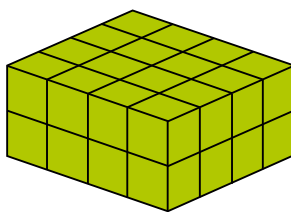***8** These cuboids are made from centimetre cubes.
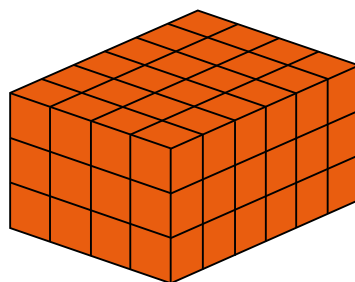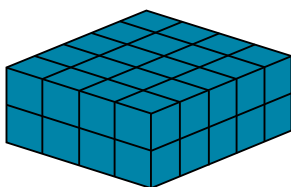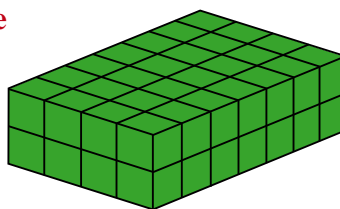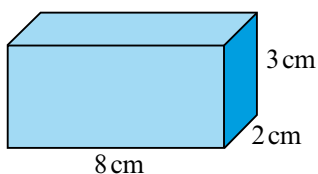Find the volume of each cuboid, without counting the cubes.

a

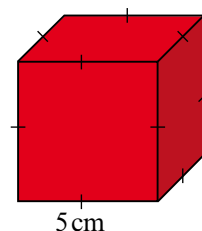**b**

c

d

e

*9 Find the volume of each cuboid.

a

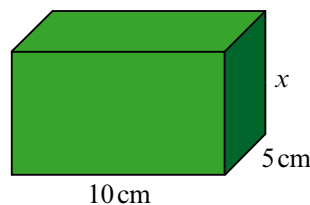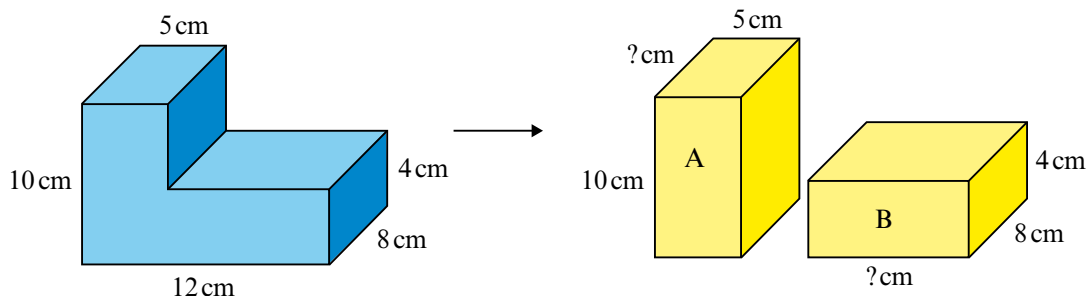3 cm
2 cm
8 cm

b

2 m
6 m
4 m

c

5 cm
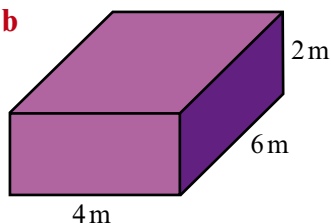
*10 The volume of this cuboid is 300 cm^3.

Find the value of the missing length.

x
5 cm
10 cm

explanation 4

*11 This shape can be broken up into two cuboids.

5 cm
10 cm
12 cm
8 cm
4 cm

5 cm
? cm
10 cm
A
B
? cm
4 cm
8 cm

a What is the missing length on cuboid A?

b Find the volume of cuboid A.

c Explain how you know that the missing length on cuboid B is 7 cm.

d Find the volume of cuboid B.

e What is the volume of the original L shape?

*12 Work out the volume of these shapes by splitting them into cuboids.

a
3 cm
3 cm
3 cm
A
3 cm
B
3 cm
9 cm

b
5 cm
? cm
6 cm
12 cm
4 cm
A
B
6 cm
15 cm

c
4 cm
4 cm
? cm
? cm
A
3 cm
B
5 cm
10 cm

d
3 cm
3 cm
4 cm
6 cm
6 cm
4 cm
A   B   C
5 cm
10 cm