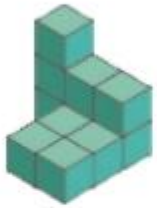
1) Find the volume of each shape. Then, order them from the greatest volume to the smallest volume.

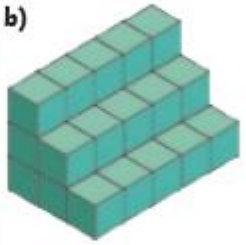
 = 1cm³

a)



_____cm³

b)

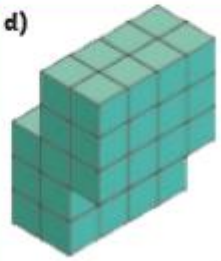


_____cm³

c)

_____cm³

d)



_____cm³

2) Which of these amounts shows the greatest volume? Which is the smallest volume? How do you know?

1mm³	1m³	1cm³

3) How many more 1cm³ interlocking cubes will need to to be added to each model to make a complete cube with sides of 3cm?

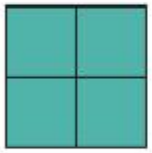
a)

b)

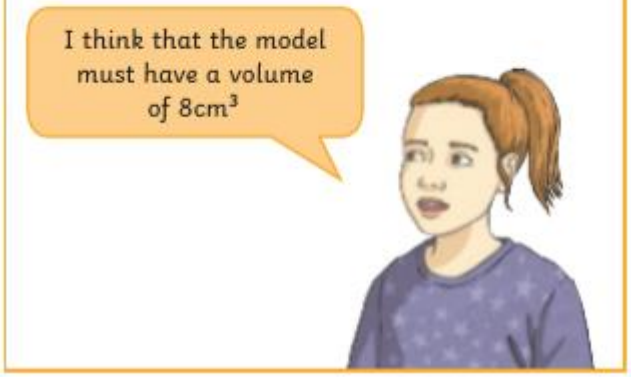
1) Joshua draws two different views of the model his friend has made out of $1cm^3$ interlocking cubes.

Keeva looks at Joshua's drawing.

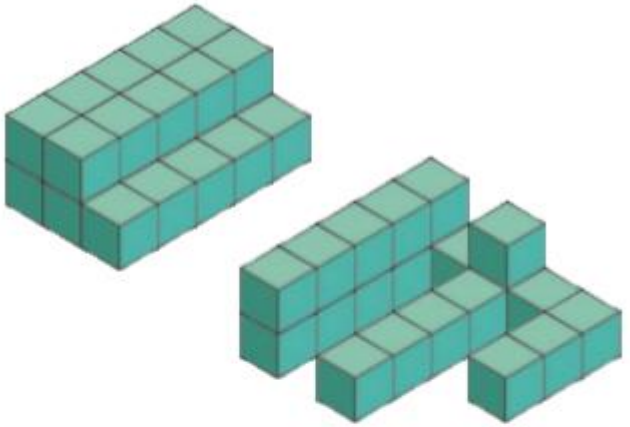
front view

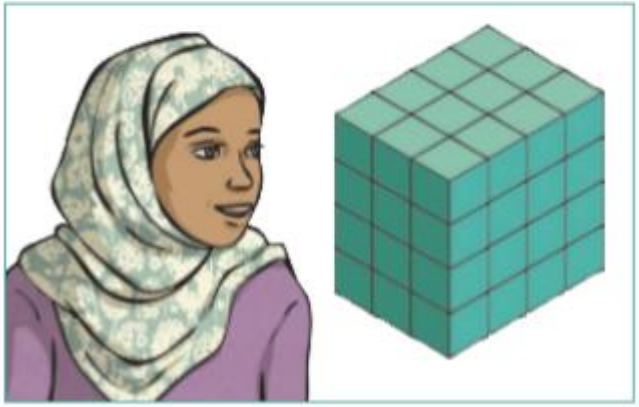


side view



2) Shen thinks that both of these shapes put together will have the same volume as Emily's cuboid.





Is Shen correct? Prove it!

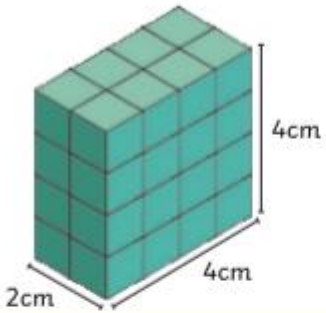
1) **a)** This cube is made from $1cm^3$ interlocking cubes.

Imagine that the cube has been made with a hollow centre so that only the faces are made from the interlocking cubes.

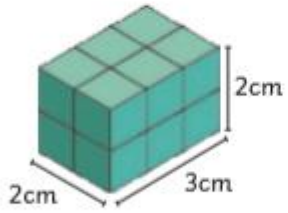
What is the volume of the cube?

b) If another similar hollow cube was made that had the dimensions 5cm × 5cm × 5cm, what would the volume of the cube be?

2) I use $1cm^3$ interlocking cubes to make some different size cuboids. I make cuboids with different side lengths of 2cm, 3cm and 4cm. Here are two of my cuboids:



_____ cm^3



_____ cm^3

a) What are the volumes of each cuboid?

b) How many more cuboids can I make which have side lengths of 2cm, 3cm and 4cm?

What is the volume of each different cuboid?

ANSWERS

1) a) $11cm^3$

   b) $30cm^3$

   c) $14cm^3$

   d) $44cm^3$

   Order from greatest to smallest is d, b, c, a

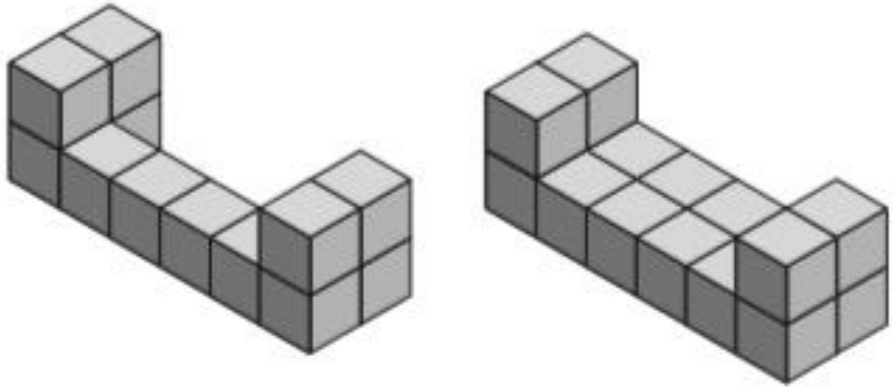
2) The greatest amount is $1m^3$.
   The smallest amount is $1\ mm^3$.

   We can use what we know about the relative size of millimetres, centimetres and metres to help us see that $1m^3 = 1m \times 1m \times 1m$ will be larger than $1cm \times 1cm \times 1cm$. This means that $1mm \times 1mm \times 1mm$ is the smallest volume.

3) a) $27cm^3 - 7cm^3 = 20cm^3$
      20 more cubes will need to be added.

   b) $27cm^3 - 10cm^3 = 17cm^3$
      17 more cubes will need to be added.

1) Keeva is incorrect. The model could have a volume of $16cm^3$ or $12cm^3$.



2) Emily's cuboid has a volume of $48cm^3$.

The first shape has a volume of $25cm^3$.
The second shape has a volume of $21cm^3$.
The total volume of both shapes is $46cm^3$ not $48cm^3$ so Shen is incorrect.

1) a) $27cm^3 - 1cm^3 = 26cm^3$

b) $125cm^3 - 27cm^3 = 98cm^3$

2) a) $2cm \times 4cm \times 4cm$ cuboid $= 32cm^3$
$2cm \times 3cm \times 2cm$ cuboid $= 12cm^3$

b) After the two example cuboids are taken into account there are another 8 more different cuboids that can be made:

$3cm \times 3cm \times 3cm$ cuboid $= 27cm^3$

$4cm \times 4cm \times 4cm$ cuboid $= 64cm^3$

$2cm \times 2cm \times 2cm$ cuboid $= 8cm^3$

$3cm \times 4cm \times 4cm$ cuboid $= 48cm^3$

$3cm \times 4cm \times 3cm$ cuboid $= 36cm^3$

$2cm \times 4cm \times 2cm$ cuboid $= 16cm^3$

$2cm \times 3cm \times 3cm$ cuboid $= 18cm^3$

$2cm \times 3cm \times 4cm$ cuboid $= 24cm^3$