Calculating volume

4/6/2020

Warm up

- How many small cubes are there in the bigger cube?

Click to reveal the answer when you've worked it out.

27. There are 3 layers. Each layer has 3 rows of 3 cubes (9 cubes). 3 lots of 9 = 27. We can do it as a multiplication.

3 x 3 x 3 = 27

How about in this one? Click when you have an answer.

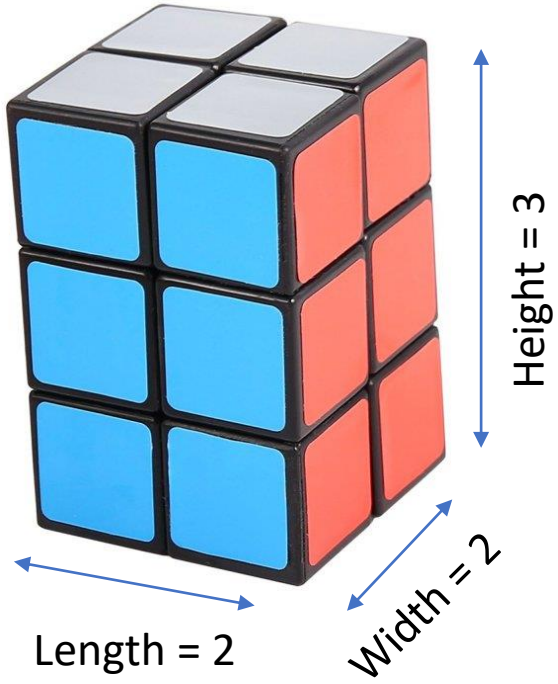
64.

There are 4 layers. Each layer has 4 rows of 4 cubes (16).

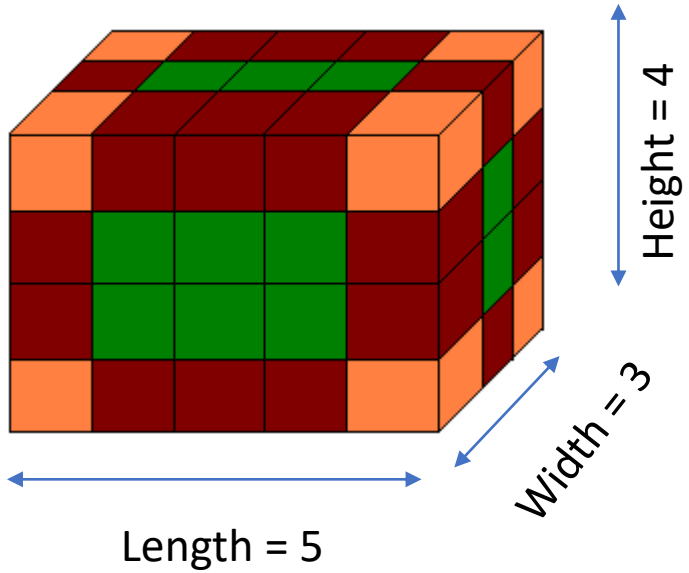
4 lots of 16 is 64.

4 x 4 x 4 = 64

How many cubes in these cuboids? Work them out by multiplying the length by the width by the height.



12 cubes. Each layer has 2 rows of 2 cubes, which means 4 cubes per layer. There are 3 layers of 4, which gives 12.
2 x 2 x 3 = 12

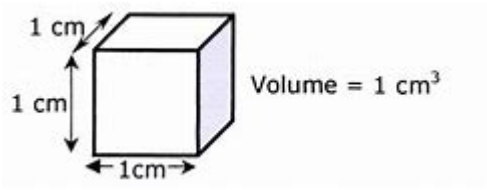


60 cubes. Each layer has 5 rows of 3 cubes. There are 4 layers of 15, which gives 60.
5 x 3 x 4 = 60

Volume is how much space a 3D shape takes up.

It can be measured in cm^3.

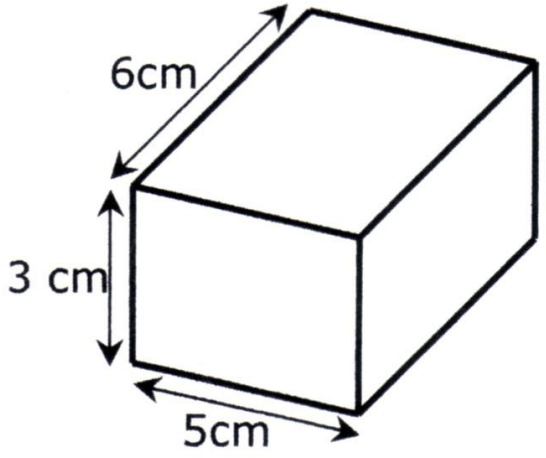
1 cm^3 is a cube which is 1cm tall, 1 cm wide and 1 cm long.



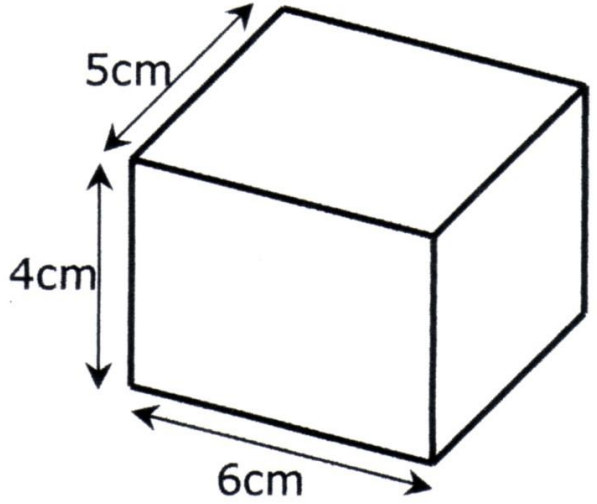
We don't need ACTUAL cubes to work out how much space a 3d shape takes up. We can use maths to work it out . . .

Just like you did before, all you do to find the volume of a cube or cuboid is multiply the length x the width x the height. This tells you how many cm^3 would fit inside the shape. In other words, how much space it takes up, or its volume.

volume = length x width x height



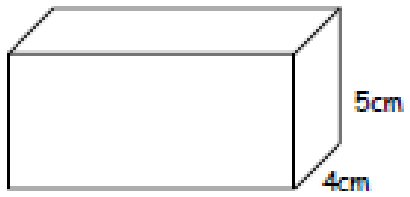
volume = 6 x 5 x 3
= 90 cm^3



volume = 5 x 6 x 4
= 120 cm^3

Can you work out the volume of these cuboids? The last few are tough so only do the first 4 if that's what you're comfortable with.

1.



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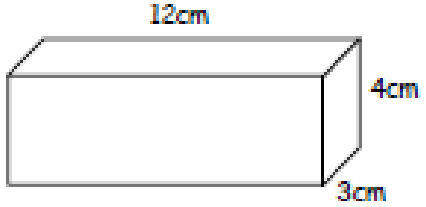

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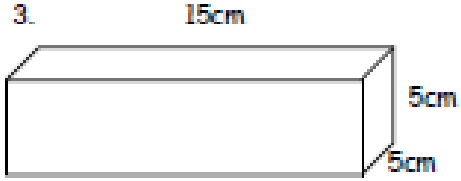

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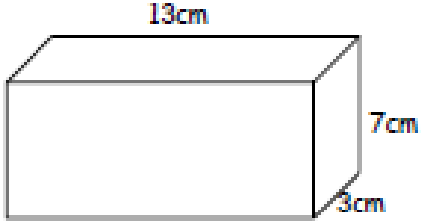

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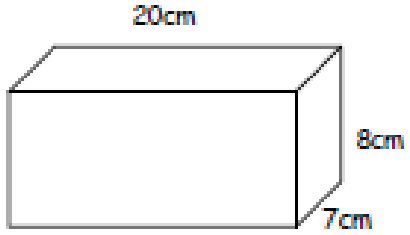

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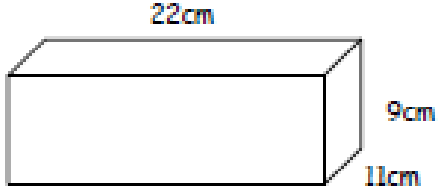


Extension . . .

Find the missing measurements in this table:

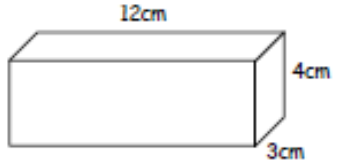
Length	Width	Height	Volume
10cm	4cm	3cm	
	6cm	2cm	$60cm^3$
8cm	2cm		$48cm^3$
10m		6m	$180m^3$
9mm	2mm		$72mm^3$

a) A cuboid has a volume of $72cm^3$. If the length, width and height are all whole numbers, how many different sets of measurements can you find?

Answers

1.

2.



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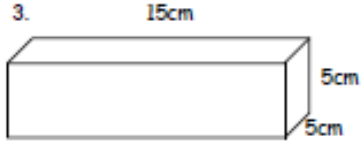

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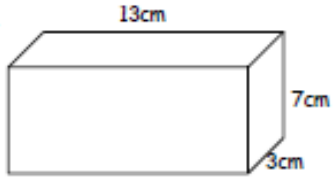

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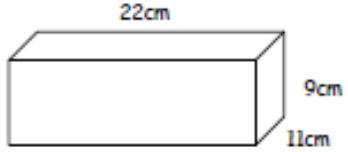

1) 200cm³ (5x4x10)
2) 144cm³ (3x4x12)
3) 375cm³ (5x5x15)
4) 273 cm³ (7x3x13)
5) 1020cm³ (7x8x20)
6) 2178cm³ (22x9x11)

Extension Answers

Length	Width	Height	Volume
10cm	4cm	3cm	$120cm^3$
5cm	6cm	2cm	$60cm^3$
8cm	2cm	3cm	$48cm^3$
10m	3cm	6m	$180m^3$
9mm	2mm	4cm	$72mm^3$

72 x 1 x 1

36 x 2 x 1

24 x 3 x 1

18 x 4 x 1

18 x 2 x 2

12 x 6 x 1

12 x 3 x 2

9 x 8 x 1

9 x 4 x 2

6 x 4 x 3

96 x 1 x 1

48 x 2 x 1

32 x 3 x 1

24 x 4 x 1

24 x 2 x 2

16 x 6 x 1

16 x 3 x 2

12 x 8 x 1

12 x 4 x 2

8 x 6 x 2

8 x 4 x 3

6 x 4 x 4