Varied Fluency
Step 8: Volume of a Cuboid

Teaching Note:

The formula for volume is l x w x h where l is horizontal, w is diagonal and h is vertical.

National Curriculum Objectives:

Mathematics Year 6: (6M8a) Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3]
Mathematics Year 6: (6M7c) Recognise when it is possible to use formulae for the area of shapes

Differentiation:

Developing Questions to support calculating the volume of cuboids using l x w x h or area of base x height. Same metric measures used within each question; multiples of 2, 3, 5 and 10 only.
Expected Questions to support calculating the volume of cuboids using l x w x h or area of base x height. Some conversion between metric measures needed (mm to cm or cm to m). Same metric measures used within each question; whole unit measurements.
Greater Depth Questions to support calculating the volume of cuboids using l x w x h or area of base x height. Some conversions between metric measures needed (mm to m or m to mm); some measurements with 1 decimal place used.

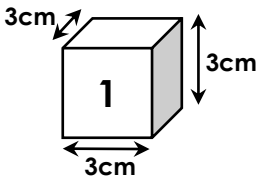
More Perimeter, Area and Volume resources.

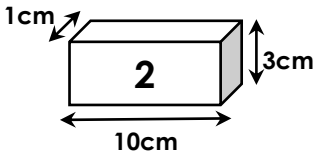
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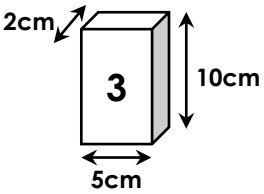
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Volume of a Cuboid

1a. Using the formula l x w x h, match the cuboids to the correct volume.







A. $30cm^3$

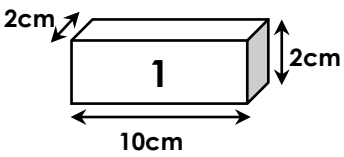
B. $27cm^3$

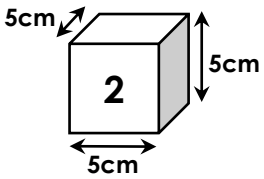
C. $100cm^3$

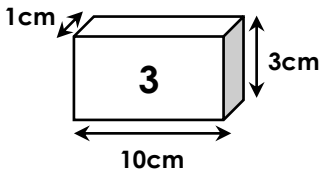
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VF

1b. Using the formula l x w x h, match the cuboids to the correct volume.







A. $40cm^3$

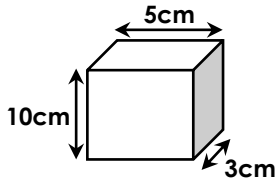
B. $30cm^3$

C. $125cm^3$

Not to scale

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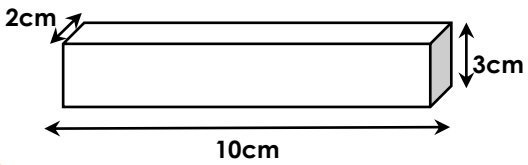
2a. True or false? I can find the volume of this cuboid by calculating $50cm^2$ x 5cm.



Not to scale

VF

2b. True or false? I can find the volume of this cuboid by calculating $6cm^2$ x 10cm.



Not to scale

VF

3a. Complete the table.

	l	w	h	v
Cuboid 1	3m	10m	5m	
Cube	2cm	2cm	2cm	
Cuboid 2	10cm		2cm	$60cm^3$

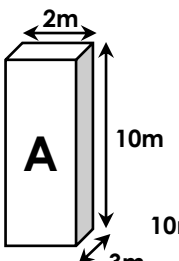
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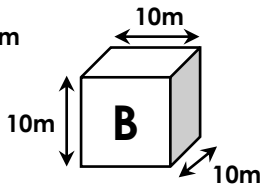
3b. Complete the table.

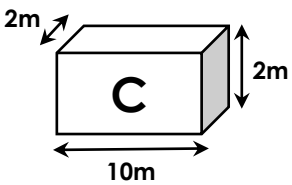
	l	w	h	v
Cuboid 1		2cm	10cm	$100cm^3$
Cuboid 2	3mm	10mm	10mm	
Cuboid 3	5m	10m	5m	

VF

4a. Order these shapes by their volume.



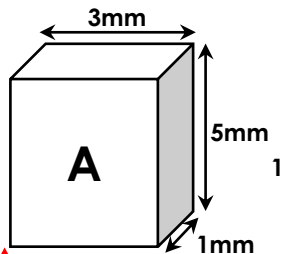


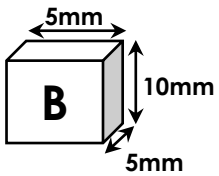


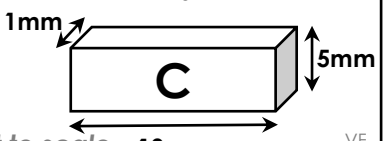
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4b. Order these shapes by their volume.







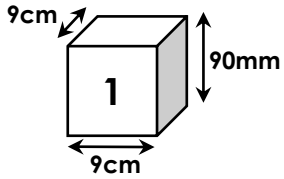
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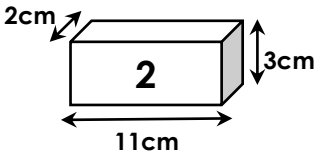
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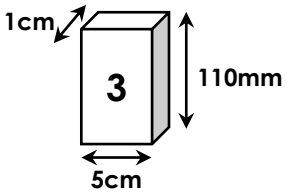
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Volume of a Cuboid

5a. Using the formula l x w x h, match the cuboids to the correct volume.







A. $55cm^3$

B. $729cm^3$

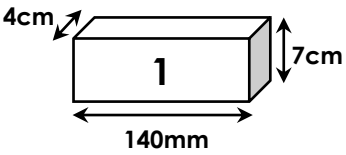
C. $66cm^3$

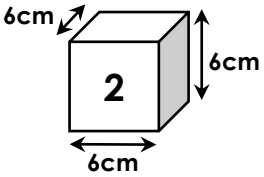
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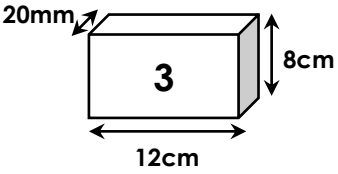
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Volume of a Cuboid

5b. Using the formula l x w x h, match the cuboids to the correct volume.







A. $192cm^3$

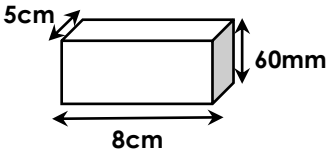
B. $216cm^3$

C. $392cm^3$

Not to scale

VF

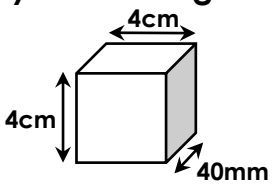
6a. True or false? I can find the volume of this cuboid by calculating $30cm^2$ x 8cm.



Not to scale

VF

6b. True or false? I can find the volume of this cuboid by calculating $8cm^2$ x 4cm.



Not to scale

VF

7a. Complete the table.

	l	w	h	v
Cuboid 1	4m	7m	500cm	
Cuboid 2	11cm		4cm	$88cm^3$
Cube		8cm		$512cm^3$

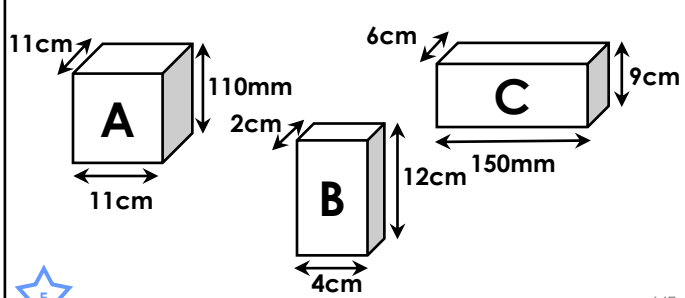
VF

7b. Complete the table.

	l	w	h	v
Cube				$8cm^3$
Cuboid 1	6mm		4mm	$216mm^3$
Cuboid 2	600cm	7m	11m	

VF

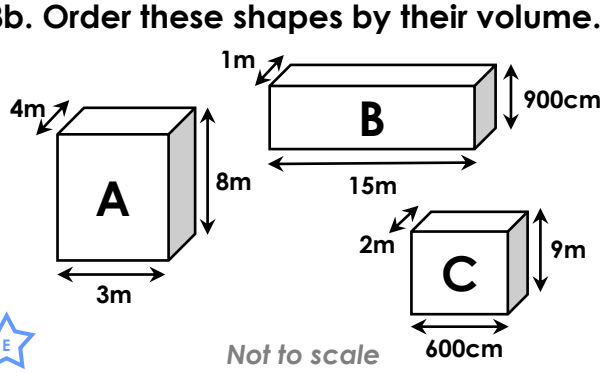
8a. Order these shapes by their volume.



Not to scale

VF

8b. Order these shapes by their volume.



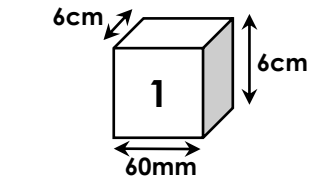
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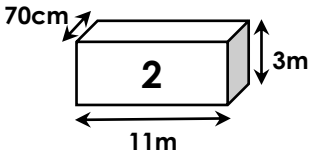
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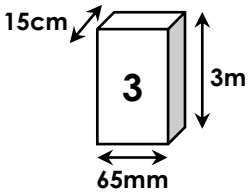
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Volume of a Cuboid

9a. Match the cuboids to their correct volume.







A. $29{,}250cm^3$

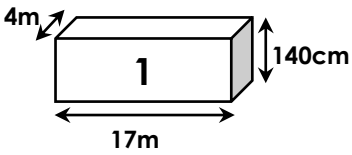
B. $23.1m^3$

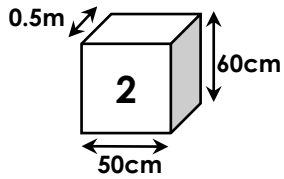
C. $216cm^3$

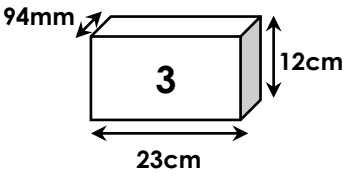
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VF

9b. Match the cuboids to their correct volume.







A. $95.2m^3$

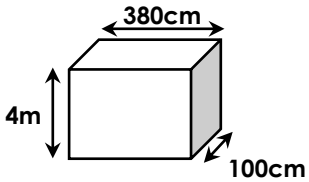
B. $2{,}594.4cm^3$

C. $0.15m^3$

Not to scale

VF

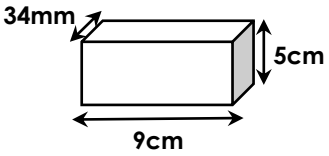
10a. True or false? I can find the volume of this cuboid by calculating $4m^2 \times 3.8m$.



Not to scale

VF

10b. True or false? I can find the volume of this cuboid by calculating $45cm^2 \times 34cm$.



Not to scale

VF

11a. Complete the table.

	l	*w*	*h*	v
Cuboid 1	1.7m	___cm	7m	$9.52m^3$
Cuboid 2	50mm	___cm	4.2cm	73,500 mm^3
Cuboid 3	180cm	2.5m	11m	___m^3

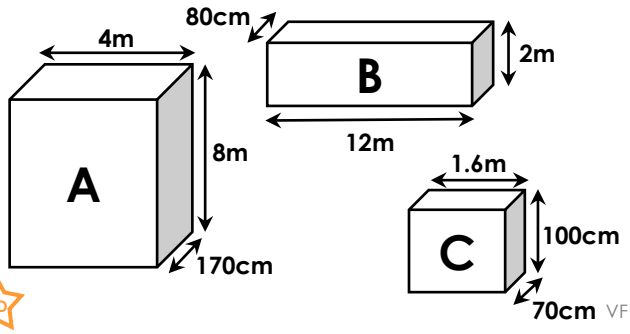
VF

11b. Complete the table.

	l	*w*	*h*	v
Cuboid 1	80mm	5cm	1.5cm	___cm^3
Cube	___cm	___cm	___cm	$729m^3$
Cuboid 2	4m	1.7m	350cm	___m^3

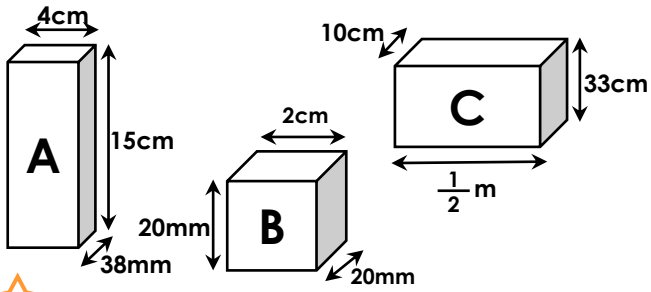
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12a. Order these shapes by their volume.



VF

12b. Order these shapes by their volume.



Not to scale

VF

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Varied Fluency
Volume of a Cuboid

Developing

1a. 1B, 2A, 3C

2a. False. $50cm^2$ x 3cm or $30cm^2$ x 5cm

3a.

	l	*w*	*h*	v
Cuboid 1	3m	10m	5m	$150m^3$
Cube	2cm	2cm	2cm	$8cm^3$
Cuboid 2	10cm	3cm	2cm	$60cm^3$

4a. C = $40m^3$, A = $60m^3$, B = $1{,}000m^3$ (or vice versa)

Expected

5a. 1B, 2C, 3A

6a. True

7a.

	l	*w*	*h*	v
Cuboid 1	4m	7m	500cm	$140m^3$
Cuboid 2	11cm	2cm	4cm	$88cm^3$
Cube	8cm	8cm	8cm	$512cm^3$

8a. A = $1{,}331cm^3$, C = $810cm^3$, B = $96cm^3$ (or vice versa)

Greater Depth

9a. 1C, 2B, 3A

10a. True

11a.

	l	*w*	*h*	v
Cuboid 1	1.7m	80cm	7m	$9.52m^3$
Cuboid 2	50mm	3.5cm	4.2cm	73,500 mm^3
Cuboid 3	180cm	2.5m	11m	$49.5m^3$

12a. A = $54.4m^3$, B = $19.2m^3$, C = $1.12m^3$ (or vice versa)

Varied Fluency
Volume of a Cuboid

Developing

1b. 1A, 2C, 3B

2b. True

3b.

	l	*w*	*h*	v
Cuboid 1	5cm	2cm	10cm	$100cm^3$
Cuboid 2	3mm	10mm	10mm	$300mm^3$
Cuboid 3	5m	10m	5m	$250m^3$

4b. A = $15mm^3$, C = $50mm^3$, B = $250mm^3$ (or vice versa)

Expected

5b. 1C, 2B, 3A

6b. False. 4 x 4 = 16, so you could use $16cm^2$ x 4cm to find the volume.

7b.

	l	*w*	*h*	v
Cube	2cm	2cm	2cm	$8cm^3$
Cuboid 1	6mm	9mm	4mm	$216mm^3$
Cuboid 2	600cm	7m	11m	$462m^3$

8b. A = $96m^3$, C = $108m^3$, B = $135m^3$ (or vice versa)

Greater Depth

9b. 1A, 2C, 3B

10b. False. You need to convert 34mm into 3.4cm: $45cm^2$ x 3.4cm

11b.

	l	*w*	*h*	v
Cuboid 1	80mm	5cm	1.5cm	$60cm^3$
Cube	900cm	900cm	900cm	$729m^3$
Cuboid 2	4m	1.7m	350cm	$23.8m^3$

12b. B = $8cm^3$, A = $228cm^3$, C = $16{,}500cm^3$ (or vice versa)

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