Maths
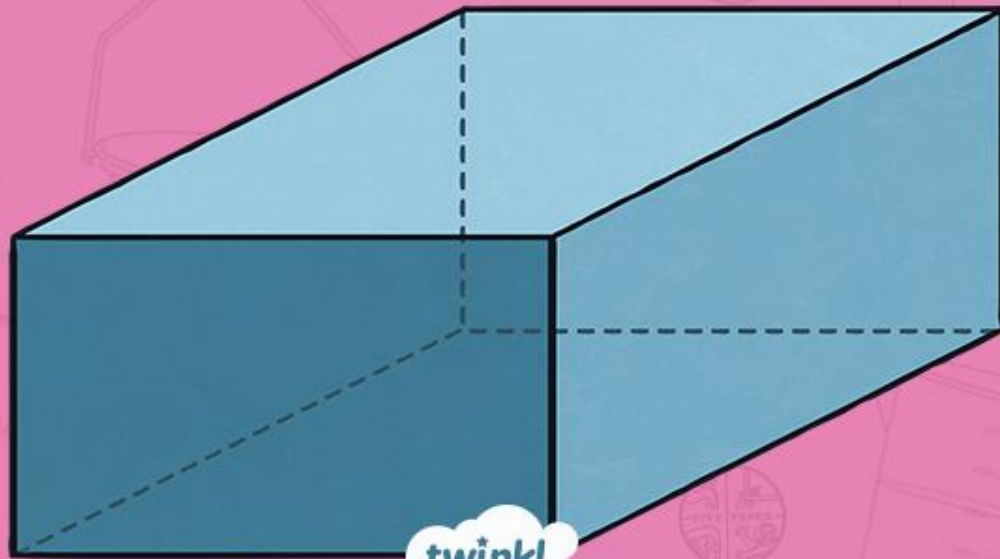
Measurement

Calculating and Comparing Volume

Aim

- I can calculate and compare the volume of cubes and cuboids.

Success Criteria

- I can calculate the volume of cubes and cuboids in metric units.

- I can compare the volume of cubes and cuboids using <, > or =.

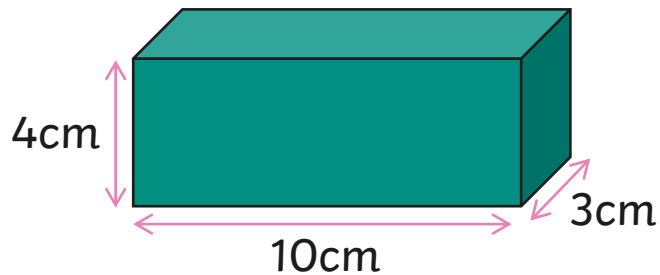- I can suggest the dimensions of cubes and cuboids that would fit between given volumes.

Calculate and Compare

? How do you calculate the volume of a cube or a cuboid?

Multiply the length by the width by the height.

4cm

10cm

3cm

? Does it matter which way round you multiplied the dimensions, for example, length by height by width?

10cm × 3cm × 4cm = 120cm³

10cm × 4cm × 3cm = 120cm³

No. It does not matter which order they are multiplied, the answer will always be the same.

Calculate and Compare
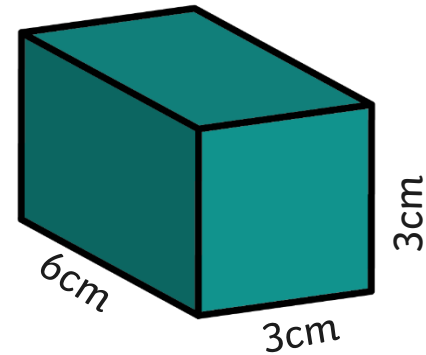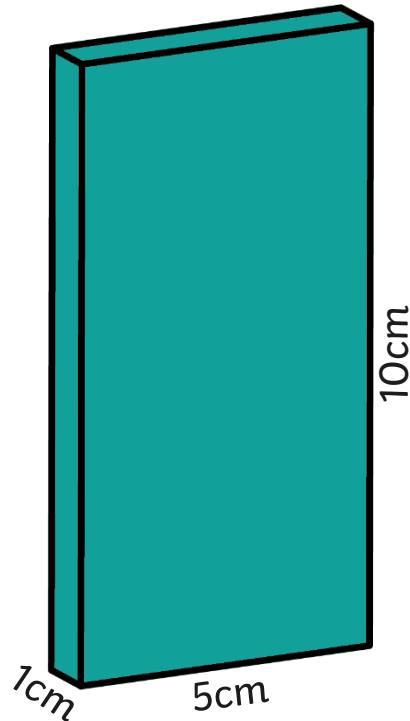
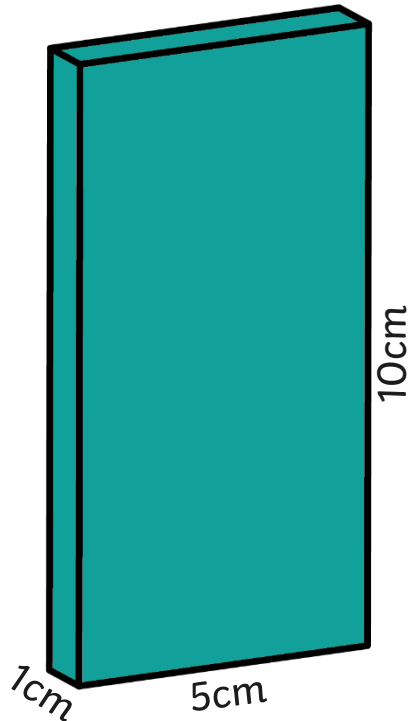Calculate the volume of the cubes and cuboids and use
<, > or = to compare.

10cm

1cm   5cm

3cm

6cm   3cm

shapes may not be drawn to the same scale

Calculate and Compare

Calculate the volume of the cubes and cuboids and use
<, > or = to compare.

10cm

1cm   5cm

<

6cm

3cm

3cm

volume = 54cm³

volume = 50cm³

shapes may not be drawn to the same scale

Calculate and Compare

Calculate the volume of the cubes and cuboids and use
<, > or = to compare.

10cm

3cm   6cm

9cm

4cm   5cm

shapes may not be drawn to the same scale

Calculate and Compare

Calculate the volume of the cubes and cuboids and use
<, > or = to compare.

10cm

3cm 6cm

=

9cm

4cm 5cm
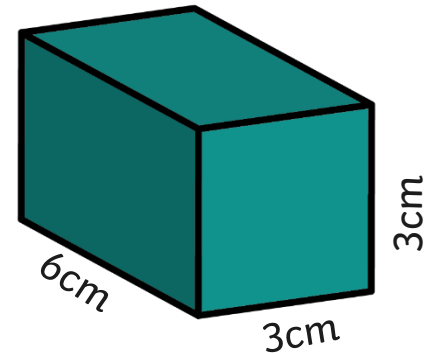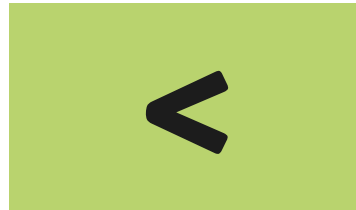
volume = 180cm³

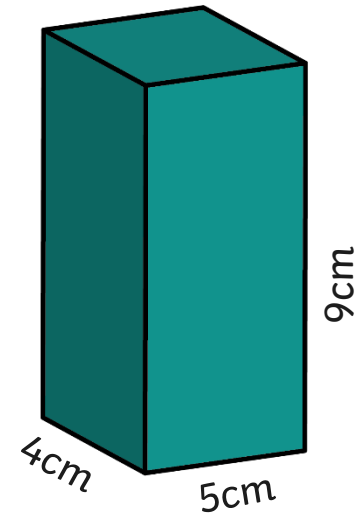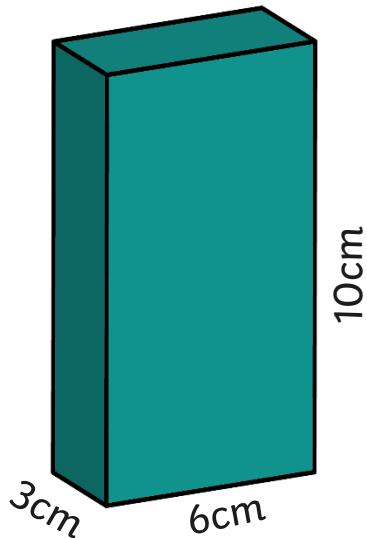**volume = 180cm³**

shapes may not be drawn to the same scale

Calculate and Compare

Calculate the volume of the cubes and cuboids and use
<, > or = to compare.

2cm

1.4cm   8cm

2.5cm

2cm   4cm

shapes may not be drawn to the same scale

Calculate and Compare

Calculate the volume of the cubes and cuboids and use
<, > or = to compare.

2cm
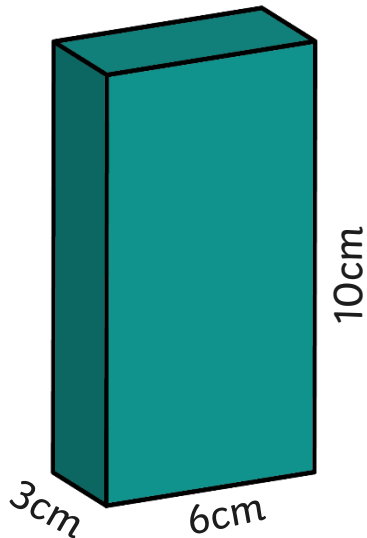
1.4cm   8cm

>

2.5cm

2cm   4cm
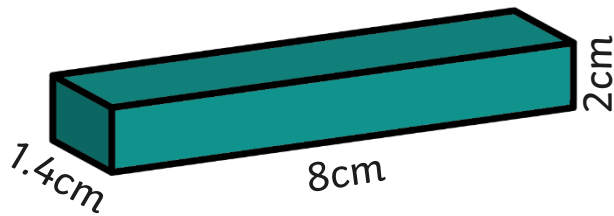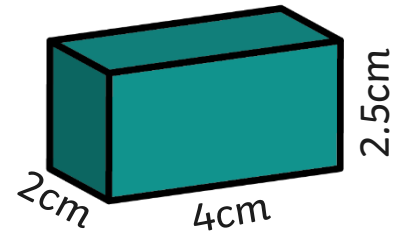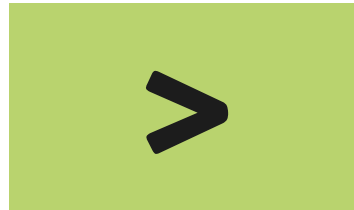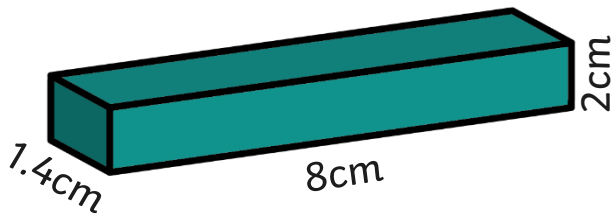
volume = 22.4cm³

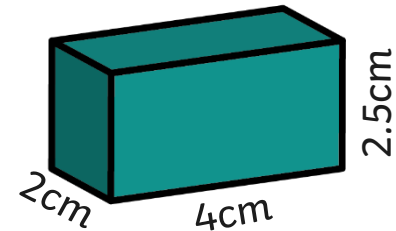**volume = 20cm³**

shapes may not be drawn to the same scale

Calculate and Order

Calculate the volume of these cubes and cuboids, then order them from smallest to greatest volume.

A 2.4cm, 20cm, 5cm

B 12cm, 9cm, 4cm

C 12cm, 4cm, 6cm

D 3cm, 9cm, 8cm
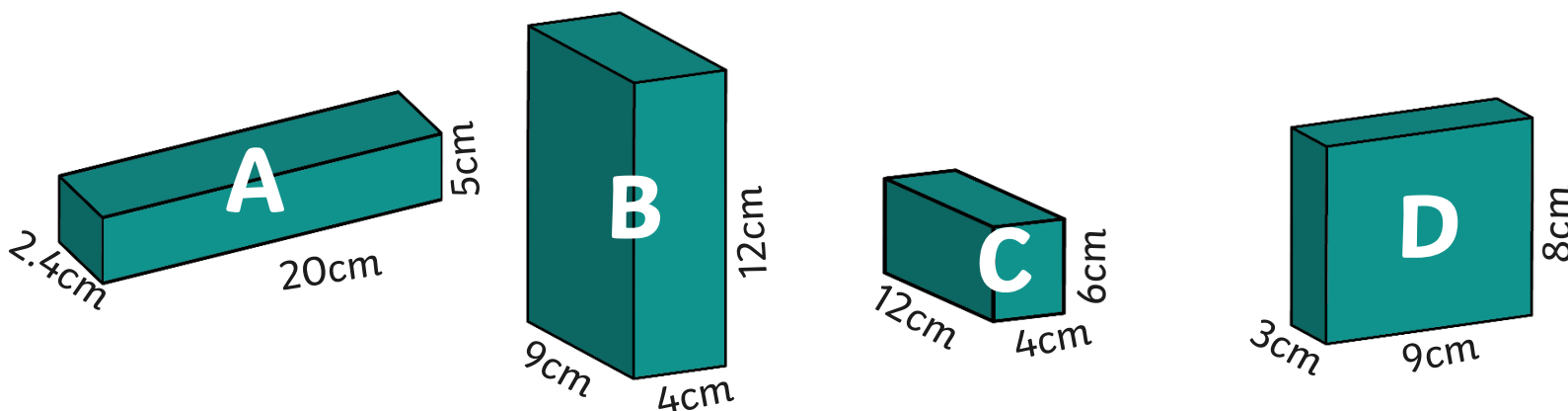
Smallest volume		Greatest volume

Calculate and Order

Calculate the volume of these cubes and cuboids, then order them from smallest to greatest volume.

A
2.4cm
20cm
5cm

B
12cm
9cm
4cm

C
12cm
4cm
6cm

D
8cm
3cm
9cm
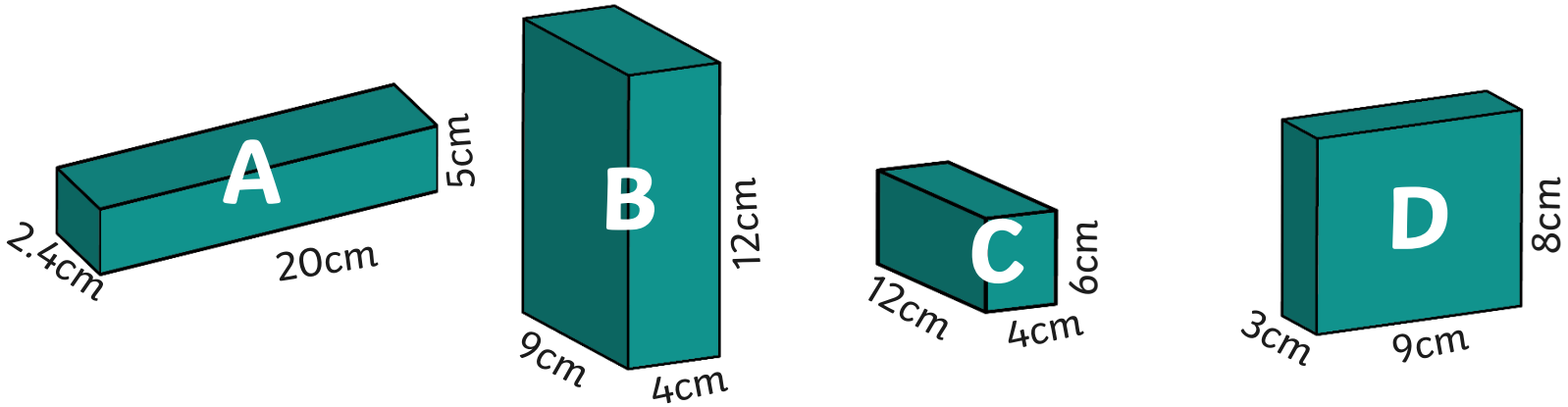
| volume = 240cm³ | volume = 432cm³ | volume = 288cm³ | volume = 216cm³ |

| Smallest volume | | Greatest volume |

Order:

D, A, C, B

In-Between

Give the dimensions of a cube or cuboid that would have a volume between the volumes of the two cuboids shown.

6cm
8cm
4cm

volume = 192cm³

10cm
6cm
6cm

volume = 360cm³

In-Between

Give the dimensions of a cube or cuboid that would have a volume between the volumes of the two cuboids shown.
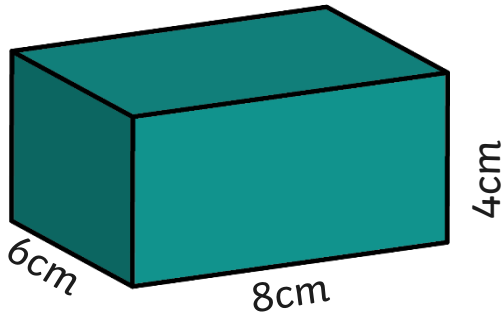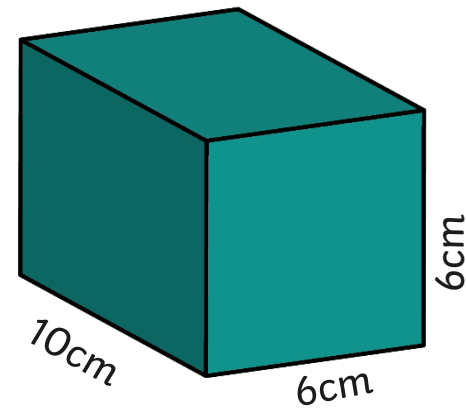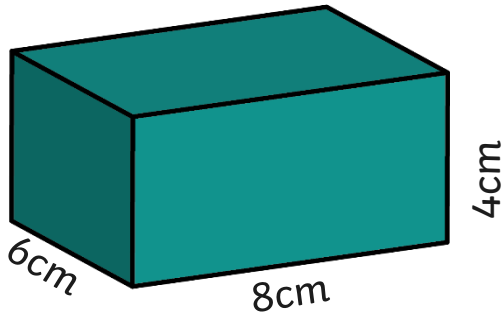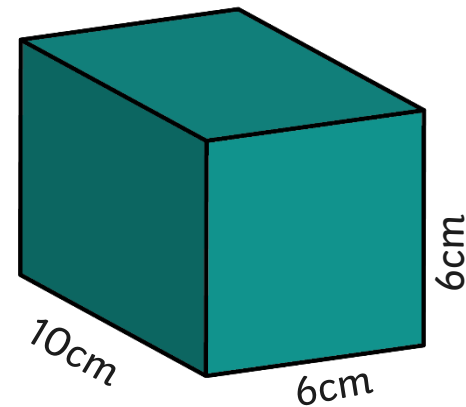

6cm
8cm
4cm

volume = 192cm³

10cm
6cm
6cm

volume = 360cm³

Answer:
Your cuboid should have a volume greater than 192cm³ and smaller than 360cm³, e.g. 5cm × 6cm × 8cm

Always, Sometimes, Never

With your partner, discuss the statements and agree whether they always, sometimes or never apply.
Give examples to show your reasoning.

Statement	Answer
If the dimensions of a cuboid are all even, the volume will be an even number measurement.	
If the dimensions of a cuboid are all odd, the volume will be an odd number measurement.	
A cube will have a volume which is an odd number measurement.	
If the dimensions of a cuboid are two odd and one even number measurements, the volume will be odd.	
If the dimensions of a cuboid are one odd and two even number measurements, the volume will be even.	

Always, Sometimes, Never

With your partner, discuss the statements and agree whether they always, sometimes or never apply.
Give examples to show your reasoning.

Statement	Answer
If the dimensions of a cuboid are all even, the volume will be an even number measurement.	**Always**
If the dimensions of a cuboid are all odd, the volume will be an odd number measurement.	**Always**
A cube will have a volume which is an odd number measurement.	**Sometimes**
If the dimensions of a cuboid are two odd and one even number measurements, the volume will be odd.	**Never**
If the dimensions of a cuboid are one odd and two even number measurements, the volume will be even.	**Always**

Activities

Red – 1 Star

Yellow – 2 Star

Green – 3 Star

Purple – extra challenge

Mastery – all groups