Reasoning and Problem Solving
Step 5: What is Volume?

National Curriculum Objectives:

Mathematics Year 5: (5M8) Estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water]
Mathematics Year 5: (5M9a) Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Find two possible shapes where the length, width and depth equal a volume less than 8cm³
Expected Find three possible shapes where the length, width and depth equal a volume of 10cm³
Greater Depth Find five possible shapes where the length, width and depth equal a volume less than 20cm³

Questions 2, 5 and 8 (Problem Solving)
Developing Find the odd one out by matching two shapes to three possible volumes.
Expected Find the odd one out by matching three shapes to four possible volumes.
Greater Depth Find the odd one out by matching four shapes to five possible volumes.

Questions 3, 6 and 9 (Reasoning)
Developing Explain which shape has the greatest volume when choosing from two simple statements.
Expected Explain which shape has the greatest volume when choosing from two statements.
Greater Depth Explain which shape has the greatest volume when choosing from three statements.

More Year 4 and Year 5 Area and Volume resources.

Did you like this resource? Don't forget to review it on our website.

Reasoning and Problem Solving – What is Volume?

1a. Sophie makes a shape that has a volume of 8cm³.

What does my shape look like?

Find two different shapes with the same volume as Sophie.

D

5 PS

1b. Damon makes a shape that has a volume of less than 8cm³.

What does my shape look like?

Find two different shapes with a volume less than 8cm³.

D

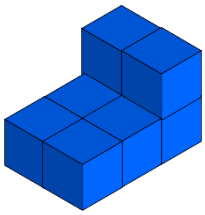
5 PS

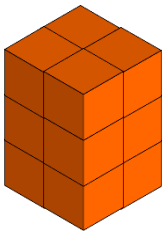
2a. Find the odd one out by matching the shape and the volume.

12cm³

8cm³

14cm³





D

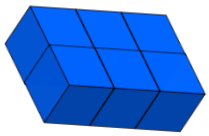
5 PS

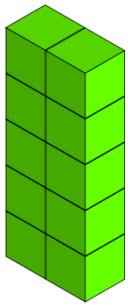
2b. Find the odd one out by matching the shape and the volume.

12cm³

10cm³

6cm³





D

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3a. Which child has the greatest volume?

Joel

My shape has a length of 2 cubes, a width of 2 cubes and a height of 2 cubes.

My shape has a length of 3 cubes, a width of 1 cube and a height of 2.

Adam

Explain.

D

5 R

3b. Which child has the greatest volume?

Milly

My shape has a length of 3 cubes, a width of 1 cubes and a height of 3 cubes.

My shape has a length of 2 cubes, a width of 3 cube and a height of 2.

Tom

Explain.

D

5 R

Reasoning and Problem Solving – What is Volume?

4a. Isla makes a shape that has a volume of 10cm³.

What does my shape look like?

Find three different shapes with a volume of 10cm³.

E

5 PS

4b. Jake makes a shape that has a volume of less than10cm³.

What does my shape look like?

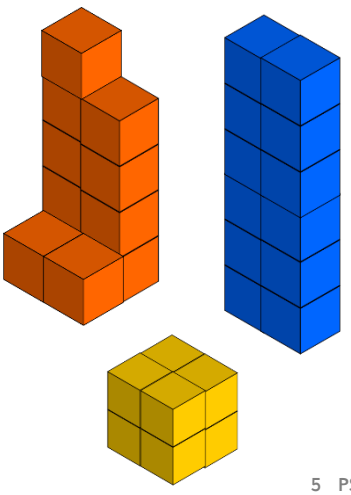
Find three different shapes with a volume of less than10cm³.

E

5 PS

5a. Find the odd one out by matching the shape and the volume.

- 8cm³
- 16cm³
- 12cm³
- 11cm³

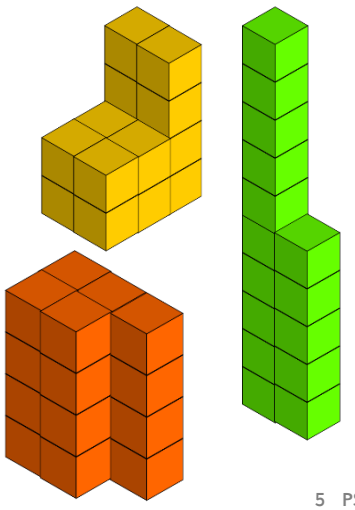


E

5 PS

5b. Find the odd one out by matching the shape and the volume.

- 15cm³
- 16cm³
- 17cm³
- 20cm³

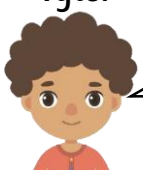


E

5 PS

6a. Which child has the greatest volume?

Tyler



My shape has a length of 4 cubes, a width of 2 cubes and a height of 2 cubes.

My shape has a length of 6 cubes, a width of 2 cubes and a height of 2 cubes.

Meera

Explain.

E

5 R

6b. Which child has the greatest volume?

Phoebe

My shape has a length of 5 cubes, a width of 2 cubes and a height of 3 cubes.

My shape has a length of 7 cubes, a width of 2 cubes and a height of 2 cubes.

Jason

Explain.

E

5 R

Reasoning and Problem Solving – What is Volume?

7a. Abdalla makes a shape that has a volume of between 10cm³ and 20cm³.

What does my shape look like?

Find five different shapes with a volume of less than 20cm³.

GD

5 PS

7b. Alison makes a shape that has a volume of less than 20cm³.

What does my shape look like?

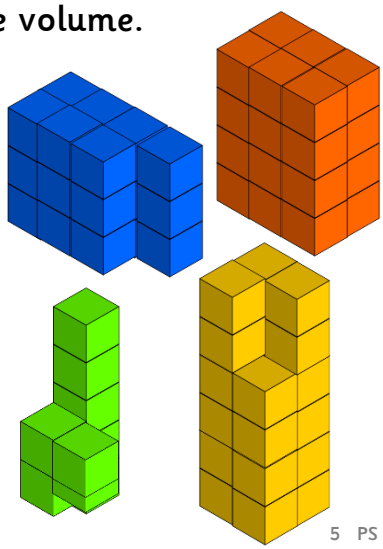
Find five different shapes with a volume of less than 20cm³.

GD

5 PS

8a. Find the odd one out by matching the shape and the volume.

- 21cm³
- 18cm³
- 24cm³
- 16cm³
- 22cm³

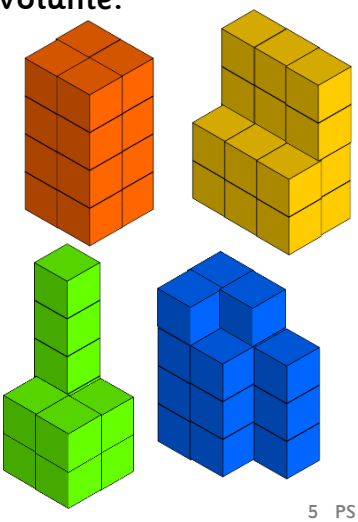


GD

5 PS

8b. Find the odd one out by matching the shape and the volume.

- 11cm³
- 21cm³
- 16cm³
- 18cm³
- 20cm³



GD

5 PS

9a. Which child has the greatest volume?

Amy

My shape has a length of 3 cubes, a width of 5 cubes and a height of 3 cubes.

Sam

My shape has a length of 4 cubes, a width of 6 cubes and a height of 2 cubes.

Sara

My shape has a length of 4 cubes, a width of 4 cubes and a height of 3 cubes.

Explain.

GD

5 R

9b. Which child has the greatest volume?

Maria

My shape has a length of 8 cubes, a width of 1 cubes and a height of 4 cubes.

Zac

My shape has a length of 3 cubes, a width of 6 cubes and a height of 2 cubes.

Chen

My shape has a length of 4 cubes, a width of 3 cubes and a height of 2 cubes.

Explain.

GD

5 R

Reasoning and Problem Solving – What is Volume?

Developing

1a. Any shape built from eight 1cm³ cubes.
1b. Any shape built from one to seven 1cm³ cubes.
2a. 14cm³ is the odd one out.
2b. 12cm³ is the odd one out.
3a. Joel is correct as his shape has a volume of 8cm³. The volume of Adam's shape is 8cm³.
3b. Tom is correct as his shape has a volume of 12cm³. The volume of Milly's shape is 9cm³.

Expected

4a. Any shape built from ten 1cm³ cubes.
4b. Any shape built from one to nine 1cm³ cubes.
5a. 16cm³ is the odd one out.
5b. 17cm³ is the odd one out.
6a. Meera is correct as her shape has a volume of 24cm³. The volume of Tyler's shape is 16cm³.
6b. Phoebe is correct as her shape has a volume of 30cm³. The volume of Jason's shape is 28cm³.

Greater Depth

7a. Any shape built using between ten and twenty 1cm³ cubes.
7b. Any shape built using between one and nineteen 1cm³ cubes.
8a. 18cm³ is the odd one out.
8b. 20cm³is the odd one out.
9a. Sam and Sara are correct as their shapes have a volume of 48cm³. The volume of Amy's shape is 45cm³.
9b. Zac is correct as his shape has a volume of 36cm³. The volume of Maria's shape is 32cm³. The volume of Chen's shape is 24cm³.