



Measure Volume and Capacity

Year 5 Week 13



Unit 17

Measure – volume and capacity



In this unit we will ...

- ⚡ Learn what the volume of a shape is
- ⚡ Find volumes of shapes by counting unit cubes
- ⚡ Draw shapes with different volumes
- ⚡ Compare the volume of different shapes
- ⚡ Estimate the capacity of different shapes

How many unit cubes are used to make this cube?

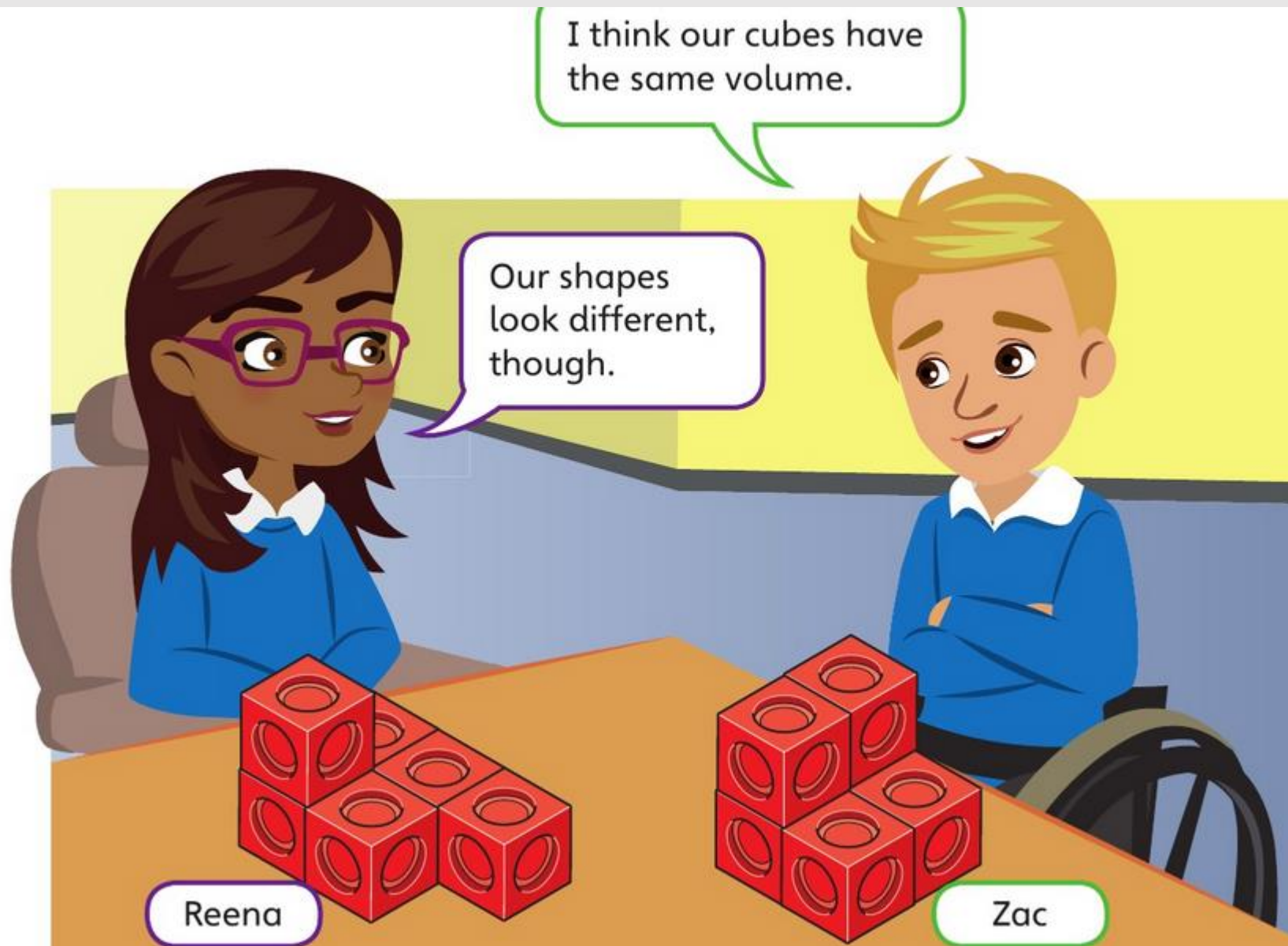


We will need some maths words.
Which of these are new?

volume	cube	cuboid	3D shape
solid	capacity	calculate	
estimate	unit cubes		
least	greatest		

Which container do you think has the greatest capacity? Why?





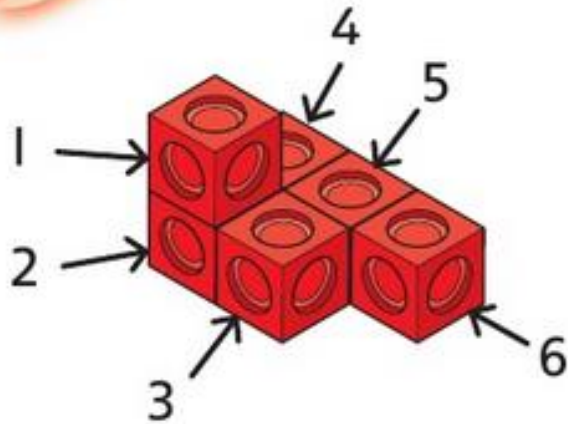
a) Is Zac correct?

What do you think is meant by **volume**?

a)

Volume means the amount of space that an object fills. We can use **unit cubes** as a way to measure volume.

I am going to count the number of unit cubes in each shape.



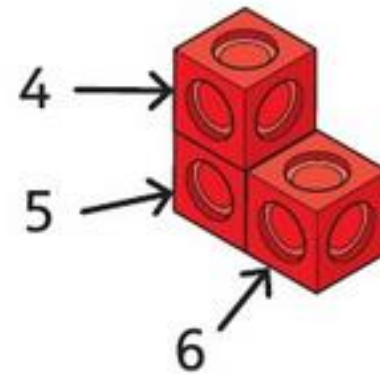
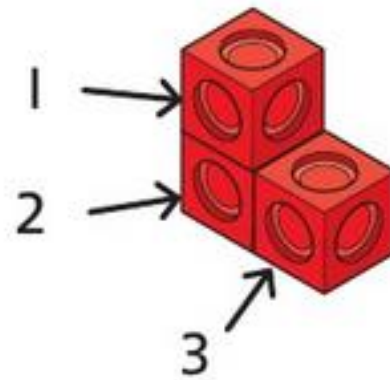
Reena's cube uses 6 cm cubes.
It has a volume of 6 unit cubes.



I think one of the cubes
in Zac's shape is hidden.

Zac's shape also uses 6 unit cubes.

It has the same volume as
Reena's shape.



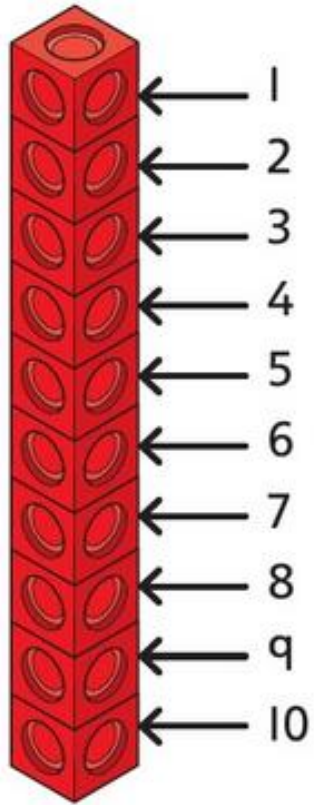


- Who has built the 3D shape with the greatest volume?
- Isla adds more cubes to her shape so that it has the same volume as Emma's shape.

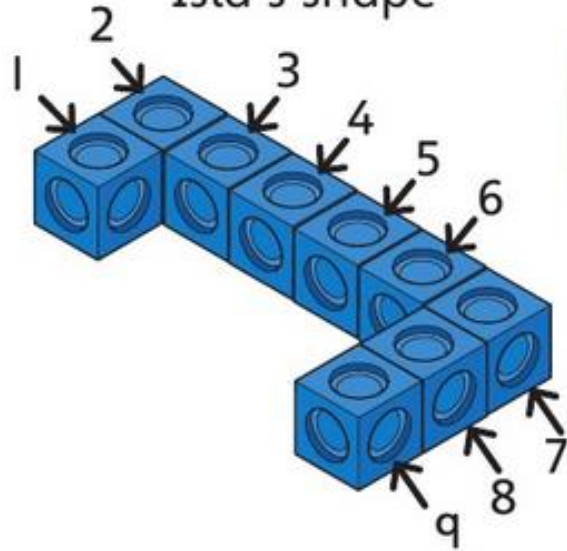
What could Isla's shape look like now?

a) Andy and Emma have made cuboids. Isla's shape is irregular.

Andy's shape



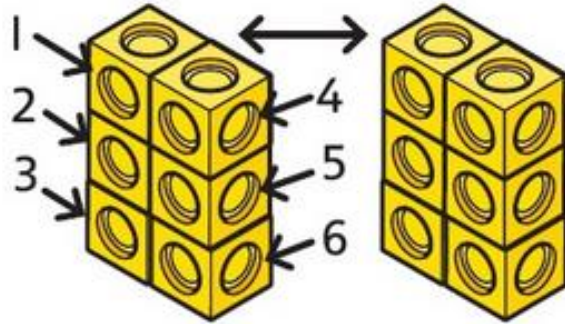
Isla's shape



I counted the cubes in each shape.



Emma's shape



I split Emma's shape into 2 layers. There are 6 cubes in each layer.

$$6 \times 2 = 12 \text{ unit cubes.}$$

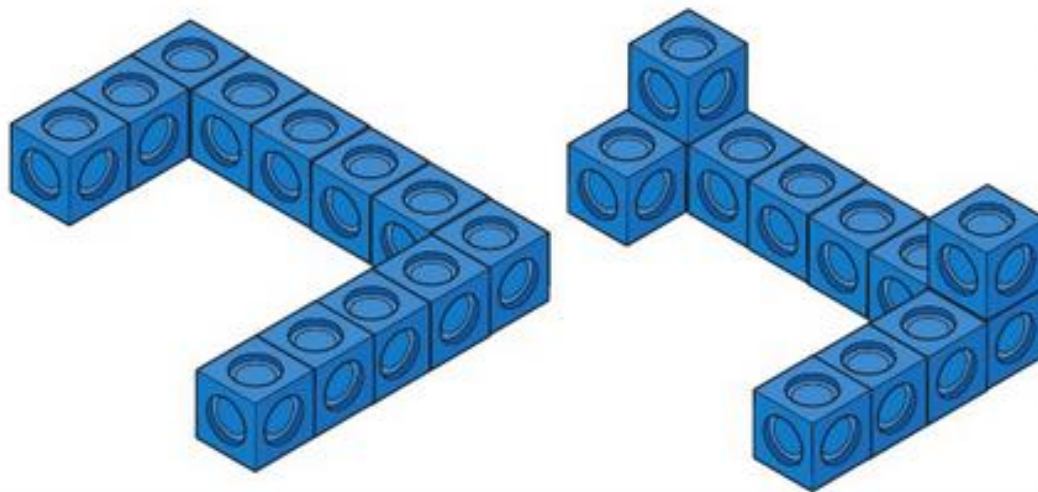
Andy's shape has a volume of 10 unit cubes.
Isla's shape has a volume of 9 unit cubes.
Emma's shape has a volume of 12 unit cubes.

$$9 < 10 < 12$$

Emma has built the shape with the greatest volume.



- b) Isla's shape has 9 cubes. Emma's shape has 12. Isla needs to add 3 more cubes for her shape to have the same volume as Emma's. It might look like one of these two shapes.





- a) Which 3D shape did Jamilla estimate the volume of?
What is the estimate of the volume of the shape?
- b) Why is it only an estimate?

- a) Jamilla estimated the volume of the triangular prism by making a shape out of cubes that could fit inside it.

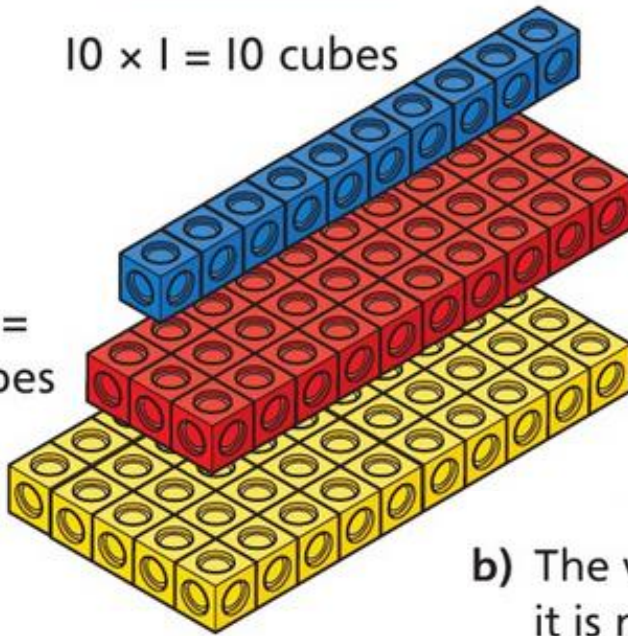
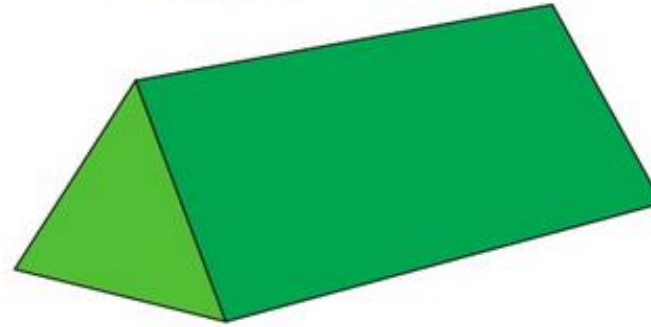
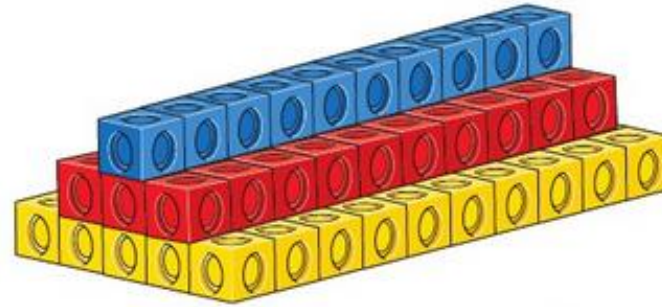


I worked out the volume of each layer and added them together.

$$10 \times 1 = 10 \text{ cubes}$$

$$10 \times 3 = 30 \text{ cubes}$$

$$10 \times 5 = 50 \text{ cubes}$$



- b) The volume is an estimate because it is not exact, as there would still be spaces left in the triangular prism if it were filled with the cubes.

The volume of the 3D shape is likely to be a bit more than 90 cubes.



Amelia

Volume- Lesson 4



a) How much water do you estimate Amelia's glass will hold?

b) There are five containers in the kitchen, labelled A to E.

Put these containers in order, from the one with the smallest capacity to the one with the greatest capacity.

a)

I know that a can of soft drink holds between 250 ml and 330 ml.

The glass looks like it holds slightly less. I estimate it holds 200 ml of water.



330 ml



You can estimate that the glass holds between 180 ml and 250 ml of water.



b)



There is a label on the milk. It says 1 l. This means 1 litre.

The ketchup bottle looks like it holds less than the milk bottle. It is not as wide or as tall.



The pan, watering can and fish tank hold more water than the milk bottle.



Smallest capacity ← → Greatest capacity

Holiday fun

Here are some ideas
you can try at home.



How long is left?

Work out how long is left until the end of your summer holiday.

How many weeks? What about how many days ... minutes ... hours ... seconds?

How many hours will you spend asleep? Or eating?

If you are travelling somewhere by car, bus, boat or plane, estimate the number of minutes the journey will take. Compare your estimates with other people in your family.

Measuring

Plan a hiking expedition with an adult from your family. Use suitable maps and read the scales carefully to accurately judge the distances and plan your rest-stops. Work out how many miles, metres or km your walk will be, and how many litres of water you will need to take with you. How much will your backpack weigh, once it is full of supplies?

Estimate how long the walk will take, and judge the best time to set off and your expected return time.