

Maths - Year 5

Measurement 4: Estimating volume and capacity

Key Vocabulary

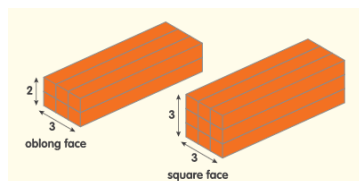
Volume	How much space something takes up, often measured in cm^3 or m^3 .
Capacity	How much a container can hold, measured in, e.g. millilitres (ml) or litres (l).
Vertex/ vertices	A point where two sides meet in a flat shape, or a point where three or more edges meet in a 3D shape.
Square number	When a number is multiplied by itself, the product is called a square number, e.g. $3 \times 3 = 3^2 = 9$, so 9 is a square number.
Cube number	When a number is multiplied by itself twice, the product is called a cube number, e.g. $2 \times 2 \times 2 = 2^3 = 8$, so 8 is a cube number.

Mathematical Skills

- Convert between cubic centimetres and millilitres or litres.
- Estimate the volume of a solid object in cubic centimetres.
- Estimate the volume of liquids in millilitres.
- Calculate the volume of a cuboid given the length, width and height.
- Describe what a cube number is.
- Calculate and recognise cube numbers (up to 6^3).
- Recognise and create 2D representations of 3D cubes and cuboids.

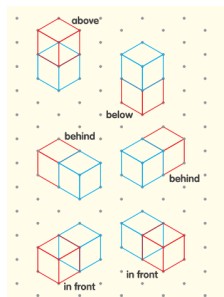
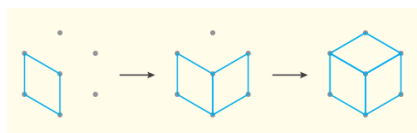
Mathematical Methods

- Finding the volume of a cuboid e.g. with Numicon 10 rods.

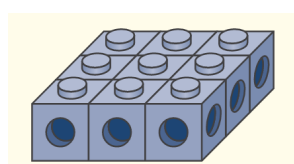


$$10\text{cm} \times 3\text{cm} \times 2\text{cm} = 60\text{cm}^3$$

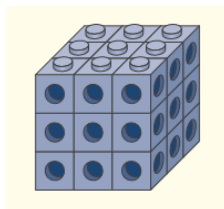
- Drawing 2D representations of cuboids.



- Building cubes and exploring cube numbers.

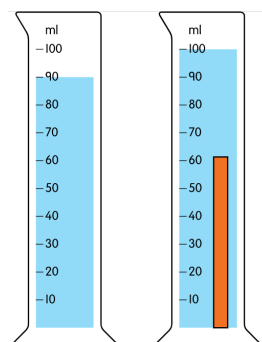


3 squared



3 cubed

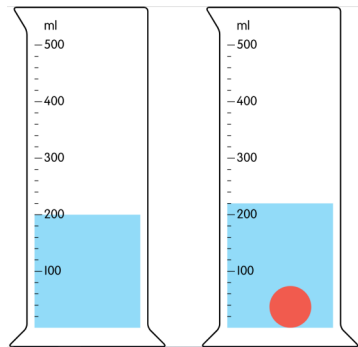
- Introducing the equivalence between cubic centimetres and millilitres e.g. If 10s-rod's 10cm^3 volume is equivalent to 10ml, then a 1-rod's volume is equivalent to 1ml, a 2-rod's 2ml etc.



The rod makes the water level rise.

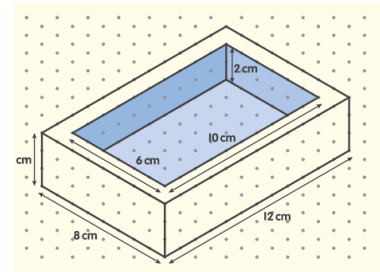
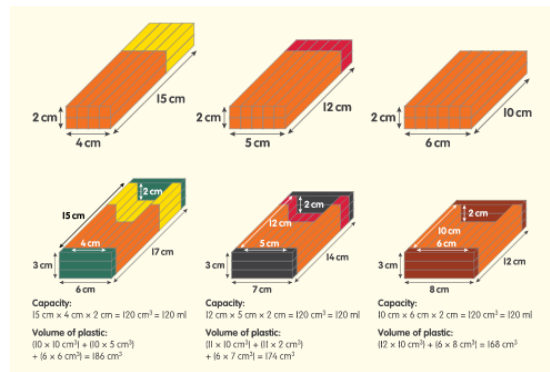
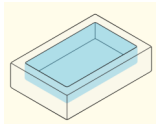
- Estimating and converting between volumes in cubic centimetres and millilitres e.g. $1\text{cm}^3 = 1\text{ml} = 0.001\text{l}$.

Estimate the volume of the rubber ball by comparing it to 1-rods (1cm^3). Check your estimation using displacement e.g. the amount the water rises can be used to calculate the volume of the rubber ball.



$$220\text{ml} - 200\text{ml} = 20\text{cm}^3$$

- Solving problems involving solid and liquid volumes and capacities e.g. designing plastic aquariums for shrimp.



Can you..?

- Rhian has twelve 6-rods. What are the dimensions of all the cuboids she can make using all her 6-rods?

- How many white 1-rods would you need to add to the cylinder to raise the water level to the 500ml mark?

