

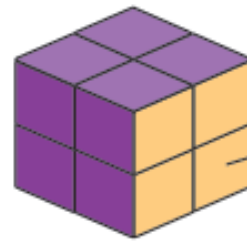
Key Vocabulary	Definition
Area	the size a surface takes up area is measured in square units (e.g. cm^2)
Volume	amount of space occupied by an object volume is measured in cubic units (see below)
Cubic units (cm^3)	The units used to measure volume
Cross-section	The face that results from slicing through a solid shape
Prism	a solid three-dimensional shape with two identical, parallel polygon bases
Cube	3 D solid that has six congruent (same shape and same size) square faces
Cuboid	A 3d shape. A right prism with six rectangular faces, sometimes referred to as a right rectangular prism
Face	Flat surface of a 3d shape
Length	distance from one end to the other
Height	Measurement from top to bottom
Width	distance across from side to side
Depth	

Volume of Cubes and Cuboids

Volume is measured in cubed units. For example, cm^3 , m^3 and km^3 .

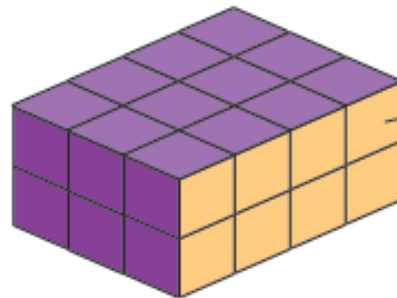
To calculate the volume of cubes and cuboids:

1. Calculate the area of the cross-section (one face).
2. Multiply the area of the cross-section (one face) by its depth.



$$\text{Area of cross section (face)} = 2\text{cm} \times 2\text{cm} = 4\text{cm}^2$$

$$4\text{cm}^2 \times 2\text{cm} = \text{Volume of } 8\text{cm}^3$$



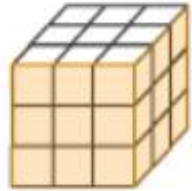
$$\text{Area of cross section (face)} = 4\text{cm} \times 2\text{cm} = 8\text{cm}^2$$

$$8\text{cm}^2 \times 3\text{cm} = \text{Volume of } 24\text{cm}^3$$



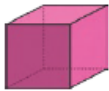


The block is a 1 centimetre cube.
It would take 27 cubes to fill the container,
3 wide, 3 deep and 3 high ... $3 \times 3 \times 3 = 27$.



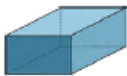
The container has a volume of 27 cm^3 .

Cube



6 square faces
12 edges
8 vertices

Cuboid



6 faces
12 edges
8 vertices

Square-based pyramid



5 faces
8 edges
5 vertices

Prior Knowledge

Area and Perimeter

Area is the amount of space inside a 2D shape.
Perimeter is the total **distance** around the outside of a 2D shape.

Real Life

- **Nets** - calculating the size of nets for pizza boxes / cupcake boxes
- **Capacity** - how much liquid can be held in a bottle
- **Filling a paddling pool** - how much water is needed to fill a paddling pool?

Zooming out...

- **Ancient Egyptians.** In 1500BC in Egypt, measurements were taken of the Sun's shadow against graduations marked on stone tables (a sun dial)
- 'Geometry' comes from the Greek word *geometria*, meaning 'earth measurement'
- **Ancient Egyptians** are thought to be the first group to begin studying geometry. We can see evidence of this type of thinking with their design and construction of the Great Pyramids