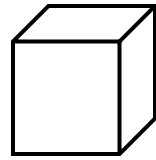


Key Vocabulary

Perimeter	The total of the lengths around the outside of a shape.
Area	The "space inside" a 2-dimensional shape. Measured in square units, e.g. cm ² .
Volume	The "space inside" a 3-dimensional shape. Measured in cube units, e.g. cm ³ .
Capacity	A measure of the amount of liquid a 3-dimensional shape can hold. Measured in units such as litres.
Surface Area	The total of the areas of all the surfaces of a 3-dimensional shape.
Polygon	A shape made with only straight sides.
Quadrilateral	A four sided polygon. Square, Rectangle, Parallelogram, Rhombus, Trapezium, Kite, Delta (Arrowhead).
Dimension	A measure taken off a shape, usually length, width (breadth), height (depth), base, diagonal.
Cube	A 3-dimensional shape that has 6 face. All faces are squares.
Cuboid	A 3-dimensional shape that has 6 face. All faces are squares.
Prism	A 3-d shape that has a constant cross-section.

Key facts / Diagrams



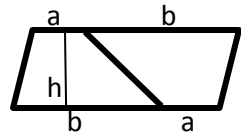
A cube with sides 5cm.
 Volume = $l \times w \times h$
 $= 5 \times 5 \times 5 = 125\text{cm}^3$
 Surface Area:
 Each face is a square with area $5 \times 5 = 25\text{cm}^2$. There are 6 square faces so the total surface area = $6 \times 25 = 150\text{cm}^2$.



Volume = $l \times w \times h$
 Surface Area:

The "top" is a rectangle, area $l \times w$.
 The "base" of the cuboid is the same as the "top".
 The "front" is a rectangle, area $l \times h$.
 The "back" of the cuboid is the same as the "front".
 The "right hand end" is a rectangle, area $w \times h$.
 The "left hand end" of the cuboid is the same as the "right hand end".
 The total surface area is these 6 areas added together: $2 \times (l \times w + l \times h + w \times h)$.

Area of a trapezium:
 Consider two trapezia joined together. They would make a parallelogram.



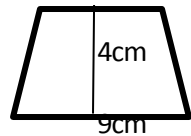
The area of the parallelogram = $(a+b) \times h$
 Therefore the area of the trapezium = $\frac{1}{2}(a+b) \times h$

Common misconceptions

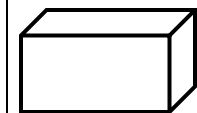
- Sometimes "extra" information is given, e.g. a sloping length in a triangle. You must identify the units that are needed and ignore extra information. Don't just try to find the area of volume by multiplying every length given.
- Remember for Surface Area there will be sides that can't be seen in the diagram. These areas needed to be added in as well.
- You must remember formulas correctly, e.g. area of a parallelogram = base x height. There is no $\div 2$, which IS needed for a triangle.

Worked examples

Trapezium



Area = $\frac{1}{2} (a+b) \times h$
 $= \frac{1}{2} (5+9) \times 4$
 $= \frac{1}{2} \times 14 \times 4$
 $= 7 \times 4$
 $= 28\text{cm}^2$.



A cuboid with sides 5cm, 3cm and 3cm.
 Volume = $l \times w \times h$
 $= 5 \times 3 \times 3 = 45\text{cm}^3$

Surface Area:
 "Top" and "base" $3 \times 5 = 15\text{cm}^2$ each.
 "Front" and "back" $3 \times 5 = 15\text{cm}^2$ each.
 "Right hand end" and "left hand end" $3 \times 3 = 9\text{cm}^2$ each.
 The total surface area = $2 \times (15 + 15 + 9) = 78\text{cm}^2$