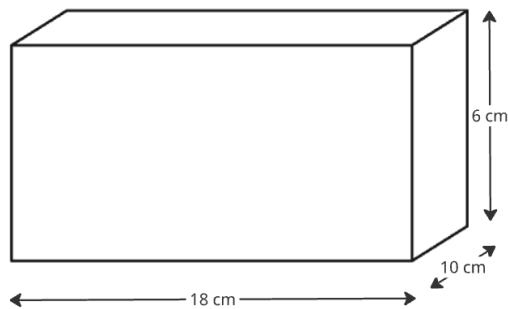# Volume and Surface Area (Prisms)

This worksheet requires you to calculate the volume and surface area of various prisms (excluding cylinders). Remember the formula for the volume of a prism is: $V = \text{Area of Cross-section} \times \text{Length}$.
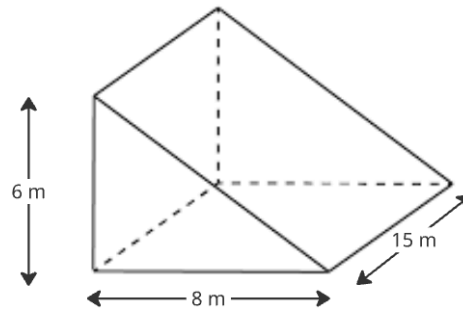
Rectangular and Triangular Prisms

1. A rectangular prism (cuboid) has a length of 18 cm, a width of 10 cm, and a height of 6 cm. Calculate its volume.

2. Calculate the total surface area of the cuboid from Question 1.

3. A triangular prism has a cross-section that is a right-angled triangle with a base of 8 m and a height of 6 m. The length of the prism is 15 m. Calculate its volume.
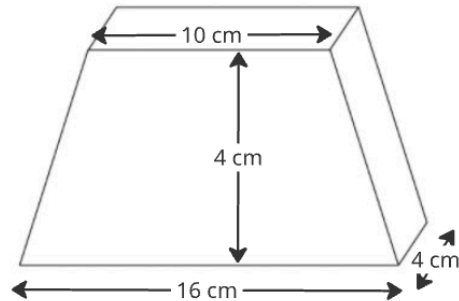

4. Calculate the total surface area of the triangular prism from Question 3.
(Hint: You will need to use Pythagoras to find the hypotenuse of the triangular base.)

Trapezoidal Prisms
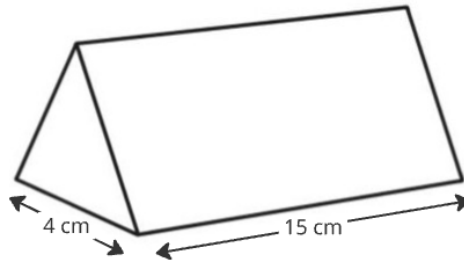
5. Calculate the volume of the trapezoidal prism shown below.

6. A water trough is in the shape of an open-top trapezoidal prism. The parallel sides of the trapezium are 0.5 m and 0.9 m, and the height is 0.4 m. The trough is 3 m long. Calculate the volume of water the trough can hold in litres. $(1 \text{ m}^3 = 1000 \text{ L})$

Reverse and Composite Problems

7. A fish tank is a rectangular prism with a square base. The total volume of the tank is $240 \text{ litres } (0.24 \text{ m}^3)$. If the base has a side length of 0.6 m, what is the height of the fish tank in metres?

0.6 m
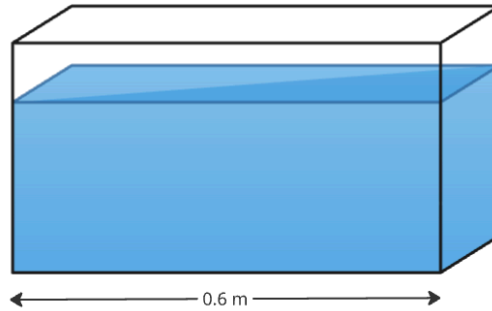
8. A company makes chocolate bars shaped like equilateral triangular prisms. The side length of the triangular cross-section is 4 cm, and the length of the bar is 15 cm.

a. Calculate the area of the triangular cross-section.
b. Calculate the volume of the chocolate bar.

(Hint: Split the equilateral triangle into two right-angled triangles to find the height.)

9. A shipping container is a rectangular prism with external dimensions 6 m $\times$ 2.5 m $\times$ 2.5 m. If the container is to be painted on all six sides, and one litre of paint covers 10 m^2, how many litres of paint are required for one container?