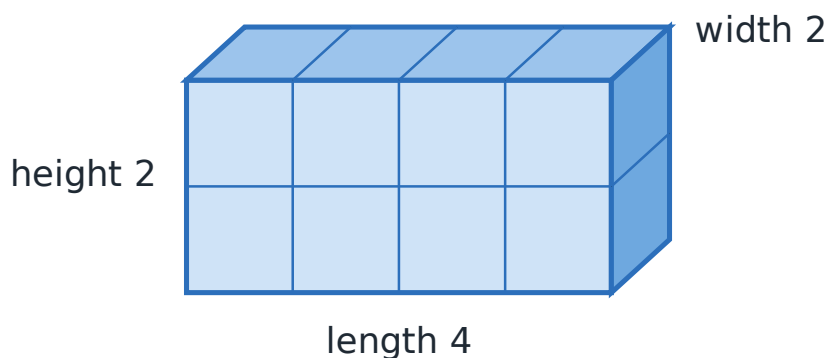


3D Space & Structures — Practice Worksheet

Part A — Prisms, pyramids & volume

Three-dimensional objects can be visualised, sketched and built. The volume of a rectangular prism is the number of unit cubes that fill it — found by multiplying length \times width \times height.

Volume of a Rectangular Prism



$$\text{Volume} = 4 \times 2 \times 2 = 16 \text{ cubic units}$$

Volume measured in cubic units.

Worked example. A prism 4 long, 2 wide, 2 high: the bottom layer holds $4 \times 2 = 8$ cubes, and there are 2 layers, so $8 \times 2 = 16$ cubes. **Volume = $4 \times 2 \times 2 = 16$ cubic units.**

Watch out. Volume is measured in *cubic* units (cm^3), not square units (cm^2). Don't forget the hidden cubes inside the prism.

Naming & visualising 3D objects

Q1. Name each: (a) 6 square faces (b) 2 triangular faces and 3 rectangular faces (c) a square base and 4 triangular faces meeting at a point.

Q2. How many faces, edges and vertices does a rectangular prism have? _____

Counting cubes to find volume

Q3. The prism in the picture is 4 long \times 2 wide \times 2 high. How many unit cubes in the **bottom layer**? How many layers? Total cubes?

Q4. Find the volume (in cubic units): (a) $3 \times 3 \times 2$ (b) $5 \times 2 \times 4$ (c) $6 \times 1 \times 3$

Describe & test a method

Q5. Write a sequence of steps that works for **any** rectangular prism to find its volume. Test your steps on a $4 \times 3 \times 2$ prism.

Q6. A box is $10 \text{ cm} \times 5 \text{ cm} \times 4 \text{ cm}$. What is its volume in cubic centimetres? _____

Construct

Q7. Using the same 12 cubes, list **two different** rectangular prisms you could build (give the dimensions of each).