



Volume of cubes and cuboids

Mana Maths

Te reo Māori terms



pūtoru

cube

Open in Te Aka

poro-tapawhā

hāngai

cuboid

Open in Te Aka

rōrahi

volume

Open in Te Aka

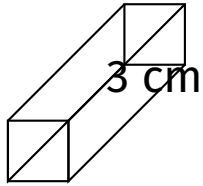
roa

length

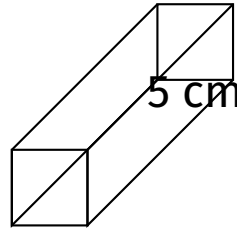
Open in Te Aka

Volume of cubes and cuboids – Foundation

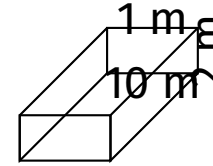
1. Find the volume of this cube.



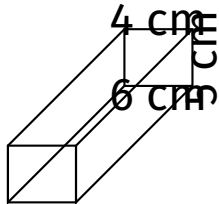
2. Find the volume of this cube.



3. Find the volume of this cuboid.



4. Find the volume of this cuboid.



5. A cube has side length 4 m. What is its volume?

6. A cuboid is 12 cm long, 3 cm wide, and 2 cm high. What is its volume?

7. A cube has side length 7 cm. What is its volume?

8. A cuboid is 9 m long, 2 m wide, and 1 m high. What is its volume?

9. A cube has side length 2.5 cm. What is its volume?

10. A cuboid is 15 mm long, 4 mm wide, and 3 mm high. What is its volume?

11. How many cubic centimetres are in 1 cubic metre?

12. How many cubic millimetres are in 1 cubic centimetre?

13. A cube has volume 27 cm^3 . What is its side length?

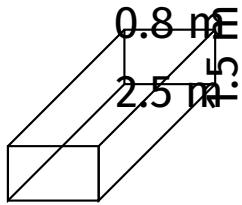
14. A cuboid has volume 60 m^3 , length 5 m, and width 3 m. What is its height?

15. A cube has volume 64 mm^3 . What is its side length?

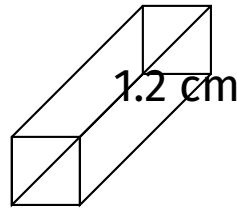
16. A cuboid has volume 48 cm^3 , length 6 cm, and height 2 cm. What is its width?

Volume of cubes and cuboids – Proficient

1. Find the volume of this cuboid.



2. Find the volume of this cube.



3. A storage box is 80 cm long, 50 cm wide, and 40 cm high. What is its volume in cubic centimetres? In cubic metres?

4. A cube has volume 125 cm^3 . What is its side length?

5. A cuboid has volume 240 mm^3 , width 6 mm, and height 5 mm. What is its length?

6. How many 1 cm cubes would fit inside a 1 m cube?

7. Convert 2.5 m^3 to cm^3 .

8. Convert 7500 mm^3 to cm^3 .

9. A fish tank is 60 cm long, 30 cm wide, and 40 cm high. What is its volume in litres? (1 litre = 1000 cm^3)

- 10.** A cube has side length 0.3 m. What is its volume in cm^3 ?
- 11.** A cuboid has dimensions 2.4 m by 1.8 m by 0.9 m. What is its volume in m^3 and cm^3 ?
- 12.** A box has volume 1.2 m^3 . If its length is 2 m and width is 0.6 m, what is its height?
- 13.** Which has greater volume: a cube with side 8 cm or a cuboid $10 \text{ cm} \times 7 \text{ cm} \times 4 \text{ cm}$?
- 14.** A room is 5 m long, 4 m wide, and 2.5 m high. What is its volume?
- 15.** A cube and a cuboid have the same volume. The cube has side 6 cm. The cuboid has length 9 cm and width 4 cm. What is the height of the cuboid?
- 16.** Explain why $1 \text{ m}^3 = 1,000,000 \text{ cm}^3$.
- 17.** A shipping container is 12 m long, 2.4 m wide, and 2.6 m high. What is its volume?

Volume of cubes and cuboids — Excellence

1. A cube has side length x cm. Write an expression for its volume.
2. A cuboid has length l cm, width w cm, and height h cm. Write an expression for its volume.
3. If a cube's side length doubles, what happens to its volume? Explain.
4. If all dimensions of a cuboid triple, what happens to its volume? Explain.
5. A cube has volume 216 cm^3 . Find its side length.
6. A cuboid has volume 360 cm^3 . Its length is 12 cm and width is 5 cm. Find its height.

- 7.** Convert 3.75 m^3 to cm^3 .
- 8.** Convert $8,500,000 \text{ mm}^3$ to m^3 .
- 9.** A swimming pool is 25 m long, 10 m wide, and has an average depth of 1.5 m. What is its volume in cubic metres? In litres? ($1 \text{ m}^3 = 1000 \text{ L}$)
- 10.** A cube and a cuboid have equal volume. The cube has side 10 cm. The cuboid has length 20 cm and width 5 cm. Find the cuboid's height.
- 11.** Which has greater volume and by how much: a 15 cm cube or a cuboid $18 \text{ cm} \times 12 \text{ cm} \times 8 \text{ cm}$?
- 12.** A room is 6 m long, 4.5 m wide, and 2.8 m high. What is its volume? If paint covers 12 m^2 per litre, how many litres are needed for the walls (excluding floor and ceiling)?

- 13.** A box measures 1.2 m \times 0.8 m \times 0.6 m. How many cubes of side 20 cm can fit inside?
- 14.** A storage container has volume 48 m³. If its length is 6 m and height is 2 m, find its width.
- 15.** A cube's volume is 64 times larger than another cube. How many times longer is its side?
- 16.** Explain why volume is measured in cubic units, not square units.
- 17.** A cuboid's length is twice its width, and its height is three times its width. If its volume is 150 cm³, find its dimensions.
- 18.** A cube of side 4 cm is cut into smaller cubes of side 1 cm. How many small cubes are produced?
- 19.** Water flows into a tank at 2 litres per second. The tank is a cuboid 1 m \times 0.8 m \times 0.5 m. How long will it take to fill?
- 20.** A rectangular prism has volume V , length l , width w , and height h . Rearrange $V = lwh$ to make h the subject.
- 21.** A company makes boxes in two sizes: small (10 cm \times 8 cm \times 6 cm) and large (15 cm \times 12 cm \times 10 cm). What is the ratio of their volumes?

22. A cube has surface area 150 cm^2 . Can you find its volume? Explain your reasoning.

23. A cuboid has a square base of side 5 cm . Its volume is 200 cm^3 . Find its height.

24. If you double the length and halve the width of a cuboid while keeping height constant, what happens to the volume?

25. A room's length, width, and height are in the ratio $3:2:1$. If its volume is 192 m^3 , find its dimensions.