

Name _____

Date _____

15.5 Volume of cubes and cuboids — worksheet

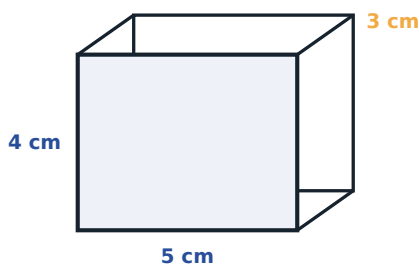
Derive and use the formula for the volume of a cube or cuboid, and use it for compound solids made from cuboids. · 63 questions · Show your working.

Remember

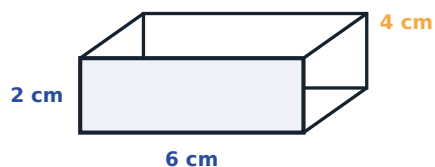
- **Volume of a cuboid** = $l \times w \times h$.
- It is also **base area** $\times$ **height** — one layer, stacked h times.
- **Volume of a cube** = $s \times s \times s = s^3$.
- Volume is measured in **cubic** units, because three lengths are multiplied.
- **1 litre** = **1000 cm³**, a cube 10 cm on each edge.
- **1 m³** = **1 000 000 cm³** — the length factor is **cubed**.
- For a compound solid, split it into cuboids and **add** the volumes; for a hole, **subtract**.
- To find a missing dimension, divide the volume by the other two.
- Doubling every edge multiplies the volume by 8, not by 2.

A · Fluency — Volumes of cuboids and cubes, and missing dimensions.

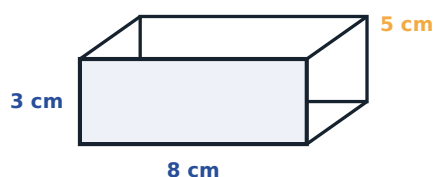
- 1 Find the **volume** of this cuboid, in cubic centimetres.



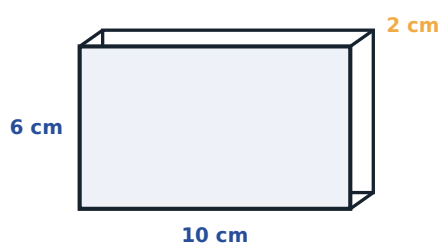
- 2 Find the **volume** of this cuboid, in cubic centimetres.



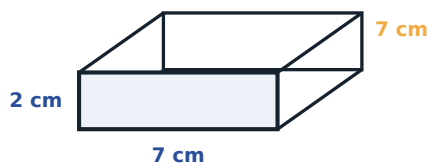
- 3 Find the **volume** of this cuboid, in cubic centimetres.



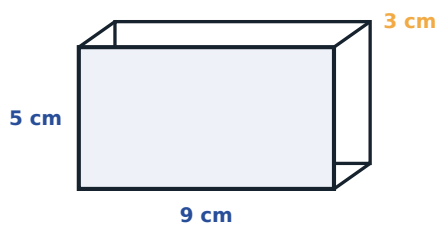
- 4 Find the **volume** of this cuboid, in cubic centimetres.



- 5 Find the **volume** of this cuboid, in cubic centimetres.



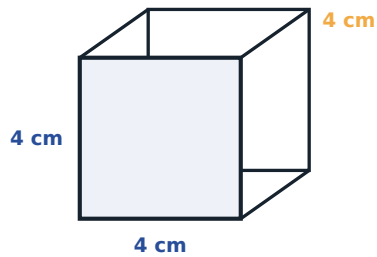
-
- 6 Find the **volume** of this cuboid, in cubic centimetres.



-
- 7 Find the **volume** of this cuboid, in cubic centimetres.



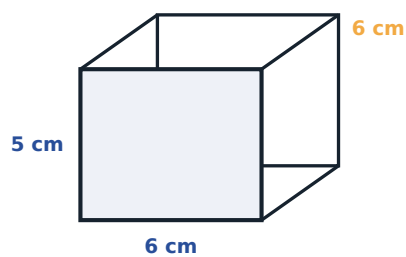
- 8 Find the **volume** of this cuboid, in cubic centimetres.



- 9 Find the **volume** of this cuboid, in cubic centimetres.



- 10 Find the **volume** of this cuboid, in cubic centimetres.



- 11 A cube has edges of 2 cm. What is its volume, in cubic centimetres?

- 12 A cube has edges of 3 cm. What is its volume, in cubic centimetres?

- 13 A cube has edges of 4 cm. What is its volume, in cubic centimetres?

- 14 A cube has edges of 5 cm. What is its volume, in cubic centimetres?

- 15** A cube has edges of 6 cm. What is its volume, in cubic centimetres?

- 16** A cube has edges of 10 cm. What is its volume, in cubic centimetres?

- 17** A cube has edges of 7 cm. What is its volume, in cubic centimetres?

- 18** A cube has edges of 8 cm. What is its volume, in cubic centimetres?

- 19** A cuboid is 5 cm long, 3 cm deep and 4 cm tall. What is the area of the face it stands on, in square centimetres?

- 20** A cuboid is 6 cm long, 4 cm deep and 2 cm tall. What is the area of the face it stands on, in square centimetres?

- 21** A cuboid is 8 cm long, 5 cm deep and 3 cm tall. What is the area of the face it stands on, in square centimetres?

- 22** A cuboid is 10 cm long, 2 cm deep and 6 cm tall. What is the area of the face it stands on, in square centimetres?

- 23** A cuboid is 7 cm long, 7 cm deep and 2 cm tall. What is the area of the face it stands on, in square centimetres?

- 24** A cuboid is 9 cm long, 3 cm deep and 5 cm tall. What is the area of the face it stands on, in square centimetres?

- 25** A cuboid is 12 cm long, 4 cm deep and 3 cm tall. What is the area of the face it stands on, in square centimetres?

- 26** A cuboid is 4 cm long, 4 cm deep and 4 cm tall. What is the area of the face it stands on, in square centimetres?

- 27** A cuboid has volume 60 cm^3 , length 5 cm and width 4 cm. What is its height, in centimetres?

- 28** A cuboid has volume 144 cm^3 , length 6 cm and width 6 cm. What is its height, in centimetres?

- 29** A cuboid has volume 120 cm^3 , length 10 cm and width 3 cm. What is its height, in centimetres?

- 30** A cuboid has volume 210 cm^3 , length 7 cm and width 5 cm. What is its height, in centimetres?

- 31** A cuboid has volume 96 cm^3 , length 8 cm and width 4 cm. What is its height, in centimetres?

- 32** A cuboid has volume 180 cm^3 , length 9 cm and width 5 cm. What is its height, in centimetres?

33 A container holds 1000 cm^3 . How many litres is that?

34 A container holds 2000 cm^3 . How many litres is that?

35 A container holds 5000 cm^3 . How many litres is that?

36 A container holds 12000 cm^3 . How many litres is that?

37 A container holds 500 cm^3 . How many litres is that?

38 A container holds 7500 cm^3 . How many litres is that?

B · Reasoning — Why the units are cubes, and what the formula is really doing.

39 Why is volume measured in cubic centimetres?

- ☐ Because solids are cubes
- ☐ Because it counts how many 1 cm cubes fit inside
- ☐ Because of the formula
- ☐ It is just a name

40 Volume of a cuboid = ...

- ☐ $l + w + h$
- ☐ $2(l + w + h)$
- ☐ $l \times w \times h$
- ☐ $l \times w$

41 Why is the volume the base area times the height?

- ☐ It is a coincidence
- ☐ Each layer is one base area thick, and there are h layers
- ☐ Because of the units
- ☐ It is not

42 A cube has edge 4 cm . Its volume is ...

- ☐ 12 cm^3
- ☐ 16 cm^3
- ☐ 48 cm^3
- ☐ 64 cm^3

43 Does doubling every edge of a cube double its volume?

- ☐ Yes
- ☐ No

44 1 litre is ...

- ☐ 10 cm^3
- ☐ 100 cm^3
- ☐ 1000 cm^3
- ☐ $10\,000 \text{ cm}^3$

- 45** 1 m^3 is how many cm^3 ?
- ☐ 1000
 - ☐ 10 000
 - ☐ 100 000
 - ☐ 1 000 000
- 46** To find the volume of a shape made of two cuboids, you ...
- ☐ multiply the volumes
 - ☐ split it and add the volumes
 - ☐ average them
 - ☐ subtract
- 47** Do two cuboids with the same volume have to be the same shape?
- ☐ Yes
 - ☐ No
- 48** Which unit fits the volume of a swimming pool?
- ☐ mm^3
 - ☐ cm^3
 - ☐ m^3
 - ☐ there is none

C · Challenge — Compound solids, holes, litres and packing.

- 49** A shape is made from a 6 cm by 4 cm by 3 cm cuboid with a 2 cm cube stuck on top. What is its total volume, in cubic centimetres?
- _____
- 50** A cuboid 10 cm by 8 cm by 5 cm has a 4 cm by 4 cm by 5 cm hole right through it. What volume remains, in cubic centimetres?
- _____
- 51** A cube has volume 125 cm^3 . What is the length of one edge, in centimetres?
- _____
- 52** A tank is 2 m by 1 m by 0.5 m. What is its volume, in cubic metres?
- _____
- 53** A tank is 50 cm by 40 cm by 30 cm. How many litres does it hold?
- _____
- 54** How many 2 cm cubes fit inside a 10 cm by 8 cm by 6 cm box?
- _____
- 55** A cuboid has volume 240 cm^3 and a square base of side 4 cm. What is its height, in centimetres?
- _____

D · Word problems — Boxes, tanks, pools and skips.

- 56** A box is 20 cm by 15 cm by 10 cm. What is its volume, in cubic centimetres?
- _____

- 57** A fish tank is 60 cm by 30 cm by 40 cm. How many litres does it hold?

- 58** A concrete block is 40 cm by 20 cm by 20 cm. What is its volume, in cubic centimetres?

- 59** A swimming pool is 25 m by 10 m and 2 m deep. What is its volume, in cubic metres?

- 60** A lorry carries 18 m^3 of sand. Each load of a wheelbarrow is 0.09 m^3 . How many barrow loads is that?

- 61** A carton is 12 cm by 8 cm by 5 cm. How many fit in a crate 48 cm by 32 cm by 20 cm?

- 62** A juice carton holds 1 litre. Its base is 10 cm by 10 cm. How tall is it, in centimetres?

- 63** A skip is 3 m by 2 m by 1 m. Rubble costs \$25 per cubic metre to remove. What does a full skip cost, in dollars?

