

Name _____

Date _____

15.6 Surface area, nets and views — worksheet

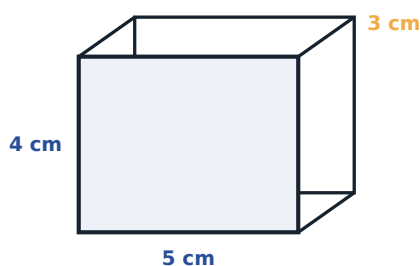
Use knowledge of area to calculate the surface area of cubes and cuboids, work with their nets, and represent the front, side and top views of a 3D shape. · 71 questions · Show your working.

Remember

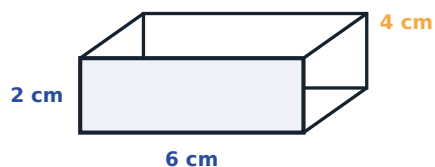
- **Surface area** is the total area of all the faces. It is measured in **cm²**, not cm³.
- A cuboid has **6 faces, 12 edges and 8 vertices**.
- The six faces come in **three matching pairs**.
- **Surface area of a cuboid** = $2(lw + lh + wh)$.
- **Surface area of a cube** = $6s^2$.
- The **net** lays all six faces out flat, so none can be forgotten.
- For an **open** box, work out the closed one and subtract the missing face.
- The total edge length of a cuboid is $4(l + w + h)$.
- The **front, side and top views** are flat rectangles: $l \times h$, $w \times h$ and $l \times w$.
- Equal volume does not mean equal surface area — a cube is the most economical box.

A · Fluency — Surface areas, faces, edges and views.

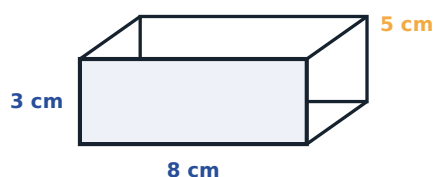
- 1 Find the **surface area** of this cuboid, in square centimetres.



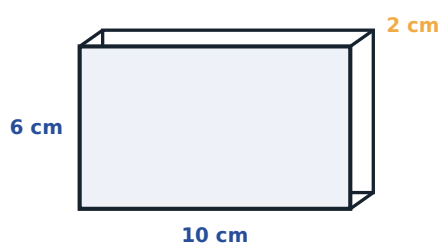
- 2 Find the **surface area** of this cuboid, in square centimetres.



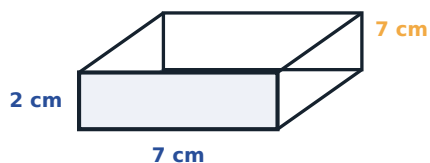
- 3 Find the **surface area** of this cuboid, in square centimetres.



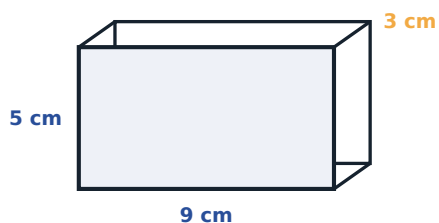
- 4 Find the **surface area** of this cuboid, in square centimetres.



- 5 Find the **surface area** of this cuboid, in square centimetres.



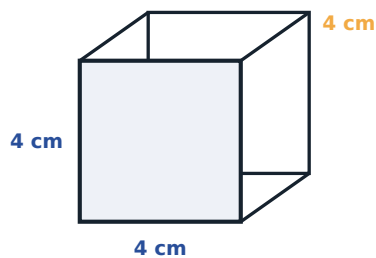
- 6 Find the **surface area** of this cuboid, in square centimetres.



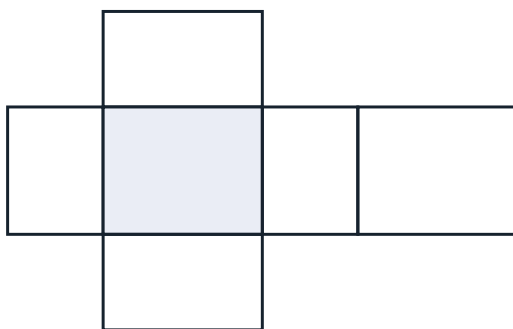
- 7 Find the **surface area** of this cuboid, in square centimetres.



- 8 Find the **surface area** of this cuboid, in square centimetres.

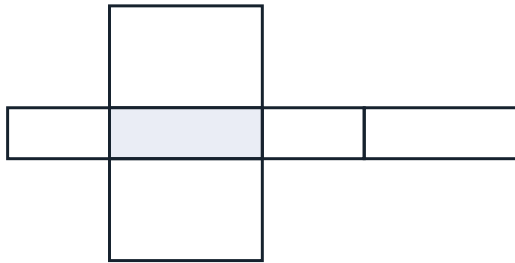


- 9 A cube has edges of 2 cm. What is its surface area, in square centimetres?
- 10 A cube has edges of 3 cm. What is its surface area, in square centimetres?
- 11 A cube has edges of 4 cm. What is its surface area, in square centimetres?
- 12 A cube has edges of 5 cm. What is its surface area, in square centimetres?
- 13 A cube has edges of 6 cm. What is its surface area, in square centimetres?
- 14 A cube has edges of 10 cm. What is its surface area, in square centimetres?
- 15 This is the net of a 5 cm by 3 cm by 4 cm cuboid. What is the total area of the six rectangles, in square centimetres?



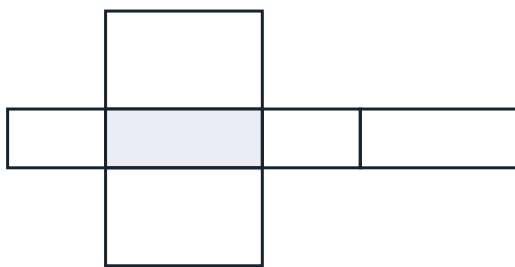
net of a $5 \times 3 \times 4$ cm cuboid

- 16** This is the net of a 6 cm by 4 cm by 2 cm cuboid. What is the total area of the six rectangles, in square centimetres?



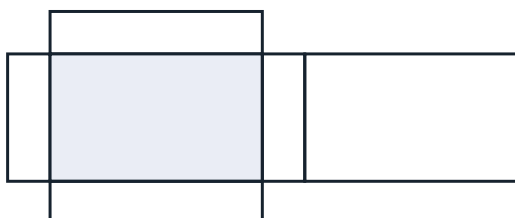
net of a $6 \times 4 \times 2$ cm cuboid

- 17** This is the net of a 8 cm by 5 cm by 3 cm cuboid. What is the total area of the six rectangles, in square centimetres?



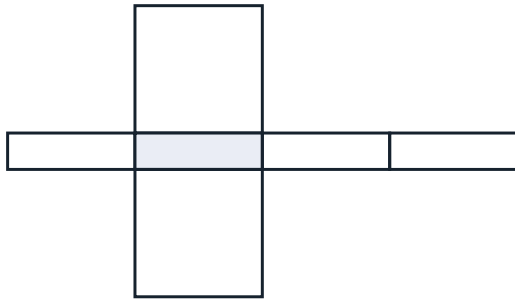
net of a $8 \times 5 \times 3$ cm cuboid

- 18** This is the net of a 10 cm by 2 cm by 6 cm cuboid. What is the total area of the six rectangles, in square centimetres?



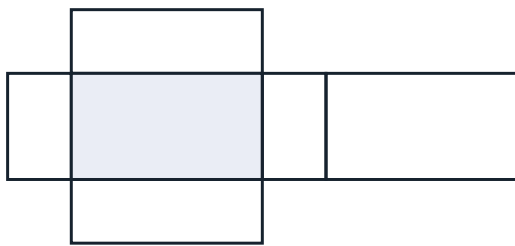
net of a $10 \times 2 \times 6$ cm cuboid

- 19** This is the net of a 7 cm by 7 cm by 2 cm cuboid. What is the total area of the six rectangles, in square centimetres?



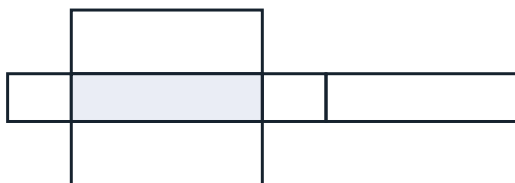
net of a $7 \times 7 \times 2$ cm cuboid

- 20** This is the net of a 9 cm by 3 cm by 5 cm cuboid. What is the total area of the six rectangles, in square centimetres?



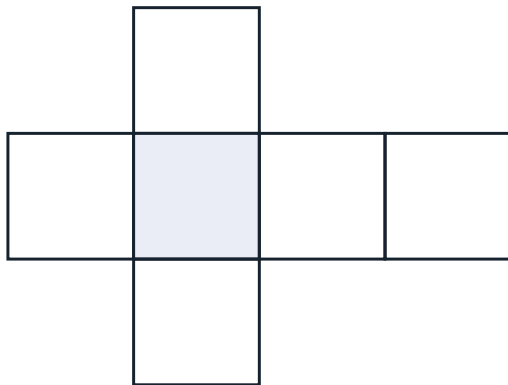
net of a $9 \times 3 \times 5$ cm cuboid

- 21** This is the net of a 12 cm by 4 cm by 3 cm cuboid. What is the total area of the six rectangles, in square centimetres?



net of a $12 \times 4 \times 3$ cm cuboid

- 22 This is the net of a 4 cm by 4 cm by 4 cm cuboid. What is the total area of the six rectangles, in square centimetres?



net of a $4 \times 4 \times 4$ cm cuboid

- 23 A cuboid is 5 cm by 3 cm by 4 cm. How many **edges** does it have?
- 24 A cuboid is 6 cm by 4 cm by 2 cm. How many **edges** does it have?
- 25 A cuboid is 8 cm by 5 cm by 3 cm. How many **edges** does it have?
- 26 A cuboid is 10 cm by 2 cm by 6 cm. How many **edges** does it have?
- 27 A cuboid is 7 cm by 7 cm by 2 cm. How many **edges** does it have?
- 28 A cuboid is 9 cm by 3 cm by 5 cm. How many **edges** does it have?
- 29 A cuboid is 5 cm by 3 cm by 4 cm. What is the total length of all its edges, in centimetres?
- 30 A cuboid is 6 cm by 4 cm by 2 cm. What is the total length of all its edges, in centimetres?
- 31 A cuboid is 8 cm by 5 cm by 3 cm. What is the total length of all its edges, in centimetres?
- 32 A cuboid is 10 cm by 2 cm by 6 cm. What is the total length of all its edges, in centimetres?
- 33 A cuboid is 7 cm by 7 cm by 2 cm. What is the total length of all its edges, in centimetres?
- 34 A cuboid is 9 cm by 3 cm by 5 cm. What is the total length of all its edges, in centimetres?
- 35 A cuboid is 5 cm long, 3 cm deep and 4 cm tall. What is the area of its **front view**, in square centimetres?
- 36 A cuboid is 5 cm long, 3 cm deep and 4 cm tall. What is the area of its **side view**, in square centimetres?

- 37 A cuboid is 5 cm long, 3 cm deep and 4 cm tall. What is the area of its **top view**, in square centimetres?
-
- 38 A cuboid is 6 cm long, 4 cm deep and 2 cm tall. What is the area of its **front view**, in square centimetres?
-
- 39 A cuboid is 6 cm long, 4 cm deep and 2 cm tall. What is the area of its **side view**, in square centimetres?
-
- 40 A cuboid is 6 cm long, 4 cm deep and 2 cm tall. What is the area of its **top view**, in square centimetres?
-
- 41 A cuboid is 8 cm long, 5 cm deep and 3 cm tall. What is the area of its **front view**, in square centimetres?
-
- 42 A cuboid is 8 cm long, 5 cm deep and 3 cm tall. What is the area of its **side view**, in square centimetres?
-
- 43 A cuboid is 8 cm long, 5 cm deep and 3 cm tall. What is the area of its **top view**, in square centimetres?
-
- 44 A cuboid is 10 cm long, 2 cm deep and 6 cm tall. What is the area of its **front view**, in square centimetres?
-
- 45 A cuboid is 10 cm long, 2 cm deep and 6 cm tall. What is the area of its **side view**, in square centimetres?
-
- 46 A cuboid is 10 cm long, 2 cm deep and 6 cm tall. What is the area of its **top view**, in square centimetres?
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B · Reasoning — Why the faces pair up, and why the net helps.

- 47 What is the surface area of a solid?
- ☐ The space inside it
 - ☐ The total area of all its faces
 - ☐ The length of its edges
 - ☐ The area of its base
- 48 How many faces has a cuboid?
- ☐ 4
 - ☐ 6
 - ☐ 8
 - ☐ 12

- 49 The surface area of a cuboid is ...
☐ $l \times w \times h$
☐ $2(lw + lh + wh)$
☐ $4(l + w + h)$
☐ $6l^2$
- 50 The surface area of a cube of edge s is ...
☐ s^3
☐ $6s^2$
☐ $4s$
☐ $12s$
- 51 Surface area is measured in ...
☐ cm
☐ cm^2
☐ cm^3
☐ litres
- 52 Why does the net help with surface area?
☐ It looks nice
☐ It lays all six faces out flat, so none is missed
☐ It shows the volume
☐ It does not help
- 53 Do two cuboids with the same volume have the same surface area?
☐ Yes
☐ No
- 54 The **front view** of a solid is ...
☐ what you see from above
☐ what you see looking straight at it from the front
☐ the net
☐ the base
- 55 How many edges and vertices has a cuboid?
☐ 8 edges, 12 vertices
☐ 12 edges, 8 vertices
☐ 6 edges, 8 vertices
☐ 12 edges, 6 vertices
- 56 A cube is painted and cut into unit cubes. Which cubes have exactly three painted faces?
☐ the middle ones
☐ the corner ones
☐ the edge ones
☐ none

C · Challenge — Working backwards, open boxes and comparisons.

- 57 A cuboid is 6 cm by 4 cm by 5 cm. What is its surface area, in square centimetres?
-

- 58** A cube has surface area 150 cm^2 . What is the length of one edge, in centimetres?

- 59** A cube has surface area 96 cm^2 . What is its volume, in cubic centimetres?

- 60** A box 10 cm by 10 cm by 10 cm is to be wrapped. What area of paper is needed, in square centimetres, ignoring overlaps?

- 61** A 1 cm by 1 cm by 8 cm rod and a cube of edge 2 cm hold the same volume. How much larger, in square centimetres, is the surface area of the rod?

- 62** An open-topped box is 12 cm long, 8 cm deep and 5 cm tall. What is the area of card needed, in square centimetres?

- 63** A cuboid has a square base of side 3 cm and height 7 cm. What is its surface area, in square centimetres?

D · Word problems — Card, walls, pools and wrapping paper.

- 64** A box is 20 cm by 10 cm by 5 cm. What area of card is needed to make it, in square centimetres?

- 65** A room is 5 m by 4 m by 3 m high. What is the total area of the four walls, in square metres?

- 66** A cube-shaped die has edges of 2 cm. What is its surface area, in square centimetres?

- 67** A swimming pool 25 m by 10 m and 2 m deep is tiled on the bottom and the four sides. What area is tiled, in square metres?

- 68** A shipping container is 12 m by 2 m by 2 m. What is its surface area, in square metres?

- 69** Paint covers 8 m^2 per litre. How many litres are needed for the four walls of a room 6 m by 4 m by 3 m high?

- 70** A gift box is a cube of edge 15 cm. What area of wrapping paper covers it exactly, in square centimetres?

- 71** A water tank is 2 m long, 1 m deep and 1 m tall, open at the top. What area of metal is needed, in square metres?
