SURFACE AREA OF CUBES AND CUBOIDS

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

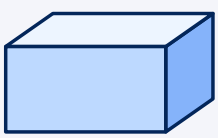
KEY IDEA

Surface area is the total area of all the faces.

A cuboid has 6 faces in 3 matching pairs.

Faces that match are the same colour.

You can only see 3 faces. The other 3 are hidden.



front & back

top & bottom

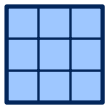
left & right

1 Each square is 1 cm². Find the area of each rectangle.

Count the squares, or work out rows × columns.

a) 

Area = ☐ cm²

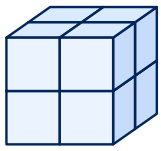
b) 

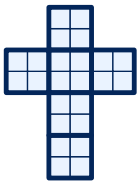
Area = ☐ cm²

c) 

Area = ☐ cm²

2 This cube is made from 1 cm cubes. Its net is drawn beside it.



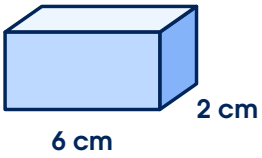


Each face has ☐ squares.

The cube has ☐ faces.

Surface area = 6 × ☐ = ☐ cm²

3 Find the area of each face of this cuboid. Then find the surface area.



front

3 cm

6 cm

☐ × ☐ = ☐

top

2 cm

6 cm

☐ × ☐ = ☐

side

3 cm

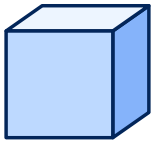
2 cm

☐ × ☐ = ☐

There are 2 of each: 2 × (☐ + ☐ + ☐) = ☐ cm²

4 A cube has 6 faces that are all the same. Find the surface area of each cube.

a)



One face: 4 × 4 = ☐

6 × ☐ = ☐ cm²

b)

7 cm²

one face

6 × ☐ =

☐ cm²

SURFACE AREA OF CUBES AND CUBOIDS

SUPPORT

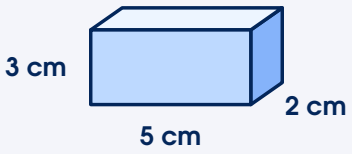
NAME _____ CLASS _____ DATE _____

KEY IDEA

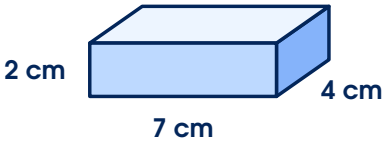
Surface area = total area of all 6 faces. Work in matching pairs:

☐ front & back	5 × 3 = 15	× 2 = 30
☐ top & bottom	5 × 2 = 10	× 2 = 20
☐ left & right	2 × 3 = 6	× 2 = 12

Surface area = 30 + 20 + 12 = 62 cm²



1 Complete the table to find the surface area of this cuboid.



FACES	LENGTH × WIDTH	ONE FACE	THE PAIR
front & back			
top & bottom			
left & right			
		total	

2 Find the surface area of each cube.

a)



One face = ☐ cm²

Total = 6 × ☐

= ☐ cm²

b)

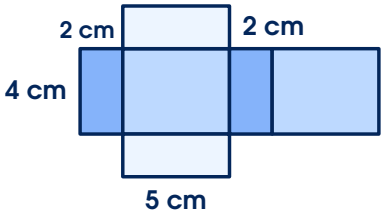


One face = ☐ m²

Total = 6 × ☐

= ☐ m²

3 This is the net of a cuboid. Matching faces are the same colour.



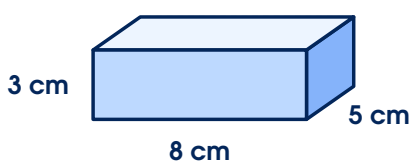
5 × 4 = ☐ cm² 2 of these

5 × 2 = ☐ cm² 2 of these

4 × 2 = ☐ cm² 2 of these

Surface area = ☐ cm²

4 Work out the surface area of this cuboid.



Find front + top + side, then double it.

2 × (☐ + ☐ + ☐)

= 2 × ☐ = ☐ cm²

SURFACE AREA OF CUBES AND CUBOIDS

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

Cuboid: SA = 2 × (front + top + side) **Cube: SA = 6 × edge × edge**

Opposite faces are identical. Area units are squared: cm², m².

FLUENCY

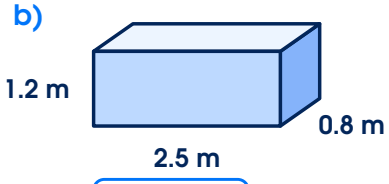
1 Work out the surface area of each cuboid.

a)



_____ cm²

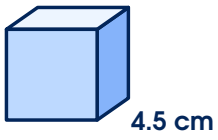
b)



_____ m²

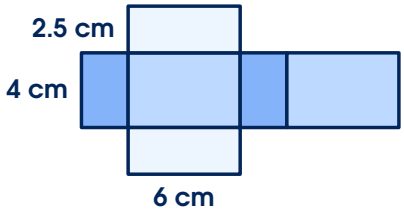
c)

cube



_____ cm²

2 This is the net of a cuboid.



a) Surface area _____ cm²

b) The cuboid's length, width and height:

_____ cm × _____ cm × _____ cm

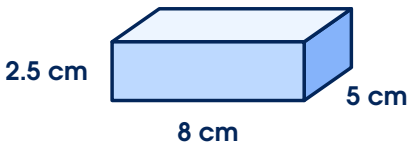
REASONING

3 Work out the edge length of each cube. Show your working.

a) A cube has a surface area of 864 cm². Edge length = _____ cm

b) A cube has a surface area of 2.16 m². Edge length = _____ m

4 Priya says the surface area of this cuboid is 72.5 cm².



Priya's working:

8 × 5 = 40 8 × 2.5 = 20 5 × 2.5 = 12.5 total 72.5 cm²

a) Explain Priya's mistake.

.....

b) Correct surface area _____ cm²

SURFACE AREA OF CUBES AND CUBOIDS

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

Give an example or a reason for each answer.

a) The surface area of a cube is a multiple of 6. ALWAYS SOMETIMES NEVER

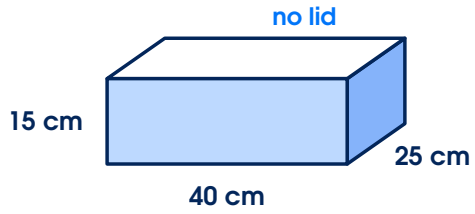
b) Doubling every edge of a cube doubles its surface area. ALWAYS SOMETIMES NEVER

c) Opposite faces of a cuboid have the same area. ALWAYS SOMETIMES NEVER

d) A cube's surface area is more than its volume. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 A storage box is a cuboid with no lid. It is made from card.

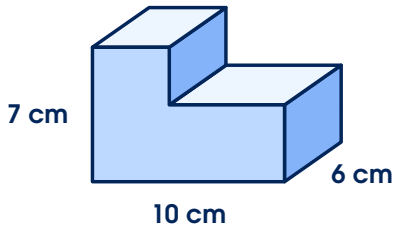


a) Area of card needed _____ cm²

Card comes in 1200 cm² sheets. Pieces can be joined.

b) Least number of sheets _____

3 Work out the surface area of this solid.



Two cuboids are joined to make this solid. It is 6 cm deep all the way through. The lower part is 4 cm high. The upper part is 4 cm wide.

Surface area _____ cm²

★ CHALLENGE FOR ALL

4 Investigate the surface areas of cuboids.

a) 24 one-centimetre cubes make a cuboid. Its edges are whole numbers of cm.

Smallest surface area _____ cm² Largest _____ cm²

b) A cuboid has edges x, 2x and 3x cm and a surface area of 198 cm². x = _____

SURFACE AREA OF CUBES AND CUBOIDS – ANSWERS

ANSWERS

BUILDING BLOCKS

1 a) 8 cm² b) 9 cm² c) 12 cm²
2 4 squares · 6 faces · 6 × 4 = 24 cm²
3 front 6 × 3 = 18 · top 6 × 2 = 12 · side 2 × 3 = 6 · 2 × (18 + 12 + 6) = 72 cm²
4 a) one face 16 cm² · 6 × 16 = 96 cm² b) 6 × 7 = 42 cm²

SUPPORT

1 front & back 7 × 2 = 14, pair 28 · top & bottom 7 × 4 = 28, pair 56 · left & right 4 × 2 = 8, pair 16 · total 100 cm²
2 a) one face 64 cm² · 6 × 64 = 384 cm² b) one face 100 m² · 6 × 100 = 600 m²
3 20 cm² · 10 cm² · 8 cm² · surface area 2 × (20 + 10 + 8) = 76 cm²
4 2 × (24 + 40 + 15) = 2 × 79 = 158 cm²

CORE

1 a) 2 × (36 + 27 + 12) = 150 cm² b) 2 × (3 + 2 + 0.96) = 11.92 m² c) 6 × 20.25 = 121.5 cm²
2 a) 2 × (24 + 15 + 10) = 98 cm² b) 6 cm × 2.5 cm × 4 cm (any order)
3 a) 864 ÷ 6 = 144, $\sqrt{144}$ = 12 cm b) 2.16 ÷ 6 = 0.36, $\sqrt{0.36}$ = 0.6 m
4 a) She found only one face from each pair (3 faces); every face has an identical opposite face, so the total must be doubled. b) 2 × 72.5 = 145 cm²

GREATER DEPTH

1 a) sometimes (true for whole-number edges; edge 1.5 cm gives 13.5 cm²) b) never (it is multiplied by 4, e.g. 6 cm² → 24 cm²) c) always d) sometimes (edge 2: 24 cm² > 8 cm³; edge 7: 294 cm² < 343 cm³)
2 a) 40 × 25 + 2 × 40 × 15 + 2 × 25 × 15 = 1000 + 1200 + 750 = 2950 cm² b) 2950 ÷ 1200 = 2.46..., so 3 sheets
3 Front and back 2 × (10 × 4 + 4 × 3) = 104 · base 10 × 6 = 60 · left 7 × 6 = 42 · tops 4 × 6 + 6 × 6 = 60 · right 4 × 6 = 24 · step 3 × 6 = 18 · total 308 cm²
4 a) smallest 2 × 3 × 4 cuboid: 52 cm² · largest 1 × 1 × 24 cuboid: 98 cm² b) $2(2x^2 + 6x^2 + 3x^2) = 22x^2 = 198$, $x^2 = 9$, $x = 3$