PART 3

UNIT
3

AUTUMN
first half

MEASURES AND PROPERTIES OF SHAPES

<table>
<tr><td>**UNIT**
3</td><td>**MEASURES AND**
PROPERTIES OF SHAPES</td></tr>
</table>

SUGGESTED TIME   **5 hours**

TEACHING OBJECTIVES

- Suggest suitable units to measure length.

- Measure and draw lines to the nearest millimetre.

- Understand, measure and calculate the perimeter of rectangles and regular polygons.

- Use, read, and write metric units of length, and convert between units.

- Record estimates and measurements from scales to a suitable degree of accuracy.

- Understand area measured in square centimetres.

- Use formula in words for the area of a rectangle.

- Use all four operations to solve measurement word problems.

- Visualise 3D shapes from 2D drawings and identify nets of an open cube.

SECTION 1	Perimeter
SECTION 2	Centimetres and millimetres
SECTION 3	Metres and centimetres
SECTION 4	Area
SECTION 5	3D shapes

HOMEWORK

- Several of the Star Challenges are suitable homework activities.
- Learn and use metric units of length, including conversions between units.
- Consolidate multiplication and division by working on area calculations.

Unit **3**

Checklist for pupils

Perimeter

You will:
- measure lines to the nearest centimetre ☐
- understand perimeter ☐
- find perimeters by measuring, counting and calculating ☐
- solve word problems and puzzles involving perimeter ☐

Centimetres and millimetres

You will:
- measure lines to the nearest millimetre ☐
- work with measurements given in centimetres and millimetres
  (cm and mm) or centimetres (cm), to one decimal place ☐
- add together measurements given in centimetres and millimetres ☐
- solve word problems using centimetres and millimetres ☐

Metres and centimetres

You will:
- work with measurements given in metres (m) and centimetres (cm) ☐
- add together measurements given in metres and centimetres ☐
- solve word problems using metres and centimetres ☐

Area

You will:
- measure areas by counting squares ☐
- work out areas measured in square centimetres ☐
- learn and use the formula for the area of a rectangle ☐

3D shapes

You will:
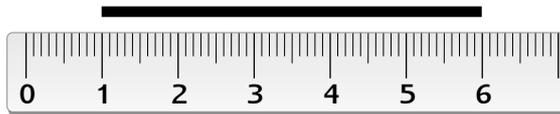- work with drawings of 3D shapes ☐
- work with nets of an open cube ☐

SECTION 1: PERIMETER

- Teach pupils how to measure lengths correctly using a ruler. Model the process pointing out common errors.

  Oops and Ouch were asked to measure this line:
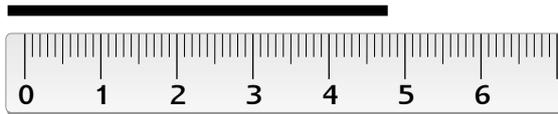
  Oops put the ruler like this:

  ## This line is 6 cm long.

1 Explain why Oops is wrong:

   ....

   Ouch put the ruler like this:

2   What did Ouch do wrong?
   ....

- Make sure pupils understand perimeter as 'the distance around the edge of a shape'. Exercises 1 and 2 reinforce this idea.

- You need to explain the difference between 'measure' and 'calculate'.

- Star Challenges 1 and 3 provide opportunities for investigative work.

KEY VOCABULARY TO LEARN AND USE

length   distance   width   breadth   perimeter
centimetre   square   rectangle   equilateral triangle
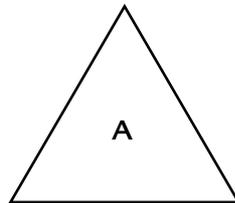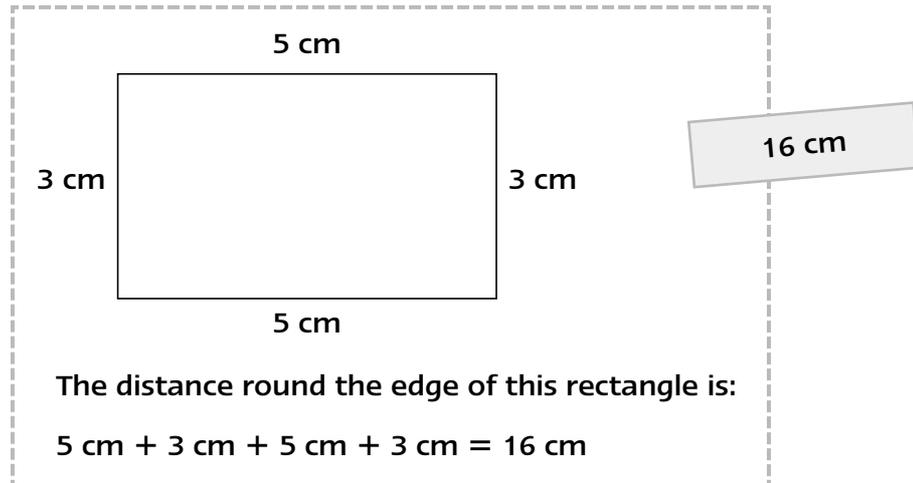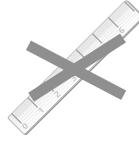*regular   pentagon   hexagon   octagon*

Perimeter

1 | **Distance round the edge**

Measure the distance round the edge of each shape.

Give each answer in centimetres.

Example

5 cm

3 cm   3 cm

5 cm

16 cm

The distance round the edge of this rectangle is:

5 cm + 3 cm + 5 cm + 3 cm = 16 cm

A

B

....

C

D

E

....

UNIT
3
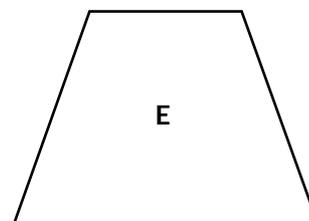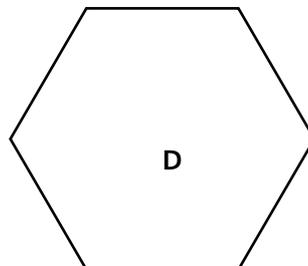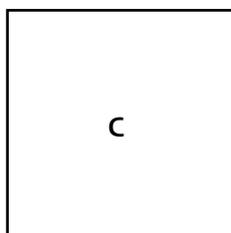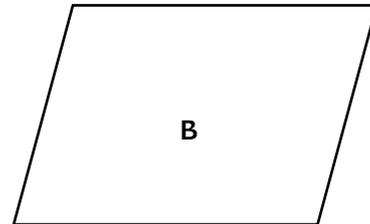
Perimeter

2 Calculating perimeters

Example

3 cm

1 cm   A

2 cm

2 cm

1 cm

1 cm

The perimeter of shape A is:

3 cm + 2 cm + 1 cm
+ 1 cm + 2 cm + 1 cm =

10 cm

All the shapes below are made from a number of squares joined together. Each square has 1 cm sides.
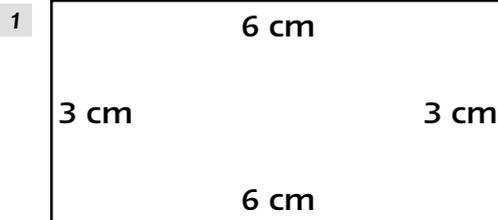
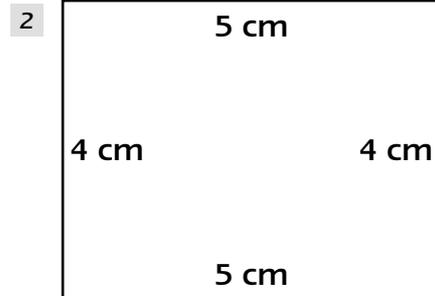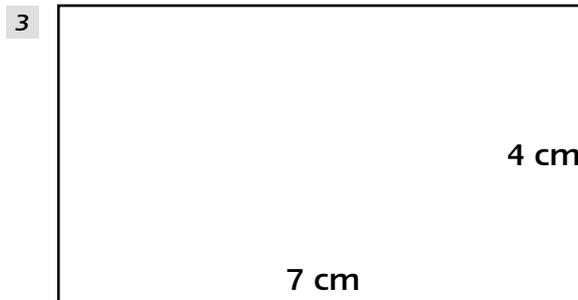<u>Calculate</u> the perimeter of each of these shapes:

Imagine walking around the outside.

HELPFUL

B

C

D

....

E

F

G

....
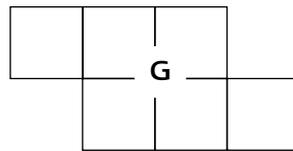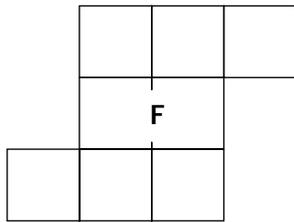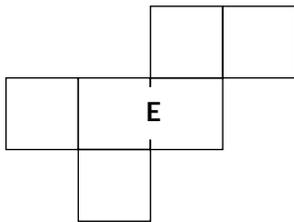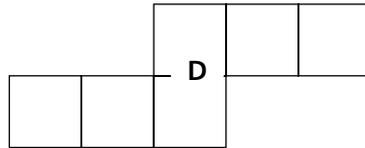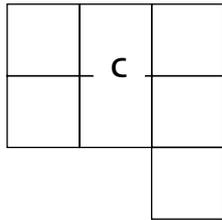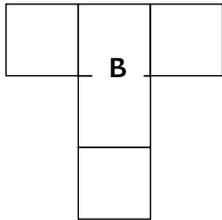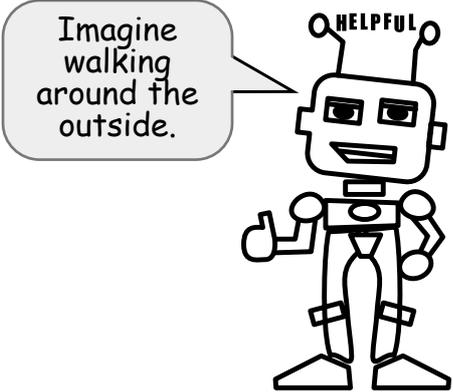
Perimeter

3 Rectangle perimeters

Calculate the perimeter of each of these rectangles:

1

6 cm

3 cm   3 cm

6 cm

Perimeter = ...

2

5 cm

4 cm   4 cm

5 cm

Perimeter = ...
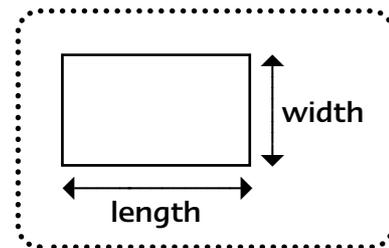
3

4 cm

7 cm

Perimeter = ...

width

length

4

2 cm

8 cm
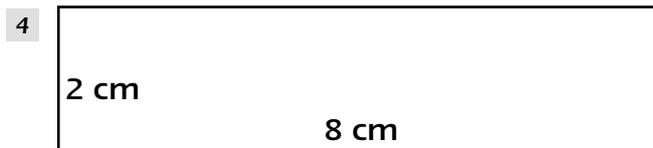
Perimeter = ...

5 A rectangle has length 20 cm and width 10 cm.
What is its perimeter? ....

6 A square has side 10 cm.
What is its perimeter? ....

7 The short side of a rectangle is 3 cm.
The perimeter is 20 cm.
What is the length of its long side? ....
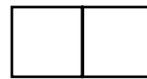
UNIT

3

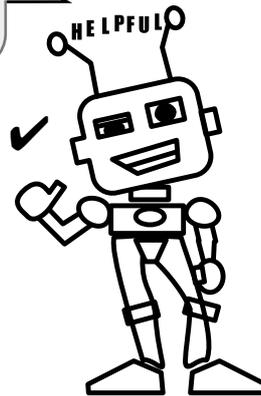# Perimeter

1 **Different perimeters**

★ ★

16–17 marks   2 stars
10–15 marks   1 star

This shape has a perimeter of 6 cm.

HELPFUL

P = 6 cm

Use centimetre squared paper.

1 Make two different shapes with 3 squares.   (2 marks)

Write down the perimeter of each shape.

2 Make five different shapes with 4 squares.   (5 marks)

Write down the perimeter of each shape.

3 Make ten different shapes with 5 squares.   (10 marks)

Write down the perimeter of each shape.

Perimeter

STAR CHALLENGE

2 **Regular polygons**

All correct 1 star

The shapes below are all regular polygons.
All the sides are the same length.

Calculate the perimeter of each regular polygon.
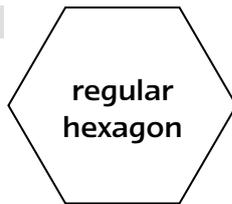
Example
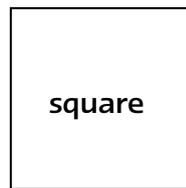
square

5 cm

A square has 4 sides.
Each side of this square is 5 cm long.

The perimeter of this square is
4 × 5 cm = 20 cm

20 cm

1

regular
hexagon

2 cm

A hexagon has ..... sides.

Each side of this hexagon is ..... cm long.

The perimeter of this hexagon is ..... cm.

2

regular
pentagon

3 cm

A pentagon has ..... sides.

Each side of this pentagon is ..... cm long.

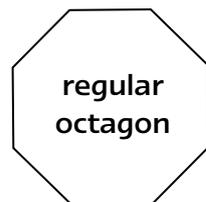The perimeter of this pentagon is ..... cm.

3
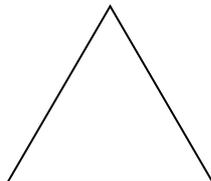
6 cm

A triangle has ..... sides.

Each side of this triangle is ..... cm long.

The perimeter of this triangle is ..... cm.

4

regular
octagon

10 cm

An octagon has ..... sides.

Each side of this octagon is ..... cm long.

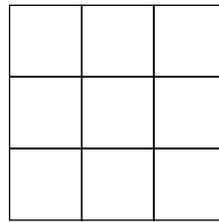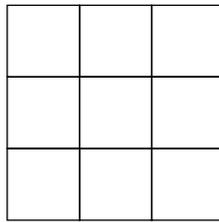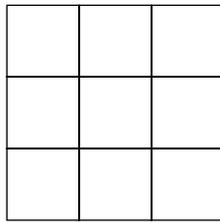The perimeter of this octagon is ..... cm.

UNIT
3

Perimeter

STAR CHALLENGE

3 **Perimeter puzzle**

★ ★ ★

15 shapes	3 stars
13–14 shapes	2 stars
11–12 shapes	1 star

The shape drawn has a perimeter of 12 cm.
There are 15 more shapes with a perimeter of
12 cm that can be made on a grid like this.

How many can you find?
Rotations and reflections of the same shape only count as 1.
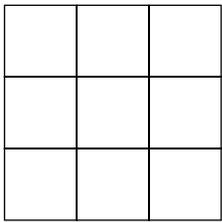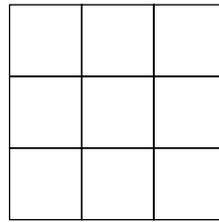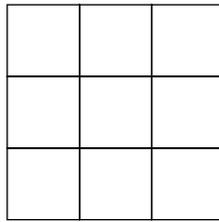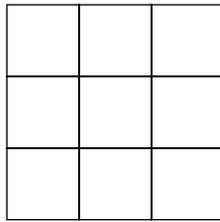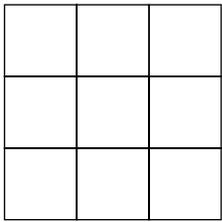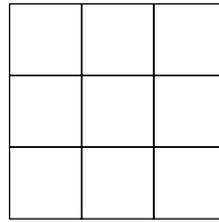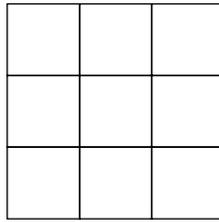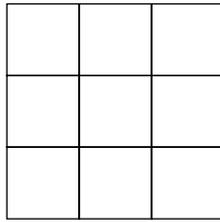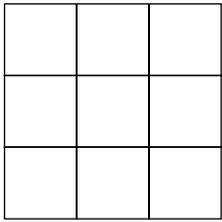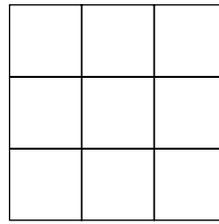
SECTIONS 2 AND 3: CENTIMETRES AND MILLIMETRES
METRES AND CENTIMETRES

DIRECT TEACHING POINTS

- Teach the three forms of giving a measurement: mm, cm and mm, and cm using decimals.
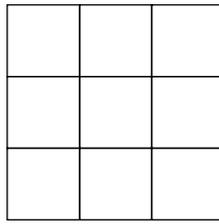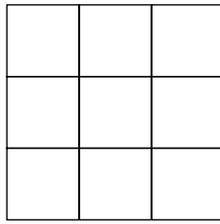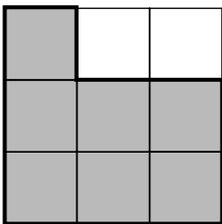
- Star Challenge 4 links to work on perimeter.

- Consolidate use of ruler to measure accurately to 1 mm.

- Mental work can concentrate on recall of conversion of units, for example:
  1 km = 1000 m, 1 m = 100 cm, 1 cm = 10 mm, 0.5 m = 50 cm, 24 mm = 2.4 cm, 112 cm = 1.12 m.

- Teach three forms: cm, m and cm, m using decimals to give measurements.

- Exercise 2 in Section 3 can form the basis of oral mental work. It reinforces complements of 100.

- Use example below as the basis of oral mental problems.

Work out the following:
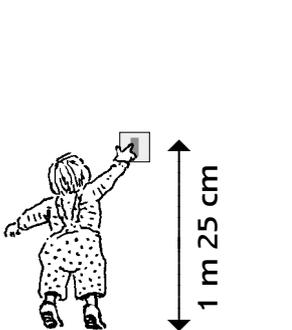
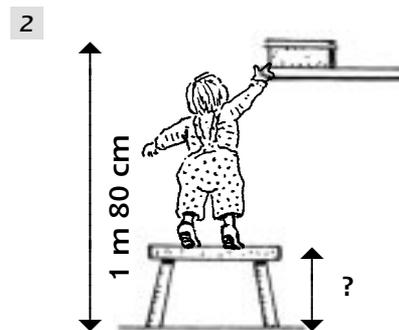**Paula is standing on tiptoe. She can just reach the light switch.**

1

She stands on a stool. How high can she reach?

....

2

She wants to reach the biscuit tin. What is the height of the smallest stool she could use?

....

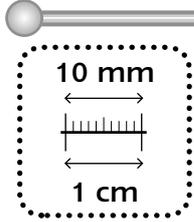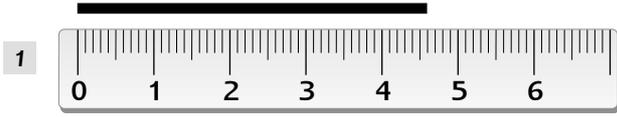KEY VOCABULARY
TO LEARN AND USE

kilometre   km   metre   m
centimetre   cm   millimetre   mm

UNIT
3

Centimetres and millimetres

1   Measuring lines
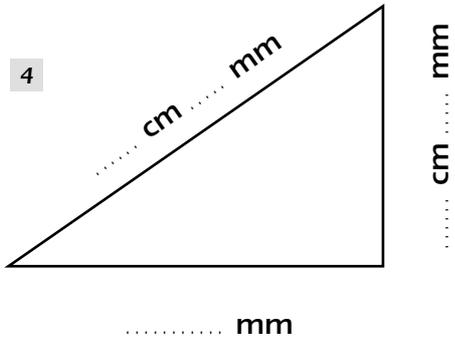
Measure each of these lines to the nearest mm:

10 mm
1 cm

1

0   1   2   3   4   5   6

Length of line = ...mm

Length of line = ... cm .....mm

2

0   1   2   3   4   5   6

Length of line = ... cm .....mm

Length of line = ...mm

3

...... cm ..... mm

.... cm ..... mm

.... mm

4

.... cm ..... mm

.... cm ..... mm

.... mm

2   Longer and shorter lines

1   Line A is 3 cm 6 mm long.

A

0   1   2   3   4   5   6
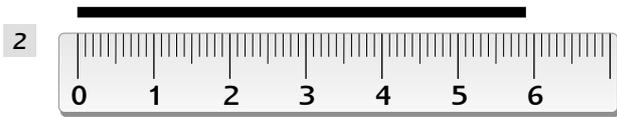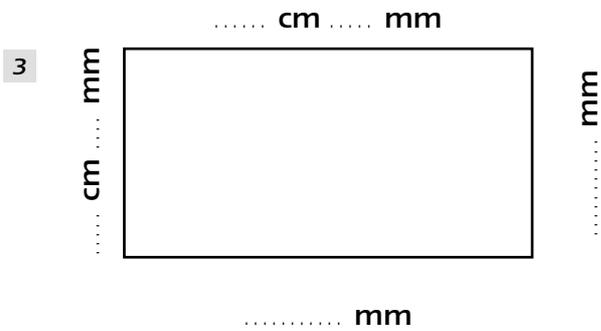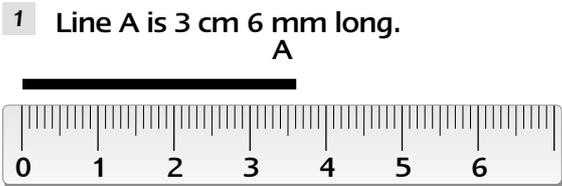
(a) Line B is 8 mm longer than A
How long is line B?

.... cm .... mm

2   Line P is 4 cm 8 mm long.

P

0   1   2   3   4   5   6
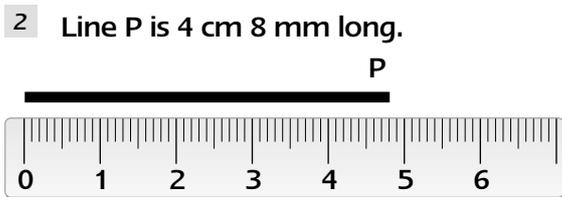
(a) Line Q is 5 mm longer than P.
How long is line Q?

.... cm .... mm

(b) Line R is 1 cm 1 mm longer than P.
How long is line R?

.... cm .... mm

(c) Line S is 1 cm 1 mm shorter than P.
How long is line S?

.... cm .... mm

Centimetres and millimetres

3   **Adding cm and mm**
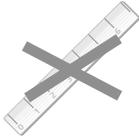
Work out the following.

The diagrams are not drawn to scale.

1   4 cm 5 mm   4 mm   The length of AC = ... cm ..... mm

A   B   C

2   5 cm 3 mm   6 mm   The length of DF = ... cm ..... mm

D   E   F

3   7 cm 2 mm   2 cm 5 mm The length of GJ = ... cm ..... mm

G   H   J

4

The length of LN is 5 cm 2 mm.

3 cm 7 mm 1 cm 5 mm

L   M   N

The length of LN is 4 cm 12 mm.

RINGO

BINGO

Ringo is right.
Bingo is wrong.

Explain why Bingo is wrong.

....

5   2 cm 6 mm   4 cm 5 mm   1 cm 8 mm

W   X   Y   Z
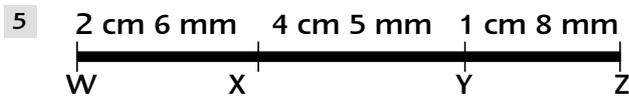
The length of WY = ... cm ...... mm

The length of XZ = ... cm ..... mm

6 My pencil is 4 cm 8 mm long. Bob's pencil is 4 mm longer.

How long is Bob's pencil?   ....

7 I have a zip 10 cm 7 mm long. The zip on my pencil case is twice as long.

How long is the pencil case zip?   ....

UNIT
3

Centimetres and millimetres

4 **Three ways to measure lines**

There are three ways to measure the same line.

10 mm

1 cm

This line is 46 mm long.

This line is 4 cm 6 mm long.

This line is 4.6 cm long.

Measure each of these lines to the nearest mm.

1

Length of line = ... mm

Length of line = ... cm ..... mm

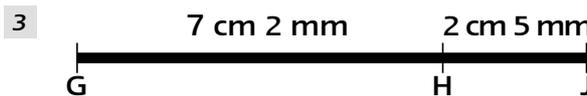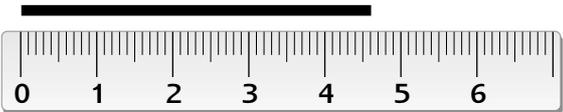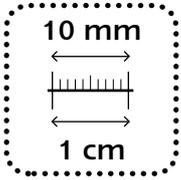Length of line = ... cm

2

Length of line = ... cm ..... mm

Length of line = ... mm

Length of line = ... cm

3

Length of line = ... mm

4

Length of line = ... cm ..... mm

5

Length of line = ... cm

6

Length of line = ... mm

7

Length of line = ... cm

Centimetres and millimetres

STAR CHALLENGE

4
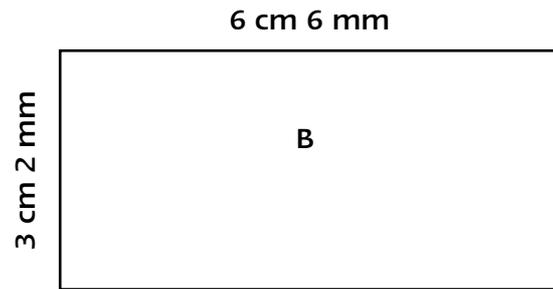
Rectangle perimeters
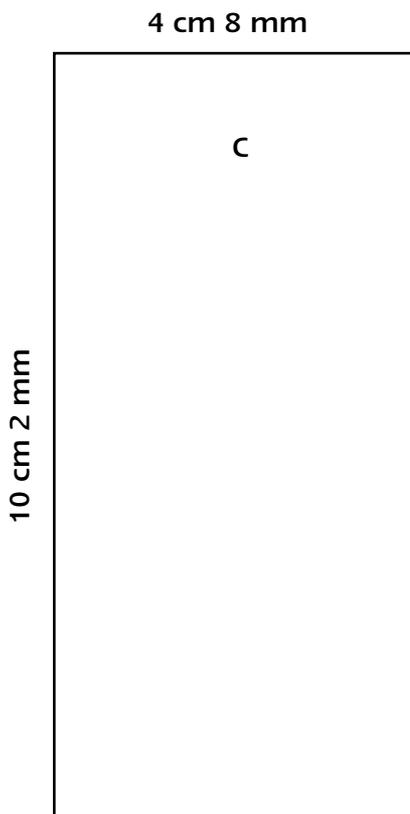
★ ★

6 correct	2 stars
4–5 correct	1 star

Calculate the perimeter of each shape.
Give the answer in cm or in cm and mm.

5 cm

3 cm

A

P = ……………

6 cm 6 mm

3 cm 2 mm

B

P = ……………

4 cm 8 mm

10 cm 2 mm

C

P = ……………

1 cm 5 mm

1 cm 5 mm

D

P = ……………

2 cm

4 cm 5 mm

E

P = ……………

2 cm 3 mm

2 cm 3 mm

F

P = ……………

UNIT
3

⚡ STAR CHALLENGE

5
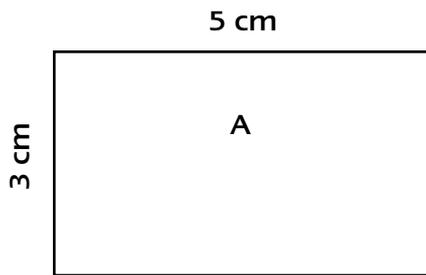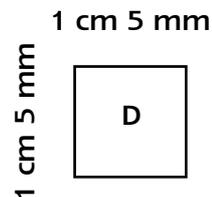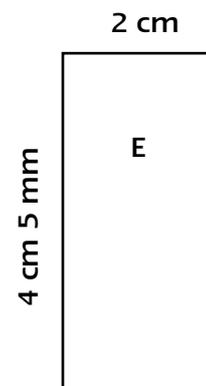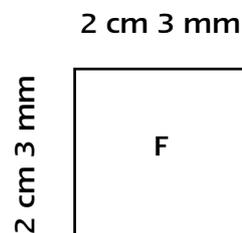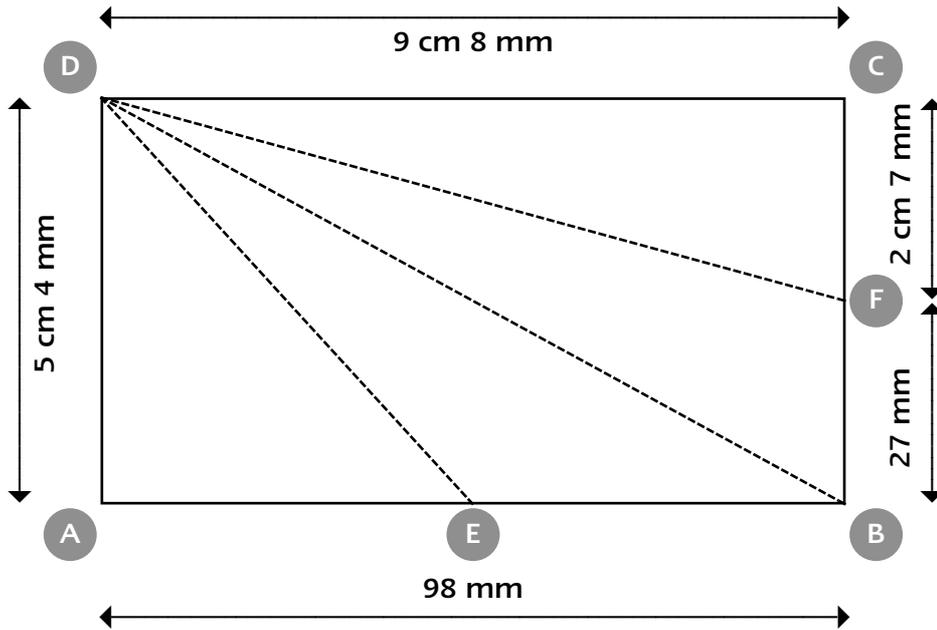
Centimetres and millimetres

Rectangle measurements

★ ★

6–7 correct 2 stars
4–5 correct 1 star

ABCD is a rectangle.
E is the midpoint of AB.
F is the midpoint of BC.

D ——— 9 cm 8 mm ——— C

5 cm 4 mm

2 cm 7 mm

F

27 mm

A ——— E ——— B

98 mm

1 The length of BC is .... mm.

2 The length of BC can also be written as .... cm .... mm.

3 AB is 98 mm long. AB is also 9 cm 8 mm long or 9.8 cm long.
   Write the length of BF in the same three ways.

   ....

4 Measure DE. Give its length in the same three ways.

   ....

5 Give the length of DF in the same three ways.

   ....
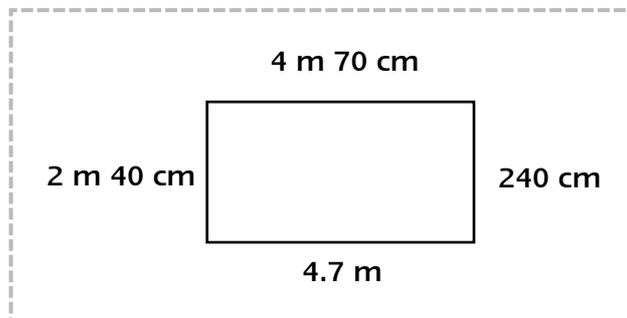
6 CE is not drawn, but it can be measured.
   Is CE the same length as DE? ....

7 AC and EF are not drawn. Is AC twice the length of EF? ....
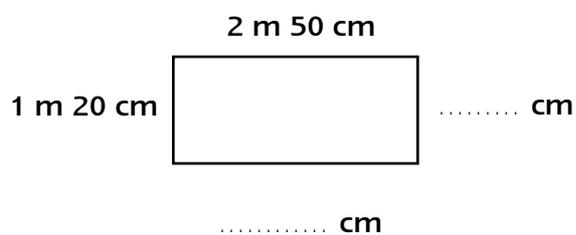
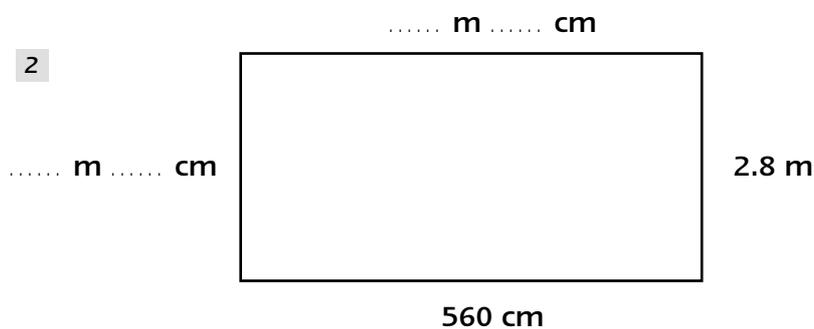# Metres and centimetres

1 Equivalent measurements

Example

4 m 70 cm

2 m 40 cm | 240 cm

4.7 m

1 m = 100 cm

Complete the following:

1

2 m 50 cm

1 m 20 cm | .... cm

.... cm

2

...... m ...... cm

...... m ...... cm | 2.8 m

560 cm

3

.... cm

..... m ..... cm | 105 cm

3.25 m

4

750 cm

.... cm | 2 m 20 cm

.... m

UNIT
3
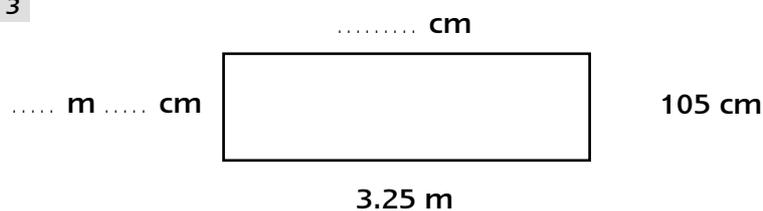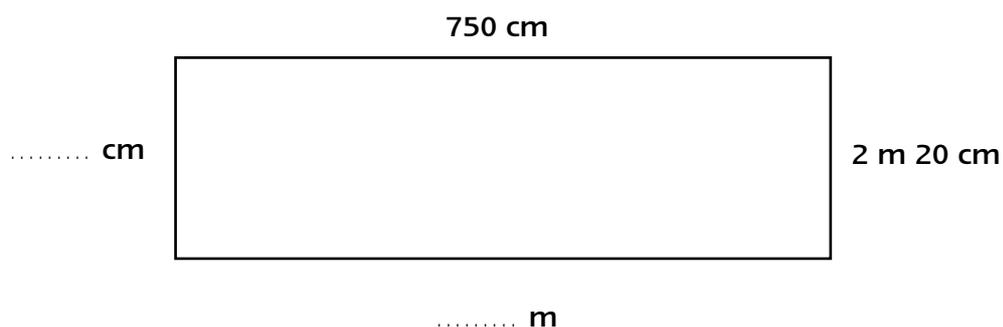
Metres and centimetres

2 **Measurement problems**

1 m = 100 cm

1 What length do I add to 70 cm to make 1 m? ....

2 What length do I add to 25 cm to make 1 m? ....

3 What length do I add to 2 m 50 cm to make 3 m? ....

4 What length is 10 cm less than 1 m? ....

5 What length is 25 cm less than 1 m? ....

6 How high is the tower? ....

60 cm

80 cm

1 m 60 cm

1 m 80 cm

1 m 60 cm

Bob
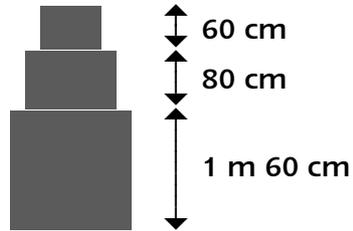
Fred

7 Bob is taller than Fred.
   How much taller is he? ....

25 cm

8 Ellie is 25 cm taller than Mary.
   Mary is 1 m 50 cm.
   How tall is Ellie? ....

1 m 50 cm

Ellie

Mary

9 Carl's desk is 90 cm long.
   His bookshelf is twice as long as his desk.
   How long is his bookshelf? ....

10 I need two pieces of wood for my project.
    The long piece is 2 m 30 cm long.
    The short piece is half the length of the
    long piece.

    How long is the short piece?

    ....
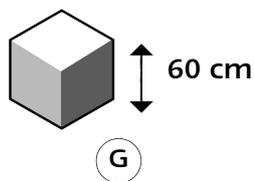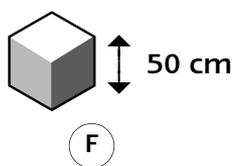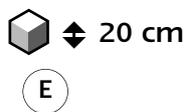
Metres and centimetres

6 **Petros' tower**

⭐⭐ ⦿

4 correct   2 stars
3 correct   1 star

1 m 45 cm

‖ 45 cm
A

‖ 35 cm
B

‖ 30 cm
C

‖ 25 cm
D

‖ 20 cm
E

‖ 50 cm
F

‖ 60 cm
G
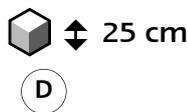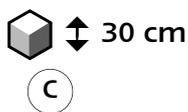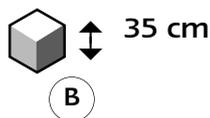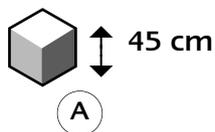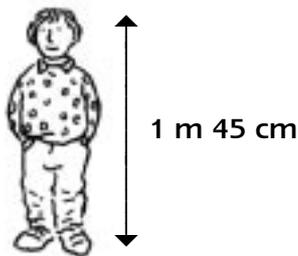
Petros wishes to build a tower of cubes exactly as tall as himself.

1 Which three different cubes could he use? . . . .

2 Which four different cubes could he use? . . . .

3 Find another combination of four cubes he could use. . . . .

4 What is the height of the tallest tower of cubes he
could build using five different cubes only? . . . .

UNIT
3

Metres and centimetres

STAR CHALLENGE

7 **Trains and lorries**

All correct 1 star

1 (a) What is the total
length of the toy
lorry and trailer
in cm? ....

45 cm   60 cm
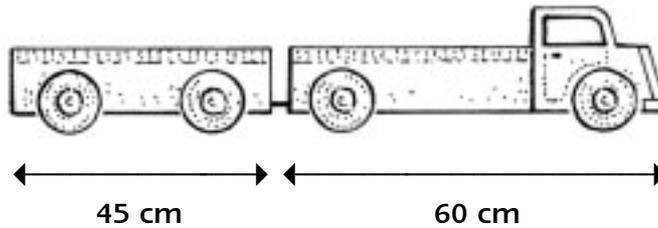
(b) What is its total
length in m and cm?   ....

(c) What is its total length in m?   ....

2 A toy train has an engine and six identical carriages.

15 cm   20 cm
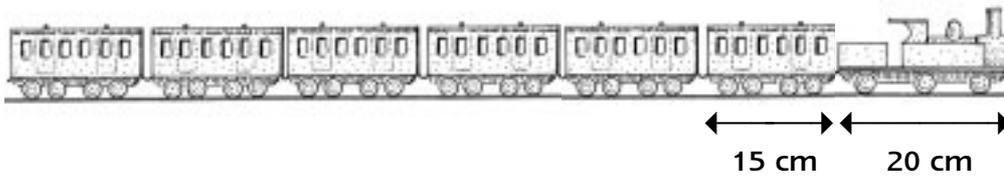
(a) What is the total length of the train in cm?

....

(b) What is its total length in m and cm?

....

(c) What is its total length in m?

....

Low Bridge
Height 4.20 m

3 A lorry is 3 m 70 cm tall. It goes under
this low bridge.

What is the size of the gap between
the top of the lorry and the bridge?

....
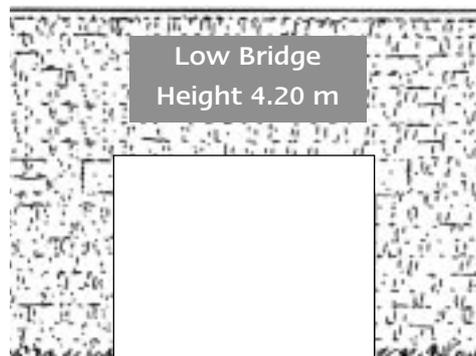
- Clarify the meaning of 'area'. Exercises 1 and 2 are consolidation exercises.

- Consolidate multiplication and division using area calculations, for example, 6 x ☐ = 30.

- Applications include finding the area of compound figures and right-angled triangles, for example, exercise 5 and Star Challenge 10.

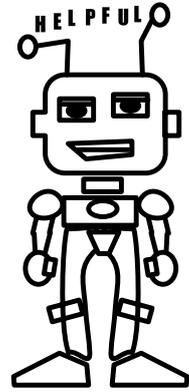- Star Challenge 9 can be extended to include other perimeters.

KEY VOCABULARY TO LEARN AND USE

area   square centimetre cm^2
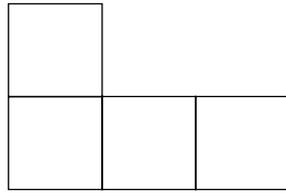*square metre m^2*

Area

1 **What is area?**

> The area of a shape is how much space it covers.

The area of this shape is 4 squares.
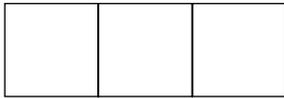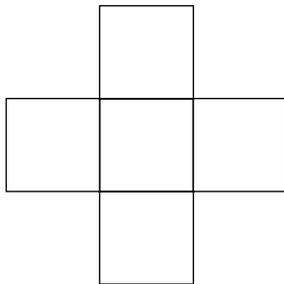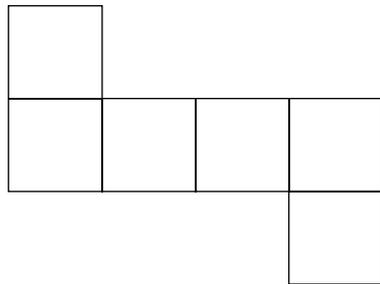
Write down the area of each shape.
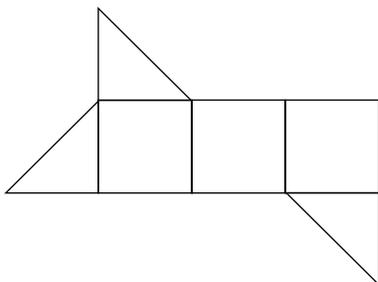
Area = 4 squares

1

Area = ……. squares

2

Area = ……. squares

3

Area = ……. squares

4

Area = ……. squares

Area

2 Square centimetres

1 cm

1 cm
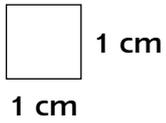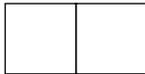
Area = 1 cm²

The most common unit of area is the square centimetre.

HELPFUL
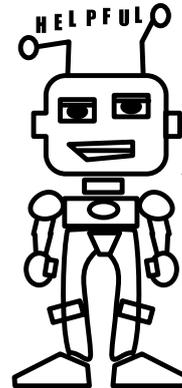
The area of this shape is 2.5 cm².

Write down the area of each shape.
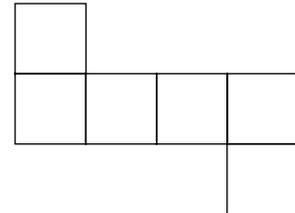Each answer must have the correct units.

1

Area = ... cm²

2
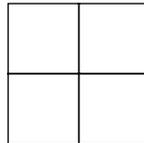
Area = ... cm²

3

Area = ... cm²

4
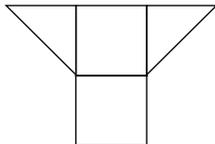
Area = ... cm²

5
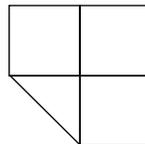
Area = ...

6
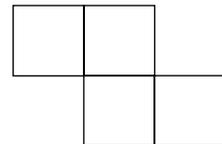
Area = ...

7
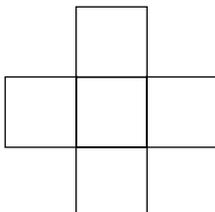
Area = ...

8
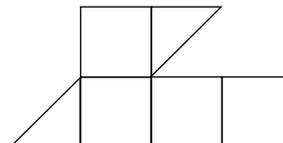
Area = ...

Area

3 Areas of rectangles

A

B

C

D

E

F
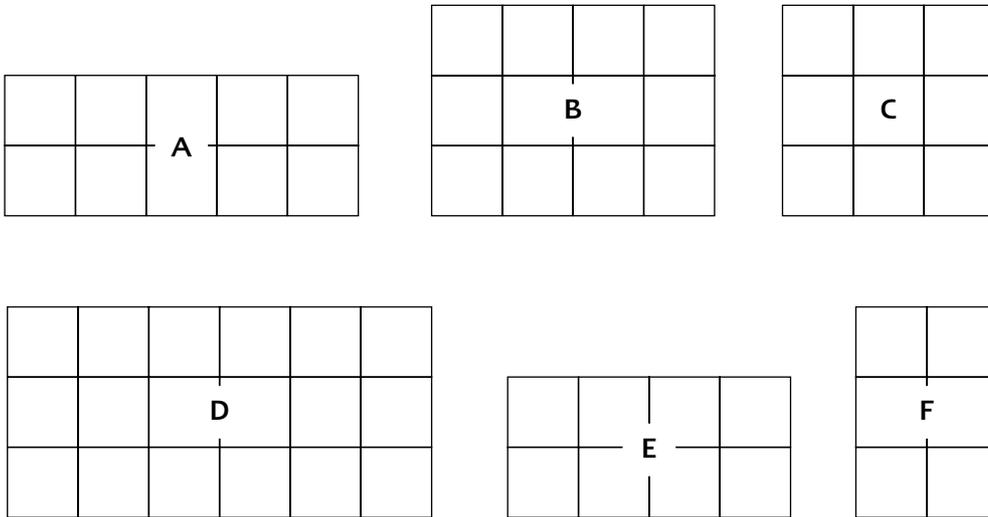
G rectangle with length = 10 cm
width = 4 cm

H rectangle with length = 6 cm
width = 5 cm

1 Complete this table for rectangles A, B, C, D, E, F, G, H.

Rectangle	Length in cm	Width in cm	Area in cm^2
A	5	2	....
B	....	....	....
C	....	....	....
D	....	....	....
E	....	....	....
F	....	....	....
G	10	4	....
H	6	5	....

width

length

Area

4 **The rule for the area of a rectangle**

> Area of rectangle = length × width

Use the rule to work out the area of each rectangle. Each answer must have the correct units.

1

5 cm

10 cm

Area = ... cm²

2

8 cm

8 cm

Area = ...

3

2 cm

15 cm

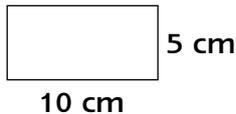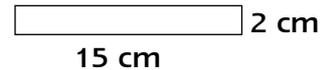Area = ...

5 **Area problems**

Work out these problems.
Use the correct units in each answer.

1 What is the area of a rectangle of length 20 cm and width 3 cm? ....

2 A rectangle has width 5 cm. The length is twice the width. What is the area of the rectangle? ....

3 What is the area of a square with 5 cm sides? ....

4 | Area = 20 cm² | What is the width of this rectangle? ....

10 cm

5 What is the length of the side of this square? ....

Area = 36 cm²

6 The area of triangle A is half the area of rectangle B. What is the area of triangle A?

....

A

10 cm

12 cm

B

10 cm

12 cm

7 What is the area of triangle C?

....

C

5 cm

8 cm

UNIT
3

Area

STAR CHALLENGE

8
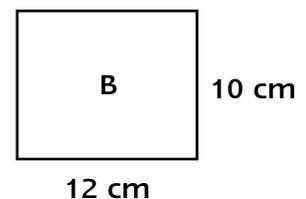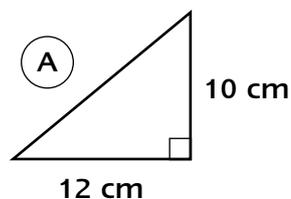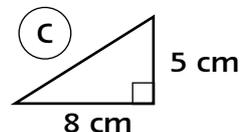
Measure and work out the area

6-7 correct 1 star

For each rectangle:
- measure the length and width
- work out the area.
- work out the perimeter

A
Area = ...
 P = ...

B
Area = ...
 P = ...

C
Area = ...
 P = ...

D
Area = ...
 P = ...

F
Area = ...
 P = ...

E
Area = ...
 P = ...

G
Area = ...
 P = ...

UNIT
3

Area

9 **Wire rectangles**

⭐ ⚪

6–8 marks 1 star
1 mark for each correct rectangle and 1 mark for each correct area

Imagine that you have a piece of wire 20 cm long.

It could make this rectangle.

6 cm

4 cm **4 cm**

6 cm
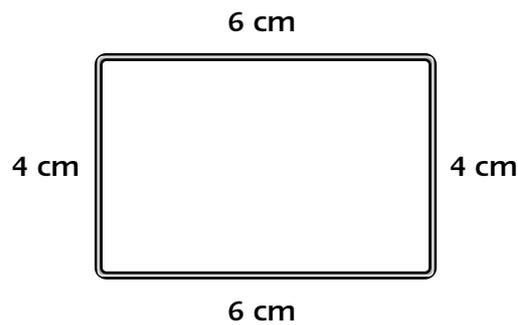
Sketch four more different rectangles that you could make with this wire.
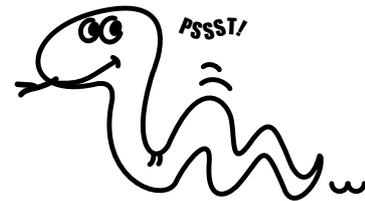
Write the length and width on each rectangle.

Inside each rectangle, write its area.

Remember: a sketch is not an accurate drawing.

PSSST!

UNIT
3

Area

STAR CHALLENGE

10 **Units of area**

9–10 correct 1 star

Work out the area of each of these shapes.

They are not drawn to scale.

Each answer must have the correct units.

3 cm | **A**
5 cm

B | 4 cm
6 cm

C | 4 m
5 m

D | 15 m
10 m

E | 2 mm
3 mm

F | 4 m
5 m

H | 4 cm
4 cm
8 cm

G | 2 m
11 m

I | 6 mm
4 mm
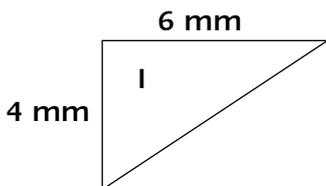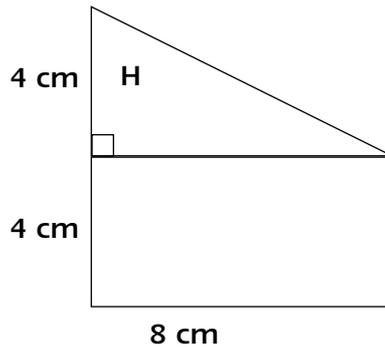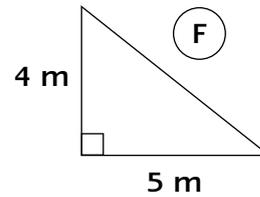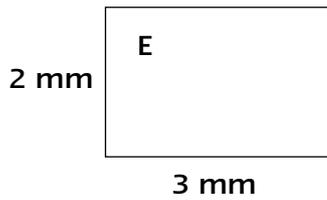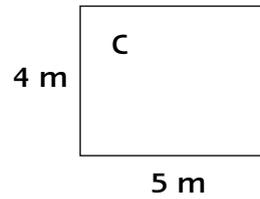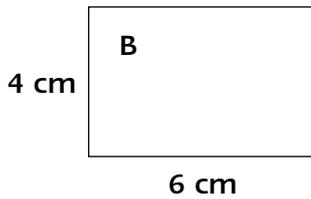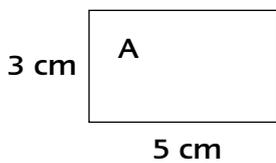
Remember: these shapes are not drawn to scale.

PSSST!

SECTION 5: 3D SHAPES

DIRECT TEACHING POINTS

- Some pupils will need a practical approach to solving the problems.

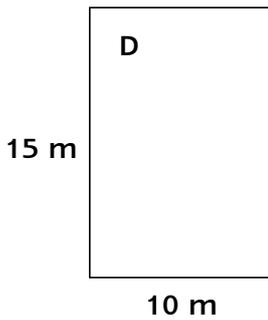- Star Challenges 11 and 12 can form the basis of a class discussion – use an OHT of the shapes to help guide the discussion.

KEY VOCABULARY *TO LEARN AND USE*

net   view

UNIT
3

3D shapes

1 Drawings of 3D shapes

A

B

D

C

E

F

H

G

Each of these
shapes has been
made with four
cubes.
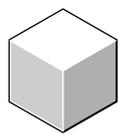
1 Work out which drawings
are different views of the
same shapes.

A = ...

.... = ...

.... = ... = ...
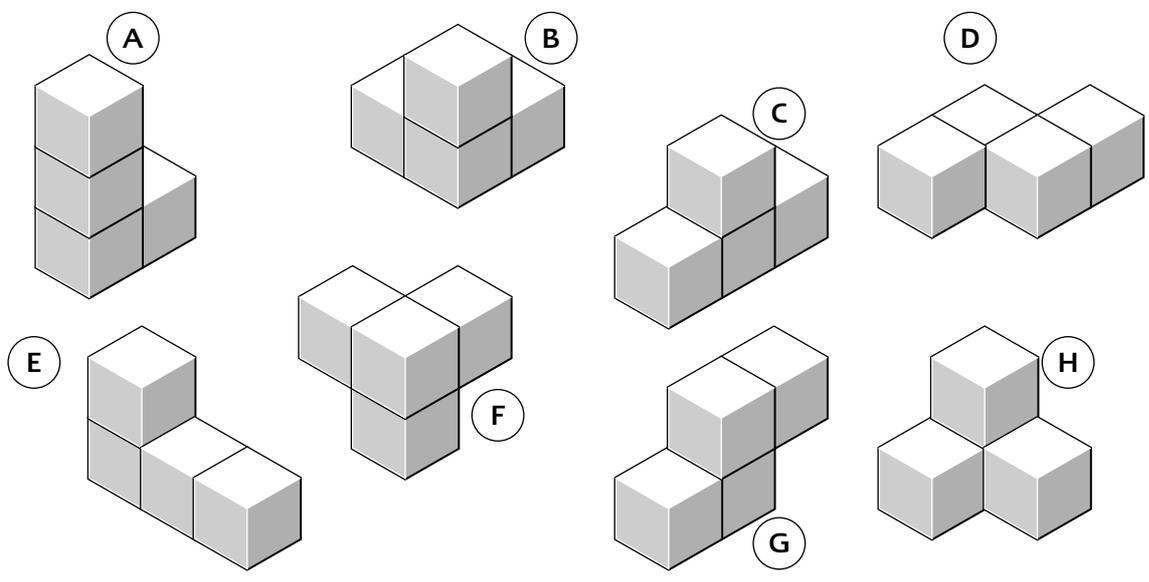
2 Make each
shape. Use
your shapes to
check whether
your answers
are right.

2 Nets of open boxes

Here are some nets.

1 For each net,
decide whether
it will fold up to
make an open box.
Under each net,
write 'Yes'
or 'No'.

A

B

C

....

....

....

D

E
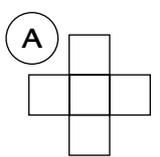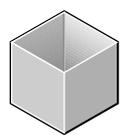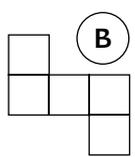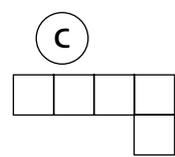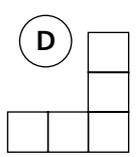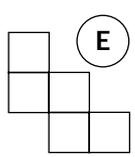
2 For each 'Yes',
shade the
square that is
at the bottom
of the open box.

....

....

UNIT
3

3D shapes

11 **Pairs of shapes**
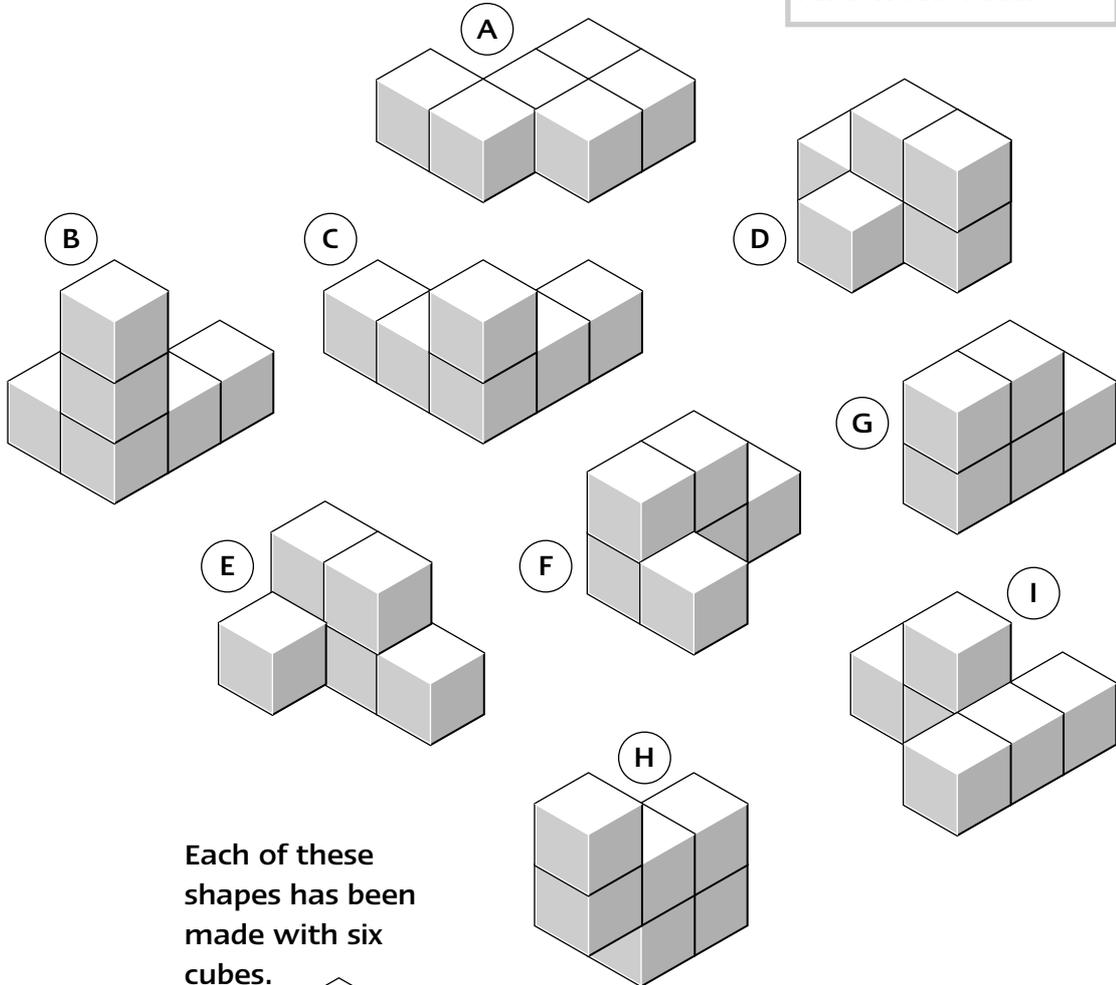
All correct 1 star

Each of these
shapes has been
made with six
cubes.
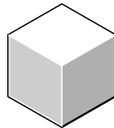
There are four pairs of identical shapes.
Try to find them all.

UNIT
3

STAR CHALLENGE

12   **Mind the paint**

3D shapes

All correct 1 star

This cube has been standing
in a pool of paint.
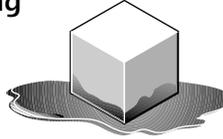
1 Which of these
nets could be
this cube?

....

....

....

A

B

C

D

E
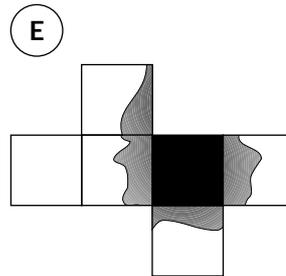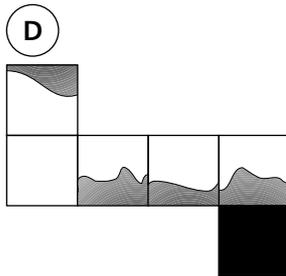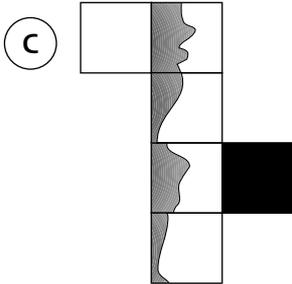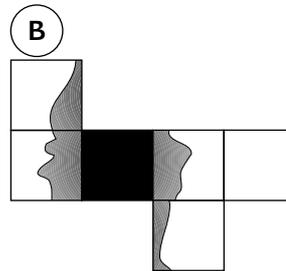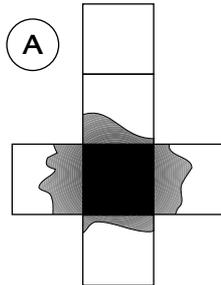
2 For this net, the painted face is
shown.

Copy the net and shade in the
edges of the four faces that are
also painted.
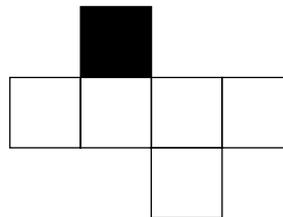
Unit **3** Answers

Section 1   **Perimeter**

1 **Distance round the edge**

(A) **9 cm**   (B) **14 cm**   (C) **12 cm**   (D) **12 cm**   (E) **12 cm**

2 **Calculating perimeters**

(A) 10 cm   (B) **12 cm**   (C) **12 cm**   (D) **14 cm**   (E) **14 cm**

(F) **14 cm**   (G) **12 cm**

3 **Rectangle perimeters**

1 **18 cm**   *2* **18 cm**   *3* **22 cm**   *4* **20 cm**   *5* **60 cm**

6 **40 cm**   *7* **7 cm**

Section 2   **Centimetres and millimetres**

1 **Measuring lines**

1 **46** mm; **4** cm **6** mm

2 **5** cm **9** mm; **59** mm

3

               5 cm **4** mm

2 cm **8** mm   **28** mm

               54 mm

4

6 cm **1** mm   **3** cm **5** mm

        50 mm
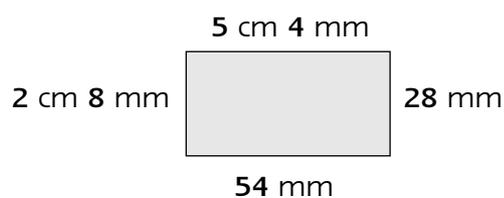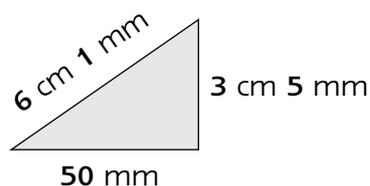
2 **Longer and shorter lines**

1 (a) **4** cm **4** mm

2 (a) **5** cm **3** mm   (b) **5** cm **9** mm   (c) **3** cm **7** mm

UNIT
3

Unit **3** Answers

Centimetres and millimetres *continued*

3 Adding cm and mm

1 4 cm 9 mm   **2** 5 cm 9 mm   **3** 9 cm 7 mm

4 12 mm should be changed to 1 cm 2 mm

5 WY = 7 cm 1 mm   XZ = 6 cm 3 mm

6 5 cm 2 mm   **7** 21 cm 4 mm

4 Three ways to measure lines

1 28 mm;   2 cm 8 mm;   2.8 cm

2 5 cm 2 mm;   52 mm;   5.2 cm

3 71 mm   **4** 5 cm 3 mm   **5** 6.5 cm

6 74 mm   **7** 2.7 cm

Section 3   Metres and centimetres

1 Equivalent measurements

1 [ ] 120 cm

250 cm

2 5 m 60 cm
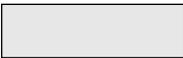
2 m 80 cm

3 325 cm

1 m 5 cm [ ]

4 220 cm

7.5 m

2 Measurement problems

1 30 cm   **2** 75 cm   **3** 50 cm

4 90 cm   **5** 75 cm   **6** 3 m

7 20 cm   **8** 1 m 75 cm   **9** 1 m 80 cm

10 1 m 15 cm

Unit 3 Answers

Section 4   **Area**

1   What is area?

| 1 | 3 squares | 2 | 5 squares | 3 | 6 squares | 4 | $4\frac{1}{2}$ squares |

2   Square centimetres

| 1 | 2 cm^2 | 2 | 4 cm^2 | 3 | 6 cm^2 | 4 | 3 cm^2 |
| 5 | 3.5 cm^2 | 6 | 4 cm^2 | 7 | 5 cm^2 | 8 | 5 cm^2 |

3   Areas of rectangles

1

Rectangle	Length in cm	Width in cm	Area in cm^2
A	5	2	**10**
B	**4**	**3**	**12**
C	**3**	**3**	**9**
D	**6**	**3**	**18**
E	**4**	**2**	**8**
F	**2**	**3**	**6**
G	10	4	**40**
H	6	5	**30**

4   The rule for the area of a rectangle

| 1 | 50 cm^2 | 2 | 64 cm^2 | 3 | 30 cm^2 |

5   Area problems

| 1 | 60 cm^2 | 2 | 50 cm^2 | 3 | 25 cm^2 | 4 | 2 cm |
| 5 | 6 cm | 6 | 60 cm^2 | 7 | 20 cm^2 |

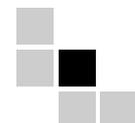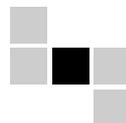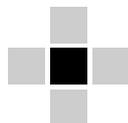**Section 5**   **3D shapes**

1   Drawings of 3D shapes

A = E   D = G   B = F = H

2   Nets of open boxes

| 1 | (A) Yes | (B) Yes | (C) Yes | (D) No | (E) Yes |

2

UNIT
3

Unit **3** Answers

Star Challenge answers

STAR CHALLENGE

1

Different perimeters

| 16–17 marks 2 stars |
| 10–15 marks 1 star |

1

P = 8 cm   P = 8 cm

2

P = 8 cm   P = 10 cm   P = 10 cm   P = 10 cm   P = 10 cm

3   Any **ten** of these shapes:

P = 12 cm   P = 10 cm   P = 12 cm   P = 12 cm

P = 12 cm   P = 12 cm   P = 12 cm   P = 12 cm

P = 12 cm   P = 12 cm   P = 12 cm   P = 12 cm

STAR CHALLENGE

2
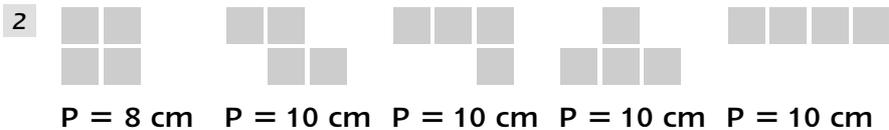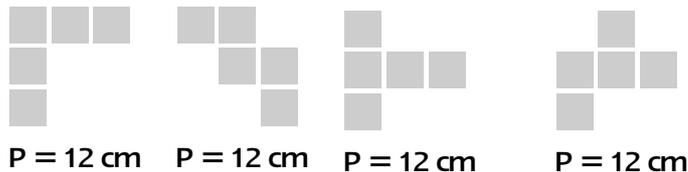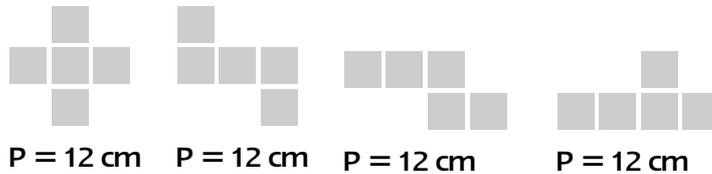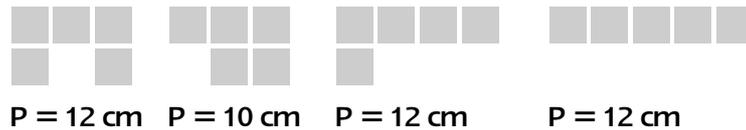
Regular polygons

| All correct 1 star |

1   A hexagon has **6** sides.
Each side of this hexagon is **2** cm long.
The perimeter of this hexagon is **6 × 2** cm = **12** cm

2   A pentagon has **5** sides.
Each side of this pentagon is **3** cm long.
The perimeter of this pentagon is **5 × 3** cm = **15** cm

3   A triangle has **3** sides.
Each side of this triangle is **6** cm long.
The perimeter of this triangle is **3 × 6** cm = **18** cm

4   An octagon has **8** sides.
Each side of this octagon is **10** cm long.
The perimeter of this octagon is **8 × 10** cm = **80** cm

Unit 3 Answers

Star Challenge answers *continued*

⚡ 3 Perimeter puzzle

15 shapes	3 stars
13–14 shapes	2 stars
11–12 shapes	1 star
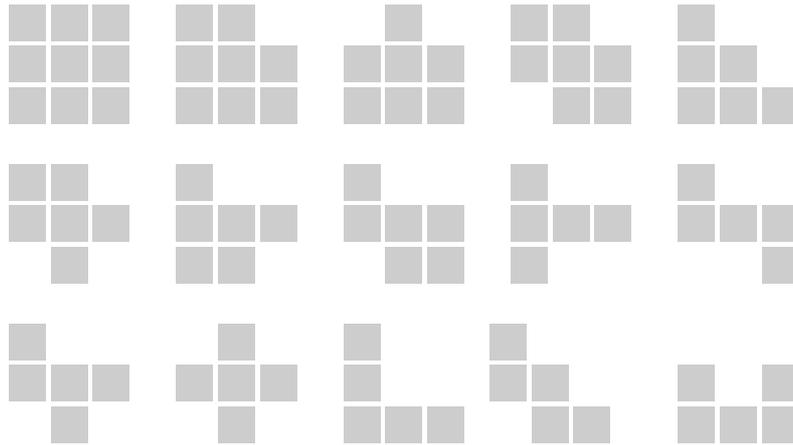
⚡ 4 Rectangle perimeters

6 correct	2 stars
4–5 correct	1 star

(A) 16 cm   (B) 19 cm 6 mm   (C) 30 cm   (D) 6 cm

(E) 13 cm   (F) 9.2 cm *or* 9 cm 2 mm

⚡ 5 Rectangle measurements

6-7 correct	2 stars
4-5 correct	1 star

1 54 mm

2 5 cm 4 mm

3 27 mm;   2 cm 7 mm;   2.7 cm

4 73 mm;   7 cm 3 mm;   7.3 cm

5 102 mm;   10 cm 2 mm;   10.2 cm

6 Yes; both are 73 mm

7 Yes; AC = 112 mm and EF = 56 mm

⚡ 6 Petros' tower

4 correct	2 stars
3 correct	1 star

1 B, F, G

2 and 3 A, C, E, F *and* B, C, E, G

4 2 m 20 cm *or* 220 cm

⚡ 7 Trains and lorries

All correct	1 star

1 (a) 105 cm   (b) 1 m 5 cm   (c) 1.05 m

2 (a) 110 cm   (b) 1 m 10 cm   (c) 1.1 m

3 50 cm

UNIT
3

Unit **3** Answers

Star Challenge answers *continued*

STAR CHALLENGE 8

Measure and work out the area | 6-7 correct 1 star

(A) 8 cm²   (B) 6 cm²   (C) 12 cm²   (D) 16 cm²

  P = 12 cm   P = 10 cm   P = 14 cm   P = 20 cm

(E) 21 cm²   (F) 40 cm²   (G) 9 cm²

  P = 20 cm   P = 26 cm   P = 12 cm

STAR CHALLENGE 9

Wire rectangles | 6-8 marks 1 star

The expected rectangles and their areas:

Length	9	8	7	5
Width	1	2	3	5
Area	9	16	21	25

STAR CHALLENGE 10

Units of area | 9-10 correct 1 star

(A) 15 cm²   (B) 24 cm²   (C) 20 m²   (D) 150 m²   (E) 6 mm²

(F) 10 m²   (G) 22 m²   (H) 48 cm²   (I) 12 mm²

STAR CHALLENGE 11

Pairs of shapes | All correct 1 star

A and **H**   **B** and **C**   **D** and **G**   **E** and **F**

STAR CHALLENGE 12

Mind the paint | All correct 1 star

1 A, B, E   2