Name:

AUS: ACMMG159
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Area of Rectangles

Learning Intention

Students will be able to:

• Find the formula for the area of a rectangle.

Success Criteria:

• **Level 1 -** I can correctly solve 5 *picture-based problems* using the formula for the area of a rectangle. (Activity 1)

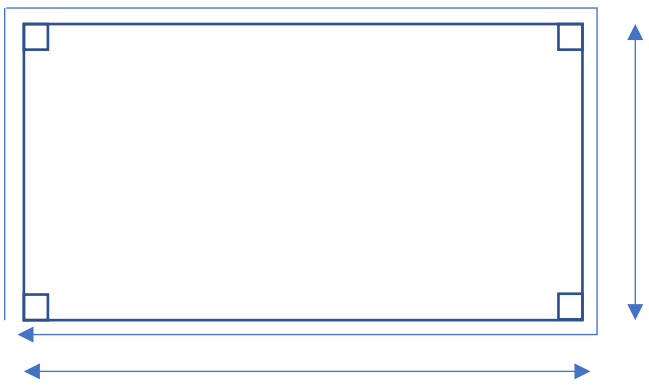
• **Level 2 -** I can correctly solve 5 *word-based problems* using the formula for the area of a rectangle. (Activity 2)

• **Level 3 -** I can correctly solve 5 compound area problems using the formula for the area of a rectangle. (Activity 3)

Vocabulary

- **Dimension –** a measurement of a particular kind, such as width, or height.
- **Right-angle –** an angle of 90°, as in a corner of a square.
- **Perpendicular –** positioned at an angle of 90° to something, like a line.
- **Perimeter** – the boundary of a closed geometrical figure. (1D)
- **Area –** the size of a surface. (2D)

Insert the underlined terms above on the figure below:



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Activity 1

Work out the area of the following rectangles. They are not to scale.

1)

Area = _____ square cm

2)

Area = _____ square ft

3)

Area = _____ square m

4)

Area = _____ square in

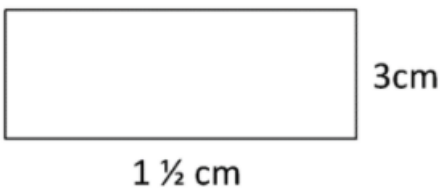
5)

Area = _____ square m

6)

Area = _____ square cm

7)



8)

Activity 1 Answers:

(1) 24 square cm, (2) 35 square ft, (3) 9 square m, 4) 40 square in, (5) 18 square m, (6) 40 square cm, (7) 4.5 cm^2 (8) 34 cm^2

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Activity 2

1) A rectangle measuring 20 cm by 4 cm. Area = _____

2) A square with side 12 cm. Area = _____

3) A rectangle with sides 2 ½ cm and 4 cm. Area = _____

4) A square with sides of 30 cm. Area = _____

5) A rectangle with sides 9 mm and 20 mm. Area = _____

6) A rectangle with sides 30 cm and 20 cm. Area = _____

7) A square with side 70 cm Area = _____

8) A square with sides of ½ m. Area = _____

9) A rectangle with sides 8 cm and 3½ cm Area = _____

10) A rectangle with sides 0.4 cm and 3 cm Area = _____

11) Look at resealable bag package below.

a) What is the total amount of plastic (in cm^2) in a single resealable bag?

b) What is the total amount of plastic in a 50 pack of resealable bags?

12a) I have a wall that is 10m wide and 3m tall. What is the surface area of the wall?

b) I want to paint the wall. It takes 0.2 litres of paint to cover a $1m^2$ patch. How many litres of paint do I need to completely cover the wall?

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Activity 2 Answers:

1) A rectangle measuring 20 cm by 4 cm.	Area = 80 cm^2
2) A square with side 12 cm.	Area = 144 cm^2
3) A rectangle with sides 2 ½ cm and 4 cm.	Area = 10 cm^2
4) A square with sides of 30 cm.	Area = 900 cm^2
5) A rectangle with sides 9 mm and 20 mm.	Area = 180 mm^2
6) A rectangle with sides 30 cm and 20 cm.	Area = 600 cm^2
7) A square with side 70 cm	Area = 4900 cm^2
8) A square with sides of ½ m.	Area = ¼ m^2
9) A rectangle with sides 8 cm and 3 ½ cm	Area = 28cm^2
10) A rectangle with sides 0.4 cm and 3 cm	Area = 1.2 cm^2

11) Area of one side of resealable bag = 18 cm x 17 cm = 306 cm^2. There are two sides on a reusable bag. Total plastic = 2 x 306 cm^2 = 612 cm^2

12a) 30 m^2

12b) 0.2L per m^2 x 30 m^2 = 6L of paint.

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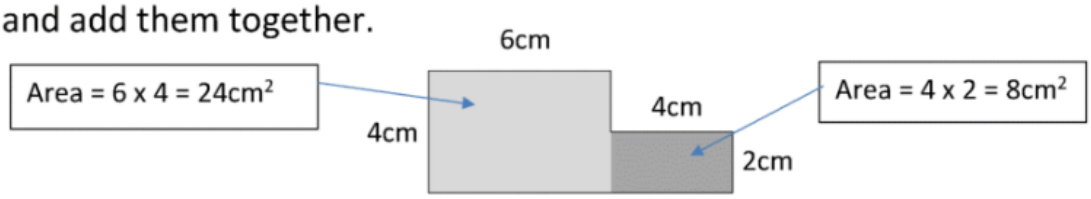
Activity 3 – Compound Areas (Extension)

Example #1:

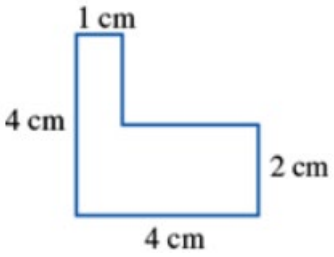
To find the area of these shapes, work out the area of the two rectangles and add them together.



The total area of this shape is $24\text{cm}^2 + 8\text{cm}^2 = 32\text{cm}^2$.

Example #2:

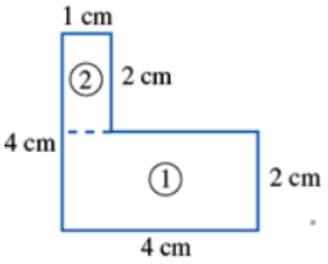
Find the area of the following figure:



Working:

1 Divide the shape into two rectangles.

b



2 Calculate the area of each rectangle separately by substituting the correct values of l and w into the formula $A = lw$.

$$\begin{aligned}\text{Area of rectangle 1} &= l \times w \\ &= 4 \times 2 \\ &= 8\,\text{cm}^2 \\ \text{Area of rectangle 2} &= l \times w \\ &= 2 \times 1 \\ &= 2\,\text{cm}^2\end{aligned}$$

3 Add the two areas. Remember to answer in the correct unit (cm^2).

$$\begin{aligned}\text{Area of shape} &= \text{area of rectangle 1} \\ &\quad + \text{area of rectangle 2} \\ &= 8\,\text{cm}^2 + 2\,\text{cm}^2 \\ &= 10\,\text{cm}^2\end{aligned}$$

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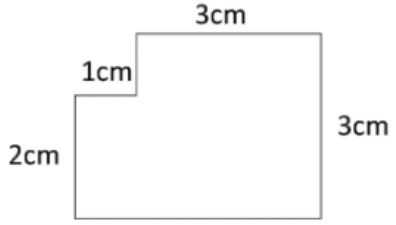
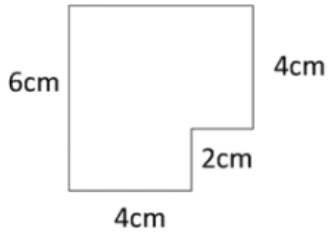
Work out the area of the following shapes (not to scale):

1)



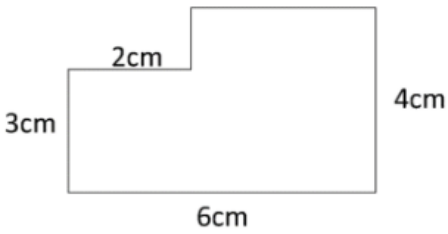
Area = _____ cm^2

2)



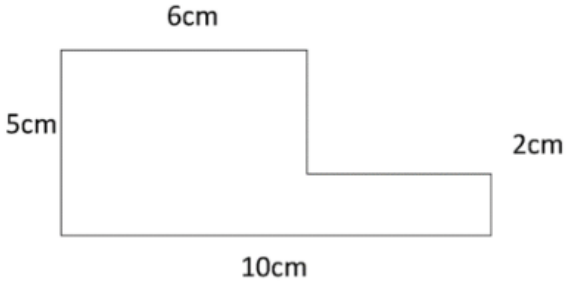
Area = _____ cm^2

3)



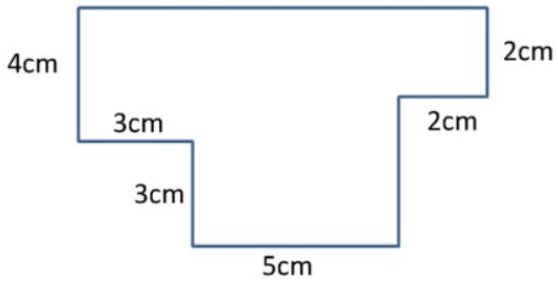
Area = _____

4)



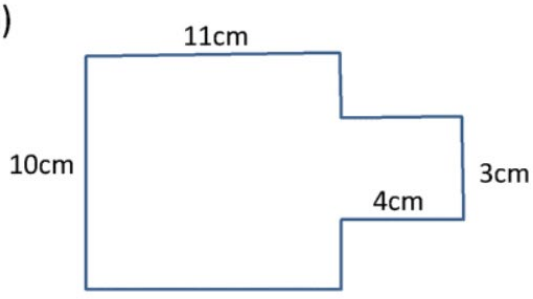
Area = _____

5)



Area = _____

6)



Area = _____

Activity 3 Answers:

(1) 11 cm^2, (2) 32 cm^2, (3) 22 cm^2, (4) 38 cm^2 (5) 18 square m, (6) 12 + 35 + 4 = 51 cm^2 (7) 110 + 12 = 122 cm^2