Area

Name: _____

Date: _____

Instructions: No answer bank: show your working for the shape maths. Number the steps in order, answer the case study questions, explain the key terms, then write full-sentence answers and plan the extended answer.

1. Shape maths (show your working)

Question	Working and answer
Trapezium: parallel sides 9 cm and 15 cm, height 6 cm	
Rhombus: diagonals 12 cm and 7.5 cm	
Regular pentagon: side 10 cm, apothem 6.9 cm	
0.35 m² in cm²	
Triangle area 42 cm², base 12 cm. Height?	

Did you know?

- The apothem of a regular hexagon is about 0.866 times its side.
- 1 km² = 100 ha = 1,000,000 m².
- A square is a rhombus, so A = d × d ÷ 2 also works for a square using its diagonal.
- Area units go up in steps of 100 because both length and width are multiplied by 10.

Background

The area is the amount of flat space inside a shape. We measure it by counting square units: square centimetres (cm²), square metres (m²) and so on. A 1 cm² square has sides of 1 cm.A rectangle with length l and width w has area A = l × w, because it is made of w rows of l squares. A square has A = s × s.

2. Steps in order

Number the steps 1 to 6 (1 = first).

	Find measures: Pick out the base, height or diagonals
	Calculate: Work it out carefully
	Same units: Change all lengths to one unit
	Square units: Write the answer in cm², m² or similar
	Name the shape: Decide which formula fits
	Substitute: Put the numbers into the formula

3. Case study

> *Tayo's family want to paint one wall 5 m wide and 2.6 m high. There is a door 0.9 m by 2 m in it. One tin of paint covers 10 m².*

Case study: painting Tayo's wall

1. What is the area of the whole wall?

2. What area needs painting after taking off the door?

3. How many tins do they need for one coat, and why?

4. Key terms

Key term	What does it mean? Give an example.
Area	
Square centimetre	
Height	
Apothem	
Hectare	

5. Think it through

1. Explain how the trapezium formula comes from two triangles or a parallelogram.

2. Explain why a regular polygon's area is perimeter × apothem ÷ 2.

6. Longer answers (full sentences)

1. Convert 2.5 dm² to cm² and to mm².

2. A rectangle and a triangle share a base of 10 cm and a height of 4 cm. Compare their areas.

3. Find the area of a kite with diagonals 14 cm and 9 cm and explain the method.

4. Explain in your own words: Why is 1 m² equal to 10,000 cm² and not 100 cm²?

7. Extended answer

Extended answer: 'If you know the perimeter of a shape, you know its area.' How far do you agree?

Plan: introduction · point for (example) · point against (example) · conclusion with your judgement.