



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
Circumference, $r = 15$ cm ($\pi \approx 3.14$)	
Area, $d = 8$ cm ($\pi \approx 3.14$)	
Circumference 62.8 cm. Radius ($\pi \approx 3.14$)?	
Area of a semicircle, $r = 4$ cm ($\pi \approx 3.14$)	
Sector of 60° in a circle with $r = 6$ cm. Area ($\pi \approx 3.14$)?	

Did you know?

- Archimedes showed π lies between $3 \frac{10}{71}$ and $3 \frac{1}{7}$ over 2,200 years ago.
- $\frac{22}{7}$ is a handy fraction close to π .
- Doubling the radius doubles the circumference but makes the area four times bigger.
- Computers have worked out π to trillions of digits.

Background

A circle is the set of all points the same distance from a centre. That distance is the radius (r). A line through the centre from edge to edge is the diameter (d), and $d = 2 \times r$. The distance around a circle is its circumference. A part of the circumference is an arc. A line joining two points on the circle is a chord; the diameter is the longest chord.

2. Steps in order

Number the steps 1 to 5 (1 = first).

1	Choose: Circumference or area?
2	Units: cm for circumference, cm^2 for area
3	Circumference: $C = 2 \times \pi \times r$
4	Find r: If you have d , halve it to get r
5	Area: $A = \pi \times r \times r$

4. Key terms

Key term	What does it mean? Give an example.
Radius	
Diameter	
Circumference	
Pi (π)	
Chord	

3. Case study

Tayo's bike wheel has a diameter of 50 cm. He rides to the park, and the wheel turns 400 times.

Case study: how far did Tayo ride?

- How far does the wheel travel in one turn ($\pi \approx 3.14$)?

- How far did Tayo ride in metres?

- How many turns for 1 km, to the nearest whole turn?

5. Think it through

- Explain why the area of a circle is πr^2 , using the slice method.

- Explain why doubling the radius makes the area four times bigger.

6. Longer answers (full sentences)

1. Find the perimeter of a semicircle with diameter 10 cm ($\pi \approx 3.14$).

2. Explain the difference between a chord, a radius and a diameter.

3. A pizza of diameter 30 cm or two of diameter 20 cm: which gives more pizza ($\pi \approx 3.14$)?

4. Explain in your own words: Why do we square the radius to find the area?

7. Extended answer

Extended answer: 'Circles are the most useful shape humans have ever used.' How far do you agree?

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