Patterns in Nature and Design

Learning objective: I can identify, analyse, and create complex patterns using geometric and organic principles.

About 45 minutes. Grown-up tip: Encourage your child to look for patterns in floor tiles or wallpaper at home to help them visualise these concepts.

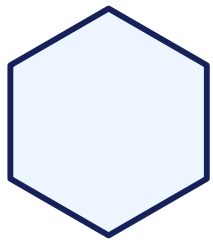
Read each question carefully. For short answers, be precise. For extended responses, ensure you use technical vocabulary correctly. Worked example: To describe a 'tessellation', you must explain how shapes fit together without gaps or overlaps like a honeycomb.

Zara the zebra loves to observe the world. She notices that a honeycomb is a perfect tessellation of hexagons, while the veins of an oak leaf create an organic, branching pattern. In the city, Zara sees repeating geometric tiles on a Victorian shop front, showing how mathematical precision creates beauty in everyday architecture.

Word bank: Symmetry · Tessellation · Motif · Geometric · Organic · Repetition · Radial

1. Define the term 'motif' in the context of pattern design. (1 mark) (1 mark)

2. Look at the shape below. Explain why this regular hexagon is a successful shape for tessellation. (2 marks) (2 marks)



3. Contrast 'geometric' patterns with 'organic' patterns. Give one example of each found in a British garden. (4 marks) (4 marks)

4. Describe the difference between 'reflective symmetry' and 'radial symmetry'. You may use a diagram to support your explanation. (4 marks) (4 marks)

5. Zainab is designing a floor for a local community centre. She wants to use a repeating pattern that covers the entire space. Explain two design rules she must follow to ensure the pattern is effective and visually balanced. (4 marks) (4 marks)

6. Extended Writing: Zara says, 'Patterns are the hidden language of the natural world.' Write a paragraph explaining this statement. Use evidence from nature (such as a spider's web, a seashell, or a flower) to support your argument. (5 marks) (5 marks)

Draw: An illustration of Zara the zebra holding a sketchbook, standing in a UK garden with a honeycomb pattern visible on a nearby tree trunk and a geometric tile pattern on a garden path.

Extension challenge: Challenge: Create a 'fractal' pattern by drawing a triangle, then adding smaller triangles to each side, repeating the process three times. Total: /25

I did it! Name: _____ Date: _____

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