Year 5 Non-Verbal Reasoning Assessment: Patterns and Logic

Learning objective: To develop spatial awareness, identify sequences, and apply logical deduction to visual patterns.

Read each question carefully. Use your reasoning skills to identify the rules governing the shapes and patterns. Work independently and show your working where possible.

Max the monkey is helping the forest animals organise their belongings. He loves to sort items by their shapes and the patterns they follow. Use your logic to help Max solve these visual puzzles.

Word bank: Rotation · Reflection · Sequence · Symmetry · Clockwise · Anticlockwise · Transformation · Pattern

1. Max has a sequence of shapes: a triangle, a square, a pentagon, and a hexagon. If the pattern continues by adding one side each time, what is the next shape in the sequence? Explain why. (2 marks)

2. Look at a shape that has been rotated 90 degrees clockwise. If the original shape had a dot at the very top, where would the dot be after the rotation? Describe its new position. (2 marks)

3. Zara the zebra is creating a symmetrical border. She draws a shape on the left side of a line. If the shape is a right-angled triangle pointing away from the line, draw what the reflection should look like on the right side. (3 marks)

4. A series of squares contains arrows. Square 1 points North, Square 2 points East, and Square 3 points South. Identify the rule for this rotation and predict the direction of the arrow in Square 4. (3 marks)

5. Kit the fox has a grid of 3x3 squares. In the first row, there is a circle, a star, and a triangle. In the second row, the shapes shift one space to the right, with the last shape moving to the front. If the third row follows this same 'shifting' rule, draw the grid and explain the logic you used to solve it. (5 marks)

6. Compare a square and a rhombus. Identify two geometric similarities and two differences regarding their angles and side lengths. (4 marks)

7. If a pattern follows a 'flip and turn' rule, describe what happens to a shape if it is reflected across a horizontal axis and then rotated 180 degrees. (6 marks)

Draw: Draw a 4x4 grid. Create a pattern where a shaded square moves diagonally from the top-left corner to the bottom-right corner over four steps.

Extension challenge: Total: /25