

# Year 5 Non-Verbal Reasoning Assessment: Patterns and Spatial Awareness

*Learning objective: To identify, analyse, and manipulate visual patterns, sequences, and 3D spatial arrangements.*

Read each question carefully. Use Max the Monkey's mathematical mindset to look for rules, rotations, and reflections. Write your answers clearly in the spaces provided.

Max the Monkey is organising his collection of geometric shapes. He notices that every sequence follows a precise mathematical rule. To solve these puzzles, you must look beyond the surface and identify how the shapes transform.

*Word bank: Rotation · Reflection · Sequence · Symmetry · Translation · Orientation · Component · Clockwise · Anti-clockwise*

**1. A square is rotated 90 degrees clockwise, then 180 degrees anti-clockwise. Describe the final orientation of the square compared to its starting position. Justify your answer. (2 marks)**

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**2. Look at this sequence: Triangle, Square, Pentagon, Hexagon. Predict the next two shapes in the sequence and explain the mathematical rule governing the progression. (2 marks)**

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**3. If a shape costing £1.50 is reflected across a vertical axis, does its price change? Explain why or why not in terms of geometric properties. (2 marks)**

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**4. Compare and contrast a translation and a reflection. Provide an example of how each might change the position or appearance of a shape on a grid. (4 marks)**

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5. A 3D cube is painted red on the top and blue on the bottom. If the cube is rotated 90 degrees on its horizontal axis, what happens to the colour positions? Describe the new arrangement. (3 marks)

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6. Max has a pattern: a circle with a dot at the top, followed by a circle with a dot at the right, then a circle with a dot at the bottom. What might happen if the pattern continues for ten more steps? Predict the position of the dot at step 12. (4 marks)

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7. Extended Writing Task: Imagine you are designing a new flag for a school team. Create a design that incorporates rotational symmetry of order 4. Describe your design in detail, explaining how you ensured the symmetry is mathematically accurate. Why is symmetry often used in flag design? (5 marks)

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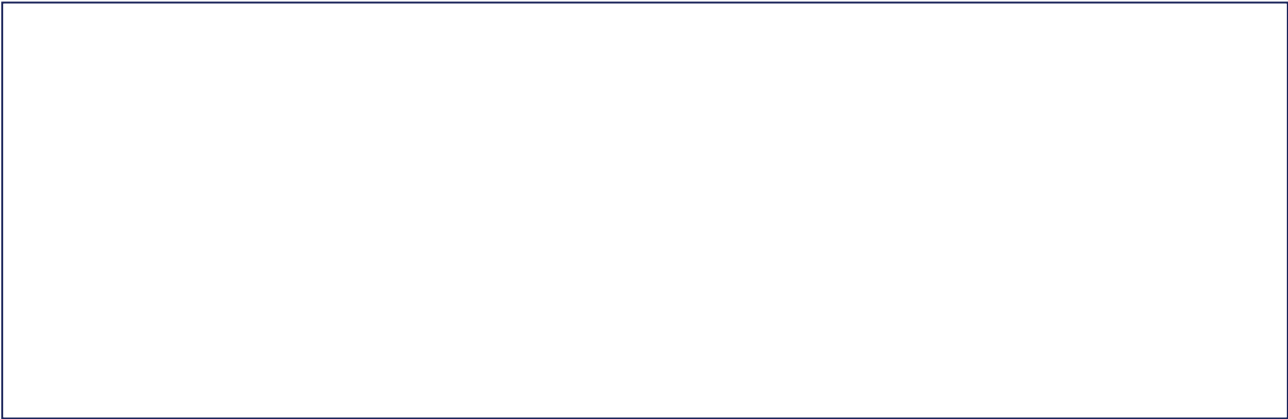
8. If you have a set of shapes worth £12.00, and you perform a transformation that creates a mirror image, is the 'value' of the pattern still the same? Justify your answer using the concept of congruence. (3 marks)

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**Draw:** In the space below, draw a shape that has a line of symmetry, then draw its reflection across a vertical line.



*Extension challenge: Total: /25*