Year 6 Non-Verbal Reasoning Assessment: Patterns and Logic

Learning objective: To identify, analyse, and apply logical rules to sequences, rotations, and spatial relationships.

Read each question carefully. You have 30 minutes to complete this paper. Max is here to help you think through the logic of every puzzle!

Max the monkey has been busy organising his collection of geometric shapes. He notices that every time he moves his shapes, there is a hidden rule to follow. Whether it is a turn, a flip, or a change in size, Max knows that maths is the key to solving the mystery.

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

1. Look at the sequence of shapes: A triangle points up, then points right, then points down. If this rotation continues clockwise by 90 degrees, what direction will the triangle point in the next step? Explain your reasoning. (2 marks)

2. Identify the odd one out in this set: A square, a rectangle, a regular hexagon, and a circle. Give a geometric reason for your choice. (2 marks)

3. If a shape is reflected across a vertical line of symmetry, what happens to the left and right sides of the image? Describe the transformation in detail. (3 marks)

4. Max has a pattern: Square, Circle, Triangle, Square, Circle, Triangle. If this pattern repeats, what will be the 10th shape in the sequence? Show how you worked it out. (4 marks)

5. Complete the analogy: 'Hand is to Glove as Foot is to...'. Then, explain the logical relationship between the two pairs. (4 marks)

6. Consider a 3D cube. If you rotate the cube 90 degrees on its horizontal axis, describe how the position of the top face changes relative to the front face. Use specific vocabulary such as 'vertex' or 'face' in your answer. (5 marks)

7. Max buys a set of wooden shapes for £4.50. If he decides to sort them into 3 equal groups based on their number of sides, how much would each group be worth if the value was split equally? (5 marks)

Draw: Draw a shape that has rotational symmetry of order 2. Label the centre point of rotation clearly.

Extension challenge: Total: /25