

Max's Pattern Puzzles: A Non-Verbal Reasoning Challenge

Learning objective: To identify, continue, and analyse complex sequences of visual patterns and spatial transformations.

Max the monkey has been busy sorting shapes and patterns for his jungle collection. Carefully examine each series and determine the logical progression to find the missing element. Use your best analytical skills to justify your choices.

Max is organising his collection of geometric tiles. He noticed that the patterns follow strict rules of movement. Some tiles rotate 90 degrees clockwise, others reflect across a vertical axis, and some increase in the number of sides. To solve these, you must think like a scientist: observe the change, identify the rule, and predict the next step in the sequence.

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

1. Max has a sequence of shapes: a triangle, a square, and a pentagon. If the number of sides increases by one each time, explain why the sixth shape in the sequence must have eight sides. (2 marks)

2. A shaded square rotates 90 degrees clockwise in each step. If the square is currently in the top-right corner of a 2x2 grid, where will it be after three rotations? Justify your answer. (2 marks)

3. Compare and contrast a reflection and a rotation. In what way does the orientation of a shape change differently in these two transformations? (3 marks)

4. What might happen to a pattern if a rule is applied incorrectly? Explain the importance of precision when following a sequence. (2 marks)

5. If a sequence of circles involves the circles doubling in size and then halving, what would the fifth circle look like if the first circle has a radius of 2cm? (2 marks)

Draw: Draw a 3-step sequence where a star shape undergoes a 45-degree clockwise rotation and changes colour from blue to yellow to red in each step.



Extension challenge: Design your own original 'Non-Verbal Reasoning' puzzle for a partner. Your puzzle must involve at least two different rules acting simultaneously (e.g., a shape moving positions while also changing size). Write a brief explanation of the rules you used to create the sequence.