

Max's Symmetry Investigation Log

Learning objective: To identify, describe, and draw lines of symmetry in 2D shapes and patterns, and complete symmetrical figures.

Help Max the monkey solve his latest geometry puzzle! Use this log to record your observations about shapes, natural patterns, and designs. Remember to use a ruler for your lines of symmetry and ensure your reflections are precise.

Word bank: Symmetrical · Asymmetrical · Reflection · Line of symmetry · Vertex · Congruent · Mirror line · Horizontal · Vertical · Diagonal

1. Shape Analysis: Choose a regular polygon. Sketch it here and draw all possible lines of symmetry. Explain why some shapes have more lines of symmetry than others. (3 marks)

2. The Mirror Test: Describe how you can prove a shape is symmetrical using a physical mirror. Justify why this method works for identifying a line of symmetry. (3 marks)

3. Compare and Contrast: Compare a square and a rectangle. How do their lines of symmetry differ? Use mathematical vocabulary to justify your answer. (4 marks)

4. Creative Design: Design an original, complex symmetrical pattern. Describe the position of your lines of symmetry (e.g., vertical, horizontal, or diagonal). (3 marks)

5. Predictive Thinking: What might happen to the symmetry of a shape if you were to rotate it by 90 degrees? Explain your reasoning. (3 marks)

6. Problem Solving: If a shape has an odd number of vertices, can it still be symmetrical? Explain your answer with an example. (3 marks)

Extension challenge: Challenge: Max has found an asymmetrical object in the forest. Describe how you could alter the object to make it symmetrical, and explain the mathematical steps required to ensure the reflection is perfectly congruent.