Max’s Geometry Garden: A Transformations Challenge

Learning objective: To accurately translate and reflect 2D shapes on a four-quadrant coordinate grid.

Follow the steps below to complete the geometry puzzle. Use a sharp pencil and a ruler to ensure your vertices are precise. Use the word bank to label your final diagram.

Draw: Draw a large 10x10 coordinate grid centred on the page. The x-axis and y-axis should be clearly marked from -5 to 5. In the top-left corner, draw Max the monkey holding a set square and a pencil. Beside him, draw a small 'Helpful Hint' sign that shows a simple arrow representing a translation of 'Right 2, Up 1'. Ensure there is plenty of white space on the grid for the student to plot the triangles A, B, and C as described in the questions.

Label words: Translation · Reflection · Vertex · X-axis · Y-axis · Quadrant · Mirror line

Steps:

1. Step 1: On your grid, plot a triangle with vertices at (1, 2), (4, 2), and (1, 5). Label this Triangle A.
2. Step 2: Translate Triangle A by 4 units to the right and 3 units down. Draw this as Triangle B. What are the new coordinates of the vertex that was originally at (1, 2)?
3. Step 3: Reflect Triangle A across the y-axis. Draw this as Triangle C. What are the coordinates of the vertex that corresponds to (1, 5)?
4. Step 4: Label the 'Mirror line' on your diagram for the reflection of Triangle C.

5. Step 5: Max wants to move a square from (-2, -2) to (-2, 2). Describe the transformation required in words.