Max’s Geometric Jungle Expedition

Learning objective: To describe, perform, and identify translations and reflections of 2D shapes on a coordinate grid.

Max the monkey is mapping out the jungle floor. Below are instructions for moving and mirroring his equipment crates. Use a coordinate grid to plot the starting positions and follow the instructions to transform them. For the final question, explain how you know if a shape has been reflected correctly.

Word bank: translation · reflection · x-axis · y-axis · coordinate · vertex · mirror line · grid

1. Max has a square crate with vertices at (1,1), (3,1), (3,3), and (1,3). Translate this shape 4 units right and 2 units up. What are the new coordinates of the vertices? (2 marks)

2. A triangular supply tent has a vertex at (2,5). If you reflect this tent across the vertical mirror line where x = 4, what will the new coordinate of that vertex be? (2 marks)

3. If a shape is translated 3 units left and 5 units down, how does this affect the x and y coordinates? Complete the rule: New x = old x _____, New y = old y _____ (2 marks)

4. True or False: When reflecting a shape, the distance from each point to the mirror line must be the same as the distance from the reflected point to the mirror line. Explain your reasoning. (3 marks)

5. Max draws a rectangle with a perimeter of £20 (where each unit on the grid represents £2 of value). If he translates the rectangle, does the perimeter change? Why or why not? (2 marks)

Draw: Draw a 4x4 coordinate grid. Plot a right-angled triangle with vertices at (1,1), (1,3), and (3,1). Reflect this triangle across the vertical line x = 4.

Extension challenge: Challenge: Create your own complex shape on a coordinate grid using at least 5 vertices. Write a set of 'Transformation Instructions' for a partner, involving both a translation and a reflection, and see if they can find the final coordinates of your shape!