Zara's Geometry Patterns: Exploring Symmetry and Tessellation

1. Square and Equilateral Triangle. These shapes tessellate because their interior angles add up to 360 degrees at each vertex, allowing them to fit together without gaps. (2 marks)

Working: A circle has curved edges and a regular pentagon has interior angles of 108 degrees, which do not divide into 360.

1 mark for identifying both shapes; 1 mark for the explanation regarding angles or gaps.

2. A hexagon has 6 lines of symmetry (3 through opposite vertices and 3 through the midpoints of opposite sides). (1 mark)

Working: Visual inspection of a regular hexagon.

1 mark for drawing at least one correct line of symmetry.

3. £3.00 (2 marks)

Working: (4 x £0.50) + (4 x £0.25) = £2.00 + £1.00 = £3.00.

1 mark for correct calculation; 1 mark for correct units (£).

4. Rotation involves turning a shape around a central point, whereas translation involves sliding a shape to a new position without turning it. (2 marks)

Look for: The distinction between 'turning' (rotation) and 'sliding' (translation).

Good: Rotation is turning a shape and translation is sliding it.

Better: Rotation is when you turn a shape around a point, but translation is when you slide it to a new place without turning it.

Best: Rotation involves turning a shape around a fixed point, changing its orientation. Translation is moving the shape to a new position by sliding it, keeping its orientation the same.

What moves an answer up: The best answer uses precise geometric terminology like 'orientation' and 'fixed point'.

5. 32 tiles. (2 marks)

Working: 4 columns x 8 rows = 32 tiles.

1 mark for correct calculation; 1 mark for correct final answer.

What a secure answer looks like

A secure answer demonstrates an understanding that tessellation relies on interior angles meeting at a point and that transformations (rotation/translation) change position or orientation, not the shape itself.

If your child is stuck

Ask the child to trace a shape on paper and physically slide it (translation) or turn it (rotation) to see how it fits against the original.

Common mistakes to watch for

Children often think all regular polygons tessellate (e.g., pentagons) and frequently confuse rotation with reflection.