

Patterns of Light: Designing Rangoli with Zara

Learning objective: To explore the cultural significance and geometric principles of Rangoli patterns for Diwali, demonstrating an understanding of symmetry and repeated motifs.

Zara the zebra loves how Rangoli art uses mathematical precision to create beautiful, symmetrical designs. Your task is to act as a pattern designer. First, use the word bank to identify the key elements of Rangoli design. Then, complete the design challenge by applying your knowledge of reflectional and rotational symmetry to finish the grid provided in the drawing section.

Word bank: Symmetry · Geometric · Diwali · Rangoli · Mandala · Tessellation · Reflection · Motif

1. Explain why symmetry is such a vital component in traditional Rangoli art. How does it affect the viewer's perception of the design? (2 marks)

2. Compare and contrast a simple Rangoli pattern with a complex tessellating design. What do they have in common mathematically? (2 marks)

3. Justify your answer: If you were creating a Rangoli design using only triangles and squares, why might it be harder to achieve a circular, organic appearance? (2 marks)

4. What might happen if a Rangoli artist decided to abandon all symmetry and used random, asymmetrical shapes instead? How would the 'feeling' of the artwork change? (2 marks)

5. If a pack of coloured sand costs £2.50 and a Rangoli stencil costs £4.75, calculate the total cost for 3 packs of sand and 1 stencil. (2 marks)

6. Describe the process of 'reflectional symmetry' as if you were teaching a younger student how to mirror a pattern across a horizontal axis. (2 marks)

Draw: Using a pencil, draw a 6x6 dot grid. Create an original Rangoli design that features both vertical and horizontal symmetry. Use a central motif (such as a stylised lotus or a sunburst) and ensure your geometric shapes repeat in all four quadrants of your grid.



Extension challenge: Design a Rangoli pattern on a budget. Imagine you have a £20.00 allowance to purchase supplies. Create an itemised list of what you would buy, calculate the remaining change, and explain why your chosen materials are the most effective for creating detailed, intricate lines.