

Max's Geometric Blueprint: Investigating Shapes

Learning objective: To identify, describe, and classify 2D and 3D shapes, including calculating missing angles and identifying properties such as vertices, faces, and edges.

Max the monkey is planning a new treehouse project and needs your help to organise his shapes. Use this fact-file template to describe the properties of specific shapes. Choose a 2D or 3D shape, draw it in the box provided, and answer the questions below to complete Max's design log.

Word bank: Polygon · Vertex/Vertices · Parallel · Perpendicular · Faces · Edges · Symmetry · Interior angles · Acute · Obtuse · Reflex

1. Shape Identity: Which shape have you chosen, and is it a regular or irregular polygon? Explain your reasoning. (2 marks)

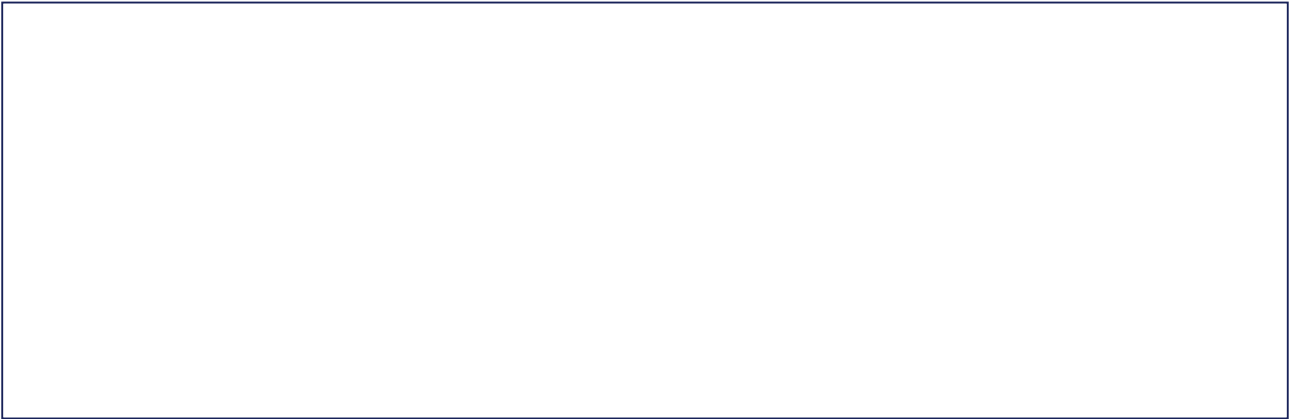
2. Geometric Properties: List the number of vertices, edges, and faces (if 3D) or sides (if 2D) for this shape. (2 marks)

3. Angle Analysis: Describe the interior angles of your chosen shape. Do you have any right angles, acute, or obtuse angles? (3 marks)

4. Lines and Symmetry: Identify any parallel or perpendicular lines within the shape. How many lines of symmetry does it have? (2 marks)

5. Application: If Max wanted to build a frame using four of these shapes, what would be the total number of vertices involved? Show your calculation. (3 marks)

Draw: Draw your chosen shape accurately in the space below, using a ruler to ensure straight edges. Label the vertices and highlight one set of parallel lines if applicable.



Extension challenge: Challenge: If your shape is a 2D polygon, calculate the sum of its interior angles using the formula $(n-2) \times 180^\circ$. If your shape is 3D, can you draw its net?