Max’s Geometry Garden: Sorting 3D Shapes

Learning objective: To identify, describe, and classify 3D shapes, including cubes, cuboids, prisms, pyramids, spheres, cones, and cylinders, by their properties (faces, edges, and vertices).

Max the monkey is organising his garden shed, but he has mixed up all his geometric supplies! Look at the list of 3D shapes in the word bank. For each question, decide if the statement is True or False. If you think it is False, explain why using the correct mathematical properties of the shape.

Word bank: Cube · Cuboid · Triangular Prism · Square-based Pyramid · Sphere · Cylinder · Cone

1. True or False: A square-based pyramid has 5 faces, 8 edges, and 5 vertices. Explain your reasoning. (2 marks)

2. True or False: A cylinder has two flat circular faces and one curved surface, but no vertices. Explain your reasoning. (2 marks)

3. True or False: A triangular prism has 5 faces, 9 edges, and 6 vertices. Explain your reasoning. (2 marks)

4. Max has a box shaped like a cube. Does this shape have the same number of vertices as a cuboid? Explain why. (2 marks)

5. True or False: A cone has 1 vertex and 1 edge. Explain your reasoning. (2 marks)

Draw: Draw a net for a cube and label where the edges meet to form a vertex.

Extension challenge: Max wants to build a tower using one sphere, one cone, and one cylinder. Why would this be a difficult shape to stack? Write a short paragraph explaining the stability of shapes with curved surfaces versus flat faces.