

Max's Mathematical Garden Design

Learning objective: To calculate the area and perimeter of rectilinear shapes and solve problems involving compound shapes.

Max the monkey is designing a series of vegetable plots for his forest garden. Use your knowledge of area (measured in cm^2) and perimeter (measured in cm) to help him calculate the dimensions of his plans. Remember: Area = length $\times$ width, and Perimeter = the total distance around the outside of the shape.

Max has created several plots. Plot A is a simple rectangle measuring 8cm by 5cm. Plot B is a compound L-shaped garden. The horizontal base is 10cm, the left side is 7cm, the top section is 4cm, and the remaining vertical and horizontal edges complete the shape.

Word bank: rectilinear · perimeter · area · compound · dimensions · formula · squared · calculate

1. Calculate the perimeter and the area of Plot A (8cm by 5cm). Show your working out clearly. (2 marks)

2. A new triangular flower bed has a base of 6cm and a perpendicular height of 4cm. Max claims the area is 24cm^2 . Is he correct? Justify your answer using the formula for the area of a triangle. (2 marks)

3. Max has a rectangular plot with an area of 48cm^2 . If one side is 6cm, what is the length of the other side? Explain your method. (2 marks)

4. Compare and contrast the effect on the perimeter and area if all sides of a 4cm by 4cm square are doubled in length. (3 marks)

5. A compound shape is made of two rectangles: one is 3cm x 5cm and the other is 2cm x 4cm. What is the total area of the combined shape? Explain why you added the two areas together. (2 marks)

Draw: Draw a compound rectilinear shape on a piece of squared paper that has a total perimeter of exactly 20cm. Label the length of every side clearly.



Extension challenge: Max wants to fence a new rectangular plot. The fencing costs £3.50 per metre. If the plot is 12 metres long and 8 metres wide, calculate the total cost to fence the entire perimeter. What might happen to the cost if Max decided to increase the width by 2 metres? Justify your answer with calculations.