

Max's Garden Geometry Challenge

Learning objective: To calculate the area and perimeter of rectilinear shapes and justify mathematical reasoning.

Max the monkey is designing a new vegetable patch. Use this planner to calculate the dimensions of his garden beds. Remember: Perimeter is the total distance around the outside, and Area is the total number of square units inside the shape. Show your working out clearly.

Word bank: perimeter · area · rectilinear · centimetres · square centimetres · dimensions · calculation · formula · total

1. Design a rectangular garden bed for Max. State the length and width, then calculate the perimeter. Explain how you found your answer. (3 marks)

2. Calculate the area of your garden bed. Justify why you must use 'square centimetres' as your unit of measurement instead of 'centimetres'. (3 marks)

3. Max wants to build a new rectilinear patch with a perimeter of 20cm. Sketch two different possible shapes and compare their areas. Which one is larger? (4 marks)

4. If Max doubles the length and the width of his garden bed, what happens to the perimeter? Explain your reasoning. (3 marks)

5. If Max doubles the length and the width of his garden bed, what happens to the area? Justify your answer with a calculation. (3 marks)

6. What might happen to the total cost if Max needs to buy wooden fencing costing £2 per centimetre for the perimeter of a 5cm by 3cm bed? Show your working. (3 marks)

Extension challenge: Creative Challenge: Imagine Max wants to create a garden bed in the shape of an 'L'. Draw this shape on squared paper, label the sides, and calculate the total perimeter and area. How does the 'L' shape change the way you calculate the area compared to a simple rectangle?