

## Max's Magnificent Garden Designs

*Learning objective: To calculate the perimeter of rectilinear shapes and find the area by counting squares.*

Help Max the monkey plan his garden plots! Use the square grid provided to help you calculate the space available for his favourite plants. Remember: perimeter is the distance around the outside, and area is the space inside.

Max is planning a new community garden. He has designed several plots for his vegetable patch. Each square on his grid paper represents 1cm by 1cm. Max knows that to keep the rabbits out, he needs to measure the perimeter of each plot carefully to buy enough fencing. To ensure his carrots have room to grow, he must calculate the total area of each bed. Plot A is a rectangle that is 4cm long and 3cm wide. Plot B is a more complex L-shaped plot with a total length of 6cm and a width of 4cm, but with a section missing from the corner.

*Word bank: perimeter · area · rectilinear · square centimetres · grid · total · dimension · calculate*

**1. Calculate the perimeter of Plot A (a rectangle 4cm by 3cm). Show your working out. (2 marks)**

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**2. What is the total area of Plot A in square centimetres (cm<sup>2</sup>)? (1 mark)**

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**3. Explain why the perimeter of a shape might increase even if the area stays the same. Provide an example. (3 marks)**

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**4. If Max wants to build a new rectangular plot with a perimeter of 20cm, what are two possible pairs of lengths and widths he could use? Justify your answer. (3 marks)**

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5. Compare and contrast the methods used to calculate perimeter and area. When would you use each in a real-life scenario? (3 marks)

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**Draw:** Draw two different rectilinear shapes on a 1cm square grid that both have an area of  $12\text{cm}^2$ , but have different perimeters.



*Extension challenge: Max wants to build a large vegetable patch with an area of  $24\text{cm}^2$ . What might happen to the cost of his fencing if he chooses a long, thin design ( $1\text{cm} \times 24\text{cm}$ ) compared to a square-like design ( $4\text{cm} \times 6\text{cm}$ )? Explain your reasoning using your understanding of perimeter.*