

# Reasoning and Problem Solving

## Step 2: Perimeter on a Grid

### National Curriculum Objectives:

Mathematics Year 4: (4M7a) [Measure and calculate the perimeter of a rectilinear figure \(including squares\) in centimetres and metres](#)

### Differentiation:

Questions 1, 4 and 7 (Reasoning)

**Developing** Identify and explain the odd one out of 3 rectangles on a grid. Shapes include internal grid lines.

**Expected** Identify and explain the odd one out of 4 rectilinear shapes on a grid. Shapes include internal grid lines.

**Greater Depth** Identify and explain the odd one out of 4 rectilinear shapes on a grid. Shapes do not include internal grid lines.

Questions 2, 5 and 8 (Reasoning)

**Developing** Explain the mistake made when calculating the perimeter of a rectangle on a grid. Shapes include internal grid lines.

**Expected** Explain the mistake made when calculating the perimeter of a rectilinear shape on a grid. Shapes include internal grid lines.

**Greater Depth** Explain the mistake made when calculating the perimeter of a complex rectilinear shape on a grid. Shapes do not include internal grid lines.

Questions 3, 6 and 9 (Problem Solving)

**Developing** Complete the shape to make a rectangle with the shortest possible perimeter.

**Expected** Complete the shape to make a rectilinear shape with the shortest possible perimeter.

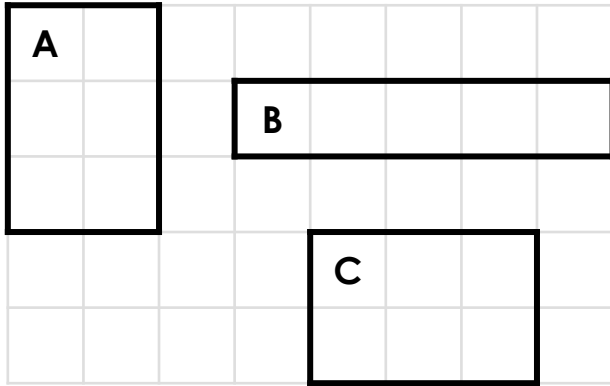
**Greater Depth** Complete the shape to make a complex rectilinear shape with the shortest possible perimeter.

More [Year 4 Length and Perimeter](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

## Perimeter on a Grid

1a. Which shape is the odd one out?



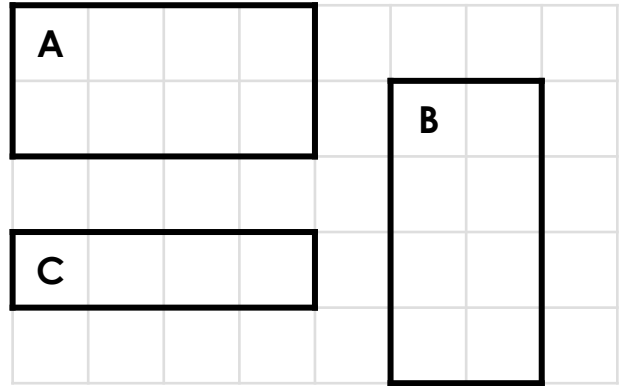
Explain your reasoning.



R

## Perimeter on a Grid

1b. Which shape is the odd one out?

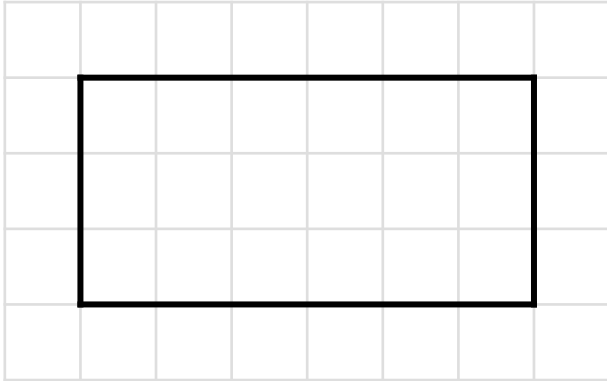


Explain your reasoning.



R

2a. Steven thinks the perimeter of this shape is 14cm.

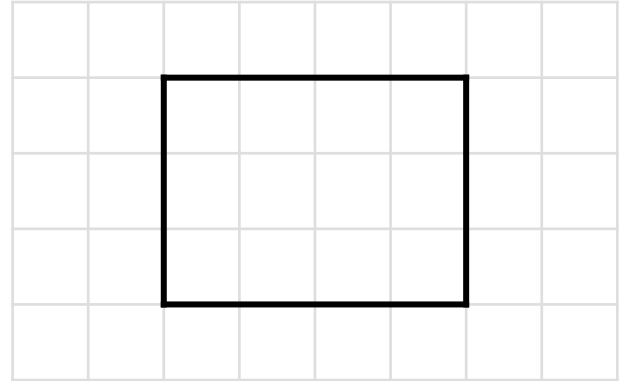


What mistake has he made?



R

2b. Fay thinks the perimeter of this shape is 12cm.

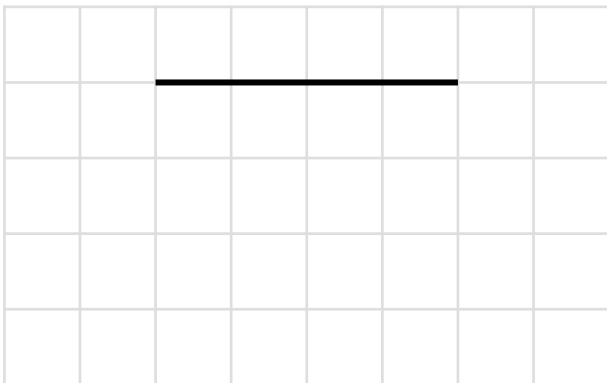


What mistake has she made?



R

3a. Nina starts to draw a rectangle.



Complete the shape to make the shortest possible perimeter.



PS

3b. Greg starts to draw a rectangle.



Complete the shape to make the shortest possible perimeter.

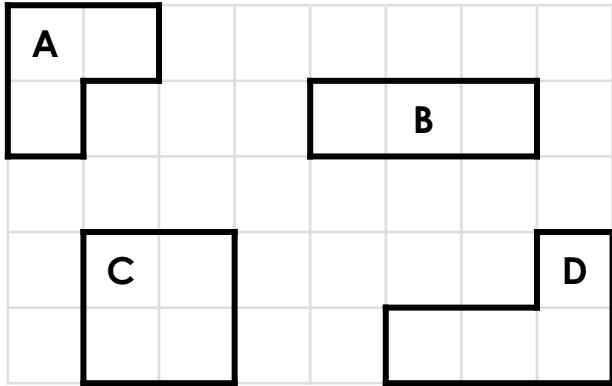


PS

## Perimeter on a Grid

## Perimeter on a Grid

4a. Which shape is the odd one out?

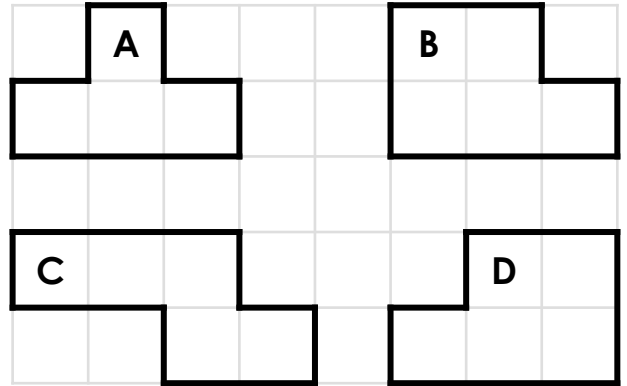


Explain your reasoning.



R

4b. Which shape is the odd one out?

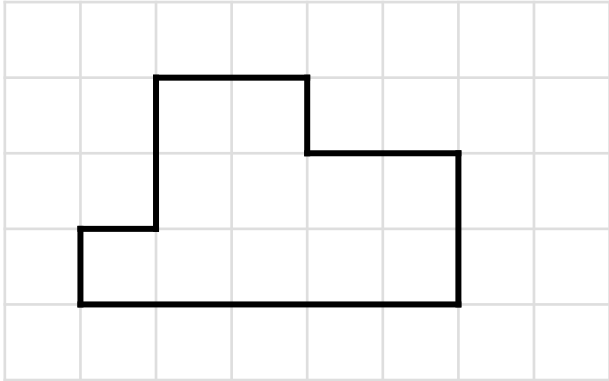


Explain your reasoning.



R

5a. Jack thinks the perimeter of this shape is 11cm.

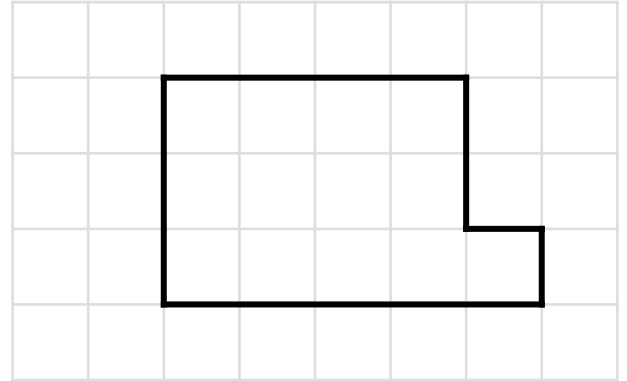


What mistake has he made?



R

5b. Alice thinks the perimeter of this shape is 20cm.

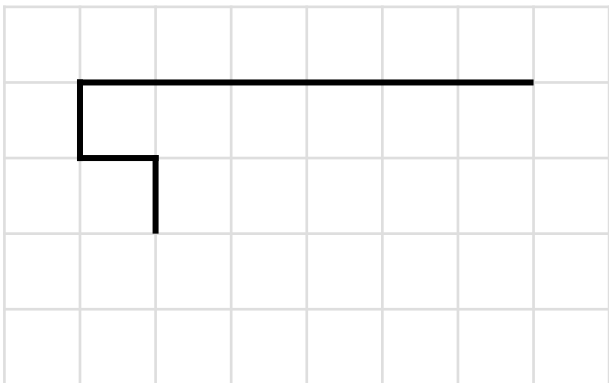


What mistake has she made?



R

6a. Amy starts to draw a shape.

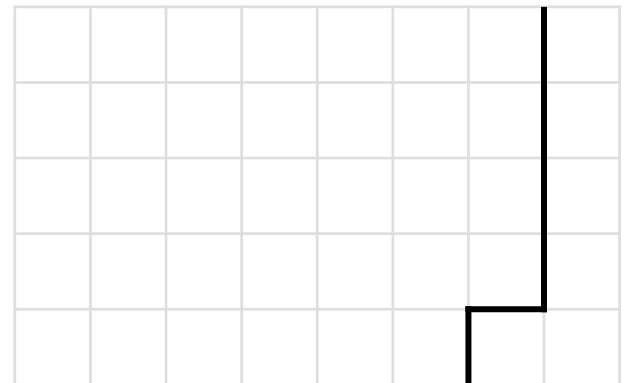


Complete the rectilinear shape to make the shortest possible perimeter.



PS

6b. Leo starts to draw a shape.



Complete the rectilinear shape to make the shortest possible perimeter.

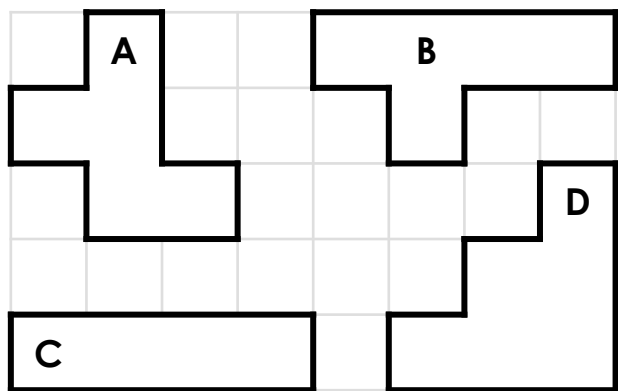


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## Perimeter on a Grid

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7a. Which shape is the odd one out?

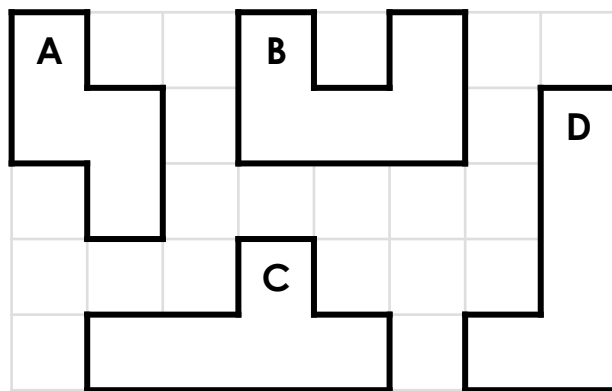


Explain your reasoning.



R

7b. Which shape is the odd one out?

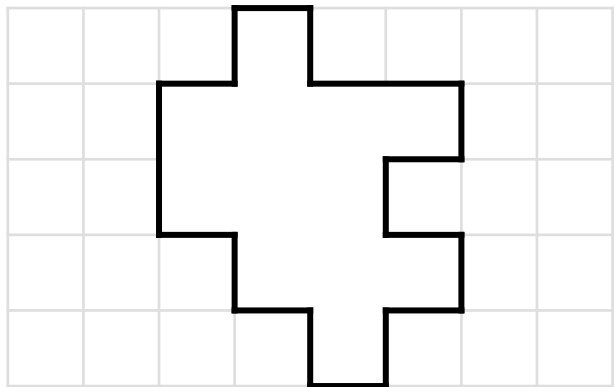


Explain your reasoning.



R

8a. Imran thinks the perimeter of this shape is 17cm.

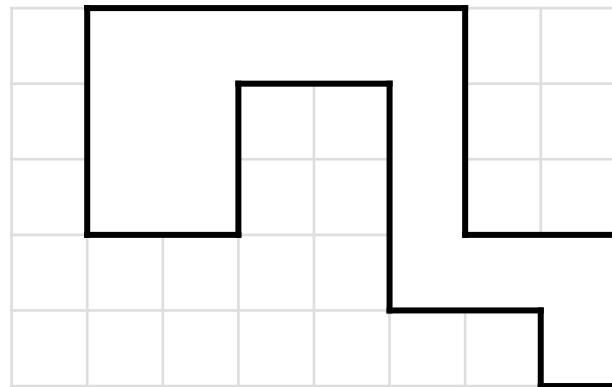


What mistake has he made?



R

8b. Bella thinks the perimeter of this shape is 15cm.

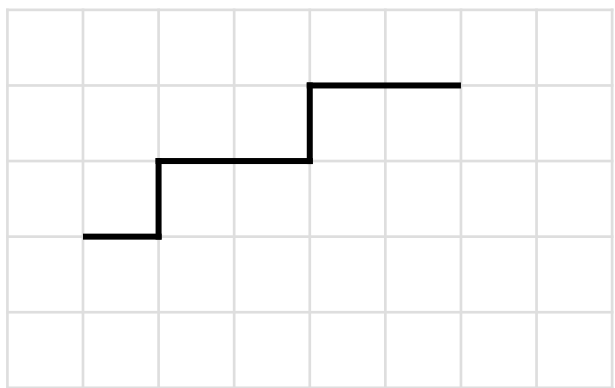


What mistake has she made?



R

9a. Leyla starts to draw a shape.

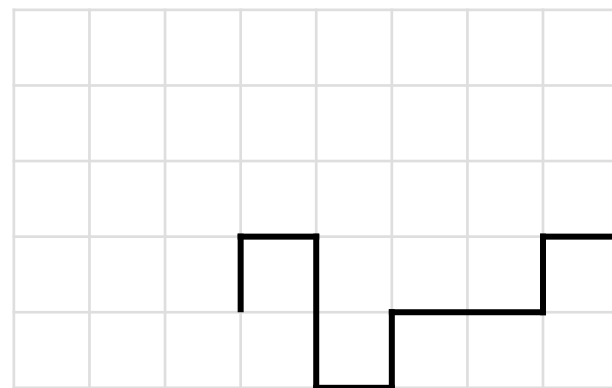


Complete the rectilinear shape to make the shortest possible perimeter.



PS

9b. Peter starts to draw a shape.



Complete the rectilinear shape to make the shortest possible perimeter.



PS

## Reasoning and Problem Solving Perimeter on a Grid

### Developing

- 1a. B has a perimeter of 12cm. A and C have a perimeter of 10cm.
- 2a. Steven has counted the number of inside squares touching the lines. The perimeter is 18cm.
- 3a. Any rectangle with a perimeter of 10cm.

### Expected

- 4a. D has a perimeter of 10cm. The other shapes have a perimeter of 8cm.
- 5a. Jack has counted the squares inside the shape instead of calculating the distance around the shape. The perimeter is 16cm.
- 6a. Any rectilinear shape with a perimeter of 16cm.

### Greater Depth

- 7a. C has a perimeter of 10cm. The other shapes have a perimeter of 12cm.
- 8a. Imran has counted all the outside squares touching the line. The perimeter of the shape is 20cm.
- 9a. Any rectilinear shape with a perimeter of 16cm.

## Reasoning and Problem Solving Perimeter on a Grid

### Developing

- 1b. C has a perimeter of 10cm. A and B have a perimeter of 12cm.
- 2b. Fay has counted the squares inside the shape instead of calculating the distance around the shape. The perimeter is 14cm.
- 3b. Any rectangle with a perimeter of 6cm.

### Expected

- 4b. C has a perimeter of 12cm. The other shapes have a perimeter of 10cm.
- 5b. Alice has counted all the outside squares touching the line. The perimeter is 16cm.
- 6b. Any rectilinear shape with a perimeter of 14cm.

### Greater Depth

- 7b. A has a perimeter of 10cm. The other shapes have a perimeter of 12cm.
- 8b. Bella has counted the area within the shape instead of calculating the distance around the shape. The perimeter of the shape is 28cm.
- 9b. Any rectilinear shape with a perimeter of 20cm.