

# Reasoning and Problem Solving

## Step 3: Perimeter of a Rectangle

### 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 (Problem Solving)

**Developing** Calculate the possible dimensions of a rectangle using a given perimeter. All measurements are in cm.

**Expected** Calculate the possible dimensions of a rectangle using a given perimeter. Measurements are given in cm and mm (no conversion needed).

**Greater Depth** Calculate the possible dimensions of a rectangle using a given perimeter. Measurements are given in cm and mm (conversion needed).

Questions 2, 5 and 8 (Problem Solving)

**Developing** Calculate the perimeter of a larger rectangle by using the given dimensions of a smaller rectangle within it. All measurements are in cm.

**Expected** Calculate the perimeter of a larger rectangle by using the given dimensions of a smaller rectangle within it. Measurements are given in cm and mm (no conversion needed).

**Greater Depth** Calculate the perimeter of a larger rectangle by using the given dimensions of a smaller rectangle within it. Measurements are given in cm and mm (conversion needed).

Questions 3, 6 and 9 (Reasoning)

**Developing** Apply basic knowledge of rectangles to the principles of calculating the perimeter to say if a statement is correct.

**Expected** Apply the principles of calculating the perimeter of a rectangle to investigate if a statement is correct.

**Greater Depth** Apply more complex principles of calculating the perimeter of a rectangle to investigate if a statement is correct.

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

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

## Perimeter of a Rectangle

1a. Ava has drawn a rectangle with a perimeter of 18cm, but a paint splat has covered the measurement of each side.



What could the measurements of each side be in cm?



PS

## Perimeter of a Rectangle

1b. Logan has drawn a rectangle with a perimeter of 24cm, but a paint splat has covered the measurement of each side.



What could the measurements of each side be in mm?



PS

2a. Here are some toy bricks lined up on the floor. One brick has a length of 5cm and a width of 2cm.



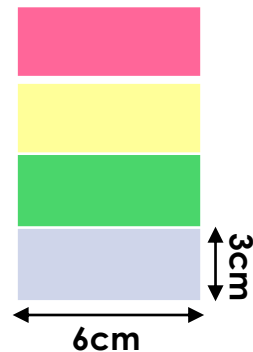
Calculate the perimeter of the line of bricks.



*not to scale*

PS

2b. Here is a tower of toy bricks. One brick has a length of 6cm and a width of 3cm.



Calculate the perimeter of the tower.



*not to scale*

PS

3a. Gus says,

If my rectangle has one side of 11cm, then the opposite side must also be 11cm.



Is Gus correct? Prove it.



R

3b. Muna says,

I worked out the perimeter of my shape and all the sides were equal in length. My shape is a rectangle.



Is Muna correct? Prove it.



R

## Perimeter of a Rectangle

4a. Lola has drawn a rectangle with a perimeter of 240mm, but a paint splat has covered the measurement of each side.



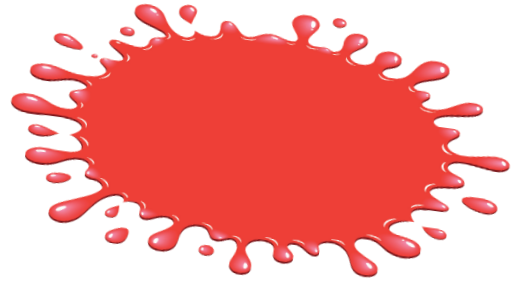
What could the measurements of each side be in mm?



PS

## Perimeter of a Rectangle

4b. Henry has drawn a rectangle with a perimeter of 44cm, but a paint splat has covered the measurement of each side.

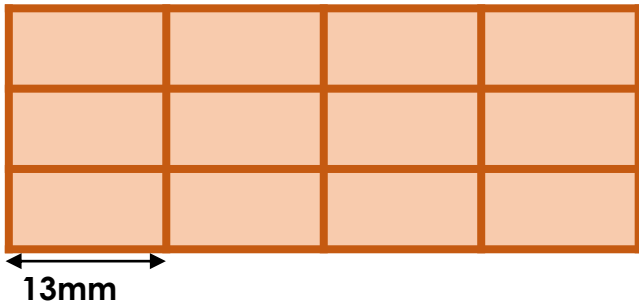


What could the measurements of each side be in cm?



PS

5a. This wall is made up of bricks. Each brick has a length of 13mm and a total perimeter of 36mm.



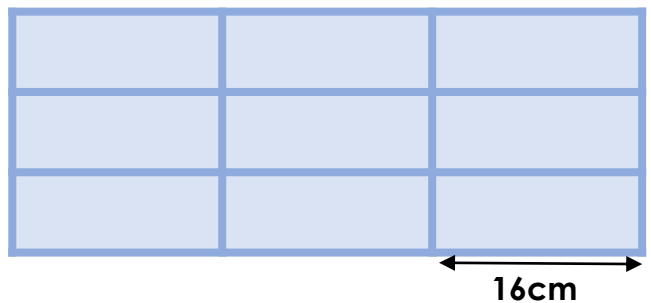
Calculate the perimeter of the whole wall.



*not to scale*

PS

5b. This wall is made up of stones. Each stone has a length of 16cm and a total perimeter of 42cm.



Calculate the perimeter of the whole wall.



*not to scale*

PS

6a. Ralph says,



If a shape has a perimeter of 31cm, then it cannot be a rectangle.

Is Ralph correct? Prove it.



R

6b. Ilona says,



If a rectangle has sides which are all odd numbers, the answer will be an odd number too.

Is Ilona correct? Prove it.



R

## Perimeter of a Rectangle

7a. Orla has drawn a rectangle with a perimeter of 240mm, but a paint splat has covered the measurement of each side.



What could the measurements of each side be in cm?

Find 3 different solutions.



PS

## Perimeter of a Rectangle

7b. Sam has drawn a rectangle with a perimeter of 360mm, but a paint splat has covered the measurement of each side.



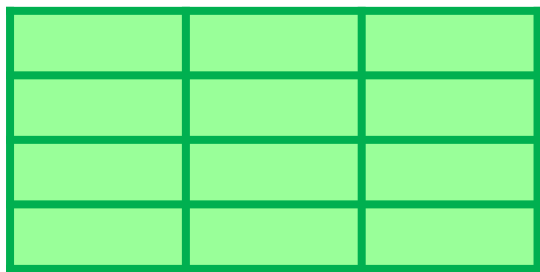
What could the measurements of each side be in mm?

Find 3 different solutions.



PS

8a. This floor is made up of tiles. The total perimeter of one tile is 180mm. The width of each tile is half the length.



Calculate the perimeter of the floor in cm.



*not to scale*

PS

8b. This floor is made up of wooden floorboards. The total perimeter of one floorboard is 240mm. The length of each floorboard is double the width.



Calculate the perimeter of the floor in cm.



*not to scale*

PS

9a. Elodie says,



The perimeter of a rectangle will always be an even number.

Is Elodie correct? Prove it.



R

9b. Spencer says,



If a rectangle has two sides which are odd numbers, then the perimeter will also be an odd number.

Is Spencer correct? Prove it.



R

## Reasoning and Problem Solving Perimeter of a Rectangle

### Developing

1a. Various answers, for example:  $6\text{cm} + 6\text{cm} + 3\text{cm} + 3\text{cm}$ ;  $7\text{cm} + 7\text{cm} + 2\text{cm} + 2\text{cm}$

2a.  $34\text{cm}$

3a. Yes. The opposite sides of the rectangle are always of the same length.

### Expected

4a. Various answers, for example:  $80\text{mm} + 40\text{mm} + 80\text{mm} + 40\text{mm}$ ;  $120\text{mm} + 50\text{mm} + 120\text{mm} + 50\text{mm}$ .

5a.  $134\text{mm}$ .

6a. Yes. A perimeter which is an odd number cannot be made using whole numbers. Accept 'no' if the children reference decimal numbers.

### Greater Depth

7a. Various answers, for example:  $50\text{mm} + 50\text{mm} + 120\text{mm} + 120\text{mm}$ ;  $30\text{mm} + 30\text{mm} + 90\text{mm} + 90\text{mm}$ ;  $40\text{mm} + 40\text{mm} + 80\text{mm} + 80\text{mm}$

8a.  $60\text{cm}$  (each tile is  $60\text{mm}$  by  $30\text{mm}$ ).

9a. Yes. The opposite sides in a rectangle must be equal. When added together these will make an even number. Accept 'no' if the children reference decimal numbers.

## Reasoning and Problem Solving Perimeter of a Rectangle

### Developing

1b. Various answers, for example:  $8\text{cm} + 8\text{cm} + 4\text{cm} + 4\text{cm}$ ;  $7\text{cm} + 7\text{cm} + 5\text{cm} + 5\text{cm}$ .

2b.  $36\text{cm}$

3b. No. Muna must have drawn a square; a rectangle will have two pairs of sides which are different lengths.

### Expected

4b. Various answers, for example:  $10\text{cm} + 10\text{cm} + 12\text{cm} + 12\text{cm}$ ;  $15\text{cm} + 15\text{cm} + 7\text{cm} + 7\text{cm}$ .

5b.  $126\text{cm}$

6b. No. This can be proven with an example such as,  $7\text{cm} + 7\text{cm} + 9\text{cm} + 9\text{cm} = 32\text{cm}$ .

### Greater Depth

7b. Various answers, for example:  $50\text{mm} + 50\text{mm} + 130\text{mm} + 130\text{mm}$ ;  $40\text{mm} + 40\text{mm} + 140\text{mm} + 140\text{mm}$ ;  $60\text{mm} + 60\text{mm} + 120\text{mm} + 120\text{mm}$

8b.  $40\text{cm}$  (each board is  $80\text{mm}$  by  $40\text{mm}$ ).

9b. No. This can be proven with an example such as,  $11\text{cm} + 11\text{cm} + 12\text{cm} + 12\text{cm} = 46\text{cm}$ .