

## **Area and Perimeter Prior Assessment Questions 1 and 2**

**Objective:** I can find the perimeter of shapes (including ones that contain missing amounts)

**NC: M 4 recognise that shapes with the same areas can have different perimeters and vice versa**

### **Teacher Input Ideas:**

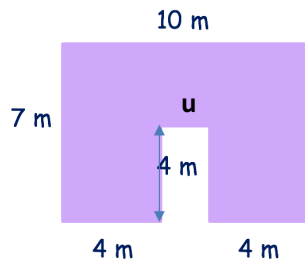
Set up a context for the children to understand why perimeter is used, using real life examples. Such as: finding the perimeter of the classroom to buy bunting or decorations for a celebration and making vegetable patches out of wood for the garden/school grounds.

For example: we want to make some vegetable patches in our school grounds. We are going to use these wooden meter sticks to measure the wood to make the outside of the patches. Create different shapes and model to the children how to find the perimeter. Establish that the perimeter is the measurement of the outside of a shape/space. I have used 4 metres here, 5 metres here, 4 metres here and 5 metres here to make a rectangular patch. Model to the children adding the amounts up to give the answer of the perimeter. Ask the children for mental methods to add this up quickly such as using number bonds and doubling.

Or you could set up a mystery/problem for the children to solve. Use 1 metre length bamboo sticks, canes or ribbons to make different shapes hidden around the school or playground. Inform the children that ribbons/bamboo sticks have been stolen for today's lessons. Ask the children to find out how many have been stolen and where they are. A simple investigation sheet could be made for groups of children to fill out what they find. Children could hunt for these around the school grounds/hall. The children are to work out what shape has been made and count how many of the ribbons/sticks have been used to make each shape. Once the children have collected a couple of examples, establish with the children that the ribbons, poles etc. have been used to make the outside/outline of shapes. Each one is 1m in length. Discuss that the outline/outside of the shape that has been created with the objects is called the perimeter. Children could also look at the dictionary definition here. Establish that the children have already found the perimeter and discuss what this is and how they have found it. Provide the children with a variety of different shapes including different triangles, quadrilaterals (to secure shapes vocabulary) and make irregular shapes using squares and rectangles. The children to record the perimeter of the different shapes and then work out how many have been used altogether.

**Missing amounts:** Look at Q2 from the prior learning assessment. Ask the children to discuss how they worked this out and where their difficulties were. Discuss which information they should use to help them. Establish that these problems were trickier as not all sides had labels with the measurements on and the drawings are not drawn to scale therefore we cannot measure these.

Ask the children for any suggestions of the information that could be used.



Model to the children that we can use number sentences to help us to work out the unknown amounts. I am going to label the amount I don't know as U for unknown. Discuss how the 10m side is the same length as the two bottom measurements and the unknown measurement. Therefore:

$$4 + 4 + u = 10$$

$$\text{or } 10 - 4 - 4 = u$$

Workout together and establish that the answer is 2. Then look at how the 7m measurement can be used to find the other missing side. Children to then workout the perimeter of the whole shape.

### Practice Activities

**Purple Practice:** Most suited for children who made errors in question 1 due to lack of understanding of what the perimeter is.

Recorded and practical option: Give the children the drawings on the purple activity. The children could use metre ribbons or metre sticks, etc to recreate a large version of this. The children then to walk around the edge of the shape adding up how many metres to fully understand what the perimeter is. Question the children on what they are doing and how they are finding the perimeter. Once the children feel confident, they can complete the sheet which has a variety of shapes for the children to find the perimeter. The children can record the sum that they are doing and work out the answer. Children can also be encouraged to use mental methods to help.

**Green Practice:** Most suited for children who made errors in Question 2 of the Prior Learning Assessment and would benefit from finding the perimeter of shapes with missing amounts.

The children are required to use the measurements provided for each shape and apply their knowledge of shape properties. For example, the children have been given 1 or 2 measurements for squares, rectangles and triangles. If the children are finding these

questions tricky, encourage them to think about the properties of each shape. For example, an equilateral triangle has 3 sides the same length. Therefore, if I have one measurement, I can use this for all sides. The use of algebra may help the children to find missing amounts (see input). For example: you could label missing amounts  $m$ .

$$m + 20 = 30.$$

Additionally, there are a variety of fluency opportunities here too that the children can apply at the end of the task. For example, the children may be encouraged to apply shape vocabulary and label each shape and convert  $m$  measurements to  $cm$  measurements and vice versa.

**Yellow Practice** Most suited for children who are ready to apply algebra knowledge to find the missing amounts in Q2 of the Prior Learning Assessment.

This activity provides the children with the opportunity to find the missing values of sides of the shapes to work out the perimeter and record the sum they have performed as an algebra equation.

**Mastery** The children are encouraged to use what they know about shape and perimeter to find the missing amounts in each problem.

This activity could be performed practically for those children that are finding it difficult to solve. The children could be given 36 metre sticks or 36 metres of ribbon or string to explore constructing the rectangle to help them to find the missing width.

For the second question, the children could use paper and measure out the square. If they know the perimeter is 80cm, what must have each side be? Measure this. Now let's cut this into 4 equal squares. What do we notice? How much of one side is this?  $20$  divided by  $2 = 10cm$ . Let's measure to check. So, if this side is  $10cm$ , what are all the other sides?  
 $10 + 10 + 10 + 10 = 40cm$

For the last problem, the children are to work out the problem and then measure the lengths accurately to create the triangle.

**Answers:**

**Purple:**

- |        |        |        |
|--------|--------|--------|
| 1) 20m | 2) 20m | 3) 32m |
| 4) 14m | 5) 52m | 6) 36m |
| 7) 60m | 8) 34m | 9) 36m |

**Green:**

1) 24m

2) 18m

3) 36m

4) 75cm

5) 93cm

6) 108cm

7) 44m

8) 104cm

9) 2.3 m

**Yellow:**

1) Perimeter = 8.6m

2)  $p = 18 \text{ m}$

3)  $2 + 3 + 2 = m$

$u = 5$

perimeter = 30m

4)  $m = 10 + 8$

$8 + u = 19$

perimeter = 74

5)  $m = 39$

perimeter = 99cm

6)  $12 + 12 = u$

$30 - 20 = m$

perimeter = 108cm

7)  $10 - 2 = 8$

$m = 8 \div 2$

perimeter = 28m

8)  $9 + 18 = m$

$u + 7 = 25$

perimeter = 104 cm

9)  $u = 9 - 3 - m$

(m is the same size as 3)

$m = 3$

$u = 9 - 3 - 3 = 3$

perimeter = 46cm

**Mastery:**

1)  $36 - 12 = 24$  (the side we have)

$24 - 12 = 12$  (the opposite side to the rectangle)

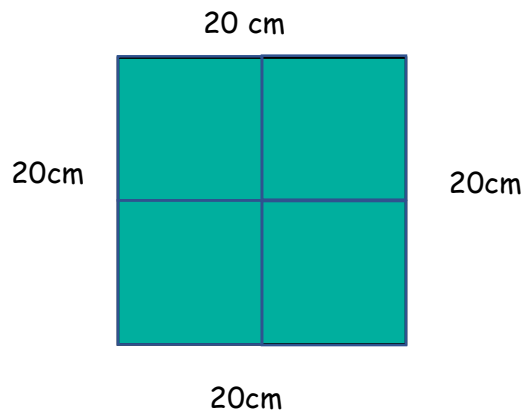
I need to make 2 more shorter sides which must be of equal length

So,  $12 \div 2 = 6$  cm

2)  $80 \text{ cm} \div 4 = 20\text{cm}$  (each side of the square)

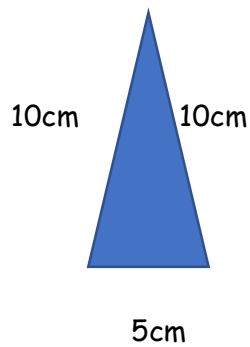
$20 \div 2 = 10$  cm ( each side/length will fit the sides of 2 small squares)

$10 + 10 + 10 + 10 = 40\text{cm}$  ( the perimeter of the small square)



3)  $25 \div 5 = 5$  cm (2+2+1 double the 2 sides and add the base)

$10 + 10 + 5 = 25$

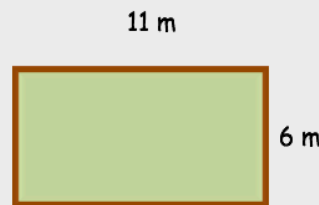
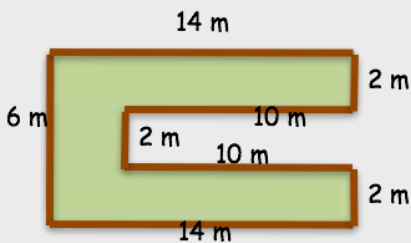
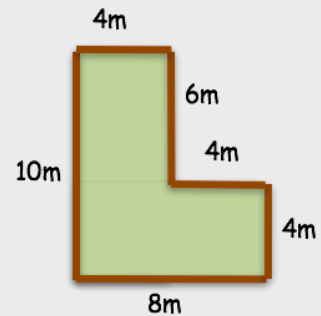
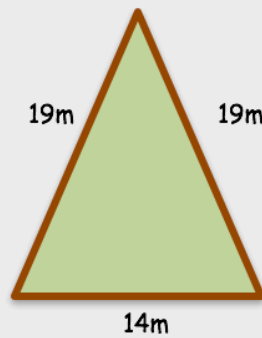
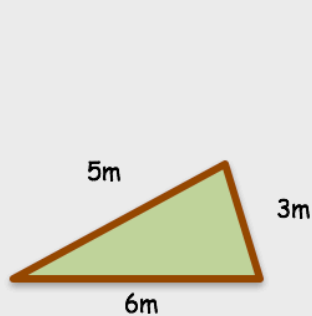
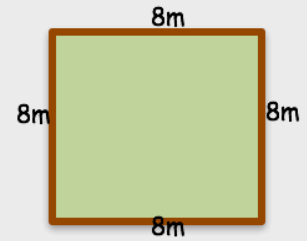
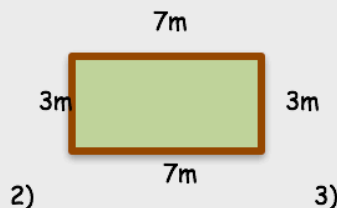
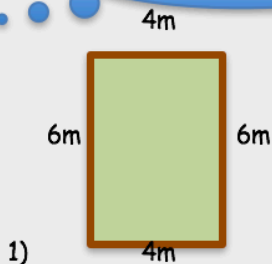


LO: I can find the perimeter of different shapes.

Mr Potter is designing some vegetable patches for the school grounds. Work out the perimeter of each shape.

TIPS:

Can you use any mental methods to help you? Such as using number bonds, doubling, partitioning or rounding.




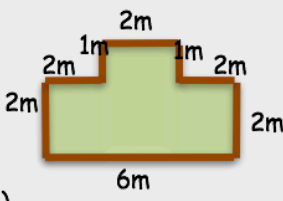
Lo: I can find the perimeter of different shapes, including shapes with missing measurements.


Mr Potter is designing some vegetable patches for the school grounds. Work out the perimeter of each shape using the measurements provided.

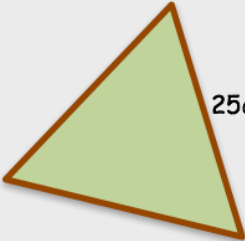
TIPS:

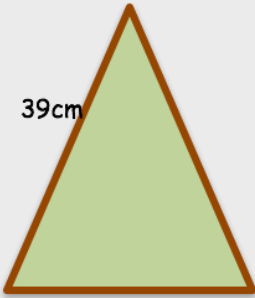
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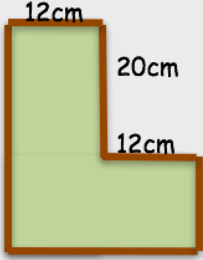
1) 

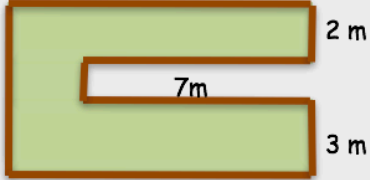
2) 

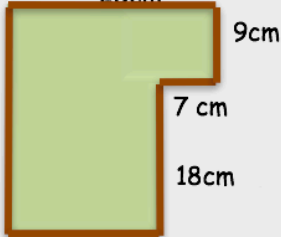
3) 

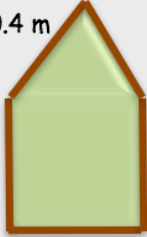
4) 

5) 

6) 

7) 

8) 

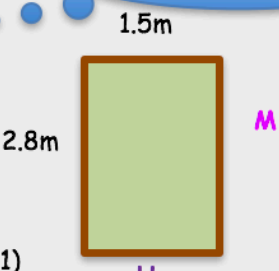
9) 

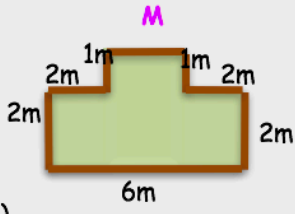
Lo: I can find the perimeter of different shapes, including shapes with missing measurements.

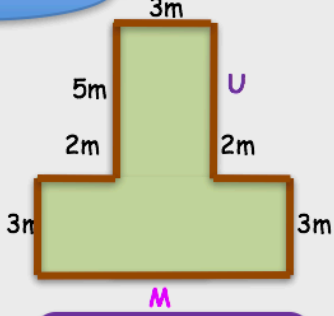
Mr Potter is designing some vegetable patches for the school grounds. Work out the perimeter of each shape using the measurements provided.

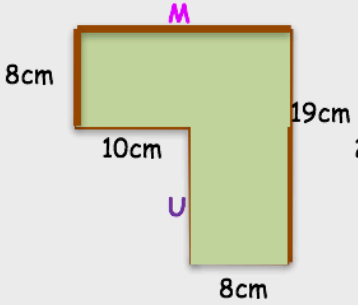
Challenge:

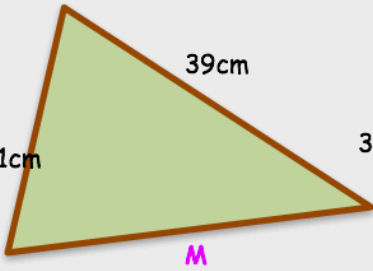
Can you express each calculation you have performed as an algebraic equation? A few examples are below to help you.

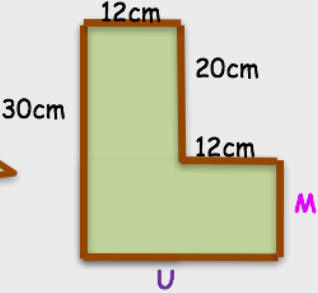
1)   $M = 2.8$   
 $U = 1.5$   
Perimeter =

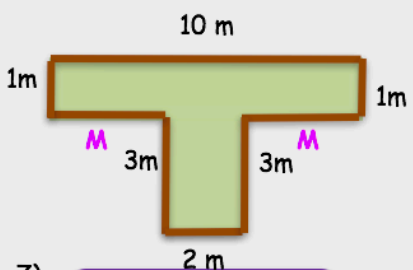
2)   $2 + M + 2 = 6$   
Perimeter =

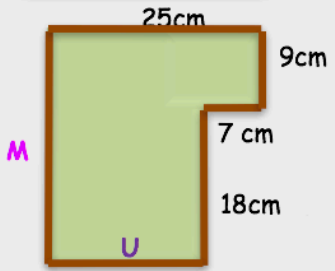
3)  Perimeter =

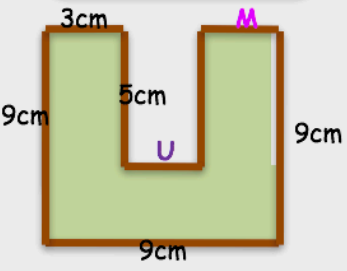
4)  Perimeter =

5)  Perimeter =

6)  Perimeter =

7)  Perimeter =

8)  Perimeter =

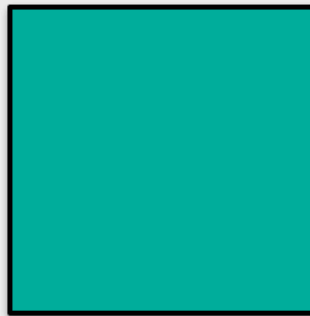
9)  Perimeter =



1. A rectangle has a perimeter of 36 m. One side is 12 m. What is the width?



2. The perimeter of one large square is 80cm. The square is split into 4 equal squares. What is the perimeter of one small square?



3. The perimeter of an isosceles triangle is 25 cm. The base of the triangle is half the length of the 2 other sides. Draw the triangle with the correct measurements.