

## Outcomes:

- MS2.1** Estimates, measures, compares and records lengths, distances and perimeters in metres, cm and mm
- MS2.2** Estimates, measures, compares and records the areas of surfaces in square centimetres and square metres.
- WMS2.2** Selects and uses appropriate mental or written strategies, or technology, to solve problems
- WMS2.4** Checks the accuracy of a statement and explains the reasoning used
- WMS2.5** Links mathematical ideas and makes connections with, and generalisations about, existing knowledge and understanding in relation to Stage 2 content

## Prior Learning

Students have had practice in estimating, measuring, comparing and recording the areas and perimeters of rectangular shapes using the formal units of centimetres and square centimetres.

## Description of Activity

Students are to work out the possibilities for a rectangular shape to have an area of 120 square centimetres.  
 Students should draw and label their possibilities  
 Students then determine the shape that gives the smallest perimeter, justifying their answer.

### Differentiation

- \* Year 3 students may be presented with a rectangle with a smaller area e.g. 60 square centimetres.
- \* Students working below a Stage 2 level may be presented with some examples as a scaffold.

## Resources

Rulers, pencils, paper.

## Achievement Criteria

	E	D	C	B	A
<b>MS2.1</b>	<ul style="list-style-type: none"> <li>• Needs significant teacher guidance to work out the perimeter of shapes.</li> <li>• Does not understand cm.</li> </ul>	<ul style="list-style-type: none"> <li>• With some teacher assistance can calculate the perimeter of drawn shapes.</li> <li>• Does not record using cm.</li> </ul>	<ul style="list-style-type: none"> <li>• Correctly calculates the perimeter of most of the drawn shapes.</li> <li>• Shapes are similarly drawn.</li> <li>• Records lengths using cm.</li> </ul>	<ul style="list-style-type: none"> <li>• Correctly calculates the perimeter of all drawn shapes.</li> <li>• Attempts to differentiate between some shapes.</li> <li>• Records lengths using cm and/or mm.</li> </ul>	<ul style="list-style-type: none"> <li>• Correctly calculates the perimeter of all drawn shapes.</li> <li>• Makes a good attempt to differentiate between shapes.</li> <li>• Records lengths in decimal notation.</li> </ul>
<b>MS2.2</b>	<ul style="list-style-type: none"> <li>• Requires significant assistance to identify and draw shapes.</li> </ul>	<ul style="list-style-type: none"> <li>• Draws and labels some shapes with the correct area with some teacher assistance.</li> </ul>	<ul style="list-style-type: none"> <li>• Independently draws and labels at least 4 shapes with the correct area.</li> </ul>	<ul style="list-style-type: none"> <li>• Draws and labels at least 6 different possibilities (not including inverse).</li> </ul>	<ul style="list-style-type: none"> <li>• Draws and labels a wide variety of whole number and fraction possibilities.</li> </ul>
<b>WMS2.4</b> <b>WMS2.5</b>	<ul style="list-style-type: none"> <li>• Needs assistance to explain how they got their answer.</li> </ul>	<ul style="list-style-type: none"> <li>• Identifies the shape but does not justify their answer.</li> </ul>	<ul style="list-style-type: none"> <li>• Identifies the shape that has the smallest perimeter and briefly explains how they got their answer. E.g. I added the sides.</li> </ul>	<ul style="list-style-type: none"> <li>• Explains in detail how they calculated the perimeter, demonstrating their strategy. E.g. algorithm, doubling.</li> </ul>	<ul style="list-style-type: none"> <li>• Explains strategy in details and identifies and explains the pattern and relationship between perimeter and area.</li> </ul>

## Teacher Observations

## Stage 2 Assessment - Measurement

Name:

Date:

**Task 1:** A rectangle has an area of 120 square centimetres. Draw and label as many of the possibilities you can think of.

**Task 2:** Work out which of the possibilities you have drawn, has the smallest perimeter. Explain how you got your answer and why it is correct.

## Stage 2 Assessment - Measurement

Name:

Date:

**Task 1:** A rectangle has an area of 60 square centimetres. Draw and label as many of the possibilities you can think of.

**Task 2:** Work out which of the possibilities you have drawn, has the smallest perimeter. Explain how you got your answer and why it is correct.

## Stage 2 Assessment - Measurement

Name:

Date:

**Task 1:** A rectangle has an area of 60 square centimetres. Draw and label as many of the possibilities you can think of. An example has been included to get you started.

**Task 2:** Work out which of the possibilities you have drawn, has the smallest perimeter. Explain how you got your answer and why it is correct.



30cm

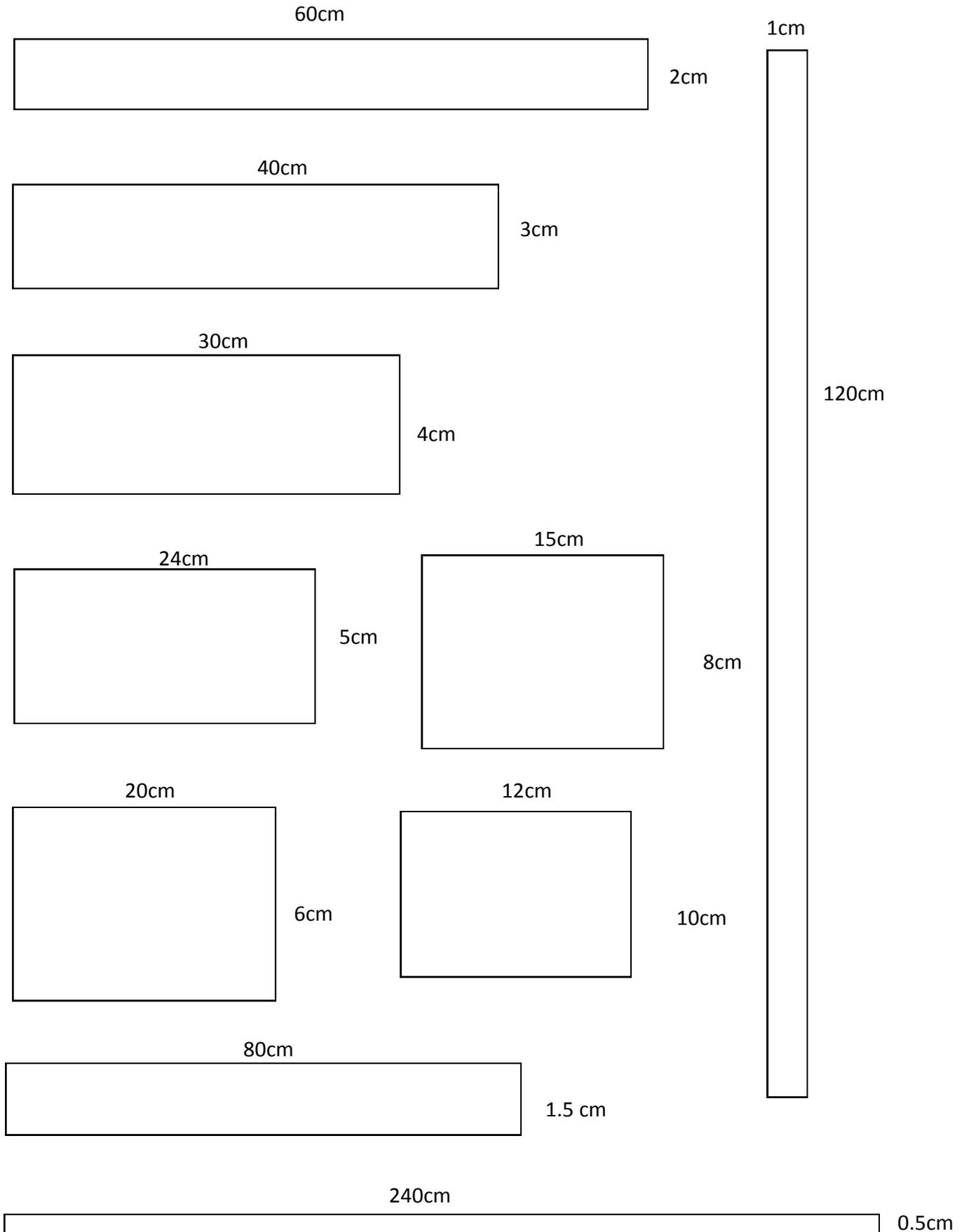
2cm

Area = length x width  
=  $30 \times 2$   
= 60 square centimetres ( $\text{cm}^2$ )

Perimeter = length + width + length + width  
=  $30\text{cm} + 2\text{cm} + 30\text{cm} + 2\text{cm}$   
= 64cm

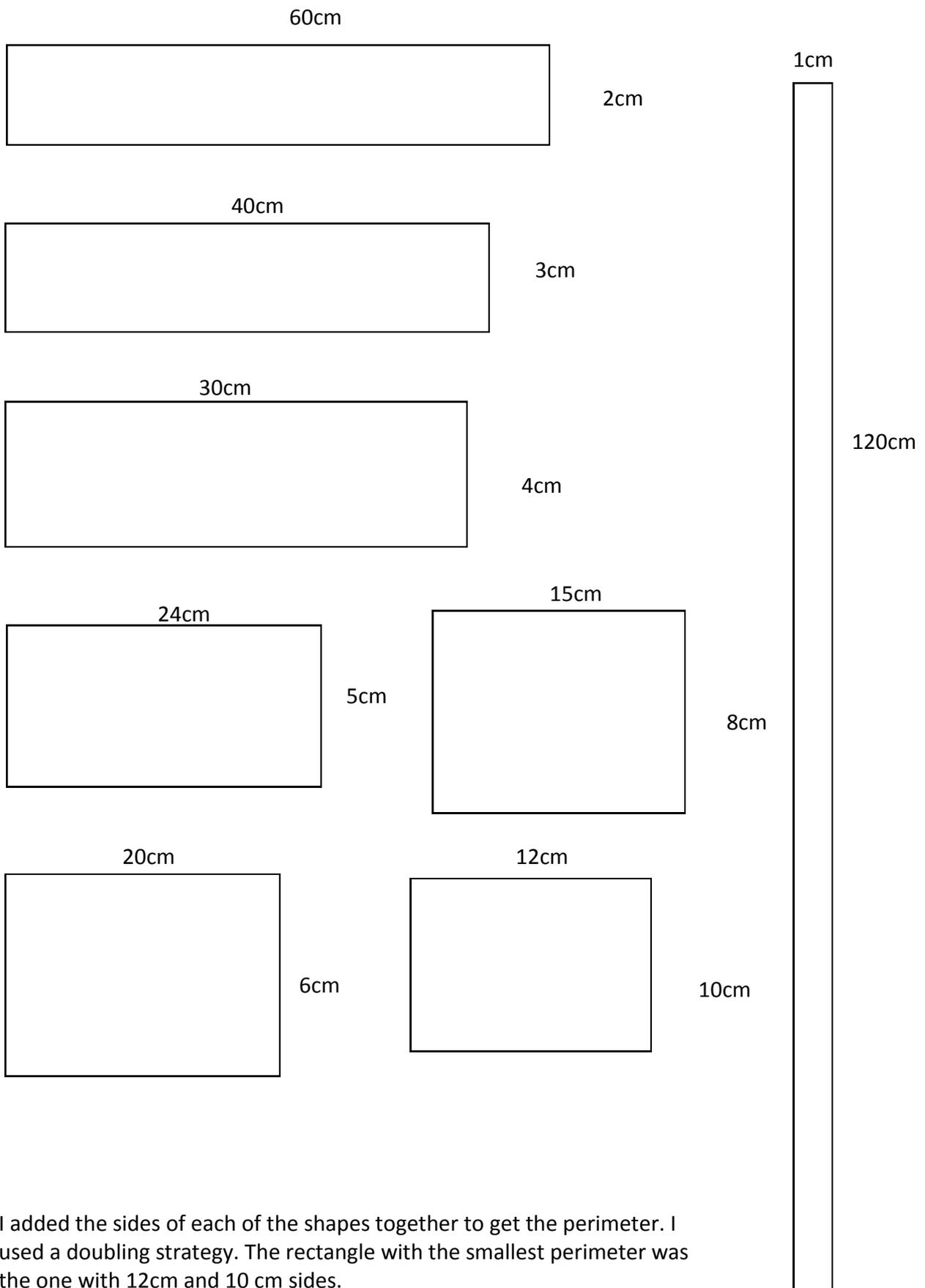
**Now try some of your own!**

# Student Work Sample (A)



I started adding up the sides to find the perimeters and found that the closer the lengths of the sides got to each other the smaller the perimeter was. So I could then work out that the rectangle with the sides of 10cm and 12cm had the smallest perimeter because there was only 2cm difference in the length and width. It had a perimeter of 44cm. I worked this out by doubling 12 and doubling 10 and adding them together.

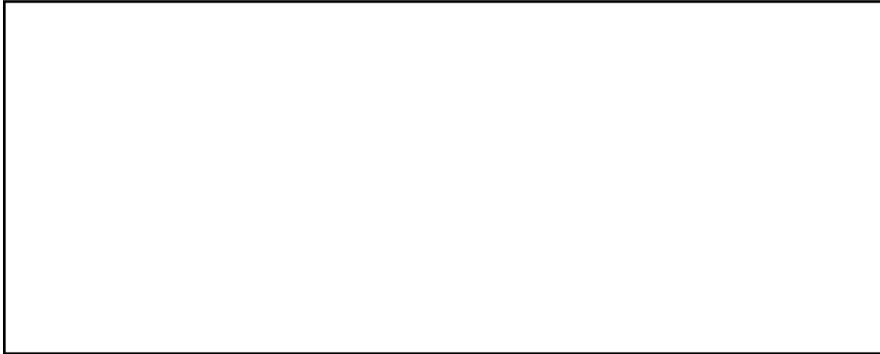
## Student Work Sample (B)



I added the sides of each of the shapes together to get the perimeter. I used a doubling strategy. The rectangle with the smallest perimeter was the one with 12cm and 10 cm sides.

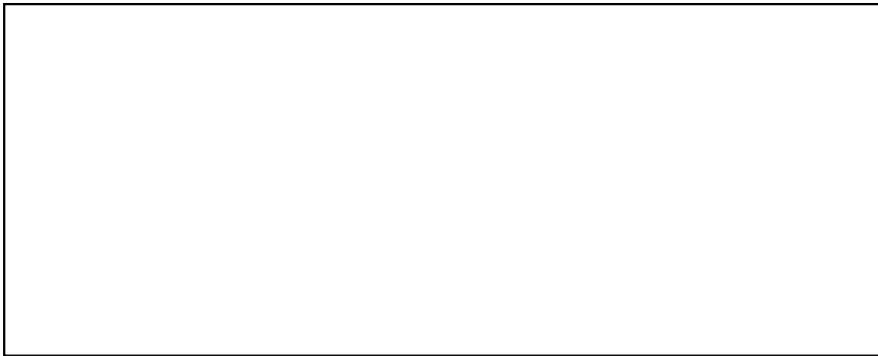
## Student Work Sample (C)

120cm



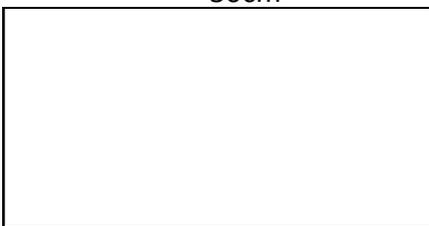
1cm

60cm



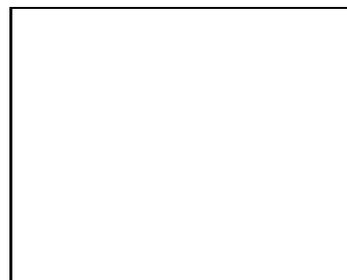
2cm

30cm



4cm

40cm



3cm

The square with the sides of 40cm and 3cm has the smallest perimeter. I added up all the sides and got 86cm.