

Partially covered areas

Purpose

To calculate the total number of items in an array when the number of groups can be seen but the individual items in each group are not visible

Outcomes

NS1.3 Use a range of mental strategies and concrete materials for multiplication and division

MA1-6NA

Framework reference

To move students to Multiplication and Division Level 3

Materials

- Notebook: *Partially covered areas*
- 12 tiles and one dice for each pair of students

Teaching point


- The students need to understand, in the *Strengthening the concept* activity, that the top tile in the column and the tile at the beginning of the row are superimposed.
- In the *Strengthening the concept* activity, the students could use dice with numbers one to ten.



Suggested *Short, focussed, frequent* activity

	Outline	Questions
Introduction	<p>On page one of the notebook, <i>Partially covered areas</i>, drag the blue array to the left and enlarge it by clicking and dragging on the small circle on the bottom right hand side.</p> <p>Ask the students to identify how many cells there are in this array. When the students have identified that there are eight cells, select students to explain how they counted the total number of cells.</p> <p>Shrink back the blue array and repeat the activity with the other arrays on page one of the notebook.</p>	<p><i>In what different ways could we count the total number of cells in this array?</i></p> <p><i>How would I count the cells if I counted them in rows?</i></p> <p><i>How would I count them in columns?</i></p>



	Outline	Questions
Concept development	<p>Display the <i>Block of chocolate</i> on page two of the notebook. Explain to the students that some of the chocolate squares have been eaten, although no complete rows or columns are missing.</p> <p>Have a student indicate with a finger where the complete block of chocolate would have been.</p> <p>Organise the students into pairs and ask them to discuss how they could determine the total number of squares of chocolate. Select pairs of students to share their strategies to find out the total number of chocolates.</p> <p>Repeat the activity with <i>Bathroom floor</i>, in which the students have to determine the total number of brown tiles when some of them are covered by the green mat.</p> <p>Continue in the same manner with <i>Patchwork quilt</i>, where the students have to identify the number of squares in the rectangular quilt when part of it is covered by a blanket.</p> <p>Follow the same process for the activity, <i>Black and white mat</i>, to identify the total number of small squares in the mat.</p>	<p><i>Which strategy do you think is the easiest one to use? Why?</i></p>
Strengthening the concept	<p>Have the students continue working in pairs. Provide each pair with 12 tiles and a six-sided dice. Have one student roll the dice and use the tiles to form a row with as many tiles as the number rolled. Have the same student roll the dice again and form a column with as many tiles as the number rolled. Have the pair of students then determine how many tiles there would be in the completed array.</p> <p> Have the students repeat the activity, taking it in turns to roll the dice.</p>	

