Booragul Public School NSW Syllabus for the Australian Curriculum – Measurement and Geometry

Sub Strand – Area 1			
Outcome	Teaching and Learning Activities	Notes/ Future Directions/Evaluation	Date

Stage 2 A student: › uses appropriate terminology to describe, and symbols to represent, mathematical ideas MA2-1WM › selects and uses appropriate mental or written strategies, or technology, to solve problems MA2-2WM › checks the accuracy of a statement and explains the reasoning used MA2-3WM › measures, records, compares and estimates areas using square centimetres and square metres MA2-10MG	Language Students should be able to communicate using the following language: area, surface, measure, grid, row, column, **square centimetre**, **square metre**, estimate. The abbreviation m^2 is read as 'square metre(s)' and not 'metre(s) squared' or 'metre(s) square'. Similarly, the abbreviation cm^2 is read as 'square centimetre(s)' and not 'centimetre(s) squared' or 'centimetre(s) square'.

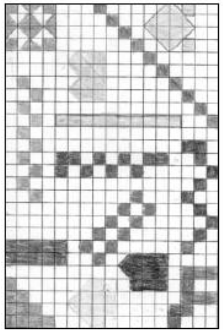
Ignition Activity

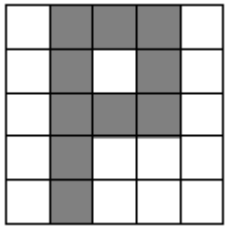
Students measure the same sized rectangle using a variety of smaller rectangular shapes.
Discuss the results – Why is it important to use the same unit of measure?

Explicit Mathematical Teaching

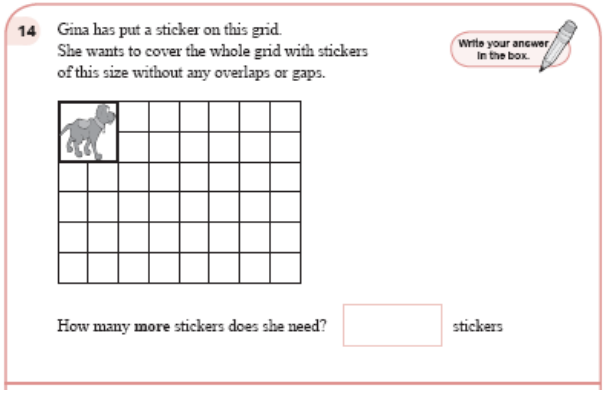
Recognise and use formal units to measure and estimate the areas of rectangles
• recognise the need for the square centimetre as a formal unit to measure area
• use a 10 cm × 10 cm tile (or grid) to find the areas of rectangles (including squares) that are less than, greater than or about the same as 100 square centimetres
• measure the areas of rectangles (including squares) in square centimetres
 use efficient strategies for counting large numbers of square centimetres, eg using strips of 10 or squares of 100 (Problem Solving)
• record area in square centimetres using words and the abbreviation for square centimetres (cm^2), eg 55 square centimetres, 55 cm^2
• estimate the areas of rectangles (including squares) in square centimetres
 discuss strategies used to estimate area in square centimetres, eg visualising repeated Units (Communicating, Problem Solving)
• recognise the need for a formal unit larger than the square centimetre to measure area
• construct a square metre and use it to measure the areas of large rectangles (including squares), eg the classroom floor or door
 explain where square metres are used for measuring in everyday situations, eg floor coverings (Communicating, Problem Solving)
 recognise areas that are 'less than a square metre', 'about the same as a square metre' and 'greater

Literacy
Critical and creative thinking

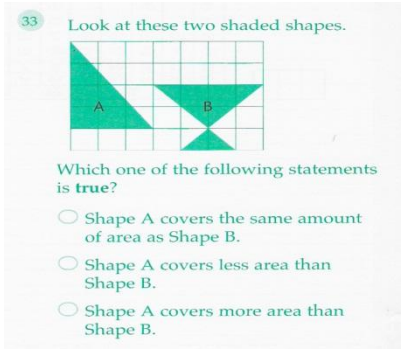
than a square metre' (Reasoning) • recognise that an area of one square metre need not be a square, eg cut a 1 m by 1 m square in half and join the shorter ends of each part together to create an area of one square metre that is rectangular (two metres by half a metre) (Problem Solving, Reasoning) • record areas in square metres using words and the abbreviation for square metres (m^2), eg 6 square metres, 6 m^2 • estimate the areas of rectangles (including squares) in square metres • discuss strategies used to estimate area in square metres, eg visualising repeated units (Communicating, Problem Solving)		
Whole Class Teaching **How do I know?** Provide students with a variety of cardboard rectangles and a sheet of grid paper. Have the students place the rectangles on top of the grid paper and use the grid structure to determine the total number of units covered by the rectangle. Have students share their results with others and explain how they determined the total. Discuss with students why grid paper is useful for measuring. *Developing Efficient Numeracy Strategies Stage 2* pp. 98-99		
Area of 10 squares Students use grid paper to construct a shape that has an area of 10 square units. Students construct other shapes that have the same area and discuss that an area of ten square units may apply to many different shapes. 		
Make A Square Metre Teacher outlines a square metre on the floor with chalk or masking tape. Students discuss the length of each side and predict what the area of the shape would be called. Several students are asked to place 10cm square tiles in rows starting at one side. The class estimates, then counts how many will fit along each side. The class discusses how many tiles will be needed to cover the square metre, and how many square centimetres this would be. Individual students record the array of tiles and label with length and area measurements. *Teaching Measurement Stage 2 and Stage 3*-pp. 56–57		
Measuring Area in the playground		

Students measure defined areas in the playground using the paper square metre templates. Record the measurements and the array. Allow for 'left over' area when measuring with the square metre. Students check the measured dimensions of the area with a trundle wheel or tape measure. *Teaching Measurement Stage 2 and Stage 3*-pg 59		
Guided Group/Independent Activities **Block Letters** The teacher provides students with 1 cm grid paper. Students select three letters to draw on their grid with a width of 1 cm Eg  Students measure and record the area of their letters eg the area of the P above is 10 cm2. Students estimate whose letter will take up the most squares or have the greatest area. Students then compare the areas of their letters with those of other students to find the letter with the largest area. *Variation:* Students draw the letters of their name. Possible questions include: ▮ how many squares did it take to make your name? ▮ whose name would take the most squares? Why?		
Constructing a square metre In groups, students make a one square metre model out of newspaper sheets taped together. recognise that an area of one square metre need not be a square, eg cut a 1 m by 1 m square in half and join the shorter ends of each part together to create an area of one square metre that is rectangular (two metres by half a metre)		
Hopscotch Students in pairs make a 50cm square and discuss how many will be needed to make 1 square metre. Using the 50cm x 50cm tile, students design a hopscotch grid that has a maximum total area of three square metres. *Teaching Measurement Stage 2 and Stage 3*-pg 58		
Factors from rectangles Students are provided with grid paper and the teacher assigns a number from 1 to 16 to each pair of students. Students are asked to draw or make rectangles that contain their assigned number of squares. (pp. 159-161 *Counting On* teaching activities)		
BSTNAPLAN Questions to do with Area		

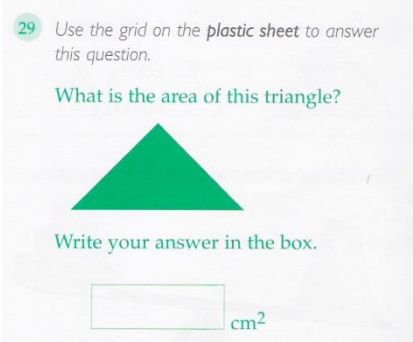
NAPLAN 2008 Question 14-Yr3



BST 2006 Question 33-Yr 3



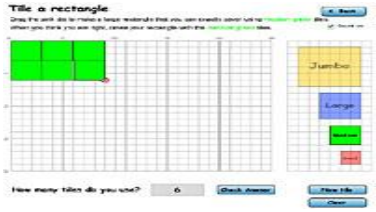
BST 2006 Question 29-Yr 3



Computer Learning Objects

The tiler-Stages 1-3

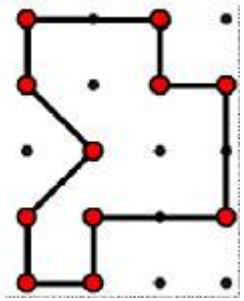
The tiler can be used to strengthen the idea of area multiplication and the related change of units. The need to change units is a common feature of area conversion questions e.g. *How many square tiles of width 10cm would be needed to tile a floor 2m long and 1m wide?*

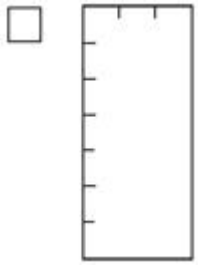


FINDING THE AREA OF RECTANGLES- STAGES 1-2

Finding the area of rectangles is designed to introduce students to the concept of area as covering a surface, and to introduce the formula for calculating the area of a rectangle.

Digital geoboard

Students make shapes that have an area of 8 square units on the digital geoboard.  **THE ARRAY**-STAGES 1-2 'The array' is a tool that allows students to create arrays to learn their basic multiplication facts. 		
Reflection Time should be allowed at the end of each class lesson to revise learning outcomes shared and strategies used.		
Planned Assessment **Area multiplication** Show the cardboard unit square and the "7 x 3" rectangle. *How many squares like this would you need to cover the rectangle completely*? Provide the student with a copy of the grid and ask: *Can you draw what the squares would look like*?		



Granny's Rug" – p.132 – "Mathematics Assessment for Learning"
Granny's rug measured 1 square metre but she wanted it to be a different shape, draw a diagram of how granny's rug could look now and explain.

Calculating Area in Square Centimetres
Provide students with rectangles from the lesson How do I know? Students use a 1cm grid overlay to calculate the area of the rectangles. Students record and explain how they worked out the area.

cm2 and m2
The teacher provides students with a collection of materials of various sizes. In pairs, students select the appropriate unit
(cm2 and m2) and estimate the area of each item. Students check their estimates by measuring areas using square
centimetre tiles/grids or square metre templates. Students then record their results in a table.

Item	cm^2 or m^2	Estimate	Measurement

Length x breadth
Students use 1 cm grid paper to draw different rectangles, each with an area of 24 cm^2. Students label the lengths of the sides in centimetres and discuss the relationship between the lengths of the sides and the area of the rectangles. The investigation can be extended by considering areas such as 36 cm^2, 20 cm^2, or students' own choices. Some students may wish to experiment with fractional units.
(p. 62 *Teaching measurement Stage 2 and Stage 3*)