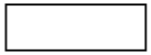
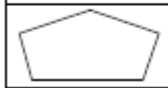
Booragul Public School NSW Syllabus for the Australian Curriculum – Measurement and Geometry

Area 2			
Outcome	**Teaching and Learning Activities**	**Notes/ Future Directions/Evaluation**	**Language / Date**
A student: › describes mathematical situations and methods using everyday and some mathematical language, actions, materials, diagrams and symbols **MA1-1WM** › supports conclusions by explaining or demonstrating how answers were obtained **MA1-3WM** › measures, records, compares and estimates areas using uniform informal units **MA1-10MG** **Syllabus Content Note:** 1st content outcome relates to comparing and ordering several shapes based on area using uniform **informal** units • The concept of **tessellation** has migrated to Area in the AC and used to explain the structure of the unit tessellation in terms of rows and columns The remainder of the outcomes are very similar to Area 1 – note informal units used throughout. The syllabus does not require measuring using cm/m until stage 2 **Syllabus reference:** Hard copy page 96 Digital: 101		**Background information** Refer to background information in Area 1.	• area, • surface, • measure, • **grid**, • row, • column.

Activities		
Explicit mathematical knowledge AC syllabus reference: When students understand why **tessellating units** are important, they should be encouraged to make, draw and describe the spatial structure (grid). Students should develop procedures for counting tile or grid units so that no units are missed or counted twice. **Tessellation - Explain meaning of tessellate** **Discuss patterns of tiles in bathrooms/hallways at home. Which tiles have no gaps? Why?** In small groups, students select a shape (eg square, circle, triangle, hexagon, rhombus, trapezium) to investigate whether it tessellates. Students trace around the shape and slide it to a new position attempting to cover the surface without leaving gaps. Students share their drawings. They group the shapes according to those that tessellate and those that do not		
Tessellating Designs on a Computer - Sample Units of Work pg 78 In pairs, students create tessellating designs using a computer drawing program. Students use the computer drawing tools to make a shape and then duplicate it to see if it tessellates. Students print their designs and compare them with those made by other students.		

Estimation Sample units of work page 70

Students select a shape or tile to use as a unit to compare the area of different shapes. They estimate the number of units required to completely cover a shape, check and record their results in a table.eg

Shape	Unit	Number of Units	
		Estimate	Measurement
			
			

Possible questions include:

- did you have any parts left over?
- what would you call these parts?
- were these parts included in your count?
- how could you make sure that these parts are included next time?

Rectangles

Students are given 12 square tiles. They create a rectangle with an area of 12 tiles.
Students draw their rectangles on grid paper then rearrange the tiles to create as many different shapes as they can, with the area remaining unchanged. They record them on grid paper. Students discuss strategies used to create their shapes.
Extension: Students create further shapes, selecting different units to measure area, and record them on grid paper eg Δ = 1 unit, ■ = 1 unit. Students are asked about the number of units needed to cover their shapes.

Patchwork Quilts

The teacher poses the problem: 'Emma made a patchwork quilt with 24 rectangles and Trent made one with 12 squares.

Which quilt was bigger?' The teacher provides students with copies of rectangles so that 1 square = 2 rectangles. Students discuss their predictions with a partner. One person makes Emma's quilt and the other makes Trent's quilt. Students compare their quilts. Possible questions include: ▮ what if 2 squares = 1 rectangle? (Adapted from CMIM)		
Conservation Students are provided with two identical shapes. One shape could be mounted on cardboard and covered with plastic. The students are asked to cut the other shape into two, three or four pieces. Students predict whether the pieces will fit on top of the first shape and explain why they think so. It is important that the students are not corrected if they believe the shape will not fit, but rather allowed time for investigation. Students test their prediction by covering the cardboard shape. Students could		
Class Notice Board Students estimate how many student paintings (of the same size) would fit on a notice board/display area in the classroom. The teacher selects students to hang their paintings without gaps or overlaps. Students count paintings displayed. Possible questions include: ▮ how many paintings could we fit on the notice board/display area? ▮ are there any paintings that hang over? If so, how can we count them? ▮ is there a way we could count all of the paintings without counting each painting one-by-one?		

Table Tops - Sample Units Of Work pg 70 In small groups, students select an informal unit and calculate the area of the top of the desk. Students are provided with a variety of materials to use as informal units eg paper plates, sheets of paper/cardboard, tiles. The teacher takes digital photographs of student methods, particularly where students are overlapping units, leaving gaps, or not starting or finishing at the edge of the desk. Photographs are displayed for discussion. Possible questions include: ▮ what interesting things do you notice about the way groups measured the top of the desk? ▮ did each group measure the whole area? ▮ if two groups used the same item to cover the desk, why might they have different answers		
Area of Boxes Provide a variety of cereal boxes opened out and flattened to be used as nets. Discuss shape before being flattened ie prisms, cubes. If we wanted to measure the area of the boxes, how would we do this? Demonstrate after receiving suggestions. Provide a variety of informal units eg popsticks, books, unifix cubes, counters, tiles and blocks. Can you choose an appropriate unit to measure the area of the cereal boxes? Record how you choose a unit, estimate by visualising and measure the area of the box.		
<u>Guided Group/Independent Activities</u> What Can It Be? The teacher poses the problem: 'I measured an item from our room and found that it had an area of 10 tiles. What could it be?' Students brainstorm items that it might be and then, in pairs, use tiles to measure the area of the items. A class list of items with an area of 10 tiles is compiled. Students discuss how they chose which items to measure. Possible questions include: ▮ can you compare how you measured the area of the book and the desk? ▮ which was easier? Why? ▮ which unit have you found to be more accurate? Why?		

Estimate and Check Students draw a shape and colour the inside, to indicate the area of the shape. They then estimate and measure the area, stating the number and type of informal units used. Students discuss if another unit would be more suitable. Students investigate and record findings using other units. Possible questions include: ▮ which informal unit did you find more appropriate to estimate and measure the area of your shape? Why? ▮ what would you use to measure the area of your desktop? Why? How would you do it? ▮ can you record your findings? Variation: Students could use Kidpix or other drawing applications to draw their shape and use stamps to fill the area		