

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

<b>Area 1</b>			
Outcome	Teaching and Learning Activities	Notes/ Future Directions/Evaluation	Language / Date
<p><b>A student:</b></p> <ul style="list-style-type: none"> <li>› describes mathematical situations and methods using every day and some mathematical language, actions, materials, diagrams and symbols <b>MA1-1WM</b></li> <li>› measures, records, compares and estimates areas using uniform informal units <b>MA1-10MG</b></li> </ul> <p><b>Syllabus Content Note:</b></p> <p>1<sup>st</sup> content outcome relates to measuring and comparing areas using <b>informal</b> units</p> <ul style="list-style-type: none"> <li>• Selecting appropriate units</li> <li>• Recording areas</li> <li>• Estimating areas</li> <li>• Discussing strategies</li> </ul> <p><b>Syllabus reference:</b> Hard copy page: 94 Digital: 99</p>		<p><b>Background information from syllabus</b></p> <p>Area relates to the measurement of two-dimensional space in the same way that volume and capacity relate to the measurement of three-dimensional space.</p> <p>The attribute of area is the amount of surface (either flat or curved) and can be measured in square units, eg square centimetres (cm<sup>2</sup>), square metres (m<sup>2</sup>).</p> <p>In Stage 1, measuring the areas of objects using informal units enables students to develop some key understandings of measurement. These include repeatedly placing units so that there are no gaps or overlaps and understanding that the units must be equal in size. Covering surfaces with a range of informal units should assist students in understanding that some units tessellate and are therefore more suitable for measuring area.</p> <p>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.</p> <p>Students should also be encouraged to identify and use efficient strategies for counting, eg using repeated addition, rhythmic counting or skip counting.</p> <p>It is important that students have had some measurement experiences before being asked to estimate areas, and that a variety of estimation strategies is taught.</p> <p>Students may have a prior understanding of area based upon the concept of boundaries and/or landmarks, such as those used by Aboriginal communities.</p>	<ul style="list-style-type: none"> <li>• area,</li> <li>• surface,</li> <li>• <b>measure,</b></li> <li>• <b>row,</b></li> <li>• <b>column,</b></li> <li>• <b>gap,</b></li> <li>• <b>overlap,</b></li> <li>• <b>parts of (units),</b></li> <li>• <b>estimate.</b></li> <li>• <b>tessellation</b></li> </ul>

Activities		Register
<p><b><u>Explicit Mathematical Teaching</u></b></p> <p>Area is the measure of the amount of surface. Surface refers to the outer faces or outside of an object. A surface may be flat or curved.</p> <p>At this Stage, measuring the area of objects using informal units enables students to develop some key understandings of measurement. These include repeatedly placing units so there are no gaps or overlaps and understanding that the units must be equal in size. Covering surfaces with a range of informal units should assist students in understanding that some units tessellate and are therefore more suitable for measuring area.</p> <p>It is important that students have had some measurement experiences before being asked to estimate, and that a variety of estimation strategies is taught. When students understand why tessellating units are important, they should be encouraged to make, draw and describe the spatial structure (grid).</p> <p>Students should develop procedures for counting the tile or grid units so that no units are missed or counted twice.</p> <p>Students should also be encouraged to identify and use efficient strategies for counting eg using repeated addition or rhythmic counting.</p> <p>Drawing the covering appears to be an effective way of focusing students' attention on the array structure. However, tracing may not help students, as some of them will be able to trace an accurate array, yet not understand its structure. Drawing or visualising accurate arrays suggests that students can represent covering a region with rectangular units, without gaps or overlap.</p>		
<p><b><u>Ignition Activity</u></b></p> <p>Students draw a closed shape. To indicate the area, colour it in. Compare the area with another child's shape and estimate which is larger. Measure using an appropriate unit.</p>		

<p><b>Hands and Feet</b></p> <p>The teacher poses the question: ‘Which has the bigger area - your foot or your hand?’ Students trace around one of their feet and one of their hands and use grid overlays (same shape) to find the area of each part. Students then compare their results to determine who has the biggest hand and/or foot in the class.</p> <p>Possible questions include:</p> <ul style="list-style-type: none"> <li>■ does the person with the biggest foot have the biggest hand?</li> <li>■ how much bigger is your foot than your hand?</li> </ul> <p>Relate to arrays</p>		
<p><b>Table Tops - Sample Units Of Work pg 70</b></p> <p>In small groups, students select an informal unit and calculate the area of the top of the desk.</p> <p>Students are provided with a variety of materials to use as informal units eg paper plates, sheets of paper/cardboard, tiles.</p> <p>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.</p> <p>Photographs are displayed for discussion.</p> <p>Possible questions include:</p> <ul style="list-style-type: none"> <li>■ what interesting things do you notice about the way groups measured the top of the desk?</li> <li>■ did each group measure the whole area?</li> <li>■ if two groups used the same item to cover the desk, why might they have different answers</li> </ul>		
<p><b>Rugs</b></p> <p>The teacher shows the students a collection of 4 or 5 small rugs/towels/tea towels</p> <p>The teacher then poses the problem:</p> <p>‘I want to use one of these rugs/towels/tea towels for my pet dog/cat. Which one will give my pet the largest area to lie on?’</p> <p>Students estimate which rug/towel/tea towels has the largest area.</p> <p>In small groups, students select materials to cover the rugs to measure which one has the largest area.</p>		

<p><b>Area of Boxes</b></p> <p>Provide a variety of cereal boxes opened out and flattened to be used as nets. Discuss shape before being flattened ie prisms, cubes.</p> <p>If we wanted to measure the area of the boxes, how would we do this? Demonstrate after receiving suggestions.</p> <p>Provide a variety of informal units eg popsticks, books, unifix cubes, counters, tiles and blocks.</p> <p>Can you choose an appropriate unit to measure the area of the cereal boxes?</p> <p>Record how you choose a unit, estimate by visualising and measure the area of the box.</p>		
<p><b><u>Guided Group/Independent Activities</u></b></p> <p><b>What Can It Be?</b></p> <p>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?’</p> <p>Students brainstorm items that it might be and then, in pairs, use tiles to measure the area of the items.</p> <p>A class list of items with an area of 10 tiles is compiled.</p> <p>Students discuss how they chose which items to measure.</p> <p>Possible questions include:</p> <ul style="list-style-type: none"> <li>■ can you compare how you measured the area of the book and the desk?</li> <li>■ which was easier? Why?</li> <li>■ which unit have you found to be more accurate? Why?</li> </ul> <p><b>Estimate and Check</b></p> <p>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.</p> <p>Possible questions include:</p> <ul style="list-style-type: none"> <li>■ which informal unit did you find more appropriate to estimate and measure the area of your shape? Why?</li> <li>■ what would you use to measure the area of your desktop? Why? How would you do it?</li> <li>■ can you record your findings?</li> </ul>		

<p>Variation: Students could use Kidpix or other drawing applications to draw their shape and use stamps to fill the area</p>		
<p><b>Stamping</b>          Using a computer drawing package, students are asked to draw a large shape (A). They then select a smaller shape or picture to use as a 'stamp'. Students 'stamp' the smaller shape inside the larger one, without gaps or overlaps.          Possible questions include:</p> <ul style="list-style-type: none"> <li>■ how many of the smaller shapes did you fit in your larger shape?</li> <li>■ can you work this out without counting each shape one by-one?</li> </ul> <p>Students repeat this activity by creating a second large shape (B). They then compare the shapes A and B and determine which is larger. They discuss their method of comparison. Some students may have compared the number of 'stamps' on each shape, but if they used different 'stamps' they need to reflect on the importance of using the same 'stamp' to compare.</p>		