**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| TERM:  | WEEK: 5 | STRAND: Measurement and Geometry | **SUB-STRAND:** Area 2 | **WORKING MATHEMATICALLY** :**MA2-1WM, MA2-2WM** |
| OUTCOMES: MA2-10MG  | Measures, records, compares and estimates areas using square centimetres and square metres |
| **CONTENT:**  | * **Compare the areas of regular and [irregular shapes](http://syllabus.bos.nsw.edu.au/glossary/mat/irregular-shape/?ajax" \t "_blank" \o "Click for more information about 'irregular shapes') by informal means.**
* \* Measure the areas of common two-dimensional shapes using a square-centimetre grid overlay
* \* Compare how different placements of a grid overlay make measuring area easier or harder
 |
| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * Discussion and hands on investigation – Can students compare areas using informal units e.g. The area of their hand is 20 counters. Can students identify shapes that tessellate and those that do not? Students recognise and express the need for a standard unit.
 |
| WARM UP / DRILL | * Warm up- Counting in 2s, 5s, 10. Look around the classroom for items that can be counted – encourage students to develop procedures for counting so that units are not missed. Game `- Counting buzz- e.g. Every 5th number they have to shout Buzz
 |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | * **How can you work out the surface area of a small gift box**? *Please read the question to me. If you don't know a word, leave it out.*2 *Tell me what the question is asking you to do.*3. *Tell me how you are going to find the answer.*4. *Show me what to do to get the answer. "Talk aloud" as you do it, so that I can understand how you are thinking.* 5. *Now, write down your answer to the question*.
 |
| QUALITY TEACHING ELEMENTS | **INTELLECTUAL QUALITY** | **QUALITY LEARNING ENVIRONMENT** | **SIGNIFICANCE** |
| Deep knowledge Deep understandingProblematic knowledgeHigher-order thinkingMetalanguage | Explicit quality criteriaEngagementHigh expectationsSocial supportStudents’ self-regulation | Background knowledgeCultural knowledgeKnowledge integrationInclusivity Connectedness |
| RESOURCES | Paper clips, transparent grid overlays, grid paper, shapes, gift boxhttp://nrich.maths.org/4964/index |

**TEACHING AND LEARNING EXPERIENCES**

|  |  |
| --- | --- |
| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| Encourage and model procedures for counting tiles or grids so that no units are missed or counted twice. Model recording results in tables using tallys.Introduce mathematical language tessellates, triangular grid/ hexagonal grid.Model finding the area of a shape using the IWB and a square centimetre grid overlay. Discuss answers and strategies used to calculate answers. How can I find the area of this shape? How many square centimetres will fit into the shape?What are the names of the various tile shapes? How many tiles? Which shape fits without gaps? Which shape fits without overlaps? Which shape tessellates? Which shape is the best to cover the rectangle? Why did you use a rectangular/square tile to cover the rectangle? What do we call this shape? Why? How could we use a square centimetre grid overlay to measure the area of this rectangle?  | LEARNING SEQUENCERemediationS1 or Early S2 | * Area Activity

Students find shapes that fit with and without gaps by measuring a desktop with various tiles, lids, coasters (including shapes that don’t leave gaps). Students record results in a table.List the shapes that have no gaps and explain that these shapes tessellate. Ask students what they think this means. InvestigationStudents go on a tour of the school and record shapes that tessellate. They estimate areas of spaces with tessellating patterns. For example – the brick wall has an area of 50 bricks.[Nrich Math](http://nrich.maths.org/9028)s – Torn Shapes[Area Teaching aid –](http://www.echalk.co.uk/maths/dfes_numeracy/Assets/area_flash.swf) How to calculate area?[Area Interactive Games](http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/perimeter_and_area/index.html) |
| LEARNING SEQUENCES2 | * Grid Overlays

Students measure the area of a handprint using a grid overlay. Record the type of grid and the measure in a table. Repeat using different grids. 1. Finding Hand Area - Place one of your hands flat on your desk. Estimate how many square centimetres of the desk your hand is covering. Now place one hand on the square-centimetre grid and carefully trace around it. Colour and count the complete squares inside the outline of your hand..How many times will your hand fit over the cover of your exercise book? Use this to estimate the area of your book’s front cover. Area of front cover sq. cm. Estimate how many square centimetres of plastic would be needed to completely cover your exercise book.Investigation: Students measure areas of 2D shapes using a square cm overlay. If they change the position of the grid do they get a different result?* **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 e.g.Students measure and record the area of their letters e.g. 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? |
| LEARNING SEQUENCEExtension Late S2 or Early S3 | * Surface Area

Show students a collection of objects, e.g.. a card, a small book, a gift box. Get them to measure the area using square centimetres. Flatten the box and measure with a cm grid. Students investigate objects that are around the classroom that can be measured in square cm. |
| **EVALUATION & REFLECTION** | **Student Engagement: Achievement of Outcomes:****Resources: Follow Up:** |