**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| TERM: | WEEK: | STRAND: Measurement & Geometry | **SUB-STRAND**: 2D Space 1 | **WORKING MATHEMATICALLY:**  MA3-1WM & MA3-2WM |
| OUTCOMES: MA3-15MG | | **Manipulates, classifies and draws two-dimensional shapes, including equilateral, isosceles and scalene triangles, and describes their properties.** | | |
| **CONTENT:** | | **Classify two-dimensional shapes and describe their features**   * Explain the difference between regular and irregular shapes * Identify and draw regular and irregular two-dimensional shapes from descriptions of their side and angle properties * Use tools such as templates, rulers, set squares and protractors to draw regular and irregular two-dimensional shapes * Use computer drawing tools to construct a shape from a description of its side and angle properties | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | **Pre-Assessment Task:** Students create a range of regular and irregular 2D shapes using toothpicks and record their findings. Refer to the embedded activity to the left. | | |
| WARM UP / DRILL | | **Mad Minute:** Students list, draw and label as many 2D shapes as possible in 3 minutes.  Results are compiled and recorded by the teacher on the IWB for reflection at the end of the unit when students will repeat the activity and compare the accuracy of their initial facts and constructions. | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | Andre had three irregular triangles, two regular hexagons, one irregular pentagon, a rectangle and a circle.What is the total number of sides on all of Andre’s polygons?How many sides are there in only the irregular shapes? | | |
| QUALITY TEACHING ELEMENTS | | **INTELLECTUAL QUALITY** | **QUALITY LEARNING ENVIRONMENT** | **SIGNIFICANCE** |
| * Deep knowledge * Deep understanding * Problematic knowledge * Higher-order thinking * Metalanguage * Substantive communication | * Explicit quality criteria * Engagement * High expectations * Social support * Students’ self-regulation * Student direction | * Background knowledge * Cultural knowledge * Knowledge integration * Inclusivity * Connectedness * Narrative |
| RESOURCES | | Maths Tracks activities (embedded) ,set squares, protractors, rulers, toothpicks, interactive activities – referenced,  Smart Notebook program or similar, paper and PVA glue for gluing down toothpicks (optional). | | |

**TEACHING AND LEARNING EXPERIENCES**

|  |  |  |
| --- | --- | --- |
| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES | |
| Explicitly communicate lesson outcomes and expectations of work quality.Define and reinforce metalanguage used in the unit e.g. two-dimensional shape (2D shape), square, rectangle triangle, circle, pentagon, hexagon, octagon, quadrilateral, parallelogram, rhombus, square, trapezium, kite, regular shape, irregular shape, features, properties, side, parallel, pair of parallel sides, opposite, vertex (vertices), angle, right angle, acute angle, obtuse angle and line (axis) of symmetry.Revise the following facts  * *A 2D shape has two dimensions, length and width (breadth).* * The number of sides a shape has is one of its properties. * P*olygons are 2D shapes with three or more straight sides.* * Polygons can be **regular** or **irregular**. * It is **regular** if the sides andangles are equal.   *E.g.*  *An equilateral triangle and square are regular.*  *A rectangle is irregular because the sides are not equal.*  *A rhombus is irregular because the angles are not equal.* Explicitly teach how to use rulers, set squares and protractors to construct a range of regular and irregular shapes*.* | LEARNING SEQUENCERemediationS2 or Early S3 | * **2D Shape Revision:** Revise the names of 2D shapes page 8 of Maths tracks stage 3A, unit 13 (attached) and the embedded notebook lesson below. |
| LEARNING SEQUENCES3 | * **2D Shape Revision:** Consolidate teaching points by using the above notebook lesson and completing the on-line activity at <http://www.haelmedia.com/html/sg_m2_001.html> * **Interactive Game:** Students identify 2D shapes from the descriptions of their properties. http://teams.lacoe.edu/documentation/classrooms/amy/geometry/6-8/activities/quad\_quest/quad\_quest.html * **Toothpick constructions:** Working in pairs students explore and construct a variety of regular and irregular 2D shapes from given numbers of toothpicks and explain the difference between them using their knowledge and understanding of taught facts. * **IWB Activity:** Students use the drawing functions in Smart Notebook to construct regular and irregular shapes from given descriptions. Extension: students use the built in protractor and ruler to check for equal sides and angles to prove the validity of their constructions. * **Measuring instrumentation**: Working in pairs, students construct regular and irregular shapes using set, squares, protractors and rulers from the descriptions of their side and angle properties. * **Investigation**: Students then use critical thinking to create shapes by adding and subtracting toothpicks as described in the attached activity (Toothpicks.doc). |
| LEARNING SEQUENCEExtensionEarly S4 | * **Creating 2D shapes from triangles:** In groups, students cut out the triangles   (on attached Student Sheets 5b, 5c and 5d) and arrange them to make various 2D shapes.Please refer to pages 25-27 & 29-33 in the embedded file ‘Regular and Irregular 2D Shapes’ for full details and related resources. |
| **EVALUATION & REFLECTION** | **Student Engagement:** **Achievement of Outcomes:**  **Resources:** **Follow up:** |