**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| 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 (4 sided) two-dimensional shapes and describe their features.**   * Explore by measurement angle properties of [squares](http://syllabus.bos.nsw.edu.au/glossary/mat/square/?ajax), [rectangles](http://syllabus.bos.nsw.edu.au/glossary/mat/rectangle/?ajax), [parallelograms](http://syllabus.bos.nsw.edu.au/glossary/mat/parallelogram/?ajax) and [rhombuses](http://syllabus.bos.nsw.edu.au/glossary/mat/rhombus/?ajax) * Select and classify a two-dimensional shape from a description of its features * Identify and draw regular and irregular two-dimensional shapes from descriptions of their side and angle properties * Recognise that 2D shapes can be classified in more than one way eg. Rhombus = Parallelogram | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | **Worksheet**: Students Classify 2D shapes and their properties from written descriptions.  Copy Maths Tracks pages 15,16,37,41 and 46 as paged in attached PDF below or Scootle Shape sorter from Tale. *Image below.* | | |
| WARM UP / DRILL | | **Be a Shape Wizard:** Use the Smart Notebook presentation to the left to drill and revise the names of 2D Shapes.  **iPad Geoboard App (*Geoboard Speed Challenge)*:** Students work in pairs to create as many  2D shapes as possible in two minutes (without duplication).  **Concentration game:** Students match names to 2D Shapes - <http://www.math-play.com/shapes-game.html> | | |
| NEWMAN’S PROBLEM orTENS ACTIVITY | | Andrea ran around a regular hexagonal shaped monument with sides measuring 12km each.She did this repeatedly over a fortnight.How far did Andrea run in total? | | |
| 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 | | Metalanguage signage and environmental poster display, 2D shape flashcards, Set of 2D shapes, geoboards, IWB visual presentation on 2D shapes, geo-strips, paper and textas for signage, worksheets on 2D shapes and types of angles, set squares, protractors, rulers and student grid-books, spreadsheet file and quadrilaterals | | |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTIONMODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES | |
| * **Explicitly communicate lesson outcomes and expectations of work quality.** * **Teach and review** the names of regular and irregular shapes and how they can also be classified as polygons, quadrilaterals, parallelograms etc.  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.IWB memory game – Match names to regular and irregular shapes.Explore properties of 2D shapes <http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/3d/index.htm> Quick Quiz Properties of 2D shapes <http://teams.lacoe.edu/documentation/classrooms/amy/geometry/6-8/activities/quad_quest/quad_quest.html>iPad app - Revise the names of angles including acute, right, obtuse, straight, reflex and revolutions. Use the iPad app - ‘Ez Geometry 5 Types of Angles.’  * **Geo-Strip Challenge**. Divide class into teams. Students create angles using geo-strips and challenge peers to name them and identify shapes in which they would be found. Team points are allocated for correct answers**.** | LEARNING SEQUENCERemediationLate S2 | * **Revision:** Review terms and explore properties of simple 2D shapes. / Revise angle types e.g. acute, obtuse, right and straight. * **Simulation Game:** Students identify 2D shapes in the environment through the simulation game below. <http://www.bbc.co.uk/bitesize/ks2/maths/shape_space/2d_shapes/play/popup.shtml> * Students investigate and identify basic 2D shapes and their properties using pattern blocks. * Students identify and label angle types in simple polygons. |
| LEARNING SEQUENCES3 | * **Worksheet:** Students complete written activities below, correctly identifying regular and irregular 2D Shapes. <http://www.math-salamanders.com/image-files/printable-shapes-regular-and-irregular-shapes-bw-nolab.gif> * **Celebrity Heads**: Students use questioning to identify the names of concealed shapes displayed above and behind their heads to determine *their* identity. E.g. Do I have parallel lines? Do I have any obtuse angles? * **2D Shape Mysteries**: Students are given a range of quadrilaterals (squares, rectangles, parallelograms and rhombuses). In groups of four, explore and record angle properties. Students then report back to the class. E.g. A square has four equal sides / angles where each angle equals 90o. Extension: Students investigate angle sums of quadrilaterals. * **Who am I?:** Students draw regular and irregular shapes from their description.   Students work in teams of 3. Peers challenge teams to draw given shapes from their properties (E.g. Number / length of sides, angle size) using rulers, set squares and protractors.   * **Groups to discuss the question**: Can any two dimensional shapes be classified in more than one way?   E.g. a rhombus can be classified as a parallelogram / or quadrilaterals / or polygons   * **Have students play the Properties game:** Click on attachment to the left. * **Investigatio**n: Find shapes in the environment – Students take photographs on iPads and in teams or individually produce a PowerPoint Presentation detailing shapes found and their properties. Draw conclusions as to why shapes with right angles and straight angles are frequently used in man-made constructions. * Discuss multi-classifications e.g. a rhombus/ rectangle can also be classified as a parallelogram. * **Assessment:** Using a spreadsheet, students independently complete a table of properties for the 2D shapes covered. Click on icon to left for example of layout. |
| LEARNING SEQUENCEExtensionLate S3 | * **Construction Task**: Students construct 2D shapes using set squares, protractors and rulers depicting equal sides, equal angles, parallel lines etc. Mathematical symbols to be used to identify equivalence and angle properties. * **Angle Sums:** Students explore properties and angle sums of other shapes e.g. Hexagons. * **Barrier Game:** Students follow directions to draw robots using various polygons. |
| **EVALUATION & REFLECTION** | **Student Engagement:** **Achievement of Outcomes:**  **Resources:** **Follow up:** |