**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK: 2.1 | STRAND: Measurement & Geometry | **SUB-STRAND:** 2D Space 1 | **WORKING MATHEMATICALLY:** MA2-1WM & MA2-2WM |
| OUTCOMES: MA2-15MG | **Manipulates, identifies and sketches two dimensional shapes, including special quadrilaterals, and describes their features** |
| **CONTENT:**  | **Compare and describe features of two dimensional shapes, including special quadrilaterals*** Recognise the vertices of two dimensional shapes as the vertices of angles that have the sides of the shape as their arms
* Identify right angles in squares and rectangles
* Group parallelograms, rectangles, rhombuses, squares, trapeziums and kites using one or more attributes, e.g. quadrilaterals with parallel sides and right angles (*right angles only covered in this lesson)*
* Identify and describe two-dimensional shapes as either ‘regular’ or ‘irregular’, e.g. this shape is a regular pentagon because it has five equal sides and five equal angles
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | **Pre-Assessment**Provide students with a set of pattern blocks and have them sort the blocks into groups of rectangles, parallelograms etc. |
| WARM UP / DRILL | Have students draw as many of any given shape that the teacher suggests. Teacher is looking for understanding that a rectangle in any orientation is still a rectangle. |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | If I asked you to draw a shape that has 4 equal sides and 4 right angles, what shape would you draw? |
| 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
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| RESOURCES | Maths books, computers, paddle pop sticks and a set of printed shapes |

**TEACHING AND LEARNING EXPERIENCES**

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| 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** parallel, congruent, angles, edges and vertices. Circle, triangle, quadrilateral, parallelogram, rectangle, rhombus, square, trapezium, kite, pentagon, hexagon, octagon, regular shape, irregular shape, orientation, features, properties, side, parallel, pair of parallel sides, opposite, length and vertex (vertices).
* **Shape Sort:** group shapes based on if they have right angles or not.

<http://wsassets.s3.amazonaws.com/ws/nso/swf/6f240e81f2cda60f56a83e1c8650912e.swf>

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| * **Introduce/review the term angle:** The amount of turning between two lines meeting at a common point.
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* **Review angles types focusing on right angles.** Use the overview and interactive angle make below.

<http://www.mathsisfun.com/definitions/right-angle.html>* **Discuss where right angles appear in shapes** and how to recognise them.
* **Explicitly teach that the vertices of 2D shapes are the arms of angles.**

Use a printed set of shapes and a large protractor to teach students how to measure for right angles using board.* **Discuss regular and irregular shapes in relation to angles** using the site below.

<http://www.mathsisfun.com/geometry/regular-polygons.html>* **Modelled Activity:**

Complete this shape sort of shapes based on if they right angles or not.<http://wsassets.s3.amazonaws.com/ws/nso/swf/6f240e81f2cda60f56a83e1c8650912e.swf> | LEARNING SEQUENCERemediationS1 or Early S2 | * **Matching game:** Students complete the interactive matching game <http://www.mathplayground.com/matching_shapes.html>
* **Pop Stick Models:** Students use paddle pop sticks to model different angles. This activity can be first led by the teacher and then in students pairs.
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| LEARNING SEQUENCES2 | * **Classifying Angles:** Students identify angles that are greater to, less than or equal to a right angle.

<http://au.ixl.com/math/year-3/angles-greater-than-less-than-or-equal-to-a-right-angle>* **Digital Protractor:** Students rotate the protractor to identify right angles in shapes.

<http://www.amblesideprimary.com/ambleweb/mentalmaths/angleshapes.html>* **Kinaesthetic Challenge:** Arm angles Ask the students to stand up, and stick an arm straight out so that it is neither horizontal nor vertical. (This helps separate the idea of "straight" from the idea of "horizontal or vertical". Students often confuse those.) Then ask them to stick the other arm out, so that their arms make an acute angle, a right angle, an obtuse angle. You can also make cardboard angle makers. Then students measure the angle made with the arms. Then transfer this to a protractor and identify the exact measurement of the angle.
* **Investigation:** Cut paper plates with 90 degree angles. Have students investigate the classroom for items that have right angles. Students record the objects they find. Compare objects as a whole class and compile a class list of items that have right angles. Discuss if there are any shapes that occur more often.
* **Assessment:** Provide students with a set of shapes (both regular and irregular) that they stick in their work books. Have students write if the following occurs in each shape; Does it have equal sides? Does it have parallel sides? Does it have right angles? Is it a regular or irregular shape**?**
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| LEARNING SEQUENCEExtension Late S2 or Early S3 | * **Measuring Angles:** Provide students with a set of printed shapes and have them measure the internal angles of the shapes. Have students analyse what measurements they have obtained to hypothesis about particular shapes. They can then sort them based on the measurements that they have obtained.
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| **EVALUATION & REFLECTION** | **Student Engagement:** **Achievement of Outcomes:****Resources:** **Follow up:** |