**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK:  | 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 the special quadrilaterals*** Manipulate, compare and describe features of two-dimensional shapes, including the special quadrilaterals: parallelograms, rectangles, rhombuses, squares, trapeziums and kites
* Name a shape, given a written or verbal description of its features
* Identify regular shapes in a group the includes irregular shapes, such as a regular pentagon in a group of pentagons
* Explain the difference between regular and irregular two dimensional shapes
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | **Pre-Assessment** Have students write down/draw all the 2D shapes they know. Either have students write down the features of each shape or as a whole class, construct a shape chart of 2D shapes and their features. |
| WARM UP / DRILL | Conceal 2D Shape in a bag or behind a screen. Gradually bring a small part of the shape into view. Write down all the shapes students think it could be. Slowly pull the shape up and ask students to eliminate shapes from their list. Discuss the properties of the shape. Hold the shape at tilted angles to increase the difficulty. |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | I have a shape with 2 short sides and 2 long sides. What shape could it be? |
| 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 | Students’ work books, a variety of 2D shapes and a bag or screen |

**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,** two-dimensional shape (2D shape), 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).
* **Review existing knowledge by completing the pre-assessment task.**
* Fill gaps in students’ knowledge.
* Make classroom charts or display pre-printed language charts for 2D shapes.
* **Compare and discuss the features of each shape**. Sort shapes into a variety of groups based on their attributes.
* **PowerPoint quiz** (attached file to right)
* **Discuss the following questions:**
* **What is a closed /open shape?**
* **What is a polygon?** A polygon (Greek term for many angles) is a closed shape with three or more angles and sides.
* **What is a regular shape?** Shapes that have equal angles and sides of equal length. To be a regular shape you can rotate it and it still looks exactly the same.
* **What is an irregular shape?** A rectangle is an irregular shape because when you rotate it, it is not the same.
 | LEARNING SEQUENCERemediationS1 or Early S2 | * **Revision:** Students review their knowledge of basic shapes (square, circle, triangle, rectangle) at

<http://www.bbc.co.uk/cbeebies/teletubbies/games/teletubbies-shapegame/>* **Shape Bingo**: Students play shape bingo to consolidate knowledge.

<http://www.jumpstart.com/common/shape-bingo> - Printable |
| LEARNING SEQUENCES2 | * **Celebrity Heads:** Students give hints/discuss the properties of each shape using correct terminology. For an added element, the person wearing the celebrity head/shape head could be asked to sketch the shape they think it is after asking their questions. This game can be made more difficult by including the special quadrilaterals.
* **Digital Shape Sort:** Students sort a variety of regular and irregular shapes. <http://www.softschools.com/math/geometry/polygons/regular_and_irregular_polygons/>
* **Worksheet:** Students identify regular and irregular shapes. <http://www.math-salamanders.com/image-files/printable-shapes-regular-and-irregular-shapes-bw.gif> - Printable
* **Investigation:** In groups of three or four, students go on a shape hunt around the school grounds. Students draw and label each shape they find. *This could also be a lesson that incorporates technology. Have students take photos of items around the school yard. Print, label and display photos.*
* **Assessment:** Provide students with a variety of regular and irregular shapes including the special quadrilaterals. Given a variety of parameters, students sort them into groups, e.g. Sort the shapes into two groups 1) That have equal sides and 2) That do not have equal sides.

This assessment can be used with any parameters. Observe students sorting the shapes and discuss their knowledge of each shape. Ask questions to ensure they understand the terminology. |
| LEARNING SEQUENCEExtension Late S2 or Early S3 | * **Complex Polygons:** Students are introduced to complex regular and irregular polygons. This site includes descriptions and a quiz. <http://www.mathsisfun.com/geometry/polygons.html>
* **Geoboards:** Students use the geoboard to make a variety of regular and irregular shapes. Make a class list of shapes made and their attributes. <http://www.mathplayground.com/geoboard.html> Use the website above to demonstrate how to make shapes on the geoboard.
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| * **Students view a short clip which discusses regular and irregular shapes.** <http://www.showme.com/sh/?h=t027i8u>
* **Students explore the attributes of polygons:**

<http://sheppardsoftware.com/mathgames/geometry/shapeshoot/PolygonShapesShoot.htm>* **Modelled activity:**

Teacher reinforces shape names and metalanguage that is required for more in depth knowledge of 2D shapes. <http://www.kidsmathgamesonline.com/facts/geometry/2dpolygonshapes.html>* **Review** all the information and then have students draw as many shapes as they can.
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|  | **EVALUATION & REFLECTION** | **Student Engagement:** **Achievement of Outcomes:****Resources:** **Follow up:** |