**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK:  | STRAND: Measurement & Geometry | **SUB-STRAND:** 2D Space 2 | **WORKING MATHEMATICALLY:** MA2-1WM, MA2-2WM, MA2-3WM |
| OUTCOMES: MA2-MG15 | **Manipulates, identifies and sketches two dimensional shapes, including special quadrilaterals, and describes their features** |
| **CONTENT:**  | **Create symmetrical patterns, pictures and shapes, with and without the use of digital technologies** * Create and record tessellating designs by reflecting, translating and rotating common shapes
* Use digital technologies to create tessellating designs
* Use digital technologies to construct a design or logo by combining common shapes.
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | **Pre-Assessment:** Worksheet – Have students complete the attached worksheet and then go through the correct answers as a class. |
| WARM UP / DRILL | **Interactive Activity: –** Use the below website to demonstrate how a tessellation occurs and what it looks like:<http://www.pbs.org/parents/education/math/games/first-second-grade/tessellation/> |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  |  |
| 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 | 2D shape poster, worksheets, geo-strips, set of various 2D shapes, scissors, workbook and IWB games as referenced. |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| Introduce weekly topic to the class and communicate expectations for the lesson.* **Revise various 2D shapes** on the IWB. *NB teacher will need to prepare this resource prior to lesson.*
* **Use metalanguage that is expected of students** e.g. two-dimensional shape, square, rectangle, triangle, circle, pentagon, hexagon, octagon, quadrilateral, parallelogram, rhombus, trapezium, kite, shape, features, properties, side, parallel, pair of parallel sides, opposite, angle, right angle, acute angle, obtuse angle and axis of symmetry.
* **10 question mentals quiz. Teacher poses questions of choice that vary from those in previous lessons.** Emphasis on 2D shapes and teams complete in their table groups with table points being allocated based on correct answers.
* **Explicitly teach how translations, rotations and reflections can be used to create tessellating designs, symmetrical patterns, and pictures.**
 | LEARNING SEQUENCERemediationS1 or Early S2 | * **Discuss different ways in which tessellation patterns can be identified**, e.g. translating (sliding), reflecting (flipping) and rotating (turning).
* **Review the above techniques** by demonstrating their use on various patterns.
* **Students identify whether different 2D shapes are able to be used in tessellation patterns as they** are displayed on the IWB. 2D shapes to be used at the teacher’s discretion.

*NB teacher will need to prepare this resource prior to lesson.* |
| LEARNING SEQUENCES2 | * **Students to be split into 3 separate mixed ability groups and rotated on a daily basis between the activities below:**
1. **Worksheet:** Complete activity 3:12 from Signpost textbook on tessellations (pg 98). Optional worksheet at teachers discretion
2. **Drawing Activity:** Students draw a predetermined number of tessellating patterns with 2D shapes using on graph paper and are required to translate, rotate or reflect the objects (or combinations of).
3. **IWB Activity:** Students tessellate different shapes using the rotation tool. <http://pbskids.org/cyberchase/math-games/cant-wait-tessellate/>.
* **Investigation: Computer Design**

Students explore rotational symmetry and patterns through computer applications. The students are challenged to design a logo that incorporates rotational symmetry.Possible questions include:* How many times can you get your shape to match its original outline in one full turn?
* How many axes of symmetry does your logo have?
* Students discuss their logos.
* **Assessment**: Students are given 5 sets of various patterns and identify if they tessellate.
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| LEARNING SEQUENCEExtension Late S2 or Early S3 | * **Complex Tessellations**: Students are to draw more difficult tessellations on grid paper.
* **Worksheet**: Students complete the attached worksheet to create tessellating patterns.

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| **EVALUATION & REFLECTION** | **Student Engagement: Achievement of Outcomes:****Resources: Follow up:**  |