**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:** | | **Describe** [**translations**](http://syllabus.bos.nsw.edu.au/glossary/mat/translation/?ajax)**,** [**reflections**](http://syllabus.bos.nsw.edu.au/glossary/mat/reflection/?ajax) **and** [**rotations**](http://syllabus.bos.nsw.edu.au/glossary/mat/rotation/?ajax) **of two-dimensional shapes.**   * Use the terms 'translate', 'reflect' and 'rotate' to describe the movement of two-dimensional shapes * Rotate a graphic or object through a specified angle about a particular point, including by using the rotate function in a computer drawing program * Describe the effect when a two-dimensional shape is translated, reflected or rotated, eg when a vertical arrow is rotated 90°, the resulting arrow is horizontal * Recognise that the properties of shapes do not change when shapes are translated, reflected or rotated | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | **Pre-Assesssment: Graphic Representations:** Students write definitions for the terms translation, reflection and rotation, draw 1-3 example(s) of each and share their understanding of these transformations with the class. These definitions are then checked using the Online Maths Dictionary: <http://www.amathsdictionaryforkids.com/dictionary.html>  Students then design posters to display these transformations, which are then used to guide and direct further learning. | | |
| WARM UP / DRILL | | **Mirror-Mirror:** Using body movements, students mirror their partners (reflect) replicate their position (slide) and turn in given directions (rotate) either left/ right or clockwise/anticlockwise. | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | What 2D shapes have rotational symmetry?  What shape would be created if a square measuring 8cm x 8cm was joined with its reflection? Draw and label measurements.  What shapes would be created if a trapezium and its reflection were combined A vertically & B horizontally? Draw these 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 | | Paper, cardboard, scissors, pencil, split pins, Microsoft Word, Internet access and interactive activities (as referenced) | | |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES | |
| * **Explicitly communicate lesson outcomes and expectations work quality.** * **Review unit metalanguage** as outlined on previous unit.      * **Explicitly teach** the concept and term of slide then introduce the term ‘translate.’ A translation (slide) is a movement in a straight line without rotation, reflection or change of size. e.g.        * **Explicitly teach** the concept and term reflection. A reflection (flip) is a mirror image of a shape. A shape has line symmetry if both its parts match exactly when folded. | LEARNING SEQUENCERemediationS2 or Early S3 | * **Revision Activities for Transformations:** Students practise reflecting, translating and rotating shapes through the following interactive activities.   <http://www.sheppardsoftware.com/mathgames/geometry/shapeshoot/TranslateShapesShoot.htm>  <http://www.harcourtschool.com/activity/icy_slides_flips_turns/>  <http://www.eduplace.com/kids/mw/swfs/robopacker_grade4.html> |
| LEARNING SEQUENCES3 | * **Treasure Map:** Students translate and reflect plastic geometric shapes around a map of an island (with a 3cm x 3cm grid overlay) as directed by the teacher to locate a hidden treasure. * **The Transformation Game:** Students follow given instructions to transform and draw shapes around a grid. * **Transformation Patterns:** Students flip, slide or turn shapes and then trace around 2D shapes to create patterns. This activity can be repeated using reflections and rotations**.** * **IWB Transformations:** Students transform shapes around a Cartesian plane as directed. * **Investigation:** Download and use the shape overlays from TALE – SCOOTLE RESOURCES   The Shape overlays series of learning objects requires the student to manipulate 2D shapes by sliding and overlapping to create other 2D shapes. These include:  Shape Overlays: Picture Studio/ Shape Overlays: Find and Cut / Shape Overlays: Find, Cut and Turn /  Shape Overlays: Picture Puzzle |
| LEARNING SEQUENCEExtensionEarly S4 | * **Interactive Axis of Symmetry Activity:** Students explore the relationship between reflections and axis of symmetry using a Cartesian plane through the interactive game at <https://www.mangahigh.com/en/games/transtar> * **Discriminating Shapes** **Interactive Activity:** Shape Sorter ( Scootle resource - TALE log in required) * **Reflections** **Interactive activity:** Students complete reflection activities at the site below.   <http://www.transum.org/software/SW/Starter_of_the_day/Students/Transformations/Draw.asp> |
| **EVALUATION & REFLECTION** | **Student Engagement:** **Achievement of Outcomes:**  **Resources:** **Follow up:** |