**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
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| 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
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| 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 SEQUENCEExtension Early 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:** |