**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK: | STRAND: Measurement and Geometry | **SUB-STRAND:** 3D Space 2 | **WORKING MATHEMATICALLY:**  MA2-1WM |
| OUTCOMES: MA2-1WM | | **Uses appropriate technology to describe, and symbols to represent, mathematical ideas.** | | |
| **CONTENT:** | | **Investigate and represent three dimensional objects using drawings.**   * Draw three dimensional objects using a computer drawing tool, attempting to show depth. * Draw cylinders, cones, cubes, pyramids and prisms using computer programs | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | **Pre-Assessment:** Students use of Paint software to draw and explore a variety of objects. Use observations to assess student levels of competency. Screen shots can be taken for assessment records. | | |
| WARM UP / DRILL | | **Review Basic 3D Objects:** Using notebook software, have students identify objects as they appear on the board. Add as much information as possible regarding the attributes of each object. Students then locate these objects in environmental situations e.g. aluminium cans (cylinders) & buildings (prisms). | | |
| 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 |
| RESOURCES | | Set of 3D shapes, metalanguage signage (faces, vertices, edges, various types of pyramids and prisms), variety of real objects that represent regular 3D shapes (eg: boxes, ice cream cones, witches hats, Toblerone box etc.), access to iPads and computer software for drawing e.g. SketchUp (<http://www.sketchup.com/buy/education-licenses>) or Paint. | | |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES | |
| * **Explicitly communicate lesson outcomes and work quality.**  Define and reinforce metalanguage in the unite.g: pyramid, prism, face, edge, vertex, vertices, triangular prism, square prism, cube, rectangular prism, pentagonal prism, triangular pyramid, square pyramid, rectangular pyramid, cross-section, surface, curved, flat and perspective. Also include regular 2D shapes. (square, triangle, rectangle, pentagon, hexagon and octagon).Teach and review features of basic 3 Dimensional objects.How to draw a cube on the computer <http://www.youtube.com/watch?v=tWAUx9iW4a8>  <http://www.youtube.com/watch?v=Ykf76f8nl7Y> *Videos demonstrate the drawing of various objects using Paint Software* | LEARNING SEQUENCERemediationS1 | Students will work with a buddy to produce simple drawings 3D objects (cylinder, cube, cone) based on a real life model or an image. |
| LEARNING SEQUENCES2 | Activity: Students work on Sketch-up, Paint or other computer/iPad applications available at your school. Design basic 3D objects e.g. cubes and prisms. Teacher models the necessary process to support less confident learners. Students then try creating more complex objects such as pyramids, cones and cylinders.  * **Investigation:** Experiment with creating robots using a variety of objects drawn/created in computer software.  Assessment: Observations of students’ designs.Print completed drawings if appropriate (or provide a screen shot for teacher assessment). |
| LEARNING SEQUENCEExtensionLate S2, Early S3 | * **Using same programs as above, explore making shapes using more than one object.** Create physical models and then recreate them in the chosen software. |
| **EVALUATION & REFLECTION** | **Student Engagement:** **Achievement of Outcomes:**  **Resources:** **Follow Up:** |