**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK: | STRAND: Measurement and Geometry | **SUB-STRAND:** 3D Space 1 | **WORKING MATHEMATICALLY:** MA2-1WM |
| OUTCOMES: MA2-14MG | | Makes, compares, sketches and names three-dimensional objects, including prisms, pyramids, cylinders, cones and spheres, and describes their features. | | |
| **CONTENT:** | | **Make models of three dimensional objects and describe their key features.**   * Identify and name three dimensional objects as prisms and pyramids, cylinders, cones and spheres. * Recognise and describe the use of 3-dimensional objects in a variety of contexts (e.g. building, packaging) * Describe and compare curved surfaces and flat surfaces of cylinders, cones and spheres, and faces, edges and vertices of prisms (including cubes) and pyramids. | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | **Pre-Assessment:**  Using a spreadsheet, students independently complete a table of properties for the 3D object covered (including: number of faces, edges and vertices for each given shape). | | |
| WARM UP / DRILL | | **CLAY MODELS**  Students construct prisms and pyramids from clay, plasticine or playdough when shown a model.  Students compare and discuss their results. | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | A puzzling cube problem: <http://nrich.maths.org/1140> | | |
| 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 objects, metalanguage signage (faces, vertices, edges, various types of pyramids and prisms), spreadsheet file, magazines, “Clown” board game, dice, variety of real objects that represent regular 3D objects (e.g. boxes, ice cream cones, witches hats, Toblerone box etc.) | | |

**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 unit:e.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 the names of regular 3 dimensional objectIdentify the difference between prisms and pyramids. Use visual models. Construct a chart of differences.  * **Feely Bag:** A 3D object is placed in a bag. A student feels the object, without looking, and describes it features. The class tries to identify the object. | LEARNING SEQUENCERemediationS1 | Review terms and explore properties of regular 3D objects and 2D shapes. Discuss 2D shapes that make up each 3D face. Identify the number of edges each 3D objects has (using hands on examples).Identify and label regular 2D shapes and 3D objects.Review flat/curved surfaces. |
| LEARNING SEQUENCES2 | Investigating 3D objects: Students make prints of the faces and bases of a variety of 3D objects. A chart may be built up to illustrate the prints obtained from various objects.Real life shapes: Students look for 3D objects in the ‘real’ world. Collect pictures from magazines, old photographs, birthday cards etc. of 3D objects. In Art, children make a collage using these objects.Board Game: Make a clown using 3D objects (Activity 2, page 30 attached to the left) <http://lrr.dlr.det.nsw.edu.au/LRRDownloads/8126/1/44300_2B_u13_Print.pdf>Assessment: Using the pre-assessment spreadsheet, students independently revise and complete a table of properties for the 3D object covered (including: number of faces, edges and vertices for each given shape). |
| LEARNING SEQUENCEExtensionLate S2, Early S3 | * **Play game:** Review edges, vertices and faces. The students will need to be confident with the properties of 3D object as this game is fast**.** <http://www.bbc.co.uk/bitesize/ks2/maths/shape_space/3d_shapes/play/> * **Construct towers**: Use a variety of real life 3D objects. Draw them from various viewpoints. |
| **EVALUATION & REFLECTION** | **Student Engagement:** **Achievement of Outcomes:**  **Resources:** **Follow Up:** |