**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*** Describe similarities and differences between prisms (including cubes), pyramids, cylinders, cones and spheres including cones and pyramids.
* Use a variety of materials to make models of prisms, pyramids, cylinders, cones and spheres given a 3D object, picture of photograph to view.
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | **Pre-Assessment:** In small groups, give students an example of a cylinder, cone, sphere and a couple varieties of pyramids and prisms. Identify some of the similarities and differences – taking into consideration the number of faces, vertices and edges.  |
| WARM UP / DRILL | **IWB** – Sort the shapes. Have a variety of pictures of 3D objects (including real life examples). Sort them into 2 groups – pyramids, prisms. Can the groups be resorted (establish different categories eg: number of faces)**Shape Review** – What Shape Am I? A child describes an object to the class (cube, sphere, cylinder, cone), eg I have 4 triangular faces and 4 corners. The class guess the shape.  |
| 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 | Set of 3D objects, metalanguage signage (faces, vertices, edges, various types of pyramids and prisms), variety of real objects that represent regular 3D objects (eg: boxes, ice cream cones, witches hats, toblerone box…), access to iPads and computers and unifix cubes |

**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 objects <http://www.interactivestuff.org/match/maker.phtml?featured=1&id=15>Identify the features of 3D objects.<https://hwb.wales.gov.uk/cms/hwbcontent/Shared%20Documents/vtc/ngfl/maths/cynnal/polyhydra/polyhydra.swf> | LEARNING SEQUENCERemediationS1  | Students are given a variety of 3 dimensional shapes. Using one piece of paper for each shape, paint each face and make a print. Once dry, label the different 2D shapes/faces created for each 3D shape.Given a collection of 3D objects, group them. Discuss the groupings. |
| LEARNING SEQUENCES2 | Group 1 - Groups are presented with a variety of 3D objects (including real life examples). Classify shapes into groups of objects (cylinders, prisms etc). Record features of each group. Compare similarities and differences and present findings to the class.Group 2 - Review features of 3D shapes and their names with these interactive activities.<http://www.learnalberta.ca/content/me3usa/flash/index.html?goLesson=14>Group 3 – Make 3D models based on a picture (use links below for a series of problem solving models). Students photograph their models using an iPad to present to the group.<http://nrich.maths.org/public/leg.php?code=5049>* **Investigate** – various groups of 3D objects, including real life objects (eg: buildings and packaging). Group them and use a chart to record findings.

Assessment: Teacher holds up 2 objects (e.g. cone or cylinder). Students draw 3 columns in their book. Column 1 –things I know about the object, Column 2 – similarities between the 2 shapes, Column 3 – differences between the 2 objects. Teacher repeats this with a variety of objects |
| LEARNING SEQUENCEExtension Late S2, Early S3 | * **Variety of problem solving activities using 3D Objects at:**
* <http://nrich.maths.org/4911>
* <http://nrich.maths.org/2343>
* <http://nrich.maths.org/7300>
* <http://nrich.maths.org/64>
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| **EVALUATION & REFLECTION** | **Student Engagement:** **Achievement of Outcomes:****Resources:** **Follow Up:** |