**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK: 3 | STRAND: Measurement & Geometry | **SUB-STRAND:** 3D Space 1 | **WORKING MATHEMATICALLY:**  MA3-1WM & MA3-3WM |
| OUTCOMES: MA3-14MG | | **Identifies three-dimensional objects, including prisms and pyramids, on the basis of their properties, and visualises, sketches and constructs them given drawings of different views.** | | |
| **CONTENT:** | | **Compare, describe and name prisms and pyramids**   * Identify the ‘base’ of prisms and pyramids * Name prisms and pyramids according to the shape of their base, eg rectangular prism, square pyramid * Recognise that pyramids do not have a uniform cross-section when the section is parallel to the base * Determine that the faces of pyramids are always triangles except the base face, which may not be a triangle * Use the term ‘apex’ to describe the highest point above the base of a pyramid or cone | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | **Pre-Assessment**  Give students the name of a particular pyramid and have them write down a description for it. The description should use correct mathematical terminology. Have the student then draw the pyramid based on their description. | | |
| WARM UP / DRILL | | **3D Shape Sort –** Give each student a mini white board, or blank piece of paper. Read out the description of various pyramids and other 3D shapes and have students sketch the shape you are describing. Once the student has a sketch completed and thinks that they know what shape it is, have them hold up their board/paper. The class competes against one another, or table groups against table groups. | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | I have one face that is a square, my other faces are triangles that meet at a point called an apex. What object am I? | | |
| 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, IWB presentation on 3D shapes, Video on identifying bases to determine if a shape is a prism or pyramid <http://on.aol.com/video/how-to-identify-prisms-275615142> , plasticine, unifix cubes, fishing line, pipe cleaners, straws, bubble mixture, white boards and paper | | |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES | |
| * Explicitly communicate lesson outcomes and work quality. * **Revise metalanguage used in this unit** e.g. three-dimensional shape (3D), prism, cube, pyramid, base, uniform cross-section, face, edge, vertex (vertices), apex, top view, front view, side view, depth and net. * Have students create or add language to existing maths glossary.  ☐ View Slide-share on comparing Prisms to Pyramids.<http://www.slideshare.net/hannaht126/primary-differences-between-prisms-and-pyramids>  * On completion of activity, show students the Great Pyramid of Giza on Google Earth, on the IWB. Have students explore the landscape and compare the size of The Great Pyramid to other land features. Discuss the features of the pyramid. * **Investigate** various pyramid   cross-sections and **discuss why** the term ‘uniform cross-section’ does not apply.   * **Explicitly** teach the term ‘apex’ | LEARNING SEQUENCERemediationS2 or Early S3 | ☐ Investigate and revise 2D shapes and their properties.  ☐ Review nets of various 3D shapes and terminology.  ☐ Review the properties of a prism and a pyramid. |
| LEARNING SEQUENCES3 | * **Creating 3D shapes:** Give students a variety of different pyramid nets and have them construct and decorate them. In pairs, investigate the similarities between each pyramid. Discuss the key features of a pyramid. * **Computer Sketch:** In pairs, students work together to describe and create a pyramid on the computer. Student A selects a pyramid and describes how to draw it. Student B follows the instructions to draw the object. Both students reflect on the drawing. Students then reverse roles. Students work together to ensure that they have completed the task correctly. * **Plasticine models/cross-sections:** Have students create various pyramids using plasticine and have them use fishing line to explore making various cross-sections. Have students record their observations and sketch their findings. * **Environmental Investigation:** Have students explore the school and take photos of various pyramids with iPads. Upon returning to class have students share photos with other groups and then create a drawing of their photo. * **Investigation:** In pairs students research a famous pyramid from somewhere around the world. Students can create a diorama of the pyramid with information about the size, date it was built, how it was built etc. * **Assessment** – Create a written assessment that has various prisms and pyramids, have students name the 3D shapes and also draw the cross section for each. Students could also list the properties for each shape. |
| LEARNING SEQUENCEExtensionEarly S4 | **Extension:** Have students investigate how they think the Egyptians built the Great Pyramid of Giza. Students need to research the Pyramid and the materials that were used to create it. Students should look at the dimensions of the Pyramid before writing their hypothesis. |
| **EVALUATION & REFLECTION** | **Student Engagement: Achievement of Outcomes:**  **Resources: Follow Up:** |