**MATHEMATICS STAGE 1**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK: | STRAND: Measurement and Geometry | **SUB-STRAND:** 3D Space | **WORKING MATHEMATICALLY:**  MA1-1WM |
| OUTCOMES: MA1-14MG | | **Sorts, describes, represents and recognises familiar three-dimensional objects, including cones, cubes, cylinders, spheres and prisms.**  Describes mathematical situations and methods using every-day and some mathematical language, actions, materials, diagrams and symbols.(WM1) | | |
| **CONTENT:** | | **Describe the features of three-dimensional objects**   * Use the terms ‘flat surface’, ‘curved surface’, ‘face’, ‘edge’ and vertex appropriately when describing three-dimensional objects * Describe the number of flat surfaces, curved surfaces, faces, edges and vertices of three-dimensional objects using materials, pictures and actions | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | Pre–Assessment What are the different 3D objects students know? Describe 3D objects found around the room. Think, pair, share: which objects are similar/different and why? | | |
| WARM UP / DRILL | | Students are given multiples of the one shape and are to make as many other shapes as possible using only this shape.  Students are to record their different combinations of common shapes and display to the class. | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | If I had 3 cubes, 1 rectangular prism, 1 sphere and one cylinder, how many faces would I have altogether? How many are flat? How many are curved? | | |
| 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 classroom solids  Collection of magazines/newspapers | | |

**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 used in the unit.**   Flat surface- A plane horizontal surface with no depths.  Curved surface-A surface having no part that is a plane surface.  Face- Any of the individual surfaces of a solid object.  Edge- The line at which two surfaces of a solid object meet.  Vertex- A point where two or more edges meet. Review the properties of prisms, cylinders, cones and spheres. The discussion should bring up whether the faces are curved or flat, the shape of the faces and the number of faces, edges and corners.Talk about the shapes of the faces, recognising that 3D objects look different from different views e.g. a cup, a cone. | LEARNING SEQUENCERemediationES1 | Free Play (Three-dimensional Space) In groups, students participate in free play using a wide variety of collectable and commercial materials on a regular basis e.g. Lego, Duplo, boxes, everyday three-dimensional objects. Free play sessions may also be used to practise teacher-directed activities.  *Possible questions include:*   * Can you sort the three-dimensional objects? * Can you describe your sorting? * Can you describe the features of each three-dimensional object? |
| LEARNING SEQUENCES1 | Visualising 3D Objects: Put the solid set into a cardboard box and cover the box with a cloth. Invite a volunteer to place his or her hands inside the box and to identify one of the objects by touch. Encourage remaining students to help the volunteer by suggesting aspects to explore, such as the shape and number of faces using the terms ‘faces’, ‘edges’ and ‘corners’. Once the volunteer is sure, or cannot determine what the object is, have him or her pull the object out of the box to show the class. Discuss what features helped, or could help, identify the object. Repeat with other students.Barrier Game: Students can then work in pairs, standing back-to-back with their partner who is holding a classroom solid. The student asks questions to determine the solid, only saying the name of the object when he or she is sure what it is.Investigation: Children look for 3D objects in the ‘real’ world. Collect pictures from magazines, old photographs, birthday cards etc. of 3D objects. In Art, children could make a collage using these objects.  * **Assessment**: Lay two hoops side by side on the ground. Explain that the class is going to use the two hoops to sort the objects into two categories- those that have flat faces and those that have curved surfaces.   Choose a cube and a sphere and ask volunteers to place them in the appropriate hoops. Then hold up a cylinder and ask: Where is this object going to go? Discuss the fact that it has both curved and flat surfaces.  Guide students to consider overlapping the hoops to form an area to place objects that have both properties. Place cylinder in this area and explain to students that as the cylinder has curved and flat surfaces it belongs to both groups and so it goes in the middle where the two groups overlap. Invite volunteers to place the remaining objects. |

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|  | LEARNING SEQUENCEExtensionEarly S2 | What Object Am I? A child describes an object to a group, e.g. I have 4 triangular faces and 4 corners. Children in the group take turns to guess. The child who guesses correctly then chooses another object. Present. Discuss with children why the groups have been formed.Definitions of Prisms Ask children to come up with a definition while looking at a variety of Prisms and Pyramids. \*(Teachers definition - A solid comprising two congruent parallel faces and the lateral faces that connect them. Prisms are named according to their two matching parallel faces.) |
| **EVALUATION & REFLECTION** | **Student Engagement:** **Achievement of Outcomes:**  **Resources:** **Follow Up:** |