**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:** | | **Recognise and classify familiar three-dimensional objects using obvious features**   * Use the terms ‘surface’, ‘flat surface’ and ‘curved surface’ in describing familiar three-dimensional objects. * Identify the type and number of flat and curved surfaces of three-dimensional objects. * Use the term ‘face’ to describe the flat surfaces of three-dimensional objects with straight edges, including squares, rectangles and triangles. * Distinguish between ‘flat surfaces’ and ‘curved surfaces’ and between ‘flat surfaces’ and ‘faces’ when describing three-dimensional objects. | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | Shape Glossary: Students work in small groups to create a Shape Glossary where they record all the words they know that they can use to describe 2D and/or 3D Objects as well as their understanding of the meaning of that word. | | |
| WARM UP / DRILL | | Give students laminated cards (describing descriptions of 2D shapes) along with 2D shape models. Children sit around in a circle with laminated cards face up on the floor in the middle. One child chooses a description which is read to the class.  He/she must then choose the matching shape. | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | If I had 2 cubes, how many flat faces would there be altogether?  How many flat and curved surfaces does a cone have? | | |
| 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 | | Approximately 15 classroom solids such as prisms, cylinders and cones (1 for each pair of students), Hula hoop, Sticky notes | | |

**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, curved surface.-  face, edge, vertex-   * Show the students the solids. Hold up a cube and ask: *What is something special about the faces of this object?* (They are all squares.) Introduce the name ‘cube’ to describe the object and label the cube using a sticky note. * Invite a volunteer to find another cube from among the collection of solids. Have them describe how the two cubes are similar. Bring out the fact that cubes have six faces that are all the same size and shape. * Hold up a rectangular-based prism that has no square faces and ask: *How is this object like a cube?* (It has six faces. It has straight edges. It has eight corners.) *How is it different?* (Its faces are not squares.) * Repeat the discussion, comparing a cone to a cylinder, a cylinder to a sphere and a prism to a cylinder. | LEARNING SEQUENCERemediationES1 | * **Feely Box:** Take a box. Cut a hole in one end and attach a piece of cloth or the end of an old sock so the children can put their hand through the hole without seeing what is inside the box. Place different objects in the box. Have the children draw what they feel. |
| LEARNING SEQUENCES1 | * **Direct students to consider how to sort the objects into different groups.** Groupings could be simple, such as whether the objects have flat or curved faces, or complex, such as whether they are prisms or ‘something else’. Students work in pairs to create their own groupings. * **Investigation:** Hold up a polydron (e.g. a rectangle). Ask: Which 3D object could this rectangle be one face of? Discuss the students’ ideas and invite volunteers to identify a similar face on one of the classroom solids. * **Assessment:** Show a range of 3D objects, one at a time, and have students describe the characteristics of each object. Then show a picture of each of the 3D objects discussed and ask volunteers to describe the characteristics. Ask students to consider whether it is easier to use a real object or a picture to discuss the characteristics. |
| LEARNING SEQUENCEExtensionEarly S2 | * **Hula hoop activity:** Place a hula hoop on the ground and say: *Everything inside the hoop has to have three or more flat faces*. Choose volunteers to sort the objects accordingly. Repeat with other categories. Alternate with other ideas such as: *Everything inside the hoop cannot have a curved face.* * **Pyramid Investigation:** Display a variety of pyramids and ask children what we know about these objects. Children discuss features. * **Definitions:** Have children come up with their own definition of what is a pyramid?   (Teachers definition - A solid with any polygon as its base. The other faces are triangles that meet at a common vertex. Pyramids are named according to their base.) |
| **EVALUATION & REFLECTION** | **Student engagement:** **Achievement of Outcomes:**  **Resources:** **Follow up:** |