**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| TERM: | WEEK: 1 | STRAND: MEASUREMENT AND GEOMETRY | **SUB-STRAND: VOLUME & CAPACITY 2** | **WORKING MATHEMATICALLY:**  **MA3-1WM** |
| OUTCOMES: MA3-11MG | | **Selects and uses the appropriate unit to estimate, measure and calculate volumes and capacities and converts between units**  **of capacity.** | | |
| **CONTENT:** | | **Connect volume and capacity and their units of measurement (ACMMG138).**   * Select the appropriate unit to measure volume and capacity * Demonstrate that a cube of side 10cm will displace one litre of water * Demonstrate using a medicine cup that a cube 1 cm will displace 1 mL of water * Equate 1 cubic cm to 1mL and 1000 cubic cm to 1 litre * Find the volumes of irregular solids in cubic centimetres using a displacement strategy | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | * Worksheet-To choose and use appropriate units and instruments given a choice of several measurements and displacement types | | |
| WARM UP / DRILL | | * Identify types of measurements used for a variety of measuring situations eg distance-cm, mm, metres, km | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | Jack put six blocks each measuring five centimetres in length into a ten litre bucket of water. How much water was moved once all the blocks were in the bucket? | | |
| 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 | | Measuring cylinders, measuring jugs (variety of sizes and widths up to one litre and beyond), bowls, cups, jugs, water, sieves, wooden cm cubes etc. | | |

|  |  |  |
| --- | --- | --- |
| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES-minimum two lessons suggested | |
| Explicitly communicate lesson outcomes and work quality.  * **Teach and Review**   The comparison of millilitres to litres, the term cubic and how it is applied to shapes measured by length, width and height.   * **Define and reinforce metalanguage used in this unit**   Eg. Three dimensional shape, millilitre, litre, container, volume capacity, measure, convert, record, mark, blocks, cubic, predict, measure   * **Revise the names -**   Of volume and capacity terms from Year 5 including ways of expressing a 3D measurement and calculating the volume of an object given its measurements | LEARNING SEQUENCERemediationS2 or Early S3 | * Review terms used in volume and capacity and what they look like and mean. * Revise use of cubic centimetres in building larger objects into 3D configuration (both regular and irregular). * Revise appropriate use of volume measurements eg cubic centimetres for a small box, cubic metres for a large room. * Revise knowledge of relationship of liquid measurements eg. mL to L |
| LEARNING SEQUENCES3 | **Whole Class Instruction and Modelled Activities.**   * Worksheet-choose and use appropriate units and instruments given a choice of several measurements and displacement types * Introduce the activity as the measurement of volume by displacement. * Questioning-Show the students a model built from 1 cm blocks and a calibrated container partially filled with water. Ask the students how the volume of the model can be measured. * Discuss how to mark the water level, drop the model carefully into the water, and mark the new water level on the container. Calculate and record the volume of water displaced and compare with the volume measured by counting the blocks in the model. Discuss the relationship between number of cm blocks and mL moved. What conclusion and prediction can you make? * Investigation: Test prediction using a variety of model sizes matching cms to mL moved. Make cube models up to 10cm sides in length and predict mL s moved - what relationship does the number of cubic centimetres used have to the mL displaced-10x10x10-1000 cubic cm? |
| LEARNING SEQUENCEExtensionEarly S4 | * Evaluational Activity - Have your students work in pairs to build a model from 1 cm blocks, measure the volume of the model by displacement and record the results. Swap the marked container with another pair of students. Estimate and record the volume of the model that was added to the container which they have just received. Check the estimated volume by building a model and measuring by displacement. Check the results with the students who marked the water level. (teacher observing and making anecdotal notes on individual understanding) |
| **EVALUATION & REFLECTION** | **Student engagement Achievement of Outcomes**  **Resources Follow-up** |