**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| TERM:  | WEEK: 5 | STRAND: Measurement and Geometry | **SUB-STRAND: Volume and Capacity 2** | **WORKING MATHEMATICALLY:** **MA2 – 1WM** |
| OUTCOMES: MA2 – 11MG | **Measures, records, compares and estimates volumes and capacities using litres, millilitres and cubic centimetres.** |
| **CONTENT:**  | **Use scaled instruments to measure and compare [capacities](http://syllabus.bos.nsw.edu.au/glossary/mat/capacity/?ajax" \t "_blank" \o "Click for more information about 'capacities') (ACMMG084)*** Recognise the need for a formal unit smaller than the litre to measure [volume](http://syllabus.bos.nsw.edu.au/glossary/mat/volume/?ajax" \t "_blank" \o "Click for more information about 'volume') and capacity
* Recognise that there are 1000 millilitres in one litre, ie 1000 millilitres = 1 litre
* Relate the millilitre to familiar everyday containers and familiar [informal units](http://syllabus.bos.nsw.edu.au/glossary/mat/informal-unit/?ajax" \t "_blank" \o "Click for more information about 'informal units'), eg 250 mL fruit juice containers, 1 teaspoon is approximately 5 mL (Reasoning)
 |
| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * Worksheet – compare and order the capacities of two or more containers, and convert between millilitres and litres.

<http://www.studyladder.com.au/resources/teacher/mathematics?section=40> |
| WARM UP / DRILL | * IWB - Millilitres and litres: Activity 1

 <http://www.studyladder.com.au/resources/teacher/mathematics?section=40> |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | * I bought three cartons of milk. Each carton held 250ml of milk. How much milk did I buy in all?
 |
| 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 | IWB, measuring device calibrated in multiples of 100, containers with different capacities and volumes, cubic centimetre blocks and water. (Page 41- Signpost Maths Assessment Middle Primary). |

**TEACHING AND LEARNING EXPERIENCES**

|  |  |
| --- | --- |
| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| Explicitly communicate lesson outcomes: Students should be able to recognise the need for a formal unit smaller than a litre to measure volume and capacity, and that there is 1000 millilitres in 1 litre.* **Teach and review:** Volume and capacity can relate to the measurement of three-dimensional space, in the same way that area relates to the measurement of two-dimensional space.

Capacity refers to the amount a container can hold, and can be measured in millilitres (mL) and/or litres (L). There are 1000 mL in 1 L.Volume is the amount of space an object occupies. It can be measured in cubic centimetres (cm2) and cubic metres (m2).* **Define and reinforce metalanguage:** capacity, container, volume, measure, estimate, full, empty, liquid.
 | LEARNING SEQUENCERemediationS1 or Early S2 | * **How Could I Measure?** Students suggest different materials that could be used to measure different containers, e.g. sand, water for cylindrical containers, blocks for rectangular boxes. Record what happened when different materials were used.
 |
| LEARNING SEQUENCES2 | * **Brainstorming:** Ask students in groups of four to brainstorm what they know about measuring liquids and what units of measurement they could use. Provide students with containers with capacities labelled. Ask them what the L and mL might mean. Ask them to order the containers from least to greatest capacity and then discuss how many millilitres there are in 1 litre. Have them use calibrated containers to test.
* **Kinaesthetic challenge**: Provide students with unmarked containers and ask them to estimate the capacity. Have them check their predictions using a calibrated container.
* **Investigation**: Use a calibrated measuring device calibrated in multiples of 100 mL and familiar everyday containers. Ask students to compare the containers and group them into less than 1 litre and more than 1 litre. Have students estimate and measure their capacities in millilitres.
* **Assessment –** Students complete an assessmentsheet with the following questions. Which containers would hold less than a litre? What is the best estimate for the capacity of each container? Would you use litres or millilitres to measure the following? What is the total capacity of each set of containers? Which labels have been correctly written?
 |
| LEARNING SEQUENCEExtension Late S2 or Early S3 | * **Investigation:** Students estimate and explore how many base 10 cubes would be needed to cover the base of the cubic metre model. Students then calculate how many layers would be needed to fill the cubic metre model.
* **Investigation:** Students investigate the volume of the classroom. After estimating, students use rulers and measuring tapes, to measure the length, width and height of classroom walls.
 |
| **EVALUATION & REFLECTION** | Where the students engaged? Where resources appropriate? Did students achieve outcomes? What follow up is recommended? |

* All assessment tasks should be written in **red** and planning should be based around developing the skills to complete that task.
* Assessment rubrics or marking scale should be considered.