**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK: 3 | 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 (ACMMG084)*** make a measuring device calibrated in [multiples](http://syllabus.bos.nsw.edu.au/glossary/mat/multiple/?ajax" \t "_blank" \o "Click for more information about 'multiples') of 100 mL to measure volume and capacity to the nearest 100 mL
* convert between millilitres and litres, eg 1250 mL = 1 litre 250 millilitres
* compare and order the capacities of two or more containers measured in millilitres
* interpret information about volume and capacity on commercial packaging (Communicating)
* estimate the capacity of a container in millilitres and check by measuring
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * Worksheet – Students name everyday 1 litre containers and estimate the volume of partially filled 1 litre containers from the information on the label.
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| WARM UP / DRILL | * IWB - **Millilitres and litres: Activity 3**

 <http://www.studyladder.com.au/resources/teacher/mathematics?section=40> |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | * A jug holds 500ml of juice. After I pour a glass there is 425ml of juice left in the jug. How much juice did I pour into my glass?
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| 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
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| 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**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| Explicitly communicate lesson outcomes: Students should be able to recognise that there are 1000 millilitres in one litre. * **Teach and review:**

 1000 millilitres = 1 litre. 500 mL + 500 mL = 1 Litre 250 mL times 4 = 1 Litre  1250 mL = 1 litre 250 millilitresThe displacement strategy for finding the volume of an object relies on the fact that an object displaces its own volume when it is totally submerged in a liquid.Capacity refers to the amount a container can hold. 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 | * **Pour and Order**

Students are asked to compare and order the capacities of containers eg a cup, a jug and a pan. Students are encouraged to use their own methods. Students may fill one container and pour the contents into another container, or pour the contents of each of the containers into a third larger container and mark each level. |
| LEARNING SEQUENCES2 | * **Brainstorming:** Ask students to find examples of millilitres and litres on containers in magazine pictures. Have them discuss the need for formal units.
* **Kinaesthetic challenge**: Students collect containers which have a labelled capacity of less than 1 L, e.g. 500 mL, 250 mL. Students calculate how many times each container will have to be filled to make 1 L, record and then check by filling with water and pouring into the 1 L measure. Students then compare and order the capacities of the containers measured in millilitres. Students may need to be reminded to keep an accurate tally of the number of times they filled their container.
* **Investigation**: Students mark 100 mL gradations on an empty plastic container, using water poured from a measuring jug. Students use their calibrated container to identify single or multiple objects which displace 100 mL (marbles, golf balls, bolts, scissors or rocks) Variation: students use their calibrated container to estimate, measure and record the capacity of a variety of containers to the nearest 100 mL.
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| LEARNING SEQUENCEExtension Late S2 or Early S3 | * **Volume and Displacement:** Students participate in the following interactive, solving the volume problems:<http://www.learnalberta.ca/content/mesg/html/math6web/index.html?page=lessons&lesson=m6lessonshell15.swf>
* **Object sort:** On the IWB, sort objects into two groups; those objects that are measured in $cm^{3}$ and those, which are measured in $m^{3}$.
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| **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.