**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK: 2 | 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 decimal representations to the metric system.*** Recognise the equivalence of whole number and decimal representations of measurements of capacity.
* Interpret decimal notation for volumes and capacities eg. 8.7L is the same as 8 litres and 700 millilitres
* Record volume and capacity using decimal notation to three decimal places eg. 1.275L
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * Worksheet - matching of decimal litres to litres and millilitres and millilitres alone
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| WARM UP / DRILL | * Drilling of measurement facts concentrating on the place value of numbers eg. How many metres in a kilometre-1000 metres, centimetres in a metre-100 cm, grams in a kilogram-1000 grams. (Concentrating on the place value of each measurement with particular reference to number of zeros giving the measurement value).
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| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | A boy had bottles of water. One had 2725mL, a second had 1.45L and the third had 0.155mL. How much water is litres are there in all three containers? |
| 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 | Measuring jugs calibrated in mL and L, paper, access to water, several tables with all round access, measurement charts. |

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES |  GUIDED & INDEPENDENT ACTIVITIES-minimum three lessons suggested |
| Explicitly communicate outcomes of lesson and quality of work.* **Teach and Review**-the number of millilitres in a litre. The method of converting millilitres to litres by use of repeated 10’s. The function of the decimal point in denoting value in a number. The use of place fillers in numbers eg. 2.100= 2.1, 0.34-demonstrate
* **Discussion**-talking about the measuring of capacity involving liquids using millilitres and litres. Developing student led discussion skills in group through observation and investigation.
* **Linking** practical work on measuring and comparing millilitres to litres and millilitres and then to decimal litres through practical work-further linking concrete to abstract through the use of repeated 10s multiplication and completing the understanding of 1000 as the basis of all conversions and application to decimal measurement.
 | LEARNING SEQUENCERemediationS2 or Early S3 | * **REVISE USE OF MEASUREMENT TERMS**
* How many millilitres would we need to make a litre?
* What does the prefix ‘milli’ mean?
* Does ‘milli’ mean thousandth?
* We need 1 times 10 times 10 times 10
* 1 times 10 equals 10, times 10 equals 100, times 10 equals 1000
* So we’ll need a thousand millilitres to make a litre
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| LEARNING SEQUENCES3 | * **INVESTIGATION/DISCUSSION**
* Here is a measuring jug marked in millilitres and litres
* Can you see that we need 1000 millilitres to make a litre?
* Let’s measure the capacity of a container in millilitres and litres
* What is the capacity of the container?
* Is the capacity 1 litre and 250 millilitres?
* So could we say we have 1000 millilitres plus another 250 millilitres?
* Does that equal 1250 millilitres? – practice with a variety of measurement amount comparing the jug calibrations
* Can you express this as a decimal using the number of places in a thousand as your guide-question-how many whole litres-one what remains out of the millilitres 250 (count three places in to give your decimal point position-1.250L
* Express your millilitres and litres in a shortened form. Is 8L 700mL the same as 8.700L? How many places do you need after the decimal point? Can you express it as 8.7Land still have the same measurement?
* On your worksheet use 1000 to divide millilitres into decimal litres eg 9626mL divided by 1000=9.626L- drill.
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| LEARNING SEQUENCEExtension Early S4 | * **REVISE USE OF MEASUREMENT TERMS**
* How many millilitres would we need to make a litre?
* What does the prefix ‘milli’ mean?- revising previous knowledge as linkage.
* Does ‘milli’ mean thousandth? – display as a fraction
* We need 1 times 10 times 10 times 10
* 1 times 10 equals 10, times 10 equals 100, times 10 equals 1000
* So we’ll need a thousand millilitres to make a litre.
* Worksheet-conversion of millilitres to litres, millilitres to litres and millilitres, millilitres to decimal litres-testing understanding
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| **EVALUATION & REFLECTION** | **Student engagement Achievement of Outcomes****Resources Follow-up** |