**MATHEMATICS STAGE 1**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK: 7 | STRAND: Measurement and Geometry | **SUB-STRAND:** Mass 2 | **WORKING MATHEMATICALLY:** MA1-1WM MA1-4WM MA1-3WM |
| OUTCOMES: MA1-12MG  | **Measures, records, compares and estimates the masses of objects using uniform informal units**  |
| **CONTENT:**  | **Compares the masses of objects using balancing scales (ACMMG038)*** Estimate mass by referring to the number and type of uniform informal unit used and check by measuring
* Predict whether the number of units will be more or less when a different unit is used, eg 'I will need more pop sticks than blocks as the pop sticks are lighter than the blocks' (Reasoning)
* Record masses by referring to the number and type of uniform informal unit used eg 'I will need more pop sticks than blocks as the pop sticks are lighter than the blocks' (Reasoning)
* Solve problems involving mass (Problem Solving)
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * Can students accurately work out the difference in mass between two items measured with the same type of informal units?
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| WARM UP / DRILL | * **No more gaps -** Class discussion and prediction the mass of the same quantity of a specific objects in two differen structures. For example:
* Is a flat heavier/lighter or the same mass as 10 longs, 5 longs, 20 longs?
* Is a bundle of 10 paddlepop sitcks heavier/lighter or same mass as 20 loose paddlepop sticks, 10 loose paddlepop sticks, 5 loose paddlepop sticks.

Student’s then measure each quantity to find the mass. |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  |  |
| 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 | Metalanguage signage and environmental poster displayItems of different massMAB BlocksDifferent objects for measuring the mass of.Different units for measuring mass (marbles, paddlepop sticks, pencils, glue sticks, pasta, paper clips)Equal arm balances. |

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| Explicitly communicate lesson outcomes and work quality.* Explicitly communicate expectations of working in partners / small groups.
* Explicitly communicate expectations of working with equipment.
* Explicitly communicate how findings are to be recorded.
* **Teach and Review**
* Introduce the lesson as the

measurement of *mass*.• Demonstrate the mass of the object using MAB flats.* Record the result.
* Ask students to predict to whether the number of units to measure the object would be more of less if they used longs and give reasons why. Ask students to estimate how many longs would be needed.

• Demonstrate measuring with longs. Discuss the need to use more longs to measure the mass of the same object, because the longs are smaller and lighter. Instruct how to calculate the number of longs needed based on the number of flats used Also discuss how this makes the measurement more accurate.• Record the result and calculation.* Ask students to predict to whether the number of units to measure the object would be more of less if they used shorts and give reasons why. Ask students to estimate how many shorts would be needed.

• Demonstrate measuring with shorts. Discuss the need to use more shorts to measure the mass of the same object, because the shorts are smaller and lighter than both the flats and longs. Instruct how to calculate the number of shorts needed based on the number of longs used. Also discuss how this makes the measurement even more accurate.• Record the result and calculation.  | LEARNING SEQUENCERemediationES1  | ***Use a pan balance to compare the masses of two objects.**** **Everyone can be a balance**

Students stand with their arms outstretched to simulate equal-arm balances. Teacherholds an object in each hand and asks students to predict and demonstrate whatwould happen to their arms if the objects were placed in their hands. The teacherplaces the objects in a student’s hands to test the predictions. Student’s then use an equal arm balance to check they were right.* **What’s your prediction?**

Pairs of students compare three groups of items which have the same number, butdifferent kinds of objects, such as five pencils, five cups and five interlocking blocks orthree empty margarine containers, three blocks and three balls. Students predict first,then find which group has the greater mass by using an equal-arm balance. |
| LEARNING SEQUENCES1 | **Investigation*** **Let’s be accurate!** - Investigation in pairs or small groups. Class finds the mass of a given object using flats. Students predict whether more or less of a smaller unit (longs) will be needed to measure the mass. Student estimate how many of the smaller unit (longs) will be needed to measure the mass. Students measure using the smaller unit (longs) and record the result and calculation. Students repeat the same exercise measuring with shorts.

Students measure a new object with shorts and repeat the above activity to work out how many longs / flats will be needed to measure the mass of the same object. Students record the results and calculations. Students measure a new object with longs and repeat the above activity to work out how many shorts / flats will be needed to measure the mass of the same object. Students record the results and calculations. * **Work it out -** Teacher or student measures the mass of an object in blocks (e.g. using ten blocks)

Using this measure, students predict whether more or less of another unit, e.g. marbleswould be needed to balance the object and why. Record the estimate and reasoning and before using an equal arm balance to check. Repeat using other units (eg: pencils, pasta, paddle pop sticks, paper clips, small glue sticks.)* **Interactive activity –** Measure mass using a balance scale (informal units) <http://www.studyladder.com.au/resources/teacher/mathematics?section=39>
* **Assessment**

Can the students accurately predict whether the number of units to measure an object will be more or less when a different unit is used? Can the student accurately estimate the number of units used to measure an object with a different unit (based on whether the new unit is heavier or lighter.) Can the students give valid and accurate reasons for their predictions? |
| LEARNING SEQUENCEExtension Early S2 | **Recognise the need for a formal unit to measure mass.*** **Let’s be accurate!** – from completing this activity, students reason why it is important to have a formal unit for measuring mass.
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| **EVALUATION & REFLECTION** | **Student engagement:** **Achievement of Outcomes:****Resources:** **Follow up:** |

* 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.