**MATHEMATICS STAGE 1**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK: 5 | 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)*** compare two or more objects according to their masses using appropriate uniform informal units
* record comparisons of mass informally using drawings, numerals and words, and by referring to the uniform informal units used
* solve problems involving mass (Problem Solving)
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * Can students pick the correct type of informal unit to measure mass for the object

 **and** * Accurately use an equal arm balance to measure that object using the chosen informal unit. (Use Make Another Bag for Pre-assessment)
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| WARM UP / DRILL | * **Make Another Bag -** The teacher displays a bag with some blocks in it. Students make a bag that has the same mass by filling with blocks and then hefting the two bags. Students find the mass of just their bag by choosing appropriate units and measuring on an equal-arm balance. The measuring process and results are recorded.
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| 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 massIdentical bags or containers filled with varying amounts of the same material such as pasta, marbles, crumpled paper, nails, screws or beads.Identical bags or containers filled with different materials such as pasta, marbles, crumpled paper, nails, screws or beads.Equal arm balances. |

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| TEACHING AND LEARNING EXPERIENCES 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 activity as a way to compare mass of different objects.
* How to choose identical units to measure two different items.
* How to measure the mass of the first item on the equal arm balance. Record the result. Remove the item from the equal arm balance. Then repeat the aforementioned steps with the second item. Explain how this procedure can be used to order the mass of more than two objects.
* That the heavier mass weighs more units and the lighter mass weighs less units.
* How to estimate the number of units for the second item, based on whether it is heavier or lighter than the first item.

That mass is conserved if a group of items are rearranged | LEARNING SEQUENCERemediationEarly S1  | ***Place objects on either side of a pan balance to obtain a level balance.**** **Make the same mass**

Students make a mass (e.g. with modelling clay) that is the same as a given mass. They check using hefting and an equal arm balance. |
| LEARNING SEQUENCES1 | Investigation:* **Which is Heavier** – Working in partners students estimate, and then find which of two bags is heavier (but the students are not allowed to heft them or to put them on the equal arm balance together). Students have to measure the mass of the first bag using informal units. Record the results. Then remove the bag. Then students measure the mass of the second bag on the equal arm balance using the same type of informal unit. Record the results. Student then compare the results of the two bags to work out which bag is heavier. Students then repeat this activity with different objects.
* **Heaviest Pencil Case** – Students work in groups of three or four to estimate, and then measure whose pencil case is heaviest by measuring the mass of each pencil case with blocks (teddies, marbles etc.) and recording the results. Students need to ensure that the same informal units are selected for measuring each pencil case. Students then record the order of pencil cases from lightest to heaviest.
* **Mystery Boxes –** Working in groups,students are given three or four identical opaque boxes, such as margarine containers, which each hold one item. Student measure the mass of each container using an equal arm balance and informal units and record the mass to work out which contain is heavier/lighter. Students place the containers in order by mass and record their prediction of what the contents might be.

**Assessment*** **Has to be the same mass –** The teacher’s mystery object can be balanced by five blocks. Student’s need to find or make three objects that would have the same mass. (This must be done without hefting, with using an equal arm balance and using blocks as informal units.) Student’s need to record their results and prove their objects are the same mass as the teacher’s. Students record their trials and answers. *This activity can be modified so that the students can find or make objects that are lighter/heavier than the teacher’s object. For extension students can find or make objects that are slightly lighter/heavier and very heavier/lighter than the teacher’s object.*
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| LEARNING SEQUENCEExtension Early S2 | ***Compare and order two or more objects by mass measured to the nearest kilogram.**** **Which is Heavier –** Students complete this activity but instead of measuring with informal units they measure with kilograms.
* **Heaviest Pencil Case** - Students complete this activity but instead of measuring with informal units they measure with kilograms.
* **Mystery Boxes** - Students complete this activity but instead of measuring with informal units they measure with kilograms.
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| **EVALUATION & REFLECTION** | **Student engagement:** **Achievement of Outcomes:****Resources:** **Follow up:** |