**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK: 1 | STRAND: Measurement & Geometry | **SUB-STRAND:** Mass 2 | **WORKING MATHEMATICALLY:**  MA2-1WM, MA2-2WM |
| OUTCOMES: MA2-12MG | | **Measures, records, compares and estimates the masses of objects using kilograms and grams.** | | |
| **CONTENT:** | | **Use scaled instruments to measure and compare masses (ACMMG084)**   * recognise the need for a formal unit smaller than the kilogram * recognise that there are 1000 grams in one kilogram, ie 1000g = 1 kilogram * use the gram as a unit to measure mass, using a scaled instrument * associate gram measures with familiar objects, eg a standard egg has a mass of 60 grams (reasoning) | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | * I spy In pairs, students list as many things as they can in the room that have a mass of 1 kilogram. | | |
| WARM UP / DRILL | |  | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | Can you find two objects in the classroom that have the same size but different mass? | | |
| 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 | | **Introducing Grams – grams to kilograms matching game**  **Make 50 grams –** scales, blocks, dice and counters from the classroom, as well as small food items such as peanuts or crackers, and household items including nails, bolts and batteries  **Mass Hunt -** scales  **By the cupful –** scales, cups of different materials to be measured in grams | | |

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES | |
| Explicitly communicate lesson outcomes  * **Teach and Review - Introducing Grams** * Revise with students the methods used so far to measure mass (equal arm balance, hefting, scales). Revise also their experiences where they had to try to find objects to make one kilogram. * Ask how can we measure the mass of objects that are less than one kilogram or a bit more than one kilogram? * Explain to students that the gram is a very small unit of measurement. 1000g = 1kg.  It is helpful for students make links with kilometres and metres. 1000m=1km. * Watch <http://www.youtube.com/watch?v=nuyiT_eRpgI> * **Understanding How Grams Combine To Make Kilograms**  Have students play a 1 kilogram matching game where they need to match the number of grams needed to make 1 kilogram. For example 2x 500g = 1kg, 10x 100g= 1kg  ***\*Assessment - anecdotal observation of game*** **Questioning**   When might I want a unit of measure that is smaller than a kilogram?  What can I buy or measure in grams? | LEARNING SEQUENCERemediationS1 or Early S2 | 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 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 the difference in mass between the two bags. Students then repeat this activity with different objects. * **Two Mystery Boxes –** Working in pairs,students are given two 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 the difference in mass between the two containers.   <http://www.studyladder.com.au/resources/teacher/mathematics?section=39> |
| LEARNING SEQUENCES2 | **The stations may be taken as whole class activities or they may be set up as activities that group students**   * **Make 50 grams**   Students estimate how many of each object is needed to make a mass of 50 grams. Students select objects, record their estimate, then measure and record the actual number of objects needed to make a mass of 50 grams. Materials to weigh can include blocks, dice and counters from the classroom, as well as small food items such as peanuts or crackers, and household items including nails, bolts and batteries   * **Mass Hunt**   Find objects in the classroom, school, playground and home that have a mass of approximately 1g, 5g, 10g, 100g, 500g, 1kg. Record results in a table. Associating gram measurements with familiar objects.   * **By the cupful**   Students measure and compare the mass of cupfuls of different materials. Students estimate first by hefting, and then measure the cupfuls to find the heaviest cupful and the lightest cupful. Students order and record their measurements to the nearest 10 grams. *Extension*: students graph the results. |
| LEARNING SEQUENCEExtension Late S2 or Early S3 | * **Investigation: The Average Lunch –** Students find the average mass of lunch, including fruit and drinks, eaten by the students in their small group (this activity should be performed in the morning session). Students should record the mass of each lunch in grams and kilograms and add up each amount to calculate a total amount. Students could also find the average mass of lunch for their group.   **Assessment – Fruit Salad.** The recipe for ideal fruit salad is: 150g oranges, 250g apples, 140g bananas, 90g grapes and 60g strawberries (serves four people). Students must make the recipe for 10 people and write out the new recipe using grams and kilograms for each item of fruit. Once they have their new recipe they have to make the fruit salad within their groups, accurately weighing the fruit. |
| EVALUATION & REFLECTION | **Student Engagement: Achievement of Outcomes:**  **Resources: Follow Up:** |