**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK: 3 | STRAND: Measurement and Geometry | **SUB-STRAND:** Mass 2 | **WORKING MATHEMATICALLY:** MA3-1WM & MA3-2WM  |
| OUTCOMES: MA3-12MG | **Selects and uses the appropriate unit and device to measure the masses of objects, and converts** **between units of mass**. |
| **CONTENT:**  | **Connect between common metric units of mass:*** Explain and use the relationship between the size of a unit and the number of units needed to assist in determining whether multiplication or division is required when converting between units, e.g. ‘More grams than kilograms will be needed to measure the same mass, and so to convert from kilograms to grams, I need to multiply’ (communicating, reasoning)
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * **Worksheet –** Converting amounts from kilograms to grams and grams to kilograms. For example 1500g = 1.5kg
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| WARM UP / DRILL | * **Mathletics** – ‘Mass words problems’ and ‘Converting Units of Mass’. The activity could be used as a whole class IWB activity or set to individual accounts, if there is access.
* **Calculate and Measure -** <http://www.bbc.co.uk/schools/starship/maths/games/alien_cookbook/big_sound/full.shtml> Students have to follow a recipe by adding specific amounts of ingredients.
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| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | A farmer splits a 75kg tub of apples into five smaller tubs. Each tub holds the same amount. How many kilograms of apples are in each tub?There is a bag filled with potatoes and carrots. It weighs 1 kilogram. There is an equal amount of carrots and potatoes in the bag. The potatoes each weigh 140 grams. The carrots are all identical and each weigh less than half that amount. How many potatoes are in the bag? How many carrots? |
| 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 and internet access interactive activities, student tools (maths book, pencils etc.), Mathletics account, prepared cards for top heavy activity,  |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| * Explicitly communicate lesson outcomes and work quality.
* Define and reinforce metalanguage used in the unit e.g. grams, kilograms, mass, measure, scales, tonne, weigh
* Teach and review converting between kilograms and grams. To convert grams to kilograms, divide by 1000. To convert kilograms to grams, multiply by 1000. Students practise converting from grams to kilograms and kilograms to grams
 | LEARNING SEQUENCERemediationS2 or Early S3 | Shopping List - Students fill up bags with grocery items from a selection of items, estimating their weight according to a shopping list. They check their estimates by weighing the bags. Write a shopping list for a partner. Choose from the selected items to make your list and make sure you specify how much of each item you will need. Eg Shopping list: 200g red lentils, 300g brown lentils, 150g kidney beans and 500g chick peas. Swap lists with your partner. Fill a bag for each item on your partner’s list, estimating the weights required. Check your estimates by weighing the bags on the scales. |
| LEARNING SEQUENCES3 | * **Top Heavy –** Prepare a set of cards similar to the example below, for each pair of students. Each card has a mass written on it in either grams or kilograms. Cards are shuffled and dealt face down to each player. Players each turn over a card; the player who turned over the card with the heavier mass, scores one point Play continues until all cards have been played. The player with the highest score wins the game.

**http://www.schools.nsw.edu.au/learning/7-12assessments/naplan/teachstrategies/yr2011/images/nn_meas_mass_01_02.jpg*** **Investigation:** Various word problems (can be obtained from Mathletics) or similar to the examples below:
	+ The ingredients for 12 cupcakes are: 500g flour, 180g caster sugar, 200mL milk, 125g butter and 1 teaspoon of vanilla essence.
	+ How many cupcakes could you make if you had: 3kg flour, 720g caster sugar, 1L milk, 600g butter and 5 teaspoons of vanilla essence.
	+ Kate bought 9 bags of oranges. Each bag weighed 734g. What was the total mass of the bags? Express your answer in kg.
	+ The total mass of 3G’s bags was 128kg. If there are 28 students in 3G, what is the average mass of each bag?
	+ A regular packet of cereal has a mass of 540g. An average serving is 45g.
		- How many average servings are there in one packet?
		- There are four people in Jim’s family. Each has an average serve per day. How many days will the box last?
		- The largest sized box has a mass of 720g. How long will this box last his family?
* Jim’s family is going camping for 2 weeks. They need to take all their food with them. They want to take exactly the right amount of cereal. How many boxes of each size will they need to take?
* **Packing –** Workers at a factory pack cartons that hold a mass of 4kg. Calculate the quantity of each item that can be packed per carton.
* (Soup 500g cans, rice crackers 100g, Chocolate 20g, Jam 250g). Would a carton hold 2 tins of soup and 10 jars of jam?
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| LEARNING SEQUENCEExtension Early S4 | * Open ended problem solving questions e.g. The stated weight of a box of chocolates is 250g. If there are 20 chocolates in the box, what does each chocolate weigh?
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| **EVALUATION & REFLECTION** | **Student engagement:** **Achievement of Outcomes:****Resources:** **Follow up:** |