**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| TERM:  | WEEK: 3 | 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)** * Compare two or more objects by mass measured in kilograms and grams, using a set of scales

Interpret statements, and discuss the use of kilograms and grams, on commercial packaging (Communicating, Problem Solving)* Record masses using kilogram and grams eg 1kg 200g
 |
| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) |

|  |
| --- |
| * Can you find a collection of objects with a total mass of 2 ½ kg ?

*Check how easily children can convert grams to kilograms. Do they choose objects whose mass is nearer to the desired mass?* |

 |
| WARM UP / DRILL |  |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | Make a list of some objects in your house that have their mass marked as between 200g and 500 g? *Is one mass more common than others?* |
| 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 | Whole class – grams and kilogram weights, food packages, scalesStation 1 – recording sheet 1 , grocery items, sand, scalesStation 2 – a selection of grocery item, bags, scalesStation 3 – grocery items, scalesIdeas from - <http://www.nzmaths.co.nz/resource/weighing-stations> |

|  |  |
| --- | --- |
| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| Explicitly communicate lesson outcomes * **Teach and Review**

Give children a 25g weight to feel. Have a selection of objects on each table, including packaged food.Ask children to select items on the table which they think weigh approximately the same as 25g.Repeat with other objects and weights mixing both grams and kilograms.Discuss selections and misconceptions.Discuss the need to measure mass using grams and kilograms. Teach students how to record masses using kilograms and grams eg 1kg 200g, 1.2kg In pairs students estimate mass and complete a table using objects from their desk.

|  |  |  |
| --- | --- | --- |
| **Item** | **Estimate Mass** | **Mass in Kg and g** |
|  |  |  |
|  |  |  |
|  |  |  |

*\*Assessment – Work Sample* | LEARNING SEQUENCERemediationS1 or Early S2 | **Investigation*** **Let’s be accurate!** - Investigation in pairs.

Find 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.

 * **Interactive activity –** Measure mass using a balance scale (informal units) <http://www.studyladder.com.au/resources/teacher/mathematics?section=39>
 |
| LEARNING SEQUENCES2 | Station OneIn this station students fill up boxes and containers from everyday grocery items, estimating their weight according to the information on the packet. They check their estimations by measuring.\* Choose a box or packet to work with.1. Read the information on the box to find out the weight of the packet when it was full.2. Use the sand. Fill up the packet until you think it weighs the same amount as when it was first bought.3. Check your estimate by weighing the packet on the scales.Record your work in a table –Recording Sheet 1Station TwoIn this station 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 500g chick peasSwap 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.Station 3In this station students estimate the weight of everyday grocery items. They weigh the items to check their estimates then compare the actual weight with the weight stated on the packaging. Make sure you put masking tape over the weights of the products to encourage estimation.1. Choose a grocery item to work with.
2. Estimate the weight of the item and record.
3. Measure the weight of the item using the kitchen scales and record this.
4. Check the weight of the item using the information on the packet.
5. Compare your three weights – estimated, actual and stated. Are they different? If so, why?
 |
| LEARNING SEQUENCEExtension Late S2 or Early S3 | * **http://www.schools.nsw.edu.au/learning/7-12assessments/naplan/teachstrategies/yr2011/images/nn_meas_mass_01_02.jpgTop Heavy –** Prepare a set of cards similar to the example, 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.
* Various word problems (can be obtained from Mathletics) or similar to the examples below:
1. 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?*
2. Kate bought 9 bags of oranges. Each bag weighed 734g. What was the total mass of the bags? Express your answer in kg.
3. The total mass of 3G’s bags was 128kg. If there are 28 students in 3G, what is the average mass of each bag?
4. A regular packet of cereal has a mass of 540g. An average serving is 45g.
	* 1. How many average servings are there in one packet?
		2. There are four people in Jim’s family. Each has an average serve per day. How many days  will the box last?
		3. The largest sized box has a mass of 720g. How long will this box last his family?
		4. 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?
 |
| **EVALUATION & REFLECTION** | **Student Engagement: Achievement of Outcomes:****Resources: Follow Up:**  |

**Weighing Stations – Recording sheet 1**

**Station One**

1. Choose a box or packet to work with.

2. Read the information on the box to find out the weight of the packet when it was full.

3. Use the sand. Fill up the packet until you think it weighs the same amount as when it was first bought.

4. Check your estimate by weighing the packet on the scales.

Record your work in a table.

|  |  |  |
| --- | --- | --- |
| Packet | Original Weight | My Estimate |
|  |  |  |
|  |  |  |
|  |  |  |

**Weighing Stations - Sheet 2**

**Station Two**

1. Write a shopping list for a partner. Choose from the bulk bin grocery items to make your list and make sure you specify how much of each item you will

need.

For example:

Shopping list

200 g red lentils

300 g brown lentils

150 g kidney beans

500g chick peas

2. Swap lists with your partner. Fill a bag for each item on your partner’s list, estimating the weights required.

3. Check your estimates by weighing the bags on the scales.

**Weighing Stations – Recording Sheet 3**

**Station Three**

1. Choose a grocery item to work with.

2. Estimate the weight of the item and record.

3. Measure the weight of the item using the kitchen scales and record this.

4. Check the weight of the item using the information on the packet.

5. Compare your three weights – estimated, actual and stated. Are they different?

If so, why?

Record your work on a table like this.

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Estimated WeightRecord in grams and kilograms | Measured Weight | Weight as stated on packaging |
|  |  |  |  |
|  |  |  |  |