**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK: 3 | STRAND: Measurement & Geometry | **SUB-STRAND:** Mass 1 | **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:**  | **Choose appropriate units of measurement for mass (ACMMG108)*** interprets information about mass on commercial packaging.
* find the approximate mass of a small object by establishing the mass of a number of that object, eg, ‘The stated weight of a box of chocolates is 250g. If there are 20 identical chocolates in the box, what does each chocolate weigh?’
* select and use the appropriate unit and device to measure mass, eg electronic scales, kitchen scales.
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | Quiz: * Show students an uploaded image of a food item packaging (both front and back sides). Ask question: What information does the packaging provide the consumer about the mass of the food item?
* How would you calculate the mass of a single lolly in a packet, given that each lolly was identical in shape and size?
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| WARM UP / DRILL | Use students’ prior knowledge of timetables and inverse operations to calculate the approximate mass of a small object by establishing the mass of a number of that object. Eg, The stated weight of a bag of lollies is 100g. If there are 10 identical lollies in the bag, what is the approx.. weight of each lolly? 100g bag of lollies divided by 10 lollies = 100/10=10. Thus each lolly has an approximate mass of 10g. To check findings, multiply answer with no. of lollies, eg, 10g x 10 lollies = 100g. |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | The gross mass of a packet of Wonka’s Rainbow Nerds is 165 grams. The packet weighs 15 grams. If each lolly inside has the same equal net weight, what is the mass of each individual lolly? Is there more than one solution? |
| 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, scanned image of food label, pens, pencils, erasers, workbooks, scales, items for ‘guesstimate’ fake food challenge (eg, Ziploc bags, buttons, straws, pencils, buttons, etc.), food items to investigate labels (eg, chip packets, lolly packets, rice crackers, potatoes, etc.),items for create your own lolly bag activity (eg, an assortment of lollies, Ziploc bags, labels). |

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| TEACHING AND LEARNING EXPERIENCES |
| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| **Whole Class Instruction/Modelled Activities:*** **Wonka Weight Word Problems**

\*One box of 12 Everlasting Gobstoppers weighs 170g.The empty box weighs 14g.How much do the 12 gobstoppers weigh? How much does 1 gobstopper weigh?\*The gross mass of a box of Wonka Observatory Collection Truffles is 365g. The box contains 12 truffles, six truffles = 150g. The empty box weighs 15g. What is the mass of contents inside? How many truffles are there in the pack?* **Mass Investigation using Food Label**

The teacher will show students how to read labels of commercial food items to interpret information about mass on packaging of food items by modelling activity to completed by students in problem solving investigation. (Refer to Workstation 2: Mass Investigation using Food Labels for step-by-step instructions of how to carry out modelling of activity. | LEARNING SEQUENCERemediationS2 or Early S3 | Refer to Stage 2 Mass activities. |
| LEARNING SEQUENCES3 | * **Whole class Instruction/Modelled Activities**
* **Problem Solving Investigation:**
* **Workstation 1: ‘Guesstimate’ Fake Food Challenge**
* Student pairs will each be given a Ziploc bag containing a different fake food content, eg, counters, pencils, buttons, straws, etc. Note: the mass of contents inside Ziploc bags will vary, eg, range b/w 20g-100g. The teacher will need to record items and corresponding net mass of contents prior to student investigation.
* Students will also be given the mass of the container (eg, mass of empty Ziploc bag).
* Student pairs will weigh the Ziploc bag containing ‘fake food’ to find gross mass and then deduct the given mass of the container (eg, empty Ziploc bag) to find net mass of ‘fake food’ content.
* Students will be then determine the mass of a single piece of ‘fake food’ by first estimating no. pieces inside bag ; then dividing number of pieces by the total net mass of ‘fake food’ content.
* Students are to record fake food item and strategy/steps used to ‘guesstimate’ answer using dot points in their workbooks.
* **Workstation 2: Mass Investigation using Food Labels**

Student groups will choose two commercial food items (eg, same food item with same mass – 2 packets of chocolate freckles with mass of 250g, 2 packets of rice crackers with mass of 150g, 2 bag of potatoes with mass of 2kg, etc.) to learn how to effectively read and interpret information about mass on packaging.1. **Using Net Mass of Single Item in Packet of Same Commercial Food Items to Determine Best Monetary Value**

Using workbooks, students will:* Record the heading above.
* Record the name of product A as listed on package and price of item.
* Record the mass located underneath the name of food item on front of label.
* Open food packet/container and empty net contents onto clean surface (eg, wearing gloves to prevent contamination) and count number of items, eg, 20 freckles, 30 rice crackers, etc).
* Calculate and record answer for cost of single piece of food item (eg, 1 freckle) by dividing number of items in packet by gross mass printed on front of label.
* Repeat steps to find solution using other food item.
* Compare the findings for both items to calculate which food item is the best value of money (using mass as a determinant).
* Find net mass of contents and compare to mass printed on front of label for each food item. Do the figures match? If not, provide a reason why this is the case. Eg, food item does/does not distinguish b/w gross and net amounts by including/not including incl. mass of package. Does this impact upon the monetary value when comparing food items with the same content?

 * **Workstation 3: Create your own 65g Lolly Bag and Net Mass Word Problem**

Each student will make a 65g lolly bag (eg, 65g is gross mass =mass of container + mass of contents). Students must:* Construct a container (eg, packaging of food item) out of cardboard using the net of a rectangle prism (taking into consideration the shape/size of the lollies).
* Calculate the mass of container in order to work out the net mass of contents.
* Determine the net mass of lollies using scale and fill container.
* Create front and back labels for food item, eg, containing gross mass, net mass of contents and serving size.
* Create ‘net’ mass word problem. The word problem must involve finding the approximate mass of a small object by establishing the mass of a number of that object. Eg, The stated box of lollies is 65g, If the empty box weighs 5g and there are 10 identical lollies in the box, what does each lolly weigh?
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| LEARNING SEQUENCEExtension Early S4 | * Variation to Workstation 3: Create your own 65g Lolly Bag and Net Mass Word Problem. To extend students, have them make a lolly bag using an assortment of lollies, eg, the word problem will become more challenging as lollies will have a different mass.
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| **EVALUATION & REFLECTION** | Student engagement: Achievement of Outcomes:Resources: Follow up: |