**MATHEMATICS TEACHING AND LEARNING OVERVIEW STAGE 2**

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| TERM:  | WEEK: 3 | STRAND: Mass 1 | **SUB-STRAND:** Measurement and Geometry | **WORKING MATHEMATICALLY:** MA2-1WM MA2-3WM |
| OUTCOMES: MA2 12MG | **Measures, records, compares and estimates the masses of objects using kilograms and grams.** |
| **CONTENT:**  | **Measure, order and compare objects using familiar metric units of mass (ACMMG061)*** Compare mass using informal units
* explain why two students may obtain different measures for the same mass.
* Use balance scales to find smaller objects that will equal 1 kilogram. Record in a table.
* recognise the need for a formal unit to measure mass
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * What is a unit of measurement?
* What units do we use to measure mass? kg
 |
| WARM UP / DRILL |  |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | Money Measure (see worksheet) |
| 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 | A variety of objects suitable to use as informal units, such as: marbles, metal washers, metal nuts, small plastic teddies (or alternative), and Unifix cubes• A pan balance |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| * Ask: ‘What extra load do you carry on your back on library day?’

Use objects find the mass of two library books.* If we wanted to compare the mass of the books, how could we do this?

Discuss students’ ideas for comparing the mass of books.  | LEARNING SEQUENCERemediationS1 or Early S2 |   |
| LEARNING SEQUENCES2 | * Have each group weigh two library books using a different object.

Estimate the mass of their library books, then check the estimate using a pan balance and objects.Report their findings back to the class  Discuss: How many objects did you use? Is this a fair comparison?* Repeat the activity, with students balancing their books all using the same objects.
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| LEARNING SEQUENCEExtension Late S2 or Early S3 | 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.
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| **EVALUATION & REFLECTION** | **Student Engagement: Achievement of Outcomes:****Resources: Follow Up:**  |

**What's My Weight?**



This picture shows four equal weights on one side of the scale and an apple on the other side.

What can you say that is true about the apple and the weights?

 If the apple weighs 180g , how heavy must one weight be?

 If the apple weighed 375g , how heavy would one weight be?

If the apple was a giant one and weighed a full kilo and the weights were each 250g , what would the scale look like? How do you know? Can you prove it?

# Money Measure

##### boxes and scales

You have ten identical open-topped boxes with 10 visually identical coins in each.

In nine of the boxes each of the 10 coins has a mass of 10g.
In one box the 10 coins have masses of only 9g each.

How can you find which box is the odd one out?

You have a normal mass measurer with a single pan and a scale.

With just one weighing you can identify the box with the lighter coins.

What will you weigh?

**Pies**

**Stage: 2 Challenge Level: **

Grandma had made pies for a bake sale. She had carefully put equal amounts of mixture in each pie tin and was now trying to find the weight of the pies.

She had a problem; she only had one 200 gram weight and one 125gram weight.

She found that one pie balanced on the scale with both weights and a quarter of a pie.

How heavy was each pie?

# SOLUTIONS

**What's My Weight?**

# From the picture of the scales, the apple must weigh less than the four weights altogether.If the apple weighs 180g , for the scale to be balanced the weights would have to be 45g each because there are four of them. But we know from the picture that the apple weighs less than the weights put together, so each weight must be more than 45g .If the apple weighed 375g , then for the scale to be balanced, each weight would be 93.75g . So, for the weights to be heavier than the apple, each one must be more than 375g .One kilo is 1000g and four 250g weights would also weigh1000g altogether so the scale would be balanced.

# Money Measure

# Take one coin from the first box, two coins from the second box and so on. You will end up with 55 coins taken from the various boxes. Weigh the 55 coins. If the weight reads one gram less than 550 then 1 coin weighs 9 grams and box number 1 contains the light coins. If the weight reads 2 grams less than 550 then two coins weigh 9 grams and box number two contains the light coins and so on.

**Pies**

I got my answer of 433 1 3 grams by putting the problem into an equation. These are the steps I took to get the answer:

1. First I did the sum 200g. + 125 g. which equalled325 g.
2. Then I wrote it down like this: 325 g. + 1/4pie = pie
I then converted this to: 325 g. +1/4 pie =4/4pie (or one whole pie).
3. Next, I took 1 4 of a pie from each side leaving me with: 325 g. = 3/4 pie.
4. I multiplied each side by 4 which came out as: 1300 = 3 pies
5. I divided each side by 3 and came to the final answer of:433 1/3grams = 1 pie."

Some Online Mass Sites

<http://nrich.maths.org/4726>

http://nrich.maths.org/public/leg.php?code=152