

<i>Sub Strand – Mass 2</i>			
Outcome	Teaching and Learning Activities	Notes/ Future Directions/Evaluation	Date
Stage 2 A student: <ul style="list-style-type: none"> ➢ uses appropriate terminology to describe, and symbols to represent, mathematical ideas MA2-1WM ➢ selects and uses appropriate mental or written strategies, or technology, to solve problems MA2-2WM ➢ measures, records, compares and estimates the masses of objects using kilograms and grams MA2-12MG 	Language Students should be able to communicate using the following language: mass, measure, scales , kilogram, gram. The term 'scales', as in a set of scales, may be confusing for some students who associate it with other uses of the word 'scales', eg fish scales, scales on a map, or musical scales. These other meanings should be discussed with students.		
Ignition activities Guessing Competition! Students estimate the mass of objects in the room. Record results and then weigh objects using a pan balance in kilograms and grams. See who can get the closest			 Critical and creative thinking
Explicit Mathematical Teaching Use scaled instruments to measure and compare masses (ACMMG084) <ul style="list-style-type: none"> • recognise the need for a formal unit smaller than the kilogram • recognise that there are 1000 grams in one kilogram, ie 1000 grams = 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 about 60 grams (Reasoning) • record masses using the abbreviation for grams (g) • 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) • interpret commonly used fractions of a kilogram, including $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$ and relate these to the number of grams ▫ solve problems, including those involving commonly used fractions of a kilogram (Problem Solving) • record masses using kilograms and grams, eg 1 kg 200 g 			

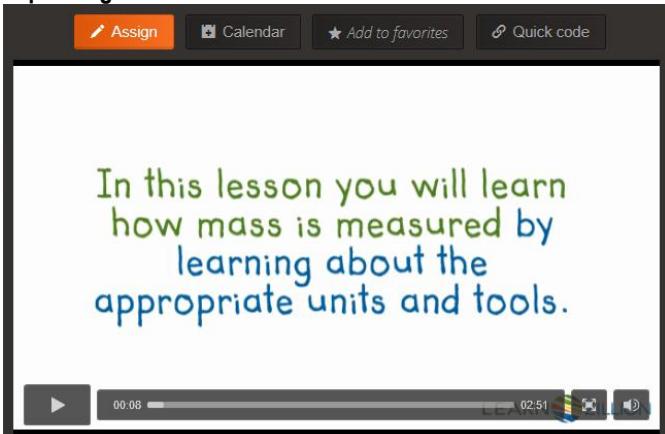
Whole class teaching

Measure using conventional units: measure quantities less than 1 kilogram, in grams using a set of scales

Knowledge and strategies

1. measure mass to the nearest 10 grams
2. estimate masses to the nearest 100 grams
3. use measuring devices accurately

Explaining mass video



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 a record their measurements to the nearest 10 grams.

Extension: students graph the results.

Step 1

Discuss the need for a measure smaller than the kilogram to obtain accurate measurements. Discuss materials or food which are measured in grams. Introduce the task. Students order the mass of cupfuls of different materials by hefting. Students use scales to find the mass of each cupful to the nearest 10 grams and record the results. Discuss the need to handle materials carefully, especially if substances such as rice or flour are used.

Step 2

Have your students work in small groups to:

- estimate the weight of a cupful of flour or other material
- weigh the cupful and record the estimate and actual weight
- repeat with a cupful of sugar or other materials
- record the results.

Step 3

Discuss students' results and the differences between materials.

<p>Questioning</p> <p><i>When might I want a unit of measure that is smaller than a kilogram? What can I buy or measure in grams? What is your estimate of the mass of a cupful? What else do you need to know before estimating?</i></p> <p>Check that students: estimate before weighing the cupfuls</p> <ul style="list-style-type: none"> • measure accurately to the nearest 10 grams • record measurements accurately. <p>Discussion</p> <p><i>What did you find when you weighed the different materials? Which material was the heaviest or lightest? How do you know?</i></p>		
<p>Teaching Measurement – Stage 2 and Stage 3 pg 120</p> <p>Fractions of a kilogram</p> <p>Students will be explicitly shown how a commonly used fraction of a kilo relates to a number of grams eg $\frac{1}{2} = 500$ g, $\frac{1}{4} = 250$ g, $\frac{3}{4} = 750$ g. Students will solve problems using these commonly used fractions of a kilo eg I have $\frac{3}{4}$ of a kilo of apples and I eat a quarter of a kilogram. How many grams did I eat? How many grams do I have left?</p>		
<h2>Guided Group/Independent Activities</h2> <p>How heavy are my books?</p> <p>Students work individually or in pairs to select six books and estimate the mass of the books in kilograms and grams. Students select appropriate scales to weigh the books. Students find and record the mass of each individual book and then calculate the mass of the six books by adding the six results. Students check their calculation by weighing the six books and commenting on any variation from their calculation. The final report should include the reasons for the selection of the measuring device.</p> <p>Teaching Measurement – Stage 2 and Stage 3 pg 124</p>		
<p>Make 50 grams</p> <p>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.</p> <p>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</p>		
<p>Mass Hunt</p> <p>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.</p>		
<p>Converting kilograms and grams to fractions</p>		

Planned Assessment

One kilogram

Students are challenged to find a number of items that will balance one kilogram. In small groups, students demonstrate and explain their work.

Cupfuls

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.

Weigh in

Students find an item that has a mass of between one and two kilograms. In small groups, students weigh their item using a set of scales. Items are then placed in order of mass. Students record their task and share with other groups.

Assessment Strategy

The teacher:

- observes student group work
- analyses student recordings

Assessment Criteria

The student:

- recognises that objects with a mass of one kilogram can be a variety of shapes and sizes
- discusses the strategy used to estimate a mass heavier than one kilogram
- weighs an object accurately in kilograms and grams

Books weigh in

Five books have a total mass of three kilograms. In small groups, students estimate, select and weigh books to see which group can get the closest to the target mass. Students report to the class listing the mass of each of their five books.

