YuMi Deadly Maths

Year 1 Teacher Resource:

MG – Dare to compare

Prepared by the YuMi Deadly Centre
Faculty of Education, QUT

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ACKNOWLEDGEMENT

We acknowledge the traditional owners and custodians of the lands in which the mathematics ideas for this resource were developed, refined and presented in professional development sessions.

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Year 1 Measurement and Geometry

Dare to compare

Learning goal	Students will identify and explore the attribute of length using informal units.
Content description	Measurement and Geometry – Using units of measurement • Measure and compare the lengths and capacities of pairs of objects using uniform informal units (ACMMG019)
Big idea	Measurement – length – notion of unit
Resources	Paper feet of different sizes, classroom objects, cubes, straws, matchsticks, modelling dough, small squares of paper

Reality

Local knowledge	Locate and describe objects in the local environmental using length vocabulary, e.g. long stick, short blade of grass. Identify environmental objects to match a descriptor, e.g. *What could you see that is long, short, narrow, wide, pointy?*
Prior experience	Check that students understand the attribute of length by comparing and ordering unnumbered objects (e.g. sticks) in the natural environment. Use and reinforce the language of length by discussing similarities and differences of the length of people's feet.
Kinaesthetic	Students measure the width of the classroom putting one foot immediately in front of the other. Count how many feet long it takes. Teacher records the results: *34 feet – John, Tim; 35 feet – Sally, Jack,* and so on. Discuss the reason the number of footsteps are different/the same. [Students with bigger feet take fewer steps and students with smaller feet take more steps to measure the same object.] Direct comparison: *What is longer – the teacher's desk or a student's desk? How can this be proved?* [Move a student desk so that it abuts the teacher's desk.] Have two boys, e.g. Harry and Jack, lie on the floor with their heads touching a wall as the baseline. *Who is the longer?* [Jack] *Who is the shorter?* [Harry] Mark with chalk or masking tape the length of the longer boy (Jack) and both boys then go back to their chairs. Indirect comparison: Place a broomstick against the wall. *Is the broomstick longer than Jack?* [Yes] *Is the broomstick longer than Harry?* [Yes] *How do you know?* [The broomstick is longer than Jack and Jack is longer than Harry.] Students measure the length of their desks with a straw as the unit. Students are given straws to measure with.

Abstraction

Body	Teacher models measuring the length of her arm from shoulder to fingertips using the palm of her hand as the measuring tool. Students count the number of palms needed to measure the length of her arm. *How many palms are there?* Students use their palms to repeat the process for their own arms. *How many palms are the same as the length of your arm?* They then find other objects that are the same length or as long as their arms. Identify other objects that are longer/shorter than the length of their arm or wider/ narrower than the width of their palms. Teacher and students decide what is going to be the class measuring unit: straws or matchsticks, and what their measuring unit is going to be called (e.g. *Freds*). Teacher models comparing the length and width of a student's desk using the class measuring unit.

Compare the number of Freds needed for both; which is longer/shorter?

Students repeat process and find objects that are the same length, longer/shorter than the number of Freds for the length of their desk.

Hand

Students use dough to make three snakes of different colours and sizes (length, width and thickness). Line the snakes up so that their heads touch the vertical edge of the desk. Using the class measuring unit (Freds), measure the length, width and height of the snakes to compare which is longer/shorter, wider/narrower, thinner/thicker. *How many Freds in each? Which is the longest/shortest snake of the three, the widest/narrowest, the thickest/ thinnest?*

Reverse: *Make a snake that is 6 Freds long, its head is 1 Fred wide and its tail is thinner than 1 Fred.*

Take 4 cubes, join them together and place against the edge of the desk as a baseline. Compare the length of one of your pencils. Is it longer or shorter than the 4 cubes?

Mind

Students visualise the objects that are longer/shorter than their arms and wider/narrower than their palms. With eyes still closed, show the length of their arm by stretching their hands apart to the same distance as the length of their arms.

Creativity

Students start at one side of a small square of paper and tear it nearly to the next corner, turn the paper around and continue tearing it into thin strips. The student who can tear the paper to make the longest piece is the winner.

Mathematics

Language/ symbols

length, long, longer, longest, short, shorter, shortest, measure, compare, thick, thicker, thickest, thin, thinner, thinnest, wide, wider, widest, narrow, narrower, narrowest, same, different

Practice

1. Students measure objects in the room and complete a class table listing the object and the number of Freds in its length.
2. Students look at the list and find an object that is longer/shorter than a given object.
3. Reversal: Students find objects that are 2, 3, 4, 5 Freds long.
4. *Create a garden that is 7 Freds long and 3 Freds wide. Draw some flowers that are 2 Freds high*.

Connections

Compare other types of measurement: how much water a jug holds and how much sugar a sugar bowl holds.

Reflection

Validation

Students take the class measuring unit home to measure and record the length/width/ height of their bed. Compare with the measurements of their classmates to find who had the longest/widest/highest bed and the shortest/narrowest/lowest bed or which students had the same measurement/s. Discuss findings. *What could be some reasons for the differences?*

Application/ problems

Provide applications and problems for students to apply to different contexts independently, e.g. *Measure the table and cupboard (length, width, height) to see if they will fit through the door.*

Extension

Flexibility. Challenge students to think about the class unit and its usefulness in measuring objects of different lengths, e.g., their desk, window, floor, the oval. Discuss some options they may take to assist in measuring larger items. Encourage students to suggest many ways in which the length of objects could be compared.

Reversing. Students measure objects to find the length (x number of Freds long) and then are given the length (x number of Freds long) and have to find objects to match that measurement.

Generalising. *To make an accurate comparison of the length of various objects, we need the same unit with which to measure, that is, we need to use the same measuring unit*.

Changing parameters. Students predict and measure the number of Freds that would be required to be the same length as a ruler (metre). How many rulers would be needed to go along the width of the room or a window? Predict and then measure with the ruler.

Teacher's notes

- Find a common class unit for measuring (straws, matchsticks, paper foot) and call this by a name that the students suggest and all accept, e.g. *Freds*.
- Use the comparative ending in "er" when comparing two objects and the superlative ending in "est" when comparing three or more objects.
- Students need to be taught the skill of visualising: closing their eyes and seeing pictures in their minds, making mental images; e.g. show a picture of a kookaburra, students look at it, remove the picture, students then close their eyes and see the picture in their mind; then make a mental picture of a different bird.
- Suggestions in Local Knowledge are only a guide. It is very important that examples in Reality are taken from the local environment that have significance to the local culture and come from the students' experience of their local environment.
- Useful websites for resources: www.rrr.edu.au; https://www.qcaa.qld.edu.au/3035.html
- Explicit teaching that **aligns with students' understanding** is part of every section of the RAMR cycle and has particular emphasis in the Mathematics section. The RAMR cycle is not always linear but may necessitate revisiting the previous stage/s at any given point.
- Reflection on the concept may happen at any stage of the RAMR cycle to reinforce the concept being taught. Validation, Application, and the last two parts of Extension should not be undertaken until students have mastered the mathematical concept as students need the foundation in order to be able to validate, apply, generalise and change parameters.