YuMi Deadly Maths

Year 2 Teacher Resource:

SP – Favourites

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 2 Statistics and Probability

Favourites

Learning goal Students will collect simple data from questions asked and display simple data in a picture graph or column graph

Content description Statistics and Probability – Data representation and interpretation

- Identify a question of interest based on one categorical variable. Gather data relevant to the question (ACMSP048)
- Collect, check and classify data (ACMSP049)
- Create displays of data using lists, table and picture graphs and interpret them (ACMSP050)

Big idea Statistics – data collection, organisation, representation, interpretation

Resources Named card for each of the 4–5 favourites, 4–5 differently coloured A4 paper/card, maths mat, Unifix cubes, coloured pencils/felts

Reality

Local knowledge Play the Julie Andrews' song "My Favourite Things" and discuss the students' favourite things. *What would you like to collect?* From the responses given select a category, e.g. leaves, rocks, songs, books, DVDs, TV shows, fruit, colours. From the discussion, specify one category and list 4 to 5 elements.

Prior experience *What would we do if we wanted to check the type of leaves/rocks we had collected outside?* [Put the ones that look alike together into groups.] *Once we had sorted the rocks, what would we do next?* [Count to see how many there were in each group.] *How could we display and keep our collection?* [Place them in lines on a bench/shelf, paste them onto a big piece of paper.]

Kinaesthetic Favourite fruit: Outside or in a large space, students line up behind their favourite fruit. As each group is made, count to see how many are in that favourite group. Give each student in the same favourite group a piece of the same coloured A4 paper/card to hold. Predict which favourite fruit's line is going to be the longest/shortest and justify the estimate. Compare with the other group/s, e.g. red berries have 4 students, yellow bananas have 6 students; *Are the berries more/less, greater than/smaller than, same as, equal to, how many more/less than the other groups?*

Abstraction

Body Torpedoing: Draw a base line and line the groups up so that some (with the fewest) are spread out with an arm's distance apart and others (with greater numbers in the group) stand very tightly next to each other. *Which group stretches the longest way*? *Does that mean this group has the fruit that most students like? What is going on here? What should we do so that the groups can be compared fairly?* [Start at the same place on a line, measure with a common unit, leave no spaces or overlaps.] Line up now so that the groups can be compared in a fair way. (Another way to distort the columns is to give some groups large pieces of paper, other groups small/medium pieces of paper so that students recognize that the space/scale must be uniform in order for the columns to be a fair representation.)

Maths Mat: Students stand in squares going up in the columns of the mat. Starting at the bottom edge/line, they then place the A4 coloured sheet that represents their favourite fruit on the squares where they are standing and make sure that each A4 sheet is touching the sheets that come before and after. Students leave the mat and one student places the name of the group's favourite fruit at the bottom edge. Discuss the column graph that has been

made, e.g. *What do the coloured A4 sheets in each column represent? Is this graph fair? How do you know?* [All the columns start at the same place – the bottom edge/line of the mat, the same size paper is used to represent one piece of fruit, an equal space is used for each piece of paper.] *How does this column graph help us to see which favourite fruit is liked by most/fewest students in the class? Describe the favourites in ascending/descending order.*

Hand Students compile a table using the data from the Favourites discussion and column graph made outside. They then construct the same column graph using Unifix cubes. After all the columns have been made using Unifix cubes, students trace around each Unifix column (leaving a space between each column) with the appropriate coloured pencil/felt pen. They colour in the columns as an extension of the body activity thus making their own column graph on paper.

Mind Students visualise a column graph described by the teacher, e.g. *I can see a column graph that has 5 Unifix cubes and another column with 7 Unifix cubes. What could these represent? I can see a picture graph that shows me 3 cats, 6 dogs and 8 birds. Picture this on a column graph.*

Creativity Students choose their own data to represent on a column graph, e.g. five of their favourite places to visit or holiday.

Mathematics

Language/ symbols data, lists, tables, tally marks, picture graph, column graph, questions, favourite, collect, display, describe

Practice

1. Students compose questions of personal interest and collect data from the questions they ask other students. Record the responses in lists/tables.
2. Display collected data in a picture graph or column graph.
3. Make a class graph of the favourites.

Connections Connect lists, tables, picture graphs, horizontal/vertical column graphs, line graphs.

Reflection

Validation *Would a graph of students' favourite foods be helpful to the tuckshop convenor? Why?*

Application/ problems Provide applications and problems for students to apply to different contexts independently by asking questions and translating given data into a picture/column graph; e.g. ask, *How do students at this school travel to school?*; graph responses to questions of their own choice.

Extension

Flexibility. Students are fluent in asking questions to obtain relevant data, constructing and interpreting data in different representations.

Reversing. Students construct a graph ↔ interpret the graph's data ↔ tell the story the graph is representing.

Generalising. *Column graphs must start from the same line. Columns are made allowing an equal space for each item and have no gaps or overlays*. *One axis shows the collected data and the other axis shows the corresponding numbers of the pictures/columns. The heights of the columns relate to quantities in the collected data – only a few means a short column, a lot means a long column. The graph and both axes are named*.

Changing parameters. Show the same data in a list, table, picture or column graph. Encourage students to use more precise language to describe the outcomes of data investigations.

Teacher's notes

- Reinforce the significance of a common base line and uniformly sized units along the quantity axis.
- 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.