

YuMi Deadly Maths

Year 2 Teacher Resource:

SP – Today's traffic tale

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

Today's traffic tale

Learning goal Students will collect simple data from opportunities to observe events and display it in a picture 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 Clipboard, paper, pencils, chalk, coloured paper, Maths Mat, toy vehicles, Unifix cubes, graph paper with large squares, stickers/pictures, thin strip of card with same number of punch holes as number of vehicles/colours, string, beads, pasta

Reality

Local knowledge Discuss events that happen day by day. What are some events that the class could observe and collect data about? For example, food ordered from tuckshop; the types of vehicles that travel along the road outside the school, e.g. cars, trucks, buses, bikes (motor and cycles), colours of the vehicles. *Are there more of one colour than another?* Make a list of the colours students see travelling along the road. Predict the colour they think they will see most. Alternatively, collect data on the types of vehicles that are mostly seen. Choose to collect data either on the types of vehicles or colours of vehicles, e.g. *What colour vehicle will be seen the most today?*

Prior experience What are common methods for collecting data, e.g. sorting and counting, observing events, asking questions, making lists, tally marks.

Kinaesthetic In groups, students are given a colour of vehicle to observe and count the number of that coloured vehicle travelling along the road.

Students write the colour of vehicle they have been given to observe at the top of the sheet. They sit in groups along the school fence with clipboards and pencils to observe, count and tally their given colour of vehicle.

After 10–15 minutes, students count the total number of vehicles they have seen in their colour group, compare their results and record the group tally at the bottom of their sheet in large numerals. Ideally each student who observed the same colour should have the same tally number.

Abstraction

Body Undercover area: Stacks of paper representing the colour of cars. (Coloured paper should come in noticeably different sizes so that the graphs will be distorted.) Have students collect sufficient sheets of paper that match their colour and the number of vehicles they counted. Ask the students to place the sheets of paper on the ground so that the colours of the vehicles may be observed. *Did every group take only one sheet of paper for each car that was seen?* [Yes] *Look at the paper columns and tell me what colour was seen most or which colour was the most popular.* Ask that group how many vehicles were counted. (Because the paper sizes differ, some groups that counted more but had smaller pieces of paper would object – their count was greater but their column is smaller.) *Why is this so?* [The pieces of paper were not the same size.] *Would it matter if one group started their column behind all the others?* [Yes, because that column would be shorter than the others]

that started ahead.] *Tell me then, what we must have if the vehicle colours are to be compared in a fair way.* [Each group must start from the same starting line and there must be paper of the same size representing each colour.]

Repeat process on the Maths Mat with coloured paper this time of the same size. Students stand in squares making a column the same size as the colour count. Place the A4 sheets of coloured paper under their feet and make sure that the sheets touch each other so no gaps are formed. *What would happen if gaps were left in the column?* [A column with gaps would be longer than a column where all sheets of paper touched.] Students count the number for each colour and each group says, for example, *There were five yellow vehicles on the road today.* The teacher records the number on the master list (table) and the next group is called. Examine the columns that have been made and compare the results of all groups. *What colour proved to be most/least popular today?*

Students could place toy vehicles on the Maths Mat that align with the number seen in that colour and compare the results of all groups; e.g. more silver/fewer red cars, greater than/smaller than, same as, equal to, how many more/less than.

Hand

Students use Unifix cubes that match the colour of vehicles. They make a Unifix graph that corresponds to the number of colours that were seen by drawing around each colour of Unifix colours on plain paper, making sure the bottom of the cubes is against the bottom of the paper. They then colour the columns that have been made and record the number at the top of each column. Name the graph.

Students are given a sheet of A4 graph paper. They rule two margins down the left-hand side and along the bottom. They then paste pictures or stickers for colours into the squares of the graph paper that correspond to the Unifix cubes and the recorded numbers. The vertical margin records the number seen (either going up in ones or twos) and the bottom margin records the colours. The picture graph is named using students' suggestions, e.g. "Today's traffic tale" or "The most popular vehicle colour".

Keeping the same colour order, students take lengths of string and a strip of card with holes, thread one through the first hole in the strip of card, tie a knot at the bottom and attach the correct number of beads to represent the number seen of that colour, tie a knot. Write the colour above or near the hole. Repeat for all colours of vehicles that were observed. A selection or all of these could be hung around the room.

Mind

Students visualise the 8 yellow cars, the 2 blue trucks etc. that were seen on the road, and then reverse by seeing the 8 yellow cars etc. represented on the picture graph. Still with their eyes closed, they could point or nod their head for each car that is added.

Creativity

Students make a picture graph showing data of their choice, e.g. the number of times they went on the different playground equipment at the park such as swings, slippery slide, monkey bars; flowers they grow in their garden such as roses, gerberas, daisies, pansies. They tell the story their picture graph shows.

Mathematics

**Language/
symbols**

data, observe, lists, tables, tally marks, picture graph, sort, count, favourite, collect, display, describe

Practice

1. Students make their own picture graph by gluing pasta onto a sheet to represent the data and putting the names next to each. Name the graph. Share the story that the data represents.
2. Make a class picture graph showing the vehicles. Students could colour their own vehicles for the class graph.

Connections

Relate picture graphs to tables and column graphs.

Reflection

Validation	Students may have growth charts that show how tall they were at different ages. Look through newspapers to see if they can find any graphs (e.g. weather). They then discuss what the graph is showing (look for clues in the graph's name and along its axes).
Application/problems	Provide applications and problems for students to apply to different contexts independently, e.g. interpret data from given picture graphs that other students have created.
Extension	<p>Flexibility. Students gain confidence in interpreting data in different representations.</p> <p>Reversing. Students construct a graph \leftrightarrow interpret the graph's data \leftrightarrow tell the story the graph is representing.</p> <p>Generalising. <i>Graphs are made so that it is easy to see the information and compare data. Graphs have a vertical line with digits to show how many and a base line with the names of the pictures. (Begin with the vertical picture graph then swap for a horizontal picture graph.) Graphs have a name so that we know what the pictures are about.</i></p> <p>Changing parameters. Show the same data in a list, table or column graph. Encourage students to use more precise language to describe the outcomes of data investigations. Explore graphs where one picture stands for two or five objects instead of one-to-one correspondence.</p>

Teacher's notes

- Ensure students know how to use tally marks before going out to observe the vehicles.
- 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.