YuMi Deadly Maths

Year 3 Teacher Resource:

SP – Lucky dip

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 3 Statistics and Probability

Lucky dip

Learning goal

Students will:

- describe everyday chance events and conduct chance experiments
- collect, organise and display data
- interpret and compare data displays.

Content description

Statistics and Probability – Chance

- Conduct chance experiments, identify and describe possible outcomes and recognise variation in results (ACMSP067)

Statistics and Probability – Data representation and interpretation

- Collect data, organise into categories and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies (ACMSP069)

Big idea

Probability – chance

Resources

Cards with chance terms, cord and pegs for pegging outcome positions, event cards, spinner (see Practice section), Unifix cubes, counters, brown paper bags, sheets of grid paper

Reality

Local knowledge

Discuss the concept of chance in the students' world, events that may and may not happen, weather, day/night, everyday events, winning games.

Prior experience

Check that students know:

- terminology of possible outcomes: certain, impossible, equally likely, even chance, unlikely, very likely, student suggestions
- how to record data – tally marks.

Kinaesthetic

Have a **Tomorrow box** with the following statements written on cards: *Tomorrow, I will get up early; Tomorrow, I will be a horse; Tomorrow, I will have my favourite dinner; Tomorrow, I will eat an apple; Tomorrow, I will go to school; Tomorrow, I will have a haircut; Tomorrow, I will fly to Mars; Tomorrow, I will eat my lunch; Tomorrow, I will visit my friend; Tomorrow, I will be sick; Tomorrow, the sun will rise in the morning.* As a student selects a card and reads the statement discuss whether it is possible, impossible or certain. Students go to the designated area in the room at the front of the class: near the windows, in the middle, near the door. Ask remaining students for "Tomorrow" statements that could be possible, impossible or certain. Discuss with the class and then the student goes to the appropriate area.

Discuss the placements and raise questions, e.g. *How would you know if something was certain to happen? Are there many things that would fall into this category? Could anything happen to change the outcome (e.g. Is it certain that you go to school on a weekday? You might get sick so you can't go to school; it could be a holiday) – is it certain or most likely? How would you know if something was impossible? Are there many things that would fall into this category? Could anything happen to change the outcome (e.g. you dress up as a horse to be one of the farm animals in a concert) – change the statement so that it will always be impossible. How can you decide if an event is likely or unlikely? How far away from certain is the event, is it more likely than unlikely? How far away from impossible is it, is it more unlikely than likely? Or does it have an equal chance and therefore is in the middle?*

Abstraction

Body

Distribute paper bags containing counters of three different colours with a colour ratio of 1:2:3. At the start of the activity, tell the students the counters that the bags contain, e.g. one green, two blue and three red counters. Ask questions: *Is it possible to take out a black or yellow counter from the bags? Why or why not? Is it certain to get a red counter from the bag?*

Why or why not?

Experiment: Distribute the colour tally sheets (three to the page for the three trials).

Colour	Tally	Total
Green		
Blue		
Red		

In pairs, students work together to conduct three trials. Each trial consists of 20 times that one counter is removed from the bag. Each time the counter is removed, a tally mark is recorded against that colour and the counter is put back into the bag. The bag is shaken, a counter removed, colour recorded and counter replaced. Students take turns at halfway to be the recorder or remover.

Interpret and compare the results, firstly in each pair, then pool results with another pair/whole class and compare: *Why do you think reds were taken out of the bag the most? Why were no yellow counters taken out? What other colour/s were missing? What colour was taken out the least? Why do you think this was so? Can you put the colours in order going from least to greatest number of the colour?*

Hand

Students are given a sheet of grid paper. Students in each pair record the results of their three trials by dividing the paper (landscape) into three equal sections. In each section, the three colour names are recorded at the bottom, a baseline is drawn and a picture/column graph is made by colouring a square for each time that colour was taken out of the bag. Rows are numbered to show the number of times and each section is named appropriately, e.g. Trial 1. Students describe and compare their trial data with classmates.

Mind

Students imagine a bag where it is certain to draw out a yellow block, impossible to draw out a yellow block, most likely to draw out a yellow block, least likely but not impossible to draw out a yellow block.

Creativity

Students create their own examples of possible, impossible, certain, most/least likely situations using drawings, counters, blocks, and so on.

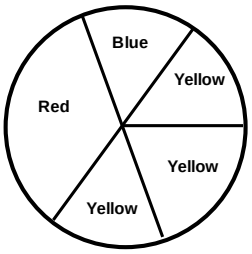
Mathematics

Language/ symbols

chance, events, possible outcomes, likelihood, likely, unlikely, impossible, possible, certain, equally likely, same chance, equal chance, more likely, most likely, less likely, least likely, lucky, unlucky, maybe, fat chance, Buckley's chance, perhaps, dead certainty, odds on, sure bet, 50-50, so-so, might happen, experiment, spinner, table, graph, data, question, observe, collect, conduct, organise, compare, describe, record, list, table, tally marks, picture graph, column graph, predict, analyse

Practice

1. Collect, record and analyse data from the three trials of coloured counters. Conduct a class discussion regarding similarities and use the language of chance to explain outcomes and conclusions.
2. Each student is given a copy of this spinner. Questions: *What different colours could you spin? What colour would you be most likely to spin? What colour would you be least likely to spin? If you were playing a game, which colour would give you the best chance of winning?*



3. Group game: Students need red, blue and yellow Unifix cubes. Each person takes turns in spinning the pointer. If the pointer stops on yellow, the person puts out a yellow Unifix cube, likewise for red or blue. After each player has had five turns, stop and count how many yellow, blue and red Unifix cubes each person has. Put all the same colours of Unifix cubes together and count the total in each

colour. *What colour did the group spin most? Least?* Compare with other groups. Put all the Unifix cubes together in groups of yellow, blue and red. *What colour did the class spin most? Least?* Use the language of chance to explain outcomes.

Connections

Activity: Tie a length of cord across the classroom. Distribute the 24 cards from the language of chance terms above to students. Ask the students with the *impossible*, *equal chance* and *certain* cards to peg them onto the cord. Discuss: *Does everyone agree? Are they in the right places? What does this mean?* Repeat process with the other chance cards and note that some need to be pegged on top of each other at the same place. Discuss the range: impossible to certain.

Relate to throwing dice, spinners, fractions, 0 – 1.

Reflection

Validation

Students draw conclusions about events in their world that give a certain, impossible, or likely chance, e.g. in games they play, sports teams they follow.

Application/ problems

Provide applications and problems for students to apply to different real-world contexts independently; e.g. *Draw three pet cages with 3–5 puppies in each so that the first cage shows it would be impossible to buy a black puppy, the second cage shows that it would be certain to buy a black puppy and the third cage shows it is possible but not certain to buy a black puppy.*

Extension

Flexibility. Students are able to use many chance terms to refer to the same conclusion and use many representations to demonstrate data.

Reversing. Provide opportunities for students to describe: an event → chance terms, and reverse, chance terms → event. For example, have three plastic bags with coloured beads: (a) 4 red, 1 blue, 1 yellow; (b) 3 red, 2 blue, 1 yellow; (c) 2 red, 2 blue, 2 yellow. *Which bag will give me the best chance of getting a red?* Reverse: *How would you put seven counters of three colours in a bag, so that in a trial of 20 lucky dips, you would get the orange colour the least number of times?*

Generalising. *Frequency of outcome is random; the larger the number or amount, the greater the chance and vice versa, the smaller the number or amount, the lesser the chance.*

Changing parameters.

1. Students design, construct and test their own spinners.
2. Students are given a table/graph relating to outcomes from spinner experiments and asked to tell the story or to answer specific questions relating to the table or graph.

Teacher's notes

- Use language-based consultation with students describing and explaining expected outcomes.
- Tables and graphs are named, columns and axes are named; column graphs may be made using Unifix colours relating to the spinner colours – trace column/s from Unifix cubes to construct the graph.
- 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.

