YuMi Deadly Maths

Year 3 Teacher Resource:

SP – Come in spinner

Prepared by the YuMi Deadly Centre
Faculty of Education, QUT

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ACKNOWLEDGEMENT

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refined and presented in professional development sessions.

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Year 3 Statistics and Probability

Come in spinner

Learning goal	Students will recognise and describe variations in results and conduct a simple experiment with spinners.
Content description	Statistics and Probability – Chance • Conduct chance experiments, identify and describe possible outcomes and recognise variation in results (ACMSP067)
Big idea	Probability – chance
Resources	Cards with chance terms and cord for pinning chance positions; hula hoops with arrows attached, cardboard arrow, cards of different colours, rope to define circle (optional); small cards with spinners of different types (see Teacher's notes)

Reality

Local knowledge	Discuss events in the local environment that are certain to happen, impossible to happen and could perhaps happen, e.g. everyday events – night will follow day, the sun will not fall out of the sky, it may rain today.
Prior experience	Check that students know terminology of possible outcomes: certain, impossible, equally likely, even chance, unlikely, very likely, student suggestions.
Kinaesthetic	Groups of five: one student with hula hoop (arrow attached) standing in the middle of the circle, the other four students with four differently coloured cards make a circle around the middle student at 12, 3, 6, and 9 clock positions. Student in middle spins hoop and records the colour data (tally marks) in a table where >halfway goes up to next colour, <halfway goes back to previous colour. Discuss the outcomes each time before the hula hoop is spun: *What colour is certain to be spun? What colour is impossible to be spun? What colour is possible to be spun?* All groups have the same four colours; after a number of spins, groups compare results of the collected data. Give reasons for the outcome results, e.g. *Why was it impossible to spin black?* [black wasn't there]. *Why was red not always certain to be spun?* [there were three other colours that were possible for the spinner to point to]. *What colour was spun most/least? Why do you think that happened? What colours were spun about the same number of times? Why do you think this was so?*

Abstraction

Body	Conduct the hula hoop experiment with different numbers of students in the group and spinners with different colour combinations; differ the size of the colour segments, i.e. equal, smaller, larger, same colour repeated but different size. For example, one student blue card, two students red cards, one student yellow, one student red; spin, record data. After a number of spins, groups describe and compare the results of the different experiments. Discuss as above the possible reasons for differences and similarities.
Hand	In pairs, students use small different types of spinners to predict outcome, spin 20 times and record data in a table; repeat using different type of spinner; describe and compare data with their predictions.
Mind	Students put a chalk mark in front of where they are standing, shut their eyes, twirl around. Open eyes and check where they are in relation to the chalk mark. Predict where they will end next time; shut their eyes and repeat process. Think: *Is the data what you expected?*
Creativity	Students draw a picture to show what they think is impossible, possible and certain to happen in their lives. If they wish, they can share with a partner or with the class.

Mathematics

Language/ symbols

chance, events, spinner, possible outcomes, likelihood, likely, unlikely, impossible, possible, certain, equally likely, same chance, equal chance, more likely, less likely, lucky, unlucky, experiment, table, graph, data, collect, conduct, compare, describe

Practice

1. Groups of four to five are given different types of spinners (1–6) to conduct colour experiments. They record results in a colour table using tally marks. When they have completed five spins each, the groups swap their spinners.
2. Graph above data, describe and compare; identify and discuss the variations in results. Elicit that it is more likely that the spinner will land where the colour has a bigger space than the other colours. Conversely, the smaller space gives a less likely chance.
3. Repeat process for other experiments that have been conducted.

Connections

Relate to throwing dice, probability.

Reflection

Validation

Students look at their world to explore situations where chance outcomes are involved, e.g. the chance of going shopping on the way home from school; the chance their favourite team will win in sporting competitions.

Application/ problems

Provide applications and problems for students to apply to different real-world contexts independently, e.g. *What's the chance of throwing a six to start playing Snakes and Ladders? What's the chance of going up the ladders or going down the snakes? What's the chance of getting the number you want to land on a property you want to buy in Monopoly, or conversely, throwing a number so that you don't land on a property where you have to pay rent on the hotel? Which one gives the better chance?*

Extension

Flexibility. Students are able to identify and describe outcomes in varying ways and contexts using comprehensive vocabulary and experiment methods.

Reversing. Students are given reversing exercises where they conduct experiments ↔ calculate the chance ↔ describe results ↔ tell the story. For example, provide different types of spinners and ask the students to select the spinner that has (a) an equal chance for blue, (b) no chance for purple, (c) an unfair chance for green. Reverse: Ask students to create spinners that have: (a) lots of red, (b) only a little yellow, (c) no chance for green, (d) equal chance for orange.

Generalising. *Frequency of outcome is random; the larger the spinner segment/extent of favourable outcomes, the greater the chance, and vice versa, the smaller the spinner segment/extent of favourable outcomes, 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.

Spinners