YEAR: 2   UNIT: 2   TOPIC: CHANCE

Chance and Data lesson plans for problems 28-30

Journal problem 28   *Chance*   BACK-TO-FRONT MATHS

Problem 28, Lesson 1:   **Novel problem**

Before you begin:
This problem encourages students to distinguish between things that are impossible and those that might happen using a familiar school setting. You may wish to introduce the problem by discussing the school sports day and what the students know about this day Ensure the students have been introduced to the terms 'might happen' and 'impossible'. In the second part of the problem, students use the events that might happen to make a further distinction between those events that are 'likely' and those that are 'unlikely'.

Leading questions:
* Is this something that is possible or is there no way that this would ever happen? (Note: there is only one situation that is impossible)
* Look at the situations that you have decided are possible. Which ones are unlikely to happen? This means that there is almost no chance of it ever happening.

Teaching Tips:
* Check the students' understanding of the terms 'might happen', 'impossible', 'likely' and 'unlikely'
* Students should be able to identify the situation that they are sure could never happen. (Note: events like 'no students will come to school' and 'the teachers will all go home early' might happen if there is a cyclone or other catastrophic event).
* Observe whether students are able to make the distinction between 'likely' and 'unlikely' and encourage them to justify their choices to their partner.

Differentiation:
Students requiring support:
See *Recognise chance situations and use the language of chance* p124
* Students may need assistance to distinguish between what is impossible and what might happen. Provide 'what if' scenarios to help them decide.
Extension:
Ask students to make up events that are 'likely', 'unlikely' or 'impossible' for other familiar situations and explain why they have put them in these categories.

Teacher information:
The Manipulation Problem asks students to compare two possible spinners and work out which one is more "fair". Students should realise that in order to be "fair" each colour should have an even share of the spinner.
Use sharing time to discuss the use of ordered lists or other strategies to ensure they have listed all of the possible outcomes.

You will need: pictures of everyday events that are possible or impossible (magazine pictures, clip art pictures etc), magazines and scissors.

Hands-on activities and games to choose from:
- Give students some pictures of everyday events that could happen. Ask them to change the picture to turn it into something impossible.
- Use spinners and dice to play chance games where students compare trials.
- Ask students to search through magazines to find pictures of possible and impossible events. Students could then order the possible events to show how likely they are.
- Give students a selection of pictures of possible and impossible events and have them sort them into 'possible' and 'impossible' events.
- Talk about events that people once thought were 'impossible' and how these are now possible through growth in scientific knowledge (e.g. landing on the moon, computers that are smaller than a whole room), and events that were thought of as 'certain' that have been avoided so far (e.g. running out of fuel, nuclear war with Russia).
- Give students some ideas for events that they think of as certain and ask them to come up with something that could happen to change the outcome (e.g. if they think that it is certain that they will have cake at their party – "but what if at the last minute someone dropped the cake?").

Tips for parents:
- Talk about plans for family outings and the chances of the weather being favourable. Include possible, impossible, likely and unlikely scenarios in the discussion (e.g. Will there be a snow storm when we are having our picnic?)
- Discuss other chance happenings that might occur (e.g. Do you think it is possible that Grandma will visit us tomorrow? What could happen at football today?) as well as how likely this is (e.g. Grandma *might* come to visit, but as she lives in Melbourne this is pretty *unlikely*).
- Talk about chance when playing games (e.g. It's possible that I will roll a six but not certain).

Differentiation:
Students requiring support:
- Students may need help to realise that there are a number of possible outcomes for the sports day. They will need to be helped to organise their solutions in a way that ensures that they are able to find all possibilities.
- Students may need help to realise that events in life are rarely black and white (certain or impossible), that there are many different possibilities, some of which are more likely than others.

Problem 28, Lesson 3:   **Backwards problem, reflection and extension**

Before you begin:
The Backwards Problem asks students to design a spinner for which the outcomes are not fair. They need to be able to decide which colour will need the biggest and smallest pieces, and to draw lines on the spinner to make the spinner represent this size.

What to look for:
- Students should be able to suggest which colour will need the biggest and smallest pieces of the spinner given the information about the teams.
- Ask students to justify their solution.
- During sharing time ask students to present their solution and justification. Discuss the less likely outcomes and why they are less likely.

Differentiation:
Students requiring support:
See *Identify all of the possible events or options* p129
- Students may need help to understand the impact of the size of each piece on the outcome of the game.

Extension:
Ask students to order the likelihoods from their spinners and decide which colours they would choose to have.

By Leah O'Neill and Tierney Kennedy   © Tierney Kennedy   *Back-to-Front Maths*

Problem 28: Chance

School Sports Day is tomorrow and all classes are getting ready. Read the stories that are about things that:

| might happen | | are impossible or will never happen |

Work with a partner to sort the cards into 2 groups — things that might happen and things that will never happen. Make sure you both agree.

Things that <u>might happen</u> can be sorted into two groups. Things that are:

| likely to happen | | unlikely to happen |

Work with your partner to sort the cards in your 'might happen' group.

Make 2 groups — things that are likely to happen and things that are unlikely to happen. Make sure you both agree.

Choose one story from each group to glue in these boxes.

Something that is
likely to happen.

Something that is
unlikely to happen.

Problem solving:

Teacher initials:
Date:

Student solved the problem with:
○ Minimal help
○ Some prompting
○ Solved after explanation
○ Did not work out a solution by themselves
○ N/A – not a novel problem

Why did you put them in these groups?

Tell a friend why these things are likely or unlikely to happen.

Peer Assessment

Name:

Application questions

Alice's family is going on a holiday to the beach for the summer holidays.

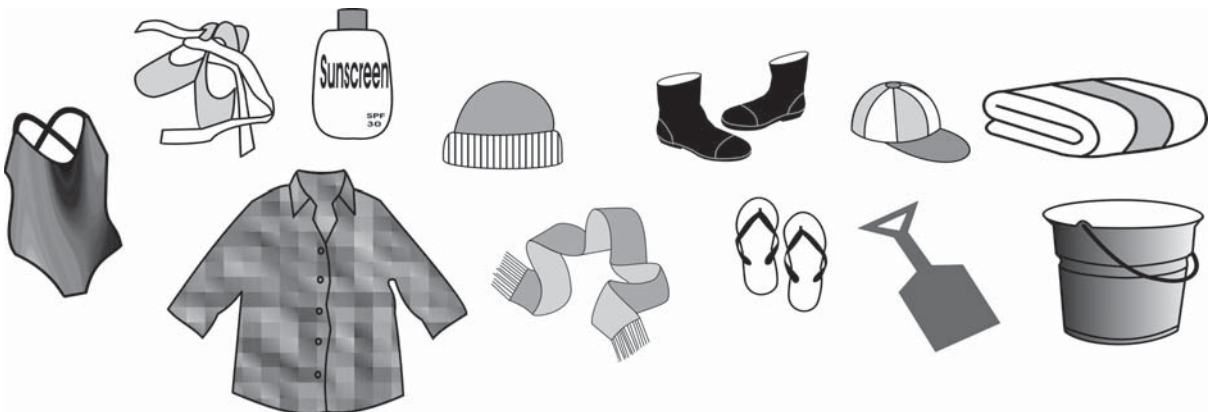✏ or ☞ Draw or write about something that might happen at the beach.

✏ or ☞ Draw or write about something that will not happen at the beach.

Alice is packing her bag ready to go.
Which of the following things is she likely to need while she is away?
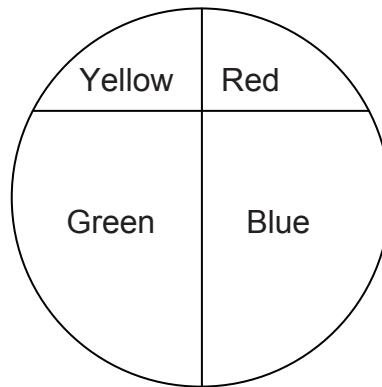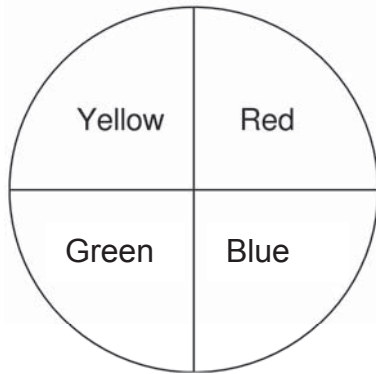
✏ Draw a circle around the things Alice is likely to need.

✗ Draw a cross through the things that Alice is unlikely to need.

Manipulation problem

There are four colours on a spinner. Each person chooses one colour. When a spinner lands on the person's colour, they score a point. Here are the spinners:

Yellow	Red
Green	Blue

Yellow	Red
Green	Blue

✍ *Would it matter which colour you chose? Explain:*

Backwards question

✏ Design a spinner where Red is the most likely to win, and Yellow is the least likely to win.