| LEVEL: Year 3/4 | CONTENT: Statistics and Probability | FOCUS: Chance |
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| In the Classroom | |
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| **PURPOSE** | <ul><li>Order chance terms and events according to their likelihood</li><li>Match familiar chance events to their likelihood</li><li>List all the possible outcomes from a simple chance experiment</li><li>Predict the likelihood of an experiment based on the possible outcomes</li><li>Use chance terms to describe the likelihood of simple chance experiments</li><li>Explain the variation in results (i.e. compare predicted to observed results)</li></ul> |
| **ENTRY TASK** | **Ordering Everyday Events**<br>Present students with a list of familiar events and chance terms. Students must list them in order on a continuum from most likely to least likely to occur and assign each event a probability of occurring. |
| **EXPLICIT TEACHING & LEARNING** | **Horse Race (Roll 2 dice)**<br><br>Students work with a partner. Each student chooses one of the horses on the board. Roll the 2 dice. Each time the horse's number is rolled the player moves their counter forward one square on the grid. The first horse to move forward 10 squares is the winner.<br><br>Talk about the chances of rolling the different totals and encourage students to record a list of all the possible outcomes. What is the likelihood of the different totals? Can you assign each outcome a probability? |
| **DISCUSSION/KEY QUESTIONS** | <ul><li>Can you order the chance terms in order of likelihood?</li><li>Can you match the events to the appropriate chance term?</li><li>Can you think of any other events that match each term?</li><li>Can you assign a probability to each event (i.e. a number value)?</li><li>Which horse do you believe is the most likely to win? Why?</li><li>What outcomes can you get from rolling 2-dice?</li><li>How can we list all the outcomes in a systematic way?</li><li>Can we use numbers to describe these outcomes?</li><li>Which number is most likely to be the total? Why?</li><li>Why does the mathematical (or theoretical) chance not always match the results?</li></ul> |
| **DELIBERATIVE PRACTICE** | The first activity is used to see if students have any misconceptions regarding the use of common chance terms. The second task is encouraging students to begin to record all the possible outcomes of a chance experiment and use this information to begin to predict the likelihood of different outcomes. |
| **REFLECTION** | As a class share the different outcomes from rolling the two dice. Using this information, talk about the probability of obtaining the different totals. This is just an introduction. Explain that the mathematical probabilities (or theoretical) can be used to predict the likelihood of results. In practice, this does not always happen. Share with students the Excel spreadsheet that shows multiples trials of the game. |
| **RESOURCES** | 6-sided dice and Counters<br>Game sheet – Horse Race Two Dice Game<br>Excel file – Roll 2 Dice; Word file – Ordering Events |

| Curriculum Connections | |
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| **CONTENT** | **VICTORIAN CURRICULUM F-10 – Statistics and Probability**<br><br>**Year 3 – Chance**<br>Conduct chance experiments, identify and describe possible outcomes and recognise variation in results(VCMSP147)<br>**Elaborations:** conducting repeated trials of chance experiments such as tossing a coin or drawing a ball from a bag and identifying the variations between trials<br><br>**Year 4 – Chance**<br>Describe possible everyday events and order their chances of occurring (VCMSP175)<br>**Elaborations:** using lists of events familiar to students and ordering them from 'least likely' to 'most likely' to occur |

# CHOOSE**MATHS**

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| | **Year 5 – Chance**<br>List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions (VCMSP203)<br>**Elaborations:** using lists of events familiar to students and ordering them from 'least likely' to 'most likely' to commenting on the likelihood of winning simple games of chance by considering the number of possible outcomes and the consequent chance of winning in simple games of chance such as jan-ken-pon (also known as rock-paper-scissors)<br>Recognise that probabilities range from 0 to 1(VCMSP204)<br>**Elaborations:** investigating the probabilities of all outcomes for a simple chance experiment and verifying that their sum equals 1 |
| **WHAT CAME BEFORE** | Some students may have a misconception regarding events that are certain and impossible. Avoid non-mathematical suggestions like, talking trees or flying cards. Some children may believe you can talk to trees, etc. Better to stick with simple chance events that can be modelled. Some students may describe choosing a red marble from a bag with only one red as impossible – explain that although highly unlikely it is still possible. |
| **WHAT COMES NEXT** | In Year 5, students much recognise that probabilities range from 0 to 1. This concept can be introduced earlier to students. Although, at this stage, it is not a requirement for students to match events to fractions, many students have a basic understanding of percentages and phrases like fifty-fifty, so it is a good idea to expose students to this information earlier. |
| **VOCABULARY** | Chance, probability, events, outcomes, continuum, list, order, certain, no chance, impossible, likely, unlikely, fifty-fifty, equal chance, familiar, trials, fractions, theoretical, observed, actual, variation, comparison |
| **MISCONCEPTIONS** | When listing all the possible outcomes of rolling 2 dice it is important to all the ways. So, for example, if you have a red and a blue dice, 1R and 5B is different from 5R and 1B. These are two separate outcomes. To help students with this concept provide them with two different coloured dice. |
| **WHAT PROFICIENCIES ARE TO BE UTILISED?**<br><br>**Understanding**<br>**Fluency**<br>**Problem Solving**<br>**Reasoning**<br>**Communicating (NSW)**<br>**Justifying (NSW)** | **Year 3 (Australian Curriculum)**<br>**Understanding** includes connecting number representations with number sequences, partitioning and combining numbers flexibly, representing unit fractions, using appropriate language to communicate times, and identifying environmental symmetry<br><br>**Fluency** includes recalling multiplication facts, using familiar metric units to order and compare objects, identifying and describing outcomes of chance experiments, interpreting maps and communicating positions<br><br>**Problem-solving** includes formulating and modelling authentic situations involving planning methods of data collection and representation, making models of three-dimensional objects and using number properties to continue number patterns<br><br>**Reasoning** includes using generalising from number properties and results of calculations, comparing angles and creating and interpreting variations in the results of data collections and data displays. |
| **ASSESSMENT** | **Exit Ticket**<br>What are the different outcomes from rolling one 6-sided dice? Which number is most likely to be rolled? Explain your thinking |

**CHOOSEMATHS**