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| **LEARNING AREA:** MATHEMATICS AND STATISTICS | | | **STRAND**: STATISTICS | **LEVEL**: 1 - 4 |
| **YEAR** 2016 | **TERM** 1 | | **WEEKS** | **YEAR LEVEL** |
| NZ Curriculum **KEY COMPETENCY** | [thinking](http://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum/Key-competencies#thinking)  [using language, symbols, and texts](http://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum/Key-competencies#language)  [managing self](http://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum/Key-competencies#managing)  [relating to others](http://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum/Key-competencies#relating)  [participating and contributing](http://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum/Key-competencies#participating) | **NZ Curriculum VALUES**  To be encouraged, modeled, and explored | Students will be encouraged to value:  **excellence**, by aiming high and by persevering in the face of difficulties  **innovation**, inquiry, and curiosity, by thinking critically, creatively, and reflectively  **diversity**, as found in our different cultures, languages, and heritages  **equity**, through fairness and social justice  **community** and participation for the common good  **ecological** sustainability, which includes care for the environment  **integrity**, which involves being honest, responsible, and accountable and acting ethically  and to **respect** themselves, others, and human rights. | |
| **SCHOOL VALUES** | Striving for excellent  Teamwork  Achieving personal best  Respect | **POSSBILE RESOURCES** | Digital Learning Objects <http://nzmaths.co.nz/digital-learning-objects>  nzmaths Learning Objects <http://nzmaths.co.nz/nzmaths-learning-objects-0>  Statistical investigations <http://nzmaths.co.nz/statistical-investigations-units-work>  statistical literacy <http://nzmaths.co.nz/statistical-literacy-units-work>  probability <http://nzmaths.co.nz/probability-units-work>  Figure it out statistics <http://nzmaths.co.nz/figure-it-out-7> | |

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| Statistical Investigation | LEVEL TWO   * Conduct investigations using the statistical enquiry cycle: * posing and answering questions; * gathering, sorting and counting, and displaying category data; * discussing the results. | Achievement objectives | LEVEL ONE   * Collect everyday objects, sort them into categories, count the number of objects in each category, and display and discuss the results. |
| LEVEL TWO   * Conduct investigations, using the statistical enquiry cycle: * posing and answering questions; * gathering, sorting, and displaying category and whole number data; * communicating findings based on the data. | LEVEL TWO   * Collect everyday objects, sort them into categories, count the number of objects in each category, and display and discuss the results. |
| LEVEL THREE   * Conduct investigations using the statistical enquiry cycle: * gathering, sorting, and displaying multivariate category and whole number data and simple time-series data to answer questions; * identifying patterns and trends in context, within and between data sets; * communicating findings, using data displays. | LEVEL THREE   * plan statistical investigations of an assertion abut a situation * collect and display discrete numeric data in stem-and-leaf graphs, dot plots and strip graphs, as appropriate. |
| LEVEL FOUR   * Plan and conduct investigations using the statistical enquiry cycle: * determining appropriate variables and data collection methods; * gathering, sorting, and displaying multivariate category, measurement, and time-series data to detect patterns, variations, relationships, and trends; * comparing distributions visually; * communicating findings, using appropriate displays. | LEVEL FOUR   * Plan statistical investigation arising from the consideration of an issue or experiment of interest * Collect appropriate data * Choose and construct quality data displays (frequency tables, bar charts, histograms) to communicate significant features in measurement data * Collect and display time-series data |

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| Statistical Literacy | LEVEL ONE   * Interpret statements made by others from statistical investigations and probability activities. | **Achievement objectives** | LEVEL ONE |
| LEVEL TWO   * Compare statements with the features of simple data displays from statistical investigations or probability activities undertaken by others. | LEVEL TWO |
| LEVEL THREE   * Evaluate the effectiveness of different displays in representing the findings of a statistical investigation or probability activity undertaken by others. | LEVEL THREE   * Use their own language to talk about the distinctive features, such as outlines and clusters in their own and others’ data displays. * Make sensible statements about an assertion on the basis of the evidence of a statistical investigation |
| LEVEL FOUR   * Evaluate statements made by others about the findings of statistical investigations and probability activities. | LEVEL FOUR   * Report the distinctive features (outliers, clusters, shape of data distribution) of data displays * Evaluate others’ interpretations of data displays * Make statements about implications and possible actions consistent with the results of statistical investigation |

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| Probability | LEVEL ONE   * Investigate situations that involve elements of chance, acknowledging and anticipating possible outcomes. | **Achievement objectives** | LEVEL ONE   * Classify events from their experiences as certain, possible, or impossible. |
| LEVEL TWO   * Investigate simple situations that involve elements of chance, recognising equal and different likelihoods and acknowledging uncertainty. | LEVEL TWO   * Classify events from their experiences as certain, possible, or impossible. |
| LEVEL THREE   * Investigate simple situations that involve elements of chance by comparing experimental results with expectations from models of all the outcomes, acknowledging that samples vary. | LEVEL THREE   * Use a systematic approach to count a set of possible outcomes * Predict the likelihood of outcomes on the basis of a set of observations |
| LEVEL FOUR   * Investigate situations that involve elements of chance by comparing experimental distributions with expectations from models of the possible outcomes, acknowledging variation and independence. * Use simple fractions and percentages to describe probabilities. | LEVEL FOUR   * Estimate the relative frequencies of events and mark them on a scale * Find all possible outcomes for a sequence of events, using a tree diagrams |

**SPECIFIC LEARNINGS OBJECTIVES**

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| LEVEL ONE | * Count all the objects using tally marks * Fill in tables * Use correct vocabulary to discuss probability * Collect and sort objects into categories * Display objects and describe the display using appropriate vocabulary * Draw a block graph to show results * Classify events as certain, possible, or impossible | **VOCABULARY REQUIRED** | Bar graph block graph collect display labels might objects pictograph show sort will won’t |
| LEVEL TWO | * Collect data methodically * Display data using tally marks * Read tally marks * Display data in a pictograph, bar chart, block graph * Read and interpret pictograph, bar chart, block graph * Sort activities and events into categories of probability * Choose outcomes of events or activities * Pose questions for investigations * Interpret display of data * Discuss data displays using appropriate vocabulary * Compare results of data displays * Report results on investigations * Use appropriate vocabulary to discuss probability | Always bigger biggest certain chance impossible investigation likely never outcomes smaller smallest sometimes survey unlikely value |
| LEVEL THREE | * Plan a survey * Collect data * Organise data appropriately * Display data on a pictogram, bar chart, stem-and-leaf chart, dot plot * Draw a strip graph * Answer questions about a graph * Discuss results of a survey making inferences based on the results * Evaluate statements about data displays * Interpret results of a survey * Work out possible outcomes of an event * Describe the likelihood of an event occurring * Predict one of two events as more likely * Predict one of a number of events as most / least likely * Write all possible outcomes of an event as a list or a table * Round measurement data to the nearest whole number where necessary * Report results of statistical investigation * Graph simple time series data * Interpret frequency table | Axes certain collection sheet distribution even chance fair impossible likely outcomes probability results uneven chance unfair unlikely spread |
| LEVEL FOUR | * Interpret time-series data * Interpret grouped data * Draw histogram to show grouped data * Use databases to sort data * Pose questions for statistical investigations * Plan a statistical investigation * Process the data of statistical investigations * Report results of statistical investigations * Devise a method to obtain a representative sample * Interpret frequency table | **VOCABULARY REQUIRED** | Database histogram horizontal axis representative sample |

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|  | PROBLEM SOLVING | DEVELOPING LOGIC AND REASONING | COMMUNICATING MATHE IDEAS |
| LEVEL 1,2,3,4 | * Pose questions * Plan exploration * Devise and use strategies * Find and use a model * Devise and use a model * Use equipment appropriately | * Classify objects * Classify numbers and ideas * Make conjectures * Prove or refute conjectures * Generalise ideas and conjectures * Interpret information and results * Follow a chain of reasoning * Use words and symbols to describe, continue and generalise patterns | * Use own and mathematical language to explain ideas * Devise and follow instructions * Record and discus results * Report results coherently. |