

New Zealand achievement objectives for Statistics in the new Mathematics and Statistics Curriculum finalised 2007

This is the “Tier 1” specification. “Tier 2” specifications which will flesh this out in progress in 2008. *From ...*

http://nzcurriculum.tki.org.nz/the_new_zealand_curriculum/learning_areas/mathematics_and_statistics/mathematics_and_statistics_curriculum_achievement_objectives

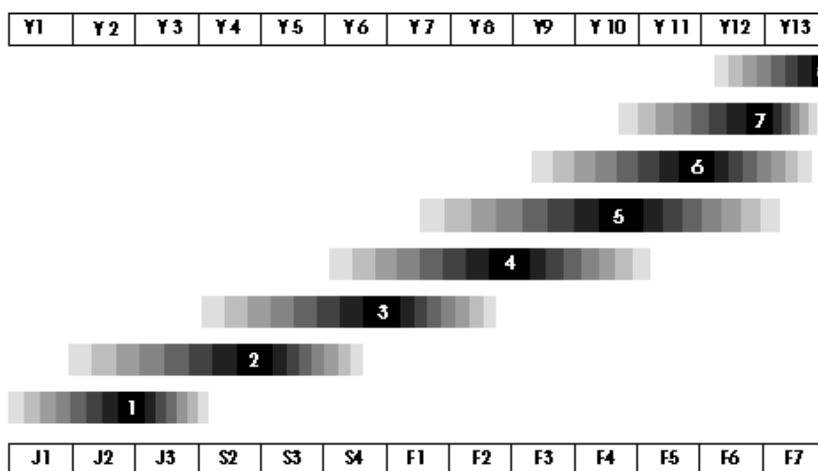
Diagrams Key:

N&A = Number and algebra

G&M = Geometry and measurement

S = Statistics

“Level” as relates to year of schooling



Level 1

In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to:

Statistical investigation

- Conduct investigations using the statistical enquiry cycle:
 - posing and answering questions
 - gathering, sorting and counting, and displaying category data
 - discussing the results.

Statistical literacy

- Interpret statements made by others from statistical investigations and probability activities.

Probability

- Investigate situations that involve elements of chance, acknowledging and anticipating possible outcomes.



Level 2

In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to:

Statistical investigation

- 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.

Statistical literacy

- Compare statements with the features of simple data displays from statistical investigations or probability activities undertaken by others.

Probability

- Investigate simple situations that involve elements of chance, recognising equal and different likelihoods and acknowledging uncertainty.



Level 3

In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to:

Statistical investigation

- 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.

Statistical literacy

- Evaluate the effectiveness of different displays in representing the findings of a statistical investigation or probability activity undertaken by others.

Probability

- 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 4

In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to:

Statistical investigation

- 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.

Statistical literacy

- Evaluate statements made by others about the findings of statistical investigations and probability activities.

Probability

- 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 5

In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to:

Statistical investigation

- Plan and conduct surveys and experiments using the statistical enquiry cycle:
 - determining appropriate variables and measures
 - considering sources of variation
 - gathering and cleaning data
 - using multiple displays, and re-categorising data to find patterns, variations, relationships, and trends in multivariate data sets
 - comparing sample distributions visually, using measures of centre, spread, and proportion
 - presenting a report of findings.

Statistical literacy

- Evaluate statistical investigations or probability activities undertaken by others, including data collection methods, choice of measures, and validity of findings.

Probability

- Compare and describe the variation between theoretical and experimental distributions in situations that involve elements of chance.
- Calculate probabilities, using fractions, percentages, and ratios.



Level 6

In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to:

Statistical investigation

- Plan and conduct investigations using the statistical enquiry cycle:
 - justifying the variables and measures used
 - managing sources of variation, including through the use of random sampling
 - identifying and communicating features in context (trends, relationships between variables, and differences within and between distributions), using multiple displays
 - making informal inferences about populations from sample data
 - justifying findings, using displays and measures.

Statistical literacy

- Evaluate statistical reports in the media by relating the displays, statistics, processes, and probabilities used to the claims made.

Probability

- Investigate situations that involve elements of chance:
 - comparing discrete theoretical distributions and experimental distributions, appreciating the role of sample size
 - calculating probabilities in discrete situations.

Level 7

In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to:

Statistical investigation

- Carry out investigations of phenomena, using the statistical enquiry cycle:
 - conducting surveys that require random sampling techniques, conducting experiments, and using existing data sets
 - evaluating the choice of measures for variables and the sampling and data collection methods used
 - using relevant contextual knowledge, exploratory data analysis, and statistical inference.
- Make inferences from surveys and experiments:
 - making informal predictions, interpolations, and extrapolations
 - using sample statistics to make point estimates of population parameters
 - recognising the effect of sample size on the variability of an estimate.

Statistical literacy

- Evaluate statistically based reports:
 - interpreting risk and relative risk
 - identifying sampling and possible non-sampling errors in surveys, including polls.

Probability

- Investigate situations that involve elements of chance:
 - comparing theoretical continuous distributions, such as the normal distribution, with experimental distributions
 - calculating probabilities, using such tools as two-way tables, tree diagrams, simulations, and technology.

Level 8

In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to:

Statistical investigation

- Carry out investigations of phenomena, using the statistical enquiry cycle:
 - conducting experiments using experimental design principles, conducting surveys, and using existing data sets
 - finding, using, and assessing appropriate models (including linear regression for bivariate data and additive models for time-series data), seeking explanations, and making predictions
 - using informed contextual knowledge, exploratory data analysis, and statistical inference
 - communicating findings and evaluating all stages of the cycle.
- Make inferences from surveys and experiments:
 - determining estimates and confidence intervals for means, proportions, and differences, recognising the relevance of the central limit theorem
 - using methods such as resampling or randomisation to assess the strength of evidence.

Statistical literacy

- Evaluate a wide range of statistically based reports, including surveys and polls, experiments, and observational studies:
 - critiquing causal-relationship claims
 - interpreting margins of error.

Probability

- Investigate situations that involve elements of chance:
 - calculating probabilities of independent, combined, and conditional events
 - calculating and interpreting expected values and standard deviations of discrete random variables
 - applying distributions such as the Poisson, binomial, and normal.