

Achievement Standard

Subject Reference	Mathematics and Statistics 1.11		
Title	Investigate bivariate numerical data using the statistical enquiry cycle		
Level	1	Credits	3
		Assessment	Internal
Subfield	Statistics and Probability		
Domain	Statistics		
Status	Registered	Status date	9 December 2010
Planned review date	31 December 2014	Date version published	9 December 2010

This achievement standard requires students to investigate bivariate numerical data using the statistical enquiry cycle.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Investigate bivariate numerical data using the statistical enquiry cycle. 	<ul style="list-style-type: none"> Investigate bivariate numerical data using the statistical enquiry cycle with justification. 	<ul style="list-style-type: none"> Investigate bivariate numerical data using the statistical enquiry cycle with statistical insight.

Explanatory Notes

- This achievement standard is derived from Level 6 of *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, and is related to the material in the *Teaching and Learning Guide for Mathematics and Statistics*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>. The achievement standard is aligned to the following achievement objectives taken from the Statistical Investigation thread of the Mathematics and Statistics learning area:
 - 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 and relationships, in multivariate data sets
 - presenting a report of findings.

- 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 (relationships between variables), using multiple displays
 - justifying findings, using displays and measures.

2 *Using the statistical enquiry cycle* involves using each component of the statistical enquiry cycle to investigate bivariate numerical data.

Numerical data:

The x variable or explanatory variable may be a continuous or discrete numerical variable.

The y-variable or response variable must be a numerical variable where the numbers measure the quantity of interest.

Using the statistical enquiry cycle with justification involves linking aspects of the statistical enquiry cycle to the context and making supporting statements which refer to evidence such as summary statistics, data values, trends or features of visual displays.

Using the statistical enquiry cycle with statistical insight involves integrating statistical and contextual knowledge throughout the statistical enquiry cycle, and may involve reflecting on the process or considering other explanations for the findings.

3 Students need to be familiar with using the statistical enquiry cycle to investigate bivariate numerical data, which involves:

- planning and conducting an investigation using bivariate numerical data
- working with a given relationship question
- determining appropriate variables and measures
- managing sources of variation
- gathering data
- selecting and using appropriate display(s)
- communicating relationship(s) in the data in a conclusion.

4 Conditions of Assessment related to this achievement standard can be found at www.tki.org.nz/e/community/ncea/conditions-assessment.php.

Replacement Information

This achievement standard and AS91035 replaced unit standard 5240 and AS90193.

Quality Assurance

- 1 Providers and Industry Training Organisations must be accredited by NZQA before they can register credits from assessment against achievement standards.
- 2 Accredited providers and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Accreditation and Moderation Action Plan (AMAP) reference

0233