

Achievement Standard

Subject Reference	Mathematics and Statistics 3.13		
Title	Apply probability concepts in solving problems		
Level	3	Credits	4
		Assessment	External
Subfield	Statistics and Probability		
Domain	Probability		
Status	Registered	Status date	4 December 2012
Planned review date	31 December 2016	Date version published	4 December 2012

This achievement standard involves applying probability concepts in solving problems.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Apply probability concepts in solving problems. 	<ul style="list-style-type: none"> Apply probability concepts, using relational thinking, in solving problems. 	<ul style="list-style-type: none"> Apply probability concepts, using extended abstract thinking, in solving problems.

Explanatory Notes

- This achievement standard is derived from Level 8 of *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007; and is related to the achievement objective:
 - Investigate situations that involve elements of chance
 - calculating probabilities of independent, combined, and conditional events in the Statistics strand of the Mathematics and Statistics Learning Area. It is also related to the material in the *Teaching and Learning Guide for Mathematics and Statistics*, Ministry of Education, 2012, at <http://seniorsecondary.tki.org.nz>.
- Apply probability concepts in solving problems* involves:
 - selecting and using methods
 - demonstrating knowledge of concepts and terms
 - communicating using appropriate representations.

Relational thinking involves one or more of:

- selecting and carrying out a logical sequence of steps
 - connecting different concepts or representations
 - demonstrating understanding of concepts;
- and also relating findings to a context or communicating thinking using appropriate statements.

Extended abstract thinking involves one or more of:

- devising a strategy to investigate or solve a problem
- identifying relevant concepts in context
- developing a chain of logical reasoning
- making a generalisation;

and also where appropriate, using contextual knowledge to reflect on the answer.

- 3 *Problems* are situations that provide opportunities to apply knowledge or understanding of mathematical and statistical concepts and methods. Situations will be set in real-life or statistical contexts.
- 4 Methods are selected from those related to:
 - true probability versus model estimates versus experimental estimates
 - randomness
 - independence
 - mutually exclusive events
 - conditional probabilities
 - probability distribution tables and graphs
 - two way tables
 - probability trees
 - Venn diagrams.
- 5 Assessment Specifications for this achievement standard can be accessed through the Mathematics and Statistics Resources page found at <http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/subjects/>.

Replacement Information

This achievement standard replaced unit standard 5258, unit standard 5259, and AS90643.

Quality Assurance

- 1 Providers and Industry Training Organisations must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.
- 2 Organisations with consent to assess and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Consent and Moderation Requirements (CMR) reference

0233