

Achievement Standard

Subject Reference Mathematics and Statistics 1.1

Title Apply numeric reasoning in solving problems

Level 1 **Credits** 4 **Assessment** Internal

Subfield Mathematics

Domain Number

Status Registered **Status date** 9 December 2010

Planned review date 31 December 2014 **Date version published** 9 December 2010

This achievement standard involves applying numeric reasoning in solving problems.

Achievement Criteria

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

Explanatory Notes

- 1 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 following achievement objectives, taken from the Number Strategies and Knowledge thread of the Mathematics and Statistics learning area, are related to this achievement standard:
- reason with linear proportions
 - use prime numbers, common factors and multiples, and powers (including square roots)
 - understand operations on fractions, decimals, percentages, and integers
 - use rates and ratios
 - know commonly used fraction, decimal, and percentage conversions
 - know and apply standard form, significant figures, rounding, and decimal place value
 - apply direct and inverse relationships with linear proportion
 - extend powers to include integers and fractions
 - apply everyday compounding rates.

2 *Apply numeric reasoning* involves:

- selecting and using a range of methods in solving problems
- demonstrating knowledge of number concepts and terms
- communicating solutions which would usually require only one or two steps.

Relational thinking involves one or more of:

- selecting and carrying out a logical sequence of steps
- connecting different concepts and representations
- demonstrating understanding of concepts
- forming and using a model;

and also relating findings to a context, or communicating thinking using appropriate mathematical 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, or proof
- forming a generalisation;

and also using correct mathematical statements, or communicating mathematical insight.

3 *Problems* are situations that provide opportunities to apply knowledge or understanding of mathematical concepts and methods. The situation will be set in a real-life or mathematical context.

4 The phrase 'a range of methods' indicates that evidence of the application of at least three different methods is required.

5 Students need to be familiar with methods related to:

- ratio and proportion
- factors, multiples, powers and roots
- integer and fractional powers applied to numbers
- fractions, decimals and percentages
- rates
- rounding with decimal places and significant figures
- standard form.

6 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 replaced unit standard 5235.

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