Achievement Standard

Subject Reference	Science 1.5				
Title	Demonstrate understanding of aspects of acids and bases				
Level	1	**Credits**	4	**Assessment**	External
Subfield	Science				
Domain	Science - Core				
Status	Registered	**Status date**	30 November 2010		
Planned review date	31 December 2014	**Date version published**	30 November 2010		

This achievement standard involves demonstrating understanding of atomic structure, particle theory and rates of reaction relating to acids and base properties, uses and reactions.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Demonstrate understanding of aspects of acids and bases.	• Demonstrate in-depth understanding of aspects of acids and bases.	• Demonstrate comprehensive understanding of aspects of acids and bases.

Explanatory Notes

1 This achievement standard is derived from *The New Zealand Curriculum,* Learning Media, Ministry of Education, 2007, Level 6. It is aligned with the Material World strand, and is related to the material in the *Teaching and Learning Guide for Science*, Ministry of Education, 2010 at http://seniorsecondary.tki.org.nz.

2 *Demonstrate understanding* typically involves describing, identifying, naming, drawing, or giving an account of aspects of acids and bases. This may require the use of chemistry vocabulary, symbols and conventions (including names and formulae), and completing word equations.

3 *Demonstrate in-depth understanding* typically involves explaining aspects of acids and bases. This may require explanations that use chemistry vocabulary, symbols and conventions (including names and formulae) and writing word equations or completing given symbol equations.

4 *Demonstrate comprehensive understanding* typically involves linking aspects of acids and bases. It may involve explaining, elaborating, justifying, relating, evaluating, comparing and contrasting, or analysing. This may require the use of chemistry vocabulary, symbols and conventions (including names and formulae), and writing balanced symbol equations.

5 *Aspects of acids and bases* will be selected from:

- Atomic structure
  - electron arrangement of atoms and monatomic ions of the first 20 elements (a periodic table will be provided)
  - isotopes
  - ionic bonding
  - names and formulae of ionic compounds using a given table of ions.

- Properties
  - acids release hydrogen ions in water
    reactions (of acids with bases) to form salts.
  - pH and effects on indicators.

- Rates of reaction and particle theory.

- Uses
  - neutralisation
  - carbon dioxide formation
  - salt formation.

6 *Acids and bases* are restricted to HCl, H_2SO_4, HNO_3, metal oxides, hydroxides, carbonates and hydrogen carbonates. Other acids may be included in examination questions. The names and formulae of any such acids will be given in the question.

7 Assessment Specifications for this achievement standard can be accessed through the Science Resources page found at www.nzqa.govt.nz/ncea/resources.

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