Achievement Standard

Subject Reference	Chemistry 2.3				
Title	Solve simple quantitative chemical problems				
Level	2	**Credits**	2	**Assessment**	Internal
Subfield	Science				
Domain	Chemistry				
Status	Registered	**Status date**	6 November 2006		
Planned review date	28 February 2008	**Date version published**	6 November 2006		

This achievement standard involves solving simple quantitative chemical problems.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Solve simple quantitative problems.	• Solve quantitative problems.	• Solve complex quantitative problems.

Explanatory Notes

1 This achievement standard is derived from achievement objectives 7.1, 7.2 and 7.3 in *Chemistry in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1994, p. 23.

2 For achievement, solving simple quantitative problems may involve using the relationships $n=m/M$ and $c=n/V$ to calculate one variable given the other two (the relationships are not given). Some problems may require students to determine molar masses from given atomic masses and formulae.

3 For achievement with merit, quantitative problems will involve at least 2 steps and require application of relationships such as $n=m/M$ and $c=n/V$. Examples of suitable problems include:
- calculating % composition of a compound
- determining empirical and molecular formulae
- calculations involving determination of the mass of solid needed to prepare a given volume of a standard solution
- determining, in moles, the amount of water removed on heating a sample of a hydrated salt to constant mass.

4 For achievement with excellence, complex problems will typically involve more than two steps, and the use of stoichiometric principles. Examples could include:

- calculating the mass of a substance produced or consumed in a reaction given the mass of another reactant or product and the balanced equation
- determining the number of waters of crystallisation in the formula of a hydrated salt
- determining the concentration of a solution given titration data and the balanced equation.

Answers to calculations must demonstrate correct units and appropriate use of significant figures.

Replacement information

This achievement standard replaced AS90307.

Quality Assurance

1 Providers and Industry Training Organisations must be accredited by the Qualifications Authority 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 0226