

Achievement Standard

Subject Reference	Chemistry 1.1		
Title	Carry out a practical chemistry investigation, with direction		
Level	1	Credits	4
		Assessment	Internal
Subfield	Science		
Domain	Chemistry		
Status	Registered	Status date	30 November 2010
Planned review date	31 December 2016	Date version published	12 December 2013

This achievement standard involves carrying out a procedure to collect and process primary data and interpret the results, with direction.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Carry out a practical chemistry investigation, with direction. 	<ul style="list-style-type: none"> Carry out an in-depth practical chemistry investigation, with direction. 	<ul style="list-style-type: none"> Carry out a comprehensive practical chemistry investigation, with direction.

Explanatory Notes

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

This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the Papa Whakaako.

- The procedures outlined in *Safety and Science: A Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000, must be followed during the practical investigation.
- With direction* means that general instructions for the investigation will be specified in writing and direction will be given in the form of a purpose, an outline of the method,

and the equipment and/or chemicals from which to choose. A template or suitable format for planning the investigation will be provided for the student to use.

- 4 A *practical chemistry investigation* includes collecting, processing, and interpreting primary data to reach a conclusion in a chemistry context using chemistry vocabulary, symbols, conventions and equations as appropriate. Suitable contexts could include: acid-metal reactions, acids and bases, rates of reaction, energy output of fuels, fermentation.
 - 5 Carry out a *practical chemistry investigation* involves:
 - developing a method for collecting primary data with units, relevant to the purpose, based on the manipulation of the independent variable over a range of values
 - processing and representing the data in an appropriate way (graph, table, calculation etc)
 - writing a conclusion based on the processed data.
 - 6 Carry out an *in-depth practical chemistry investigation* involves:
 - developing a procedure for collecting primary data, with units, relevant to the purpose, based on the manipulation of the independent variable over a valid range of values with repetition to show reliability
 - controlling the variable(s) that could have a significant effect on the results
 - using techniques to increase the accuracy of the measured values of the dependent (and independent) variable
 - processing and representing the data to enable a conclusion to be reached
 - writing a conclusion based on the processed data that links to the purpose of the investigation.
 - 7 Carry out a *comprehensive practical chemistry investigation* involves an in-depth investigation that also:
 - justifies the choices made to increase accuracy during the investigation
 - justifies the conclusion in terms of the processed data and the purpose of the investigation
 - relates investigation findings to applicable chemistry ideas.
 - 8 Conditions of Assessment related to this achievement standard can be found at www.tki.org.nz/e/community/ncea/conditions-assessment.php.
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Replacement Information

This achievement standard replaced AS90169.

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