

## Achievement Standard

<b>Subject Reference</b>	Chemistry 1.1		
<b>Title</b>	Carry out a practical chemistry investigation, with direction		
<b>Level</b>	1	<b>Credits</b>	4
		<b>Assessment</b>	Internal
<b>Subfield</b>	Science		
<b>Domain</b>	Chemistry		
<b>Status</b>	Registered	<b>Status date</b>	30 November 2010
<b>Planned review date</b>	31 December 2014	<b>Date version published</b>	30 November 2010

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

### 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>.
- 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](http://www.tki.org.nz/e/community/ncea/conditions-assessment.php).
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### Replacement Information

This achievement standard replaced AS90169.

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### 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.