

Achievement Standard

Subject Reference Science 2.1

Title Carry out a practical scientific investigation with supervision

Level 2 **Credits** 4 **Assessment** Internal

Subfield Science

Domain Science – Core

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This achievement standard involves carrying out a practical scientific investigation, with supervision, by planning the investigation, collecting and processing data, and interpreting and reporting the findings.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Carry out a practical science investigation. 	<ul style="list-style-type: none"> Carry out a quality practical science investigation. 	<ul style="list-style-type: none"> Carry out and evaluate a quality practical science investigation.

Explanatory Notes

- This achievement standard is derived from *Science in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1993, Developing Scientific Skills and Attitudes, pp. 42-51.

This achievement standard is also related to *Pūtaiao i roto i te Marautanga o Aotearoa*, Learning Media, Ministry of Education, 1996, Ngā Pūkenga me ngā Waiaro ki te Pūtaiao, pp. 70-85.
- Procedures outlined in *Safety and Science: A Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000, should be followed.

Investigations should comply with the Animal Welfare Act 1999, as outlined in *Caring for Animals: A Guide for Teachers, Early Childhood Educators, and Students*, Learning Media, Ministry of Education, 1999.
- With supervision* means the teacher will provide the context and question, and broad experimental conditions, such as the extent and availability of equipment and time. The student will select and manipulate the variables to collect primary data.

- 4 An *investigation* is an activity that covers the complete process to plan, carry out, and report on the investigation. The investigation should be based on a situation arising from content at science/pūtaiao curriculum level 7. The investigation could be based on a fair test or pattern seeking.
- 5 A *practical science investigation* will involve:
- a statement of the purpose – this may be an aim, testable question, prediction, or hypothesis based on a scientific idea
 - a method that describes:
 - for a fair test: the independent variable and its range, the measurement of the dependent variable and the control of some other variables
 - for pattern seeking: the proposed range for the two key variables and the collection of data
 - the collection of data consistent with the final method
 - recording and processing of data
 - interpreting and reporting on the findings with a conclusion reached based on the processed data in relation to the purpose of the investigation.
- 6 A *quality practical science investigation* enables a valid conclusion to be reached. This would normally involve:
- a statement of the purpose – this may include an aim, testable question, prediction, or hypothesis based on a scientific idea
 - a method that describes:
 - for a fair test: a valid range for the independent variable, the valid measurement of the dependent variable, and the control of some other variables with consideration of factors such as sampling bias and sources of errors
 - for pattern seeking: a valid range for the two key variables, and the valid collection of data with consideration of factors such as sampling bias and sources of errors
 - the collection of data consistent with the final method
 - recording and processing of data to enable a trend or pattern (or absence) to be determined
 - interpreting and reporting on the findings with a valid conclusion reached based on the processed data in relation to the purpose of the investigation
 - a discussion of the science ideas relevant to the investigation.
- 7 *Evaluate* means to justify the conclusion in terms of the method used. Justification must involve, where relevant, consideration of the:
- reliability of the data
 - validity of the method.

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