

Achievement Standard

Subject Reference	Earth and Space Science 3.1		
Title	Carry out an independent practical Earth and Space Science investigation		
Level	3	Credits	4
		Assessment	Internal
Subfield	Science		
Domain	Earth and Space Science		
Status	Registered	Status date	04 December 2012
Planned review date	31 December 2016	Date version published	04 December 2012

This achievement standard involves carrying out an independent practical Earth and Space Science investigation.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Carry out an independent practical Earth and Space Science investigation. 	<ul style="list-style-type: none"> Carry out an in-depth independent practical Earth and Space Science investigation. 	<ul style="list-style-type: none"> Carry out a comprehensive independent practical Earth and Space Science investigation.

Explanatory Notes

- This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 8, and is related to the material in the *Teaching and Learning Guide for Earth and Space Science*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>. The standard is aligned to the Nature of Science achievement objectives: Investigating in science, and Understanding about science.

Procedures outlined in *Safety and Science: A Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000, are followed. Investigations must 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.

- Carry out an independent practical Earth and Space Science investigation* involves:
 - stating a purpose for the investigation
 - developing a method that includes:
 - the valid range for key variables

- how key variables are measured
- the management of other variables
- the control of potential sources of error
- the management of sampling bias
- the reliable collection of raw data
- collecting valid raw data consistent with the chosen method
- recording and processing raw data relevant to the purpose
- interpreting the processed data to draw a conclusion related to the purpose of the investigation
- explaining how the Earth and Space Science links to the investigation
- explaining how the investigation method allowed for reliable data to be collected
- reporting on the investigation.

Carry out an in-depth independent practical Earth and Space Science investigation involves:

- confirming or refining the initial method to improve the validity and reliability of collected data by the:
 - valid measurement of the key variables
 - valid management of other variables
- interpreting the processed data to draw a valid conclusion related to the purpose of the investigation
- explaining in depth how the Earth and Space Science links to the investigation
- explaining in depth how the investigation method allowed for valid and reliable data to be collected.

Carry out a comprehensive independent practical Earth and Space Science investigation involves:

- justifying how the investigation method supports the collection of valid and reliable data
- evaluating the investigation with respect to the relevant Earth and Space Science.

3 *Independent investigation* refers to a student initiated investigation.

4 Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/>.

Replacement Information

This achievement standard replaced AS90727.

Quality Assurance

- 1 Providers and Industry Training Organisations must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.
- 2 Organisations with consent to assess and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Consent and Moderation Requirements (CMR) reference

0233