



National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Internal Assessment Resource

Science Level 1

This resource supports assessment against:

Achievement Standard 90952

Demonstrate understanding of the formation of surface features
in New Zealand

Resource title: Let's Look at Our Local Area

4 credits

This resource:

- Clarifies the requirements of the standard
- Supports good assessment practice
- Should be subjected to the school's usual assessment quality assurance process
- Should be modified to make the context relevant to students in their school environment and ensure that submitted evidence is authentic

Date version published by Ministry of Education	November 2012 Version 2 To support internal assessment from 2013
Quality assurance status	These materials have been quality assured by NZQA. NZQA Approved number A-A-11-2012-90952-01-4144
Authenticity of evidence	Teachers must manage authenticity for any assessment from a public source, because students may have access to the assessment schedule or student exemplar material. Using this assessment resource without modification may mean that students' work is not authentic. The teacher may need to change figures, measurements or data sources or set a different context or topic to be investigated or a different text to read or perform.

Internal Assessment Resource

Achievement Standard Science 90952: Demonstrate understanding of the formation of surface features in New Zealand

Resource reference: Science 1.13A v2

Resource title: Let's Look At Our Local Area

Credits: 4

Teacher guidelines

The following guidelines are designed to ensure that teachers can carry out valid and consistent assessment using this internal assessment resource.

Teachers need to be very familiar with the outcome being assessed by Achievement Standard Science 90952. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing students against it.

Context/setting

This task requires students to explore the key features of their local area on a field trip. They will create and present a report that incorporates their field trip notes and research, and demonstrates their comprehensive understanding of the formation of surface features in their local area.

To provide an authentic context, you will need to choose a site that is relevant to the students. For example: students in Auckland could visit volcanoes; students in Dunedin could observe the Dunedin volcano on the Otago Peninsula.

You could lead the field trip if it is your area of expertise or ask a local expert to guide it.

You will need to develop some resources about the local area for students to use. You could also teach about the internal and external processes involved in the formation of New Zealand, and the internal and external processes that have led to the formation of the surface features in your local area.

You may wish to develop a field trip log that students could complete during the field trip. Headings could include: Location, Description of Surface Feature, and Internal / External Process (that formed the surface feature).

Conditions

Students will work individually to complete the report.

Resource requirements

Students can research the internal and external processes involved in the formation of local surface features using secondary sources such as the Internet, geological and nuclear sciences publications, textbooks, and geology books.

Students could also interview local people who have experienced changing surface features as a result of the internal and external processes.

Some suggested websites are:

- Geological Society of New Zealand: <http://www.gsnz.org.nz/>
- University of Otago Geology Department: <http://www.otago.ac.nz/geology/>
- University of Canterbury Geology Department: <http://www.geol.canterbury.ac.nz/>
- Victoria University Geology Department:
<http://www.victoria.ac.nz/geo/geology/index.html>
- Massey University, Earth Sciences links and resource page: <http://soils-earth.massey.ac.nz/>
- Waikato University, Earth Science: <http://earth.waikato.ac.nz/>

Contact your local Rock and Mineral clubs to access local experts for your area's geology. For example:

- Canterbury Mineral and Lapidary Club: <http://www.cmlclub.org.nz/>
- Otago Rock and Mineral Club:
<http://sites.google.com/site/theotagorockandmineralclub/>

Not all clubs have websites. The Otago Rock and Mineral Club provides a list of many club contacts: <http://sites.google.com/site/theotagorockandmineralclub/the-fossil-newsletter-1/other-clubs>

Additional information

Teach the following material before students attempt this task. You could also provide this information to students as an appendix to refer to as they work.

Surface features

Surface features are the features of the landscape that can be seen in an area. These include volcanoes, limestone formations, sand dunes, landslides, glacial features, fiords, mountain ranges, and fault lines.

Geological processes

Internal processes are geological processes, such as:

- the formation of volcanoes or mountains due to collisions between the Pacific Plate and the Australian Plate
- lateral movement along tectonic plate boundaries
- the formation of volcanoes by hot spots
- movement along fault lines, such as folding, faulting, and uplift
- land movement due to earthquakes.

External processes are processes that occur on the surface of the Earth, such as erosion and weathering caused by wind, ice, water, animal and plant action, human action, and changes in sea levels.

Internal Assessment Resource

Achievement Standard Science 90952: Demonstrate understanding of the formation of surface features in New Zealand

Resource reference: Science 1.13A v2

Resource title: Let's Look At Our Local Area

Credits: 4

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of the formation of surface features in New Zealand.	Demonstrate in-depth understanding of the formation of surface features in New Zealand.	Demonstrate comprehensive understanding of the formation of surface features in New Zealand.

Student instructions

Introduction

This assessment activity requires you to present a report that demonstrates your understanding of the formation of surface features in your local area.

This activity focuses on how internal and/or external processes have affected the landscape of New Zealand. You will go on a field trip where you will collect information that explains how the internal and/or external processes have affected how the landscape looks (its surface features).

You will complete your field notes and your report individually.

Teacher note: Provide specific details about how long the students have to undertake research, carry out their field trip, and complete their report. This time will depend on your context.

You will be assessed on how well you understand how geological features of the local area you study are formed.

Task

Research

Research the surface features of the local area you will visit on the field trip. Use the resources your teacher has provided (websites, books, and brochures). In your research:

- find out about the internal and/or external processes that have formed the surface features of this area
- explain the surface features that can be seen today in terms of the internal and/or external processes that formed them.

Take your research notes and any questions you have on the class field trip.

Collect and record data

During the field trip:

- examine the surface features of your local area
- record what you observe: sketches, maps, and photographs are good ways of doing this.

Teacher note: Insert a list of URLs, books, and brochures (e.g. those published by GNS or DOC) that students could access.

Write a report

Using the notes you have gathered, write a report on the area that you have visited. Identify and describe the surface features. In your report:

- make detailed links between the surface features you have observed and the external and/or internal processes that led to the formation of these surface features
- include your research and field trip notes.

Assessment schedule: Science 90952 Let's Look At Our Local Area

Evidence/Judgements for Achievement	Evidence/Judgements for Achievement with Merit	Evidence/Judgements for Achievement with Excellence
<p>The student demonstrates understanding of the formation of surface features in New Zealand.</p> <p>The student researches the surface features of their local area and presents a report.</p> <p>The report contains information about the surface features of their area.</p> <p>The report describes how two surface features of the area were formed.</p> <p>The report describes a geological process for each surface feature.</p> <p>The student may support their report with visual representations and data where relevant.</p> <p>For example (Mount Ruapehu): Internal process</p> <p><i>Mount Ruapehu was formed by subduction, which occurred with the Pacific Plate “diving under” the Australian Plate. The Pacific Plate is basalt, which is denser than the Australian Plate. Mount Ruapehu is the southern-most volcano in the Taupo Volcanic Zone.</i></p>	<p>The student demonstrates in-depth understanding of the formation of surface features in New Zealand.</p> <p>The student:</p> <ul style="list-style-type: none"> • researches the surface features of their local area and presents a report • provides information about the surface features of their area • explains how two surface features of the area were formed • explains geological processes for each surface feature by linking the processes to the final surface feature observed today • may support their report with visual representations and data where relevant. <p>For example (Mount Ruapehu): Internal process</p> <p><i>Mount Ruapehu was formed by subduction, which occurred with the Pacific Plate “diving under” the Australian Plate. The Pacific Plate is basalt, which melts and rises because it is less dense when molten. It pools under the continental Australian Plate. The heat from the basalt melts the continental crust and both mix together. This mixing of molten basalt and continental rocks makes andesite, which is erupted out of volcanoes.</i></p>	<p>The student demonstrates comprehensive understanding of the formation of surface features in New Zealand.</p> <p>The student:</p> <ul style="list-style-type: none"> • researches the surface features of their local area and presents a report • provides information about the surface features of their area • explains in-depth how two surface features of the area were formed • explains in-depth geological processes for each surface feature by the use of reasoned explanations and in-depth linking of the processes to the final surface feature observed today • may support their report with visual representations and data where relevant. <p>For example (Mount Ruapehu): Internal process</p> <p><i>The subduction occurred because the Pacific Plate is basalt, and as it returns to the mantle, the water-rich basalt melts and rises because it is less dense when molten. It pools under the continental Australian Plate. The heat from the molten basalt melts the continental crust and both melts mix together because of convection currents. This mixing of molten basalt and continental rocks makes andesite, which is erupted out of North Island volcanoes. This magma erupts as layers of ash and lava. This lava is intermediate in terms of the amount of silica in it and the amount of flow it has (viscous). This low flow rate means that the lava that erupted from the volcano doesn't flow far and hardens to form layers. The layers build up the characteristic cone shape of the stratovolcano that is Mount Ruapehu.</i></p>

Final grades will be decided using professional judgement based on a holistic examination of the evidence provided against the criteria in the Achievement Standard.