**NZQA**

**Approved**

Achievement standard: 90952 Version 3

Standard title: Demonstrate understanding of the formation of surface features in New Zealand

Level: 1

Credits: 4

Resource title: Hauraki Plains features

Resource reference: Science VP-1.13 v2

Vocational pathway: Primary Industries

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| Quality assurance status | These materials have been quality assured by NZQA. NZQA Approved number A-A-02-2015-90952-02-7302 |
| Authenticity of evidence | Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material.Using this assessment resource without modification may mean that learners’ work is not authentic. Assessors/ educators 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. |

Vocational Pathway Assessment Resource

Achievement standard: 90952

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Vocational pathway: Primary Industries

Learner instructions

# Introduction

This assessment activity requires you to demonstrate understanding of the formation of surface features of the Hauraki Plains.

You are going to be assessed on how comprehensively you demonstrate understanding of the formation of surface features of the Hauraki Plains. You need to show that you can collect and process information by writing a report that explains thoroughly how the internal and/or external processes have affected how the landscape looks today and made it suitable for dairying.

The following instructions provide you with a way to structure your work so you can demonstrate what you have learnt and achieve success in this standard.

Assessor/educator note: It is expected that the assessor/educator will read the learner instructions and modify them if necessary to suit their learners.

# Task

Various types of agriculture within New Zealand depend on existing landscape features, for example, within the Southern Alps; a mountainous landscape dictates that the area is used for Merino sheep on large stations. Dairying however, is an enterprise that requires flat land.

You are a young share milker who is looking for land suitable for dairying and the Hauraki Plains may be ideal for this enterprise. You need to make a submission as to the suitability of the land to gain funding from the rural bank.

## Research

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

Internal and/or external processes that have formed the surface features may include the following.

* Internal processes, which are geological, 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 uplifting
	+ land movement due to earthquakes.
* External processes, which 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.

Collect information that explains how the internal and/or external processes have affected how the landscape of the Hauraki Plains looks (i.e. its surface features) and how it is suitable for dairying.

You could undertake a field trip to collect and record data by:

* examining the surface features of the area
* recording what you observe, for example sketches, maps, and photographs are good ways of doing this.

Research the internal and/or external processes involved in the formation of surface features of the Hauraki Plains using secondary sources as well, such as the internet, geological and nuclear sciences publications, textbooks, and geology books.

You could also interview local people who have experienced changing surface features as a result of these processes, and/or contacting local rock and mineral clubs to access local experts for this area’s geology.

## Write your report

Use your research to write a report on your findings. Demonstrate your comprehensive understanding of the formation of surface features of the Hauraki Plains by:

* identifying and describing the surface features
* explaining detailed links between the surface features, and the internal and/or external processes that led to the formation of these surface features
* making connections between the surface features and the suitability of the land for dairying.

Include in your report:

* your notes, research, etc.
* visual representations such as photos or diagrams to support your explanation.

# Resources

Useful websites include:

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>

Waikato University, Earth Science: <http://earth.waikato.ac.nz/>

Useful rock and mineral clubs’ websites include:

Canterbury Mineral and Lapidary Club: <http://www.cmlclub.org.nz/>

Otago Rock and Mineral Club: <http://sites.google.com/site/theotagorockandmineralclub/>

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Assessor/Educator guidelines

# Introduction

The following guidelines are supplied to enable assessors/educators to carry out valid and consistent assessment using this internal assessment resource.

As with all assessment resources, education providers will need to follow their own quality control processes. Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material. Using this assessment resource without modification may mean that learners' work is not authentic. The assessor/educator may need to change figures, measurements or data sources or set a different context or topic. Assessors/educators need to consider the local context in which learning is taking place and its relevance for learners.

Assessors/educators need to be very familiar with the outcome being assessed by the achievement standard. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing learners against it.

# Context/setting

This task requires learners to demonstrate comprehensive understanding of the formation of surface features of the Hauraki Plains. They will create a report that incorporates their research, and demonstrates their comprehensive understanding of the formation of surface features of the Hauraki Plains and its suitability for dairying.

# Conditions

Learners will write their report independently, and will be individually assessed.

Decide on the format of the report; it could be a written presentation, a PowerPoint presentation, a poster, etc. You may wish to take learners’ preferences into account in deciding on the format.

# Resource requirements

Internet, geological and nuclear sciences publications, textbooks, and geology books.

# Additional information

If possible, learners could go on a field trip to collect some of the data for this activity.

Assessors/educators could lead a field trip if it is their area of expertise, or ask a local expert to guide it. Assessors/educators may wish to develop a field trip log that learners could complete during the field trip. Headings could include location, description of surface features, and internal and/or external processes (that formed the surface feature).

# Assessment schedule: Science 90952 – Hauraki Plains features

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| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| The learner demonstrates understanding of the formation of surface features of the Hauraki Plains by:* describing how at least two surface features of the Hauraki Plains were formed making them suitable for dairying
* describing a geological process for each surface feature

Understanding is supported by visual representations and relevant dataFor example:T*he gradient of the Hauraki Plains is slight, rising only about three metres over the 25 kilometres from the Firth of Thames to Paeroa. This makes the area suitable for dairying. Between 20 and 10 million years ago, a string of large andesitic volcanoes dominated the peninsula. They erupted intermittently, spewing lava, and scattering ash and debris. All that remains of them are the ‘plugs’ or molten magma at their centres, the surrounding rock long eroded away. The erosion of these rocks supplies nutrients to the Hauraki Plains making them suitable for dairying.**The above expected learner responses are indicative only and relate to just part of what is required.* | The learner demonstrates in-depth understanding of the formation of surface features of the Hauraki Plains by:* explaining in-depth how at least two surface features of the Hauraki Plains were formed making them suitable for dairying
* explaining geological processes for each surface feature by linking the processes to the final surface feature

Understanding is supported by visual representations and relevant dataFor example:*This cross-section of the region – from the Hapūakohe Range, across the Hauraki Plains and the peninsula, along a line to the south of Thames and Tairua – shows the way faulting has shaped the land forms. Faulting has created an alternating basin and uplift. The basin, to the west of the Hauraki Fault, has filled with sediment, while volcanic deposits have added to the uplifted land forms of the peninsula. The volcanic rocks along the eastern coast of the Coromandel Peninsula mostly comprise volcanic material that erupted from massive calderas (large, deep craters) around eight million years ago, forming sheets of ignimbrite and rhyolitic domes. These features have helped produce flat land that has a rich supply of nutrients. These nutrients make grass and clover grow well and this leads to successful dairying.**The above expected learner responses are indicative only and relate to just part of what is required.* | The learner demonstrates comprehensive understanding of the formation of surface features of the Hauraki Plains by:* explaining in-depth how at least two surface features of the Hauraki Plains were formed making them suitable for dairying
* explaining thoroughly the geological processes for each surface feature by the use of reasoned explanations, and thoroughly linking the processes to the final surface feature

Understanding is supported by visual representations and relevant dataFor example:*The eastern Hauraki Plains are comprised of 14 million year old volcanos which have survived while the surrounding rock has been eroded away. The Hauraki Fault, which runs down the west side of the Coromandel Peninsula, is the axis of the Hauraki–Coromandel region. Movement on the fault line created both the mountains to its east, and the basin to its west. A later volcanic period beginning about nine million years ago produced rhyolites in place of the older andesites. Instead of forming volcanic cones, rhyolites exploded from calderas – large, deep craters – and formed sheets of ignimbrite in places. Remnant spines and domes of calderas are found south of Whitianga, at Kapowai, west of Tairua, and close to Waihī.**The erosion of the volcanic deposits flowed sediment into the western basin and slowly formed the Hauraki Plains we see today. The depth of material is the result of sinking of the basin and changes in sea levels due to glacial periods and interglacial periods. The fans coalesced and formed the flat areas we see today.**The erosion of the volcanic deposits during glacial and interglacial times has filled the Hauraki depression with volcanic and marine sediments. These sediments are rich in nutrients, especially nitrates and phosphates. These chemicals are essential to grass and clover growth. This, along with the flat areas and high water tables makes the Hauraki Plains suitable for dairying.**The above expected learner responses are indicative only and relate to just part of what is required.* |

Final grades will be decided using professional judgement based on an examination of the evidence provided against the criteria in the Achievement Standard. Judgements should be holistic, rather than based on a checklist approach.