



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

Internal Assessment Resource

Earth and Space Science Level 2

This resource supports assessment against:

Achievement Standard 91189

Investigate geological processes in a New Zealand locality

Resource title: Taupo Volcanic Zone

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 2011 To support internal assessment from 2012
Quality assurance status	These materials have been quality assured by NZQA. NZQA Approved number: A-A-11-2011-91189-01-5091
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 Earth and Space Science 91189:

Investigate geological processes in a New Zealand locality

Resource reference: Earth and Space Science 2.3B

Resource title: Taupo Volcanic Zone

Credits: 4

Teacher guidelines

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

Teachers need to be very familiar with the outcome being assessed by the Achievement Standard Earth and Space Science 91189. 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 activity requires students to demonstrate their understanding of the formation of rocks in the Taupo Volcanic Zone.

This activity is about the volcanic rocks of the Taupo Volcanic Zone, which produces Igneous Extrusive rocks.

Before carrying out this assessment activity, students should be taught about the Taupo Volcanic Zone, including:

- the area of the Taupo Volcanic Zone
- the rocks of the area
- the types of volcanoes in this area
- the resulting rocks formed from different magma types
- the significant events in the zones geological history
- the weathering and erosion of the Taupo Volcanic Zone.

Conditions

This is an individual exercise where students could be researching information via books or internet or talking to subject experts about the Taupo Volcanic Zone.

This assessment activity will take place over 10 - 15 hours of in- and out-of-class time.

Authenticity is very important in this task and can be determined and assisted by:

- conducting interviews with the student
- having signed agreements with the student and/or parents or caregivers
- checking the student's resources.

Resource requirements

Teachers can provide students with resources including the following websites and books in order to help them complete this assessment activity.

<http://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/New-Zealand-Volcanoes/Taupo-Volcano>

<http://volcano.oregonstate.edu/education/facts/obsidian.html>.

The Reed Field Guide to New Zealand Geology an introduction to rocks, minerals and fossils; Thornton, Jocelyn; Reed Books Auckland.

A Continent on the Move New Zealand Geoscience into the 21st Century; Graham, Ian; Ed. The Geological Society of New Zealand in association with GNS Science.

If your school is located close to the Taupo Volcanic Zone then Taupo's Volcanic Activity Centre could be contacted to conduct a field trip to show your students what they have been researching.

<http://www.volcanoes.co.nz/>.

Additional information

None.

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Achievement	Achievement with Merit	Achievement with Excellence
Investigate geological processes in a New Zealand locality.	Investigate in depth geological processes in a New Zealand locality.	Investigate comprehensively geological processes in a New Zealand locality.

Student instructions

Introduction

This assessment activity requires you to study the Taupo Volcanic Zone in the centre of the North Island and the formation of rocks in this volcanic zone.

You are to research and produce a report, a pamphlet, or a PowerPoint presentation to help visitors to the area understand the formation of two or more rocks found in the Taupo Volcanic Zone.

You will be assessed on the depth and comprehensiveness of your report, pamphlet, or PowerPoint presentation.

You will have 10–15 hours of in and out-of-class time to complete this activity individually.

Task

Using the resources your teacher has provided, begin researching the Taupo Volcanic Zone. Select two or more rocks found in the Taupo Volcanic Zone and create a report, a pamphlet, or a PowerPoint presentation that includes the following aspects for each rock.

- Describe how it is formed. Include the type of rock that it is.
- Explain in depth how the rock has been formed. To explain:
 - relate the formation of the selected rock to the relevant stage(s) of the rock cycle
 - relate the selected rock found in the Taupo Volcanic Zone to the geological history of the Taupo Volcanic Zone
 - link the type of magma found in the area of the Taupo Volcanic Zone to the formation of your selected rock.
- Explain in depth how the rock has been formed by linking the magma type of the relevant volcano, to the formation of the selected rock giving reasons for the formation.

- Make links between the formation of the selected rock to the relevant stage of the rock cycle and the geological history of the Taupo Volcanic Zone.
- Explain in depth how the features of the Taupo Volcanic Zone are weathered and eroded to produce the final shapes we see today.

Assessment Schedule: Earth and Space Science 91189 Taupo Volcanic Zone

Evidence/Judgements for Achievement	Evidence/Judgement for Achievement with Merit	Evidence/Judgement for Achievement with Excellence
<p>The student has produced a report, pamphlet, or PowerPoint presentation in which they investigate geological processes in a New Zealand locality.</p> <p>In the report, pamphlet, or PowerPoint presentation, the student:</p> <ul style="list-style-type: none"> • describes the formation of two rocks found in the Taupo Volcanic Zone, including: <ul style="list-style-type: none"> – identifying the types of rocks – describing the plate tectonic and rock cycle processes that have formed the types of rocks in the locality – describing the erosional processes that have shaped the current landforms in the locality. <p>For example: <i>Rhyolite is an extrusive igneous rock that is formed from silica rich magma.</i></p> <p><i>Pumice is an extrusive volcanic rock, produced when lava with a very high content of water and gases is extruded (or thrown out of) a volcano.</i></p> <ul style="list-style-type: none"> • makes links to relevant stage of the rock cycle <p>For example: <i>Rhyolite and pumice are volcanic/extrusive rocks.</i></p> <ul style="list-style-type: none"> • makes links to the geological history of an area 	<p>The student has produced a report, pamphlet, or PowerPoint presentation in which they investigate in depth geological processes in a New Zealand locality.</p> <p>In the report, pamphlet, or PowerPoint presentation, the student:</p> <ul style="list-style-type: none"> • explains the formation of two rocks found in the Taupo Volcanic Zone in depth, including: <ul style="list-style-type: none"> – identifying the types of rocks – explaining the plate tectonic and rock cycle processes that have formed the types of rocks in the locality – explaining the erosional processes that have shaped the current landforms in the locality. <p>For example: <i>Rhyolite is an extrusive igneous rock that is formed from silica rich magma derived from the melting of continental crust and erupting from a rhyolitic centre and cooling down quickly on the surface so it is a small crystal size.</i></p> <p><i>Pumice is an extrusive volcanic rock, produced when lava with a very high content of water and gases under pressure is extruded (or thrown out of) a volcano. As the gas bubbles escape from the lava, it becomes frothy. When this lava cools and hardens, the result is a very</i></p>	<p>The student has produced a report, pamphlet, or PowerPoint presentation in which they investigate comprehensively geological processes in a New Zealand locality.</p> <p>In the report, pamphlet, or PowerPoint presentation, the student:</p> <ul style="list-style-type: none"> • explains comprehensively the formation of two rocks found in the Taupo Volcanic Zone (with links in the processes explored), including: <ul style="list-style-type: none"> – identifying the types of rocks – discussing the link between the plate tectonic processes and the rock cycle processes that have formed the types of rocks in the locality – discussing the link between the erosional processes with the shape of the current landforms in the locality. <p>For example: <i>Rhyolite is an extrusive igneous rock that is formed from silica rich magma erupting from a rhyolitic volcano derived from melting continental rocks, and cooling down quickly on the surface so it is a small crystal size.</i></p> <p><i>Rhyolite is found at the Taupo Volcanic Zone because oceanic crust rocks and other sediments have been subducted under continental crust and melted, releasing water and the molten basalt is ponded under the volcanic plateau, melting the</i></p>

<p>For example: <i>Some of the rhyolite and pumice in the Taupo Volcanic Area was erupted as Ignimbrites in the Oruanui eruption 26, 500 years ago.</i></p>	<p><i>light rock material filled with tiny bubbles of gas.</i></p> <ul style="list-style-type: none"> • makes links to relevant stage of the rock cycle <p>For example: <i>Rhyolite and pumice are volcanic/extrusive rocks.</i></p> <ul style="list-style-type: none"> • makes links to the geological history of an area <p>For example: <i>Some of the rhyolite and pumice in the Taupo Volcanic Area was erupted as Ignimbrites in the Oruanui eruption 26, 500 years ago.</i></p>	<p><i>continental rocks above it, which erupt as rhyolite. Pumice is an extrusive volcanic rock, produced when lava with a very high content of water and gases under pressure is extruded (or thrown out of) a volcano. As the gas bubbles escape from the lava, it becomes frothy. When this lava cools and hardens, the result is a very light rock material filled with tiny bubbles of gas. The release of pressure as the magma comes up from the magma chamber determines how big the gas holes in the pumice are – the more pressure the bigger the gas holes in the pumice.</i></p> <ul style="list-style-type: none"> • makes links to relevant stage of the rock cycle <p>For example: <i>Rhyolite and pumice are volcanic/extrusive rocks.</i></p> <ul style="list-style-type: none"> • makes links to the geological history of an area <p>For example: <i>Some of the rhyolite and pumice in the Taupo Volcanic Area was erupted as Ignimbrites in the Oruanui eruption 26, 500 years ago.</i></p>
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Final grades will be decided using professional judgement based on a holistic examination of the evidence provided against the criteria in the Achievement Standard.