

# SECTION 3



## YEAR 11–13 NCEA ASSESSMENT RESOURCES



Tree daisy and snowberry. *Photos: Alan Cressler*

## ASSESSMENT INFORMATION AND TEACHER GUIDELINES

These internal assessments can be done as part of a school field trip to Tongariro National Park. Some of these assessments could also be done as parts of school trips to other alpine environments, such as Aoraki/Mount Cook ([www.doc.govt.nz/education-leotc-secondary](http://www.doc.govt.nz/education-leotc-secondary)). It is likely that school field trips to alpine environments could also contribute to external assessments.

Each unpacked standard below includes information from the NZQA e-notes and Clarification Documents, as well as suggestions for resources and learning activities.

<b>Level 1</b>	
<b>Science</b> (Includes Biology and Earth and Space Science (ESS))	AS 90951 v3 (1.12): Investigate the biological impact of an event on a New Zealand ecosystem
	AS 90952 (1.13): Demonstrate understanding of the formation of surface features in New Zealand
	AS 90955 (1.16): Investigate an astronomical or Earth science event.
<b>Geography</b>	AS 91009 v3 (1.3): Demonstrate geographic understanding of the sustainable use of an environment
	AS 91012 (1.6): Describe aspects of a contemporary New Zealand geographic issue
<b>Level 2</b>	
<b>Biology</b>	AS 91153 (2.1): Carry out a practical investigation in a biology context, with supervision.
	AS 91155 (2.3): Demonstrate understanding of adaptation of plants or animals to their way of life.
	AS 91158 v2 (2.6): Investigate a pattern in an ecological community, with supervision.
	AS 90811 v2 (2.2): Explain how human activity in a biophysical environment has consequences for a sustainable future
<b>Education for Sustainability (Efs)</b>	AS 90813 v2 (2.3): Demonstrate understanding of how different personal values have implications for a sustainable future
	AS 91189 v2 (2.3): Investigate geological processes in a New Zealand locality
<b>Earth and Space Science (ESS)</b>	AS 91190 v2 (2.4): Investigate how organisms survive in an extreme environment
	AS 91240 (2.1): Demonstrate geographic understanding of a large natural environment
<b>Geography</b>	AS 91244 (2.5): Conduct geographic research with guidance
	AS 91245 (2.6): Explain aspects of a contemporary New Zealand geographic issue

Level 3	
<b>Education for Sustainability (Efs)</b>	AS 91735 (3.2): Evaluate measures that may be taken to sustain and/or improve a biophysical environment
<b>Māori Environmental Practices</b>	US 6142: Explain kaitiakitanga in relation to the way Māori interact with the natural environment
<b>Māori Environmental Practices</b>	US 6143: Carry out a local kaitiakitanga activity with direction

\*Efs standards are integrated across all learning areas. They are on the NZQA framework and are part of the approved subject list. The standards can be included in a range of different courses or can be added to students' learning programmes where appropriate assessment can be part of in-depth study or extra curricula action. For more information, see - <http://seniorsecondary.tki.org.nz/Social-sciences/Education-for-sustainability>

Please note that these were the latest versions at the time of printing (September 2017) and efforts will be made to keep them up to date. It is always wise to check with NZQA that you are using the latest version.

<p><b>Conditions of assessment</b></p> <p>This investigation involves collecting information about the biological impact of an event on a New Zealand ecosystem.</p> <p>The information could come from a variety of sources such as direct observations, a field trip, collection of experimental data, resource sheets, photos, videos, websites, and reference texts.</p> <p>An event may include natural events such as floods, drought, seasonal changes, landslides and fire; or human actions such as pest control, application of fertilisers, trampling, urbanisation, or pollution.</p> <p>Environmental factors about which information is collected may include: moisture levels, light intensity, temperature, stream clarity, food availability, competition, predation, wave and wind action, shelter, and oxygen levels.</p> <p>Ecological characteristics and processes may include: food chains/webs, variety of organisms (diversity), nutrient cycles, water cycle, energy flow, interrelationships (predation, parasitism, mutualism), density, distribution pattern, and key species.</p> <p>Assessment evidence could be collected by, but is not limited to, the following methods:</p> <ul style="list-style-type: none"> <li>written report</li> <li>oral presentation</li> <li>multimedia presentation</li> <li>poster</li> </ul> <p>One reassessment opportunity would be appropriate.</p> <p>School-based authenticity policies and procedures will apply.</p> <p>The assessor can determine the time allowance for the assessment, as this is dependent on the situation.</p>	<p><b>Science 1.12</b> <b>AS 90951</b>    <b>Version: 3</b> <b>4 credits</b></p> <p><b>Investigate the biological impact of an event on a New Zealand ecosystem</b></p> <p>This achievement standard involves investigating the biological impact of an event on a New Zealand ecosystem.</p> <table border="1" data-bbox="316 577 544 1406"> <thead> <tr> <th data-bbox="316 1122 384 1406"><b>Achievement</b></th> <th data-bbox="316 853 384 1122"><b>Achievement with Merit</b></th> <th data-bbox="316 577 384 853"><b>Achievement with Excellence</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="384 1122 544 1406">Investigate the biological impact of an event on a New Zealand ecosystem.</td> <td data-bbox="384 853 544 1122">Investigate, in depth, the biological impact of an event on a New Zealand ecosystem.</td> <td data-bbox="384 577 544 853">Investigate, comprehensively, the biological impact of an event on a New Zealand ecosystem.</td> </tr> </tbody> </table> <p>This achievement standard is derived from <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, Level 6. It is aligned with the Ecology achievement objective in the Living World strand, and is related to the material in the <i>Teaching and Learning Guide for Science</i>, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p>This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the <a href="#">Papa Whakaako</a>.</p> <p><b>At achieved level:</b> Investigate involves describing observations or findings, using those findings to identify changed environmental factors, and describing how the changed environmental factors might affect organisms within the ecosystem.</p> <p><b>At merit level:</b> Investigate in depth involves using findings and biological ideas to make causal links between changed environmental factors and the ecological characteristic or process to explain the impact on organisms or implications for the ecosystem as a whole.</p> <p><b>At excellence level:</b> Investigate comprehensively involves using findings and biological ideas to make significant causal links between changed environmental factors and the ecological characteristic or process to discuss:</p> <ul style="list-style-type: none"> <li>the impact on the organisms, and</li> <li>the implications for the ecosystem as a whole.</li> </ul> <p>It may involve explaining, elaborating, applying, justifying, relating, evaluating, comparing and contrasting, and analysing.</p>	<b>Achievement</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>	Investigate the biological impact of an event on a New Zealand ecosystem.	Investigate, in depth, the biological impact of an event on a New Zealand ecosystem.	Investigate, comprehensively, the biological impact of an event on a New Zealand ecosystem.	<p><b>Clarification Document May 2015</b></p> <p>The outcome of this standard has two parts:</p> <p><b>Investigate</b> information. The aim here is to locate and select primary and/or secondary information on the biological impact of an event on a named New Zealand ecosystem.</p> <p><b>Report</b> on the biological impact of an event on a named New Zealand ecosystem.</p> <p>The assessment activity and the judgement of the associated evidence need to cover both aspects of this standard.</p> <p>Students need to describe the ecosystem before and after an event that has made an impact and to develop ideas about how the event has changed the ecosystem.</p> <p>This information can be collected individually or as part of a group.</p> <p>Students must provide evidence that is at the national standard for both criteria bullet-pointed above.</p> <p>The critical evidence required to reach the standard is the description of the biological impact of <b>one</b> event on a named New Zealand ecosystem.</p>
<b>Achievement</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>						
Investigate the biological impact of an event on a New Zealand ecosystem.	Investigate, in depth, the biological impact of an event on a New Zealand ecosystem.	Investigate, comprehensively, the biological impact of an event on a New Zealand ecosystem.						

AS 90951 v3 (Science 1.12)

## Investigate the biological impact of an event on a New Zealand ecosystem, as applied to the Tongariro National Park

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Investigate the biological impact of an event on the Tongariro ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate, in depth, the biological impact of an event on the Tongariro ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate, comprehensively, the biological impact of an event on the Tongariro ecosystem.</li> </ul>

The emphasis in this AS is on two components:

- Carrying out an investigation into the biological impact of an event on the native ecosystem of the National Park.
- Reporting on the impact of the event on the native ecosystem within the National Park.

The event could be taken from a range that may include:

**Human:** Impact of increasing numbers of walkers on the tracks and the effect on plant life.

Impact of the introduction of night lights for skiing on moths and the plants they pollinate

**Ecological:** Effect of the weeds/plant pests (e.g. wilding pines) on native plants

Effect of introduced animal pests (e.g. cats, possums, rats, weasels, hedgehogs) on native animal populations.

Effect of pest control on the native animal and plant populations.

**Physical:** Effect of volcanic ash from eruptions or lahars on freshwater or valley ecosystems.

### The teacher's role is to:

Ensure that for the selected event the student has opportunity through either a field trip, the use of photographic evidence, relevant data, video clips and accessible written materials to develop an understanding of the effect of the event on the ecosystem in question.

Some of the evidence collected will be historical so that comparison can be made with what is current. Students can work in the field cooperatively to collect current information or data, and subsequently individually using historical evidence from secondary sources, to provide the necessary comparisons for their report.

Students can use internet links and materials provided by the teacher, or field trip worksheets provided as their source material. Students should also be able to add to this. A sample list of websites is given below. Some of this material is academic and will require some interpretation on the part of the teacher to enable the student to access this.

Give one reassessment opportunity as appropriate.  
 Apply school-based authenticity policies and procedures.  
 Determine the time allowance for the assessment, as this is dependent on the situation.

### Prior student knowledge

Students will need an understanding of the special nature of the ecosystems that exist within the park. Ecosystems can range from freshwater, rainforest, beech forest, tussock lands or the desert.

### The student is expected to:

Provide clear evidence that this information been taken from another source has been processed and understood. Simply copying or closely paraphrasing material from other sources does not contribute evidence of understanding.

Gather primary and/or secondary data cooperatively but record information independently.

Students may present their findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form.

### Assessment templates:

<http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Science/Level-1-Science>

### Information Websites:

<p>Impact of a Volcanic Eruption on Agriculture and Forestry in New Zealand          Ministry of Agriculture and Forestry (July 1998)  <i>This report brings together the expertise of agriculturalists, horticulturalists, volcanologists and foresters to examine the impact a range of eruption scenarios may have on the agriculture and forestry sectors.</i></p>	<p><a href="https://www.mpi.govt.nz/document-vault/138">https://www.mpi.govt.nz/document-vault/138</a></p>
<p>Biophysical impacts of tourism          Lincoln Environmental/Centre for Resource Management          Lincoln University (1996)  <i>This information paper reviews twelve studies of biophysical impacts of tourism in New Zealand. Most studies focus on the impacts on vegetation, some look at soils and a few focus on wildlife. Only one study looks at damage to natural features.</i></p>	<p><a href="https://researcharchive.lincoln.ac.nz/bitstream/handle/10182/1197/crm_ip_56.pdf?sequence=1">https://researcharchive.lincoln.ac.nz/bitstream/handle/10182/1197/crm_ip_56.pdf?sequence=1</a></p>

How Mount Ruapehu's eruptions affect Lake Taupō Waikato Regional Council	<a href="https://www.waikatoregion.govt.nz/Environment/Natural-resources/Water/Lakes/Lake-Taupo/How-Mount-Ruapehu-eruptions-affect-Lake-Taupo">https://www.waikatoregion.govt.nz/Environment/Natural-resources/Water/Lakes/Lake-Taupo/How-Mount-Ruapehu-eruptions-affect-Lake-Taupo</a>
Story: Alpine Plants Te Ara - the Encyclopedia of New Zealand	<a href="http://www.teara.govt.nz/en/alpine-plants">http://www.teara.govt.nz/en/alpine-plants</a>
Habitat information Department of Conservation	<a href="http://www.doc.govt.nz/nature/habitats/">http://www.doc.govt.nz/nature/habitats/</a>
Tongariro National Park - place overview Department of Conservation	<a href="http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/">http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/</a>
Pest plants and animals in Tongariro National Park Department of Conservation	<a href="http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/about-tongariro-national-park/pests-and-weeds/">http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/about-tongariro-national-park/pests-and-weeds/</a>
Fire and Ice National Geographic article about Tongariro National Park (July 2009)	<a href="http://ngm.nationalgeographic.com/2009/07/tongariro/white-text/3">http://ngm.nationalgeographic.com/2009/07/tongariro/white-text/3</a>

**Also see Section 5 - Ecology and Geology, pages 2-14, for supporting information.**

**Learning in Tongariro activities (from Section 4, pages 6-13):**

Investigations on the mountain - check out the transect sites such as Scoria Flats for evidence of the effect of events.

<p><b>Conditions of assessment</b></p>	<p><b>Science 1.13</b>  <b>AS 90952</b>    <b>Version: 3</b>  <b>4 credits</b>  <b>Demonstrate understanding of the formation of surface features in New Zealand</b></p>	<p><b>Clarification Document May 2015</b></p>						
<p>Surface features may involve: volcanoes and/or volcanic features</p> <ul style="list-style-type: none"> <li>• limestone formations such as caves, sink holes</li> <li>• sand dunes and dune lakes</li> <li>• landslides</li> <li>• glacial features and valleys</li> <li>• river features and valleys</li> <li>• fiords, drowned river valleys</li> <li>• mountain ranges such as the Southern Alps, Kaikoura Mountains, Tararua Ranges</li> <li>• the Alpine Fault and other major fault lines.</li> </ul> <p>External processes are:</p> <ul style="list-style-type: none"> <li>• erosion and weathering as caused by wind, ice, water, animal and plant action, human action, sea level changes.</li> </ul> <p>Internal processes are:</p> <ul style="list-style-type: none"> <li>• formation of volcanoes or mountains due to collisions between the Pacific plate and Australian plates</li> <li>• lateral movement along tectonic plate boundaries</li> <li>• formation of volcanoes by hot spots</li> <li>• movement along fault lines, folding, faulting, and uplift</li> <li>• land movement due to earthquakes.</li> </ul> <p>Students could gather primary data through a field trip or secondary data via photographs sourced on the internet or provided by another source.. Evidence could be collected by, but is not limited to, the following methods:</p> <ul style="list-style-type: none"> <li>• written report</li> <li>• oral presentation</li> <li>• multimedia presentation</li> <li>• poster</li> </ul>	<p>This achievement standard involves demonstrating understanding of the formation of surface features in New Zealand.</p> <table border="1" data-bbox="363 636 628 1402"> <thead> <tr> <th data-bbox="363 1146 432 1402">Achievement Criteria</th> <th data-bbox="363 904 432 1146">Achievement with Merit</th> <th data-bbox="363 636 432 904">Achievement with Excellence</th> </tr> </thead> <tbody> <tr> <td data-bbox="432 1146 628 1402">Demonstrate understanding of the formation of surface features in New Zealand.</td> <td data-bbox="432 904 628 1146">Demonstrate in-depth understanding of the formation of surface features in New Zealand.</td> <td data-bbox="432 636 628 904">Demonstrate comprehensive understanding of the formation of surface features in New Zealand.</td> </tr> </tbody> </table> <p>This achievement standard is derived from <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, Level 6. It is aligned with the Earth Systems achievement objective of the Planet Earth and Beyond strand and the Nature of Science strand, and is related to the material in the <i>Teaching and Learning Guide for Science</i>, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p><b>At achieved level:</b> <i>Demonstrate understanding</i> involves describing selected external and/or internal processes and the formation of surface features in New Zealand using information, visual representations and data.</p> <p><b>At merit level:</b> <i>Demonstrate in-depth understanding</i> involves explaining selected external and/or internal processes and the formation of surface features in New Zealand using information, visual representations and data.</p> <p><b>At excellence level:</b> <i>Demonstrate comprehensive understanding</i> involves explaining thoroughly links between selected external and/or internal processes and the formation of surface features in New Zealand using information, visual representations and data. It may involve elaborating, applying, justifying, relating, evaluating, comparing and contrasting, and analysing.</p>	Achievement Criteria	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.	<p>The outcome of this standard has two key requirements:</p> <p><b>Demonstrate understanding</b> of a key science concept.</p> <p><b>Report</b> on the formation of surface features in New Zealand.</p> <p>The assessment activity and the judgement of the associated evidence need to cover both aspects of this standard.</p> <p>To reach the standard students are required to use information they have obtained from any scientific source to describe the formation of surface features in New Zealand. This may include a field trip.</p> <p>The critical evidence required to reach the standard is the report on the formation of surface features in New Zealand, and the demonstration of understanding of how internal and/or external processes affect the formation of surface features in New Zealand. Evidence of understanding of at least two surface features is needed to reach the standard. For each surface feature, evidence of understanding of one internal and/or external process affecting that surface feature needs to be demonstrated.</p> <p>A range of research evidence, experiments, videos, etc, may be supplied by the student.</p>
Achievement Criteria	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.						



<p>One reassessment opportunity would be appropriate.</p> <p>School-based authenticity policies and procedures will apply.</p> <p>The assessor can determine the time allowance for the assessment, as this is dependent on the situation.</p>		
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**AS 90952 v 3 (Science 1.13)**  
**Demonstrate understanding of the formation of surface features in New Zealand as applied to Tongariro National Park**

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Demonstrate understanding of the formation of surface features in New Zealand.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of the formation of surface features in New Zealand.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of the formation of surface features in New Zealand.</li> </ul>

The emphasis in this AS is on:

- Demonstrating understanding of how the surface features seen on the surface e.g. the volcanoes, landslides, stream and river valleys have been formed through the actions of surface forces such as wind, rain, snow and eruptions and the link with the actions beneath the surface caused by the tectonic plate movement.

**The teacher's role is to:**

Ensure that for the selected landform or mountain the student has opportunity through either a field trip or the use of photographic evidence, video clips and accessible written materials to develop an understanding of the formation of **two** surface features and can link this with the physical processes occurring both below and above the National Park area.

Surface features can be the result of the physical forces of nature (i.e. weathering and erosion). The action of rain, wind, sun (heat) and ice through the seasons should be considered. Additionally, there is the material that exists on the mountains' surface as the result of eruptions (i.e. pumice, lava bombs, ash, lava flows, and lahars). The shape of the volcano is worth considering. The steep slopes of Ngauruhoe, compared to Tongariro and Ruapehu result from the differing types of eruption and formation. Another feature is Ruapehu's crater lake. How did it come to be formed?

It is important that at least two of these features are explained.

The internal processes within the Earth that result in the Taupo Volcanic plateau are the result of the Indian-Australian and Pacific plate boundary collision. The volcanic plateau lies above the Pacific plate subducting below the continental crust of the Australian plate. This is the link that explains the existence of these volcanoes.

Students can use internet links and materials provided by the teacher, or field trip worksheets provided as their source material. Students should also be able to add to this. A sample list of websites is given below.

Give one reassessment opportunity as appropriate.  
 Apply school-based authenticity policies and procedures.  
 Determine the time allowance for the assessment, as this is dependent on the situation.

**The student is expected to:**

Provide clear evidence that this information been taken from another source has been processed and understood. Simply copying or closely paraphrasing material from other sources does not contribute evidence of understanding.

Gather primary and/or secondary data cooperatively but record information independently.

Students may present their findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form.

**Assessment templates:**

<http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Science/Science/Level-1-Science>

**Information Websites:**

Geology Te Ara - the Encyclopedia of New Zealand	<a href="http://www.teara.govt.nz/en/geology">http://www.teara.govt.nz/en/geology</a>
New Zealand Landforms GNS Science	<a href="https://www.gns.cri.nz/Home/Learning/Science-Topics/Landforms">https://www.gns.cri.nz/Home/Learning/Science-Topics/Landforms</a>
Volcanoes GNS Science	<a href="https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes">https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes</a>
Volcanoes at a Plate Boundary GNS Science	<a href="https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/Volcanoes-at-a-Plate-Boundary">https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/Volcanoes-at-a-Plate-Boundary</a>
Tectonic setting of New Zealand: astride a plate boundary which includes the Alpine Fault University of Otago	<a href="http://www.otago.ac.nz/geology/research/structural-geology/alpine-fault/nz-tectonics.html">http://www.otago.ac.nz/geology/research/structural-geology/alpine-fault/nz-tectonics.html</a>
Tongariro National Park - place overview Department of Conservation	<a href="http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/">http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/</a>
New Zealand Volcanoes - Tongariro GNS Science	<a href="https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/New-Zealand-Volcanoes/Tongariro">https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/New-Zealand-Volcanoes/Tongariro</a>
New Zealand Volcanoes - Ruapehu GNS Science	<a href="https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/New-Zealand-Volcanoes/Ruapehu">https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/New-Zealand-Volcanoes/Ruapehu</a>
New Zealand Volcanoes - Ngauruhoe GNS Science	<a href="https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/New-Zealand-Volcanoes/Ngauruhoe">https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/New-Zealand-Volcanoes/Ngauruhoe</a>

### Video clips

GNS Science YouTube channel	<a href="https://www.gns.cri.nz/Home/Learning/Videos">https://www.gns.cri.nz/Home/Learning/Videos</a>
Geography Lesson: What is a Volcano?	<a href="https://www.youtube.com/watch?v=WqktM2luLok">https://www.youtube.com/watch?v=WqktM2luLok</a>
First eruption in 100 years New Zealand's Mount Tongariro Volcano awakens	<a href="https://www.youtube.com/watch?v=SlFRBFvBLWo">https://www.youtube.com/watch?v=SlFRBFvBLWo</a>
Mt Ruapehu eruptions spectacular raw footage from the 1995 and 1996 eruptions	<a href="https://www.youtube.com/watch?v=h8W_sGYAQlc">https://www.youtube.com/watch?v=h8W_sGYAQlc</a>
Ruapehu eruption, July 1996	
Te Ara - the Encyclopedia of New Zealand	<a href="http://www.teara.govt.nz/en/video/8729/ruapehu-eruption-july-1996">http://www.teara.govt.nz/en/video/8729/ruapehu-eruption-july-1996</a>

**Also see Section 5 – Geology, page 8, for supporting information**

**Suggested pre- and post-field trip learning activities (from Section 2):**

- LA 1 Using digital tools (Section 2 page 3)
- LA 14 Shake, Rattle and Roll (Section 2 page 10)
- LA 16 What Rock's What? (Section 2 page 10)

**Learning in Tongariro activities (from Section 4, pages 6-13):**

Investigations on the mountain- looking at evidence of eruptions and lahars.

<p><b>Conditions of assessment</b></p>	<p><b>Science 1.16</b>  <b>AS 90955</b>    <b>Version: 3</b>  <b>4 credits</b>  <b>Investigate an astronomical or Earth science event</b></p>	<p><b>Clarification Document May 2014</b></p>						
<p>This investigation involves collecting, processing and communicating information about an astronomical or Earth science event.</p> <p>The information could come from a variety of sources such as direct observations, collection of experimental data, resource sheets, photos, videos, websites, and reference texts.</p> <p>Communicating will be by way of a report appropriate to the investigation.</p> <p>One reassessment opportunity would be appropriate.</p> <p>School-based authenticity policies and procedures will apply.</p> <p>The assessor can determine the time allowance for the assessment, as this is dependent on the situation.</p>	<p>This achievement standard involves investigating an astronomical or Earth science event.</p> <table border="1" data-bbox="359 595 518 1659"> <thead> <tr> <th data-bbox="359 1330 411 1659">Achievement Criteria</th> <th data-bbox="359 972 411 1330">Achievement with Merit</th> <th data-bbox="359 595 411 972">Achievement with Excellence</th> </tr> </thead> <tbody> <tr> <td data-bbox="411 1330 518 1659">Investigate an astronomical or Earth science event.</td> <td data-bbox="411 972 518 1330">Investigate, in-depth, an astronomical or Earth science event.</td> <td data-bbox="411 595 518 972">Investigate, comprehensively, an astronomical or Earth science event.</td> </tr> </tbody> </table> <p>This achievement standard is derived from <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, Level 6. It is aligned with the Nature of Science strand, and is related to the material in the <i>Teaching and Learning Guide for Science</i>, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p>This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the <a href="#">Papa Whakaako</a>.</p> <p><i>Investigate</i> involves:</p> <ul style="list-style-type: none"> <li>collecting, selecting, and processing primary or secondary data and/or information</li> <li>communicating the processed data and/or information by describing key stages of the event</li> <li>recording the sources used in a traceable format.</li> </ul> <p><i>Investigate in depth</i> involves:</p> <ul style="list-style-type: none"> <li>communicating the processed data and/or information by explaining key stages of the event.</li> </ul> <p><i>Investigate comprehensively</i> involves the further development of an in-depth investigation by:</p> <ul style="list-style-type: none"> <li>communicating the processed data and/or information by explaining thoroughly links between key stages of the event. This may involve elaborating, applying, justifying, relating, evaluating, comparing and contrasting, and analysing.</li> </ul> <p><b>NOTE:</b>  <b>An astronomical event may be selected from an historical or recent event, discovery or space probe exploration.</b></p> <p><b>An Earth science event may be selected from a historical or recent event taken from geological science, marine science, atmospheric science, or a combination of these sciences.</b></p>	Achievement Criteria	Achievement with Merit	Achievement with Excellence	Investigate an astronomical or Earth science event.	Investigate, in-depth, an astronomical or Earth science event.	Investigate, comprehensively, an astronomical or Earth science event.	<p>The outcome of this standard has two key parts:</p> <p>Investigate information. The aim here is to locate and select primary and/or secondary information for the report by using an investigation or research approach.</p> <p>Report on an astronomical or Earth science event.</p> <p>The assessment activity and the judgement of the associated evidence need to cover both aspects of this standard.</p> <p>This data can be collected individually or as part of a group. Students must provide evidence that is at the national standard for both of the criteria bullet pointed above.</p> <p>A range of research evidence, experiments, videos, etc, may be supplied by the teacher. This evidence can include primary and/or secondary information.</p> <p>For Excellence, the student needs to investigate, comprehensively, an astronomical or Earth science event. This involves the further development of an in-depth investigation, communicating the processed data and/or information by explaining thoroughly links between key stages of the event.</p> <p>For Merit, the student needs to investigate, in-depth, an astronomical or Earth science event. This involves communicating the processed data and/or information by explaining key stages of the event.</p>
Achievement Criteria	Achievement with Merit	Achievement with Excellence						
Investigate an astronomical or Earth science event.	Investigate, in-depth, an astronomical or Earth science event.	Investigate, comprehensively, an astronomical or Earth science event.						

	<p>For Achieved, the student needs to investigate an astronomical or Earth science event. This involves:</p> <ul style="list-style-type: none"> <li>• collecting, selecting, and processing primary or secondary data and/or information</li> <li>• communicating the processed data and/or information by describing key stages of the event</li> <li>• recording the sources used in a traceable format.</li> </ul>
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**AS 90955 v 3 (Science 1.16)**  
**Investigate an astronomical or Earth science event as applied to Tongariro National Park**

<b>Achievement</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>
<ul style="list-style-type: none"> <li>Investigate an Earth science event within the Tongariro National Park.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate, in depth an Earth science event within the Tongariro National Park.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate, comprehensively an Earth science event within the Tongariro National Park.</li> </ul>

**In Tongariro National Park the AS would refer to events such as volcanic eruptions and lahar flows.**

The emphasis in this AS is on:

- Investigating the cause and effects of a large scale event that has taken place in the Tongariro National Park. This would more than likely be seen to mean for students the recent volcanic eruptions that have taken place on both Tongariro and Ruapehu or lahar events that have occurred on Ruapehu. The investigation not only needs to relate to the underlying geological cause behind the event, but also the effects of that event on the surrounding environment and people.

**The teacher's role is to:**

Ensure that the materials available develop an understanding why volcanic action is a feature of the Tongariro National Park, and the resulting effect on the environment and people. Precautionary measures that are used to forewarn of events may also feature in the investigation, e.g. earthquake sensors, video monitoring, siren warnings.

The investigation should link the volcanic action to the plate boundaries and tectonic action that are the underlying factor behind these events. The volcanic plateau lies above the Pacific plate subducting below the continental crust of the Australian plate. The investigation can lead to the resulting volcanic action as magma builds up in the chambers beneath the volcano, or the earthquakes that can cause Ruapehu's crater lake walls to collapse with the resulting lahar.

Students can use internet links and materials provided by the teacher, as their source material. Students should also be able to add to this. A sample list of websites is given below.

Give one reassessment opportunity as appropriate.

Apply school-based authenticity policies and procedures.

Determine the time allowance for the assessment, as this is dependent on the situation.

**The student is expected to:**

Provide clear evidence that this information been taken from another source has been processed and understood. Simply copying or closely paraphrasing material from other sources does not contribute evidence of understanding.

Gather primary and/or secondary data cooperatively but record information independently.

Students may present their findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form.

**Assessment templates:**

<http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Science>

**Information Websites:**

Geology Te Ara - the Encyclopedia of New Zealand	<a href="http://www.teara.govt.nz/en/geology">http://www.teara.govt.nz/en/geology</a>
Volcanoes GNS Science	<a href="https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes">https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes</a>
Volcanoes at a Plate Boundary GNS Science	<a href="https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/Volcanoes-at-a-Plate-Boundary">https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/Volcanoes-at-a-Plate-Boundary</a>
Tectonic setting of New Zealand: astride a plate boundary which includes the Alpine Fault University of Otago	<a href="http://www.otago.ac.nz/geology/research/structural-geology/alpine-fault/nz-tectonics.html">http://www.otago.ac.nz/geology/research/structural-geology/alpine-fault/nz-tectonics.html</a>
Panic on Mt Tongariro as volcano erupts Nov 21 2012, Stuff news	<a href="http://www.stuff.co.nz/national/7979461/Panic-on-Mt-Tongariro-as-volcano-erupts">http://www.stuff.co.nz/national/7979461/Panic-on-Mt-Tongariro-as-volcano-erupts</a>
Remembering the 1995 Mt Ruapehu eruption 25 Aug 2015 New Zealand Earthquake Commission	<a href="https://www.eqc.govt.nz/news/remembering-the-1995-mt-ruapehu-eruption">https://www.eqc.govt.nz/news/remembering-the-1995-mt-ruapehu-eruption</a>
Heightened risk of Ruapehu eruption 11 May 2016, Radio New Zealand	<a href="http://www.radionz.co.nz/news/national/303604/heightened-risk-of-ruapehu-eruption">http://www.radionz.co.nz/news/national/303604/heightened-risk-of-ruapehu-eruption</a>
Mt Ruapehu alert level lifted after crater lake temperature rises 20C NZ Herald, 11 May 2016	<a href="http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&amp;objectid=11637377">http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&amp;objectid=11637377</a>
Ruapehu Volcano - John Seach Lahars from Mt Ruapehu Department of Conservation, 2006	<a href="http://www.volcanolive.com/ruapehu.html">http://www.volcanolive.com/ruapehu.html</a> <a href="http://www.doc.govt.nz/documents/about-doc/concessions-and-permits/conservation-revealed/lahars-from-mt-ruapehu-lowres.pdf">http://www.doc.govt.nz/documents/about-doc/concessions-and-permits/conservation-revealed/lahars-from-mt-ruapehu-lowres.pdf</a>



### Video clips

GNS Science YouTube channel	<a href="https://www.gns.cri.nz/Home/Learning/Videos">https://www.gns.cri.nz/Home/Learning/Videos</a>
Ruapehu eruption, July 1996	<a href="http://www.teara.govt.nz/en/video/8729/ruapehu-eruption-july-1996">www.teara.govt.nz/en/video/8729/ruapehu-eruption-july-1996</a>
Te Ara The Encyclopedia of New Zealand	
Mt Tongariro Eruption November 2012	<a href="https://www.youtube.com/watch?v=X2ASNu7vVGA">https://www.youtube.com/watch?v=X2ASNu7vVGA</a>
GeoNet NZ	
Incredible video volcanic lahar caught on camera at Mt Ruapehu	<a href="https://www.youtube.com/watch?v=5x5tZAHFoRU">https://www.youtube.com/watch?v=5x5tZAHFoRU</a>
Mt Ruapehu eruption on TV3 News New Zealand	<a href="https://www.youtube.com/watch?v= Ey2pdb5_VA">https://www.youtube.com/watch?v= Ey2pdb5_VA</a>
Mt Ruapehu eruptions spectacular raw footage	<a href="https://www.youtube.com/watch?v=h8W_sGYAQlc">https://www.youtube.com/watch?v=h8W_sGYAQlc</a>

Also see Section 5 – Geology, pages 8–14, for supporting information

<p><b>Conditions of assessment</b></p> <p><i>Geographic understanding</i> refers to an understanding of the spatial dimension of the environment, and an understanding of how people interact with environments and the consequences of that interaction.</p> <p><i>Environment</i> refers to a part of the earth's surface characterised by a specific use.</p> <p><i>Use of an environment</i> refers to using it for a purpose such as mining, farming, fishing, tourism, energy production, recreation, forestry, transportation.</p> <p><i>Sustainable use</i> refers to the extent to which this use can be maintained in the future to minimise environmental impacts.</p> <p>Assessment evidence could be collected by, but is not limited to, the following methods:</p> <ul style="list-style-type: none"> <li>written report</li> <li>oral presentation</li> <li>multimedia presentation</li> <li>poster</li> </ul>	<p><b>Geography 1.3</b> <b>AS 91009 Version: 3</b> <b>3 credits</b></p> <p><b>Demonstrate geographic understanding of the sustainable use of an environment.</b></p> <p>This achievement standard involves demonstrating geographic understanding of the sustainable use of an environment.</p> <table border="1" data-bbox="331 674 528 1648"> <thead> <tr> <th data-bbox="331 1328 408 1648">Achievement Criteria</th> <th data-bbox="331 1005 408 1328">Achievement with Merit</th> <th data-bbox="331 674 408 1005">Achievement with Excellence</th> </tr> </thead> <tbody> <tr> <td data-bbox="408 1328 528 1648">Demonstrate geographic understanding of the sustainable use of an environment.</td> <td data-bbox="408 1005 528 1328">Demonstrate in-depth geographic understanding of the sustainable use of an environment.</td> <td data-bbox="408 674 528 1005">Demonstrate comprehensive geographic understanding of the sustainable use of an environment.</td> </tr> </tbody> </table> <p><b>Explanatory Notes</b></p> <p>This achievement standard is derived from the second Level 6 Geography achievement objective of <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, and is related to material in the <i>Teaching and Learning Guide for Geography</i>, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p>This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the <a href="#">Papa Whakaako</a>.</p> <p><b>At achieved level:</b> Demonstrate geographic understanding typically involves:</p> <ul style="list-style-type: none"> <li>describing how and why people use the selected environment</li> <li>describing the consequences of this use on people and environment</li> <li>describing the sustainability, or otherwise, of the selected environment with continued use.</li> </ul> <p><b>At merit level:</b> Demonstrate in-depth geographic understanding typically involves:</p> <ul style="list-style-type: none"> <li>explaining the consequences of the use of the selected environment on people and environment</li> <li>explaining the sustainability, or otherwise, of the selected environment with continued use.</li> </ul> <p><b>At excellence level:</b> Demonstrate in-depth geographic understanding typically involves:</p> <ul style="list-style-type: none"> <li>explaining the consequences of the use of the selected environment on people and environment</li> <li>explaining the sustainability, or otherwise, of the selected environment with continued use.</li> </ul>	Achievement Criteria	Achievement with Merit	Achievement with Excellence	Demonstrate geographic understanding of the sustainable use of an environment.	Demonstrate in-depth geographic understanding of the sustainable use of an environment.	Demonstrate comprehensive geographic understanding of the sustainable use of an environment.	<p><b>Clarification Document Dec 2016</b></p> <p>This document has been updated to indicate that a single use of an environment is sufficient to meet the requirements of the standard.</p> <p><b>The interaction between people and the environment is the explicit objective of this standard.</b></p> <p>The term '<b>environment</b>' refers to the region in which the activity occurs. The size of the selected environment needs to be carefully considered and could be determined by the use that is to be studied, for example: Waihi and mining, Marlborough Sounds and aquaculture or tourism, Waitaki Basin and hydroelectric power generation.</p> <p><b>How people use the selected environment</b></p> <p>Evidence must relate to the activities and processes that directly use the environment, such as sowing grass to improve pasture quality, or clearing overburden to provide access to the ore. Some processes involved in the activity are unsuitable, e.g. milking, which does not directly use the environment.</p> <p><b>The consequences of the selected use on people and the environment</b></p> <p>Consequences must relate to people within the selected environment. This includes people directly involved in the 'use' and those indirectly affected.</p> <p>The consequences for the environment can discuss the immediate location and the wider area, but must remain within the selected environment.</p> <p><b>Sustainability</b></p> <p>A critical aspect of this standard is the understanding of the concept of sustainability with a future focus. The depth of the explanation of this aspect strongly influences the quality of student</p>
Achievement Criteria	Achievement with Merit	Achievement with Excellence						
Demonstrate geographic understanding of the sustainable use of an environment.	Demonstrate in-depth geographic understanding of the sustainable use of an environment.	Demonstrate comprehensive geographic understanding of the sustainable use of an environment.						

<p>One reassessment opportunity would be appropriate.</p> <p>School-based authenticity policies and procedures will apply.</p> <p>The assessor can determine the time allowance for the assessment, as this is dependent on the situation.</p>		<p>work and their opportunity to reach Merit and Excellence.</p>
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**AS 91009 v3 (Geography 1.3)**  
**Demonstrate geographic understanding of the sustainable use of an environment as applied to the Tongariro National Park**

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Demonstrate geographic understanding of the sustainable use of the Tongariro National Park</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in depth geographic understanding of the sustainable use of the Tongariro National Park</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive geographic understanding of the sustainable use of the Tongariro National Park</li> </ul>

The emphasis in this AS is on:

- Carrying out research in to the effect of human activity on the sustainability of the National Park. In particular there are two options for study. The Ruapehu’s recreational use for winter sports, and secondly the designated walks that are found within the Park boundaries.
- Students need to be able to identify a use and the facilities that have been put in place to supply the human need. Also they will need to consider the environmental consequences of the recreational use and the threats this poses to the environment and the controls necessary. Finally the question of the sustainability of the recreational use has to be considered. What management strategies have been put in place to ensure the longevity of the Park’s facilities protecting the environment whilst still leaving it available for recreational users.

**The teacher’s role is to:**

Ensure that for the selected recreational use, the student has opportunity through either a field trip, the use of photographic evidence, relevant data and accessible written materials to develop an understanding of the nature of the recreational use and the potential impact of that use.

Students should be able to work collaboratively on this study but will need to record their own information for the presentation of their final assessment task.

Students can use internet links, written materials, and field trip worksheets provided as their source material. Students should also be able to add to this. A sample list of websites is given below.

Give one reassessment opportunity as appropriate.

Apply school-based authenticity policies and procedures.

Determine the time allowance for the assessment, as this is dependent on the situation.

**The student is expected to:**

Provide clear evidence that this information been taken from another source, has been processed and understood. Simply copying or closely paraphrasing material from other sources does not contribute evidence of understanding.

Gather primary and/or secondary data cooperatively but record information independently.

Students may present their findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form.

**Assessment templates:**

- <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Social-sciences/Geography/Level-1-Geography>
- Geography 1.3 (AS 91009): The Tongariro Crossing Walk (to request a copy of the editable student task assessment templates, email conserved@doc.govt.nz)

**Information websites:**

Tongariro National Park - place overview Department of Conservation	<a href="http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/">http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/</a>
Fascinating facts about Tongariro National Park Department of Conservation	<a href="http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/about-tongariro-national-park/fascinating-facts-about-tongariro/">http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/about-tongariro-national-park/fascinating-facts-about-tongariro/</a>
Tongariro National Park Management Plan 2006-2016 Department of Conservation	<a href="http://www.doc.govt.nz/Documents/about-doc/role/policies-and-plans/national-park-management-plans/tongariro-national-park/tongariro-national-park-management-plan.pdf">http://www.doc.govt.nz/Documents/about-doc/role/policies-and-plans/national-park-management-plans/tongariro-national-park/tongariro-national-park-management-plan.pdf</a>
Story: National Parks Te Ara - the Encyclopedia of New Zealand	<a href="http://www.teara.govt.nz/en/national-parks/page-1">http://www.teara.govt.nz/en/national-parks/page-1</a>
Mt Ruapehu - skiing and other activity information Ruapehu Alpine Lifts (2017)	<a href="http://www.mtruapehu.com/">http://www.mtruapehu.com/</a>
UNESCO World Heritage List - Tongariro National Park UNESCO World Heritage Centre	<a href="http://whc.unesco.org/en/list/421">http://whc.unesco.org/en/list/421</a>

**Also see Section 5, pages 16-21 – Tourism and Sustainability for supporting information**

<p><b>Conditions of assessment</b></p> <p>Assessment evidence could be collected by, but is not limited to, the following methods:</p> <ul style="list-style-type: none"> <li>• written report</li> <li>• oral presentation</li> <li>• multimedia presentation</li> <li>• poster</li> </ul> <p>One reassessment opportunity would be appropriate.</p> <p>School-based authenticity policies and procedures will apply.</p> <p>The assessor can determine the time allowance for the assessment, as this is dependent on the situation. (Two weeks would appear to be an optimum.)</p>	<p><b>Geography 1.6 AS 91012 Version: 2 4 credits</b></p> <p><b>Describe aspects of a contemporary New Zealand geographic issue</b></p> <p>This achievement standard involves describing aspects of a contemporary New Zealand geographic issue.</p> <table border="1" data-bbox="331 882 555 1697"> <thead> <tr> <th data-bbox="331 1435 405 1697"><b>Achievement Criteria</b></th> <th data-bbox="331 1167 405 1435"><b>Achievement with Merit</b></th> <th data-bbox="331 882 405 1167"><b>Achievement with Excellence</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="405 1435 555 1697">Describe aspects of a contemporary New Zealand geographic issue.</td> <td data-bbox="405 1167 555 1435">Describe, in depth, aspects of a contemporary New Zealand geographic issue.</td> <td data-bbox="405 882 555 1167">Comprehensively describe aspects of a contemporary New Zealand geographic issue.</td> </tr> </tbody> </table> <p><b>Explanatory Notes</b></p> <p>This achievement standard is derived from the second Level 6 Geography achievement objective of <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, and is related to material in the <i>Teaching and Learning Guide for Geography</i>, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p><b>At Achieved level:</b> Describe aspects of a contemporary New Zealand geographic issue typically involves:</p> <ol style="list-style-type: none"> <li>describing the nature of the contemporary geographic issue</li> <li>describing the different viewpoints and/or opinions individuals (or groups) hold in relation to the issue</li> <li>describing the strength(s) and weakness(es) of possible courses of action</li> <li>recommending a course of action with a reason.</li> </ol> <p><b>At Merit level:</b> Describe, in depth, aspects of a contemporary geographic issue typically involves:</p> <ol style="list-style-type: none"> <li>describing, in detail the different viewpoints and/or opinions individuals (or groups) hold in relation to the issue, using specific information</li> <li>assessing the strength(s) and weakness(es) of each course of action</li> <li>supporting a recommended course of action with detailed reasons.</li> </ol> <p><b>At Excellence level:</b> Comprehensively describe aspects of a contemporary geographic issue typically involves:</p> <ol style="list-style-type: none"> <li>fully describing the different viewpoints and/or opinion individuals (or groups) hold in relation to the issue, using specific information and geography terminology and concepts, and showing insight and incorporating stakeholder beliefs, values and/or perspectives</li> </ol>	<b>Achievement Criteria</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>	Describe aspects of a contemporary New Zealand geographic issue.	Describe, in depth, aspects of a contemporary New Zealand geographic issue.	Comprehensively describe aspects of a contemporary New Zealand geographic issue.	<p><b>Clarification Document Dec 2016</b></p> <p>This document has been updated to indicate that while more than one possible course of action is required this is not restricted to three.</p> <p>The parameters of the contemporary New Zealand issue are identified in Explanatory Note (EN) 3 of the standard.</p> <p><b>The nature of the issue</b></p> <p>A description of the nature of the issue will ideally include:</p> <ul style="list-style-type: none"> <li>• an outline of the issue</li> <li>• a description of the significance of the location (a map could be included)</li> <li>• a description of the related natural and/or cultural features</li> <li>• a statement or inference of the effect of the issue on people and the environment.</li> </ul> <p><b>Viewpoints</b></p> <p>The viewpoints can be from an individual or from a group. Two or three different viewpoints would be sufficient. The description of the viewpoints must relate directly to the geographic issue.</p> <p>For the requirements of ‘fully describing the different viewpoints’, see EN 2 for the Excellence criteria. A comprehensive response relies on the student having a sound understanding of both the issue and the points of view being considered.</p> <p><b>Assessing strengths and weaknesses</b></p> <p>Strengths and weaknesses of courses of action to address or resolve the issue must be described and assessed. There is no longer a requirement that two strengths and weaknesses are considered for each course of action. The progression is from a description (for Achieved) to an assessment (for Merit).</p> <p>When assessing strengths and weaknesses, students need to make a judgement on the value of each strength and weakness and the extent to which they could influence the final decision. Refer to examples given in the exemplar material <a href="http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/subjects/geography/annotated-exemplars/">http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/subjects/geography/annotated-exemplars/</a></p>
<b>Achievement Criteria</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>						
Describe aspects of a contemporary New Zealand geographic issue.	Describe, in depth, aspects of a contemporary New Zealand geographic issue.	Comprehensively describe aspects of a contemporary New Zealand geographic issue.						

	<p>i. fully supporting a recommended course of action with detailed reasons, demonstrating why the chosen course of action is better than the other courses of action.</p> <p><b>Aspects</b> refer to the nature of the contemporary geographic issue, viewpoints that relate to the issue and different course of action that can be taken to address or resolve the issue.</p> <p><b>Contemporary</b> means now or in the near future.</p> <p><b>Geographic issue</b> refers to a context that involves a concern, problem, debate or controversy related to a natural or cultural environment, which also includes a spatial dimension. The issue must be a local, regional or national issue within New Zealand.</p> <p><b>Specific information</b> refers to that from individuals (or groups) and quotes from a variety of sources.</p> <p><b>Showing insight</b> refers to showing perception and linking causes with effects.</p>	
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**AS 91012 v2 (Geography 1.6)**  
**Describe aspects of a contemporary New Zealand geographic issue in relation to the Tongariro National Park.**

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Describe aspects of a contemporary New Zealand geographic issue as applied to the Tongariro National Park.</li> </ul>	<ul style="list-style-type: none"> <li>Describe, in depth, aspects of a contemporary New Zealand geographic issue as applied to the Tongariro National Park.</li> </ul>	<ul style="list-style-type: none"> <li>Comprehensively describe aspects of a contemporary New Zealand geographic issue as applied to the Tongariro National Park.</li> </ul>

The emphasis in this AS is on:

- Investigating and describing the different viewpoints on a contemporary (relevant and within a recent timeframe) issue that could involve such aspects as the operations within the National Park or how people view the National Park. It is important that students identify differing points of view, at least two or three is sufficient, however they need to show an understanding of the points of view offered by assessing them on their merits given the issue being studied. Where a course of action has been determined the points of view on offer should be taken into account. How have they influenced the decision? Is it a favoured decision and why was it taken?

Issues that students may like to investigate:

- Limiting the number of tourists using the Tongariro track.
- Expanding the ski facilities to allow for night-time skiing.
- Expanding the use of snow makers to allow for skiing later into the season.
- The restriction on further development of ski lodges on the mountain.
- Opening up the ski resort facilities to encourage more tourism in the National Park.
- Charging a levy for all tourists visiting the National Park.

**The teacher's role is to:**

Ensure that for the selected contemporary issue, the student has opportunity to identify differing viewpoints and analyse them in detail. There should be access to written materials that provide evidence for viewpoints and decisions that have been where appropriate. It could be feasible for a student to survey opinions but they should be collaborated.

Students will need to record their own information and sources for the final presentation of their assessment task for authenticity.

Students can use internet links, written materials, and field trip worksheets provided as their source material. Students should also be able to add to this. A sample list of websites is given with some information.



Give one reassessment opportunity as appropriate.  
 Apply school-based authenticity policies and procedures.  
 Determine the time allowance for the assessment, as this is dependent on the situation.

**The student is expected to:**

Provide clear evidence that the issue and the viewpoints are clearly understood. Simply copying or closely paraphrasing material from other sources does not contribute evidence of understanding. They need to show critical thinking in their analysis of the issue.

Students may present their findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form.

**Assessment templates:**

<http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Social-sciences/Geography/Level-1-Geography>

**Information websites:**

<b>Should tourists pay a levy to use the National Park?</b>	
Tapping the tourists to keep NZ 100% pure 11 December 2016, Stuff News	<a href="http://www.stuff.co.nz/business/87220617/tapping-the-tourists-to-keep-nz-100-pure">http://www.stuff.co.nz/business/87220617/tapping-the-tourists-to-keep-nz-100-pure</a>
Brighter Future? Does tourism trump taonga? 6 June 2017, Radio NZ	<a href="http://www.radionz.co.nz/programmes/brighter-future/story/201845116/brighter-future-does-tourism-trump-taonga">http://www.radionz.co.nz/programmes/brighter-future/story/201845116/brighter-future-does-tourism-trump-taonga</a>
'The entirety of New Zealand is a national park: the case for implementing a border fee' 21 Feb 2017, The Spinoff	<a href="https://thespinoff.co.nz/society/21-02-2017/the-entirety-of-new-zealand-is-a-national-park-the-case-for-implementing-a-border-fee/">https://thespinoff.co.nz/society/21-02-2017/the-entirety-of-new-zealand-is-a-national-park-the-case-for-implementing-a-border-fee/</a>
Greens plan tourist tax for conservation 11 August 2016, Newshub	<a href="http://www.newshub.co.nz/home/politics/2016/08/greens-plan-tourist-tax-for-conservation.html">http://www.newshub.co.nz/home/politics/2016/08/greens-plan-tourist-tax-for-conservation.html</a>
New Zealand debates a hiking fee 5 Jan 2017, The Economist	<a href="https://www.economist.com/news/asia/21713895-country-torn-new-zealand-debates-hiking-fee">https://www.economist.com/news/asia/21713895-country-torn-new-zealand-debates-hiking-fee</a>
<b>Expansion of facilities on the ski slopes</b>	
Mt Ruapehu Alpine Lifts 2017	<a href="https://www.mtruapehu.com/">https://www.mtruapehu.com/</a>
Chairlift opened on Mount Ruapehu 7 May 2017, Wanganui Chronicle	<a href="http://www.nzherald.co.nz/wanganui-chronicle/news/article.cfm?c_id=1593426&amp;objectid=11851227">http://www.nzherald.co.nz/wanganui-chronicle/news/article.cfm?c_id=1593426&amp;objectid=11851227</a>
Big Read: Mt Ruapehu business fights against cooling times 24 Dec 2016, NZ Herald	<a href="http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&amp;objectid=11700817">http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&amp;objectid=11700817</a>
Ruapehu skifields to bring in more snowmakers	<a href="http://www.radionz.co.nz/news/national/320643/ruapehu-skifields-to-bring-in-more-snowmakers">http://www.radionz.co.nz/news/national/320643/ruapehu-skifields-to-bring-in-more-snowmakers</a>

17 Dec 2016, Radio NZ	
NZ's biggest ski area reinvents itself for 2017 7 April 2017, NZ Herald	<a href="http://www.nzherald.co.nz/sponsored-stories/news/article.cfm?c_id=1503708&amp;objectid=11833277">http://www.nzherald.co.nz/sponsored-stories/news/article.cfm?c_id=1503708&amp;objectid=11833277</a>
New Zealand's ski fields gear up for winter 2017 2 May 2017, NZ Tourism	<a href="http://media.newzealand.com/en/news/new-zealands-ski-fields-gear-up-for-winter-2017/">http://media.newzealand.com/en/news/new-zealands-ski-fields-gear-up-for-winter-2017/</a>

Also see Section 5 – Ecology, pages 2–8, and Tourism and Sustainability, pages 18–21, for supporting information.

Conditions of assessment	<p><b>Biology 2.1</b>  <b>AS 91153 Version: 2</b>  <b>4 credits</b>  <b>Carry out a practical investigation in a biology context, with supervision</b></p>	<p><b>Clarification Document Feb 2014</b></p>						
<p>Assessment against this standard may be based on a stand-alone or an individual investigation that can contribute findings to a larger group or class investigation. In a group or class investigation, individual findings may be discussed and individual students may interpret their own findings in the light of other students' investigations and findings. Findings from outside the group or class such as published information or historical findings relevant to the investigation may also be used.</p> <p>The nature of the investigation could be the manipulation of variables (fair test), the pattern or relationship or the use of models.</p> <p>It is intended that this investigation be carried out with supervision. This means that the teacher provides guidelines for the <b>investigation such as</b></p>	<p>This achievement standard involves demonstrating understanding of adaptation of plants or animals to their way of life.</p> <table border="1" data-bbox="384 539 568 1693"> <thead> <tr> <th data-bbox="384 1272 427 1693">Achievement</th> <th data-bbox="384 887 427 1272">Achievement with Merit</th> <th data-bbox="384 539 427 887">Achievement with Excellence</th> </tr> </thead> <tbody> <tr> <td data-bbox="434 1272 568 1693"> <ul style="list-style-type: none"> <li>Carry out a practical investigation in a biology context, with supervision.</li> </ul> </td> <td data-bbox="434 887 568 1272"> <ul style="list-style-type: none"> <li>Carry out an in-depth practical investigation in a biology context, with supervision.</li> </ul> </td> <td data-bbox="434 539 568 887"> <ul style="list-style-type: none"> <li>Carry out a comprehensive practical investigation in a biology context, with supervision.</li> </ul> </td> </tr> </tbody> </table> <p>This achievement standard is derived from <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, Level 7. It is aligned with the following achievement objectives in the Nature of Science stand:</p> <p><b>Investigating in Science</b>  Develop and carry out investigations that extend their science knowledge, including developing their understanding of the relationship between investigations and scientific theories and models</p> <p><b>Understanding about Science</b>  Understand that scientists have an obligation to connect their new ideas to current and historical scientific knowledge and to present their findings for peer review and debate;</p> <p><b>and</b> is related to the material in the <i>Teaching and Learning Guide for Biology</i>, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p>Investigations must be based on contexts arising from content at Level 7 of <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, Living World strand.</p> <p>Procedures outlined in <i>Safety and Science: a Guidance Manual for New Zealand Schools</i>, Learning Media, Ministry of Education, 2000, must be followed. Investigations must comply with the Animal Welfare Act 1999, as outlined in <i>Caring for Animals: a Guide for Teachers, Early Childhood Educators, and Students</i>, Learning Media, Ministry of Education, 1999.</p> <p>This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the <a href="#">Papa Whakaaako</a> for the relevant learning area.</p> <p><b>At achieved level: Carry out a practical investigation involves:</b></p> <ul style="list-style-type: none"> <li>developing a statement of the purpose written as a hypothesis linked to a scientific concept or idea</li> <li>using a method that describes: <ul style="list-style-type: none"> <li>for a fair test: a range for the independent variable, the measurement of the dependent variable and the control of some other key variables</li> </ul> </li> </ul>	Achievement	Achievement with Merit	Achievement with Excellence	<ul style="list-style-type: none"> <li>Carry out a practical investigation in a biology context, with supervision.</li> </ul>	<ul style="list-style-type: none"> <li>Carry out an in-depth practical investigation in a biology context, with supervision.</li> </ul>	<ul style="list-style-type: none"> <li>Carry out a comprehensive practical investigation in a biology context, with supervision.</li> </ul>	<p>This has been updated in its entirety to address new issues that have arisen as a result of the external moderation process.</p> <p><b>'Supervision'</b> means that the context and broad experimental conditions can be provided. It involves managing the sharing of others' findings to ensure that sufficient data is collected by a range of students, or is provided by the teacher. An individual discussion with students in order to clarify their ideas in the planning stage is permitted.</p> <p><b>The investigation</b> can be a: fair test (e.g. the manipulation of a variable such as temperature in an enzyme investigation), or pattern/relationship (e.g. a field study of a population or community), or model (e.g. diffusion using agar jelly containing an indicator).</p> <p>Students develop and complete their own, single investigation covering the complete process of planning, carrying out, processing and interpreting data, and reporting.</p> <p>Students can also: plan and carry out the investigation as a group for manageability. The teacher must provide written verification that each student has actively participated and recorded their own data, e.g. by submitting a class grid which indicates whether these requirements have been met have access to their portfolio of biological ideas and concepts learned during the teaching of the relevant context as they write their report.</p>
Achievement	Achievement with Merit	Achievement with Excellence						
<ul style="list-style-type: none"> <li>Carry out a practical investigation in a biology context, with supervision.</li> </ul>	<ul style="list-style-type: none"> <li>Carry out an in-depth practical investigation in a biology context, with supervision.</li> </ul>	<ul style="list-style-type: none"> <li>Carry out a comprehensive practical investigation in a biology context, with supervision.</li> </ul>						

<p><b>the context for the investigation,</b> instructions that specify the requirements for a comprehensive investigation, and broad experimental conditions such as the availability of equipment or chemicals. Students then develop and complete the investigation from the initial guidelines given by the teacher.</p> <p><b>Supervision may involve discussion between teachers and individual students</b> in order to clarify the students' ideas and may also involve teachers managing the process of sharing findings.</p> <p>Conditions of Assessment related to this achievement standard can be found at <a href="http://ncea.tki.org.nz/R esources-for-Internally-Assessed-Achievement-Standards">http://ncea.tki.org.nz/R esources-for-Internally-Assessed-Achievement-Standards</a>.</p>	<ul style="list-style-type: none"> <li>- for a pattern seeking or modelling activity: the data that will be collected, range of data/samples, and consideration of some other key factors</li> <li>• collecting, recording, and processing data relevant to the purpose of the investigation</li> <li>• interpreting and reporting on the findings</li> <li>• reaching a conclusion based on the student's processed data which is relevant to the purpose of the investigation</li> <li>• identifying and including relevant findings from another source.</li> </ul> <p><b>At merit level: Carry out an in-depth practical investigation involves:</b></p> <ul style="list-style-type: none"> <li>• using a method that describes: <ul style="list-style-type: none"> <li>- for a fair test: a valid range for the independent variable, the valid measurement of the dependent variable and the control of other key variables with consideration of factors such as sampling bias and sources of errors</li> <li>- for a pattern seeking or modelling activity: a valid collection of data with consideration of factors such as sampling bias and sources of errors</li> </ul> </li> <li>• collecting, recording, and processing data which enables a trend or pattern (or the absence of a trend or pattern) to be determined</li> <li>• reaching a valid conclusion based on the student's processed data which is relevant to the purpose of the investigation</li> <li>• a discussion of the biological ideas relating to the investigation that is based on the student's findings and those from other source(s).</li> </ul> <p><b>At excellence level: Carry out a comprehensive practical investigation involves:</b></p> <ul style="list-style-type: none"> <li>• justification of the choices made during the sound investigation, ie evaluating the validity of the method or reliability of the data and explaining the conclusion in terms of the biology ideas relevant to the investigation.</li> </ul> <p><b>A practical investigation</b> is an activity covering the complete investigation process: planning and carrying out the investigation, collecting primary data, processing and interpreting data, and reporting on the investigation. Students may make changes to their initial method as they work through the investigation.</p>	<p><b>The purpose</b> must be re-written as a hypothesis linked to a scientific concept or idea. The conclusion is based on the trend (or absence) shown in the processed data, relevant to the purpose (and hypothesis), rather than just a summary of this data.</p> <p><b>Findings of others</b> are provided by the teacher, usually 2-3 sources, and must not include information which gives direction on developing the investigation. The sources provided as findings of others may include: qualitative information like diagrams/graphics from scientific reports, published textbooks e.g. the writing of plants if excessive fertilizer is added</p> <p>quantitative information e.g. graphs, tables, statistical data from scientific reports, published textbooks, previous student grouped data or shared data.</p> <p><b>In-depth and comprehensive investigations</b> require a discussion of the biological ideas based on the findings and those from other source(s). For Excellence, the evidence explaining a valid conclusion based on relevant biology ideas can also be found in the discussion based on the student's findings and those from the other source(s).</p> <p><b>Dual Assessment with 91158</b> requires a task and assessment schedule for each investigation.</p>
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## AS 91153 v2 (Biology 2.1)

### Carry out a practical investigation in a biology context, with supervision

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Carry out a practical investigation in a biology context, with supervision</li> </ul>	<ul style="list-style-type: none"> <li>Carry out an in-depth practical investigation in a biology context, with supervision</li> </ul>	<ul style="list-style-type: none"> <li>Carry out a comprehensive practical investigation in a biology context, with supervision</li> </ul>

The emphasis in this AS is on:

This achievement standard involves carrying out a practical investigation in a biology context, with supervision eg in the Tongariro National Park.

The emphasis is on developing and testing a hypothesis, collecting data to test the hypothesis.

The most likely investigation will involve a pattern seeking or relationship study within an ecological context within the Park. E.g. investigating the density/numbers of plant species moving away from a walking track, investigating relative numbers of different dominant species on north facing/south facing slopes, at different altitudes or in regions with no, some or plenty of human intervention.

Reporting on the data and its relationship to the biological principles.

It is entirely feasible for the investigation to be carried out as a group activity, and to share data in a class investigation. Students will need to record their own data and write up their own reports.

**It is strongly advised that the investigation is discussed with the local DOC officers. There are a number of 20m<sup>2</sup> quadrats available for student investigations. Certain areas of the park may be more suitable for student investigations and there may be existing data that could provide background material for comparison. It is also possible that some areas of the Park, which may have been thought to be suitable, are too sensitive for a class investigation.**

**The teacher's role is to:**

Ensure that for the selected investigation, the student has opportunity through either a field trip, along with the use of photographic evidence, relevant data and accessible written materials to develop an understanding of the distribution pattern and the underlying factors that directly relate to the supposed pattern.

Verify that the student's work is authentic.

Clarify with the student that they understand the nature of the investigation and how the evidence will provide for understanding the pattern being investigated.

Students will need an understanding of the ecology and the biology of the organisms within the Park's alpine and sub alpine communities. This may involve a generic description of the types of patterns that could be found in these regions. The information given by the teacher should in no way be leading in terms of the student's investigation conclusions or discussion.

Students can use internet links, written materials, and field trip worksheets provided as their source material. Students should also be able to add to this. A sample list of websites is given with some information.

Give one reassessment opportunity as appropriate.

Apply school-based authenticity policies and procedures.

Determine the time allowance for the assessment, e.g. 2 – 3 weeks including field work, as this is dependent on the situation.

**The student is expected to:**

Provide clear evidence that they have been active in collecting the relevant data. Simply copying material from other students does not contribute evidence. Students may present their hypothesis, findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form but need to show the relevance of their findings in terms of the biological ideas.

**Assessment templates:**

<http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Science/Biology>

**Information Websites:**

Alpine Habitats Department of Conservation	<a href="http://www.doc.govt.nz/nature/habitats/alpine/">www.doc.govt.nz/nature/habitats/alpine/</a>
Dryland Habitats Department of Conservation	<a href="http://www.doc.govt.nz/nature/habitats/drylands/">http://www.doc.govt.nz/nature/habitats/drylands/</a>
Tongariro Alpine Crossing Department of Conservation	<a href="http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/things-to-do/tracks/tongariro-alpine-crossing/">http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/things-to-do/tracks/tongariro-alpine-crossing/</a>
Story: Alpine Plants Te Ara - the Encyclopaedia of New Zealand	<a href="http://www.teara.govt.nz/en/alpine-plants">http://www.teara.govt.nz/en/alpine-plants</a>
New Zealand Alpine Plants Department of Conservation	<a href="http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/nz-alpine-plants-lowres.pdf">http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/nz-alpine-plants-lowres.pdf</a>
Podocarp-hardwood forests- biodiversity Department of Conservation	<a href="http://www.doc.govt.nz/documents/about-doc/concessions-and-permits/conservation-revealed/podocarp-hardwood-forests-lowres.pdf">http://www.doc.govt.nz/documents/about-doc/concessions-and-permits/conservation-revealed/podocarp-hardwood-forests-lowres.pdf</a>

Forests

New Zealand Plant Conservation Network

[http://www.nzpcn.org.nz/page.aspx?ecosystems\\_plant\\_communities\\_forests](http://www.nzpcn.org.nz/page.aspx?ecosystems_plant_communities_forests)

Also see **Section 5- Ecology** for supporting information

<p><b>Conditions of assessment</b></p>	<p><b>Biology 2.3</b> <b>AS 91155 Version: 2</b> <b>3 credits</b> <b>Demonstrate understanding of adaptation of plants or animals to their way of life</b></p>	<p><b>Clarification Document Feb 2014</b></p>						
<p><b>Understanding of adaptation</b> is demonstrated in relation to one life process over three taxonomic or functional groups of multi-cellular plants or animals, or across two related life processes within one taxonomic or functional group.</p> <p><b>Adaptation</b> involves the range of ways in which organisms have developed strategies to carry out the life processes. An adaptation refers to a feature and its function as it enables an organism to carry out a life process and thus occupy a specific ecological niche. It may include structural, behavioural, or physiological features of an organism. An adaptation provides an advantage for the organism in its specific habitat and ecological niche.</p> <p><b>Way of life</b> encompasses the ways in which an organism carries out all its life processes. It includes:</p> <ul style="list-style-type: none"> <li>relationships with other organisms – competition, predation, parasitism, mutualism</li> <li>reproductive strategies</li> <li>adaptations to the physical habitat.</li> </ul>	<p>This achievement standard involves demonstrating understanding of adaptation of plants or animals to their way of life.</p> <table border="1" data-bbox="352 539 584 1624"> <thead> <tr> <th data-bbox="352 1234 424 1624">Achievement</th> <th data-bbox="352 853 424 1234">Achievement with Merit</th> <th data-bbox="352 539 424 853">Achievement with Excellence</th> </tr> </thead> <tbody> <tr> <td data-bbox="424 1234 584 1624"> <ul style="list-style-type: none"> <li>Demonstrate understanding of adaptation of plants or animals to their way of life.</li> </ul> </td> <td data-bbox="424 853 584 1234"> <ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of adaptation of plants or animals to their way of life.</li> </ul> </td> <td data-bbox="424 539 584 853"> <ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of adaptation of plants or animals to their way of life.</li> </ul> </td> </tr> </tbody> </table> <p>This achievement standard is derived from <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, Level 7. It is aligned with the following achievement objective in the Living World strand: Life Processes</p> <ul style="list-style-type: none"> <li>Explore the diverse ways in which animals and plants carry out the life processes and is related to the material in the <i>Teaching and Learning Guide for Biology</i>, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</li> </ul> <p>This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the <a href="#">Papa Whakaako</a> for the relevant learning area.</p> <p><b>At achieved level:</b> <i>Demonstrate understanding</i> involves describing the adaptations and identifying the aspects of the adaptations that enable each organism to carry out its life process(es) in order to survive in its habitat.</p> <p><b>At merit level:</b> <i>Demonstrate in-depth understanding</i> involves providing a biological reason that explains how or why the adaptations enable each organism to carry out its life process(es) in order to survive in its habitat.</p> <p><b>At excellence level:</b> <i>Demonstrate comprehensive understanding</i> involves showing understanding by linking several biological ideas. The linking of ideas may involve justifying, evaluating, comparing and contrasting, or analysing, and must include consideration of the two points from below appropriate to the chosen context.</p> <p>In the context of <i>understanding of adaptation</i> related to one life process over three taxonomic or functional groups of multi-cellular plants or animals:</p> <ul style="list-style-type: none"> <li>comparing diversity of adaptation in response to the same demand across different taxonomic or functional groups. Demand could be low temperature, high wind, frozen for part of year or rock substrate in different plant groups such as tussocks, Raoulia and snowberry</li> </ul>	Achievement	Achievement with Merit	Achievement with Excellence	<ul style="list-style-type: none"> <li>Demonstrate understanding of adaptation of plants or animals to their way of life.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of adaptation of plants or animals to their way of life.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of adaptation of plants or animals to their way of life.</li> </ul>	<p>This has been updated in its entirety to address new issues that have arisen as a result of the external moderation process.</p> <p><b>The intent</b> is for the student to demonstrate understanding of adaptations of plants or animals to their way of life, to enable each species to carry out its <i>life process(es)</i> in order to <i>survive in its habitat</i>.</p> <p><b>Demonstrating understanding</b> in either all plant or all animal species to show understanding of adaptation to their way of life can be shown in one of two main ways</p> <p><b>Option 1</b> - related to one life process over three taxonomic or functional groups of multi-cellular plants or animals, by:</p> <ul style="list-style-type: none"> <li>selecting the groups of plants or animals to focus on <i>comparing diversity of adaptation</i>, in response to the <i>same demand</i>, across the three different taxonomic or functional groups. For example, for support and locomotion in animals this could include ungulates (e.g. horses), primates (e.g. chimps and apes) and felines (e.g. great cats like lions, tigers and leopards)</li> <li>selecting evidence from at least one organism representative of each group and their way of life, to enable each to survive in its habitat.</li> </ul> <p><b>Option 2</b> - across two related life processes within one taxonomic or</p>
Achievement	Achievement with Merit	Achievement with Excellence						
<ul style="list-style-type: none"> <li>Demonstrate understanding of adaptation of plants or animals to their way of life.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of adaptation of plants or animals to their way of life.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of adaptation of plants or animals to their way of life.</li> </ul>						



<p><b>Life processes</b> are selected from:</p> <ul style="list-style-type: none"> <li>• internal transport</li> <li>• gas exchange</li> <li>• transpiration</li> <li>• nutrition</li> <li>• excretion</li> <li>• support and movement</li> <li>• sensitivity and co-ordination</li> <li>• reproduction.</li> </ul> <p>Conditions of Assessment related to this achievement standard can be found at <a href="http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards">http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards</a>.</p>	<ul style="list-style-type: none"> <li>• limitations and advantages involved in each feature within each organism</li> </ul> <p>In the context of <i>understanding of adaptation</i> across two related life processes within one taxonomic or functional group:</p> <ul style="list-style-type: none"> <li>• connections between two life processes within each organism which enhance the effectiveness of both processes</li> <li>• limitations and advantages involved in each feature within each organism.</li> </ul> <p>Suitable life processes to study adaptations in an alpine environment would be transpiration, support or reproduction.</p>	<p>functional group of multi-cellular plants or animals, by selecting the group to focus on the <i>connections between two life processes</i> within each organism which enhance the <i>effectiveness of both processes</i>. For example, with herbivores as the functional group - nutrition and internal transport in insects (e.g. locusts) and ruminants (e.g. sheep, goats, deer or cattle) selecting evidence from at least two organisms representative of the group, to enable each organism to survive in its habitat and their way of life (required for this option).</p> <p><b>Taxonomic or functional groups</b> must be specified in the task. Choice of organisms can be guided by their <i>habitat</i> and <i>ecological niche</i>, rather than on a narrow taxonomic grouping alone. For example, if the taxonomic group was broadened to vertebrates, and the two related life processes were circulation and gas exchange (i.e. the second option), a fish and a bird or mammal could be chosen.</p> <p><b>Adaptation involves</b> the range of ways in which organisms have developed strategies to carry out their life processes</p> <p><b>Way of life</b> encompasses aspects of the ways in which an organism carries out all its interrelated life processes.</p>
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**AS 91155 v2 (Biology 2.3)**  
**Demonstrate understanding of adaptation of plants or animals to their way of life**

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Demonstrate understanding of adaptation of plants or animals to their way of life</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of adaptation of plants or animals to their way of life</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of adaptation of plants or animals to their way of life</li> </ul>

**The emphasis in this AS is on:**

This achievement standard involves demonstrating understanding of adaptation of plants or animals to their way of life e.g. in the extreme environmental conditions found within Tongariro National Park.

The emphasis is on demonstrating how the organism's life processes are adapted to cope with the extremes of the high alpine environment, and it is suggested that plants will make a suitable study for this A.S. Students may wish to look at internal transport systems, gas exchange, reproduction in relation to the climatic environment.

The clarifications above make the point that students have two options when carrying out this study. Option 1 provides the opportunity for students to compare a life process across three taxonomic plant groups. An example of each particular group can be found within close locality of each other, hence providing a real context for the student study.

**It is strongly advised that the investigation is discussed with the local DOC officers. There are a number of 20m<sup>2</sup> quadrats available for student investigations. It is also possible that some areas of the Park, which may have been thought to be suitable, are too sensitive for a class investigation.**

**The teacher's role is to:**

Ensure that for the selected study, the student has opportunity through either a field trip, along with the use of photographic evidence, relevant information and accessible written materials to develop an understanding of the life systems of plants, in particular alpine plants.

Verify that the student's work is authentic.

Clarify with the student that they understand the life process and the adaptations that plants have evolved.

Students will need an understanding of the ecology and the biology of the organisms within the Park's alpine and sub alpine communities. This may involve a generic description of plant life processes and an understanding of the climatic conditions found in the National Park throughout the year. The information given by the teacher should in no way be leading in terms of the student's findings with regard to the plant adaptations.

Students can use internet links, written materials, and field trip worksheets provided as their source material. Students should also be able to add to this. A sample list of websites is given with some information.

Give one reassessment opportunity as appropriate.  
 Apply school-based authenticity policies and procedures.  
 Determine the time allowance for the assessment, e.g. 2 - 3 weeks including field work, as this is dependent on the situation.

**The student is expected to:**

Provide clear evidence that they have been active in collecting the relevant data. Simply copying material from other students does not contribute evidence.  
 Students may present their hypothesis, findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form but need to show the relevance of their findings in terms of the biological ideas.

**Assessment templates:**

<http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Science/Biology>

**Information Websites:**

Alpine Habitats Department of Conservation	<a href="http://www.doc.govt.nz/nature/habitats/alpine/">www.doc.govt.nz/nature/habitats/alpine/</a>
Flora and Fauna of Tongariro National Park Department of Conservation	<a href="http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/about-tongariro-national-park/flora-and-fauna/">http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/about-tongariro-national-park/flora-and-fauna/</a>
Dryland Habitats Department of Conservation	<a href="http://www.doc.govt.nz/nature/habitats/drylands/">http://www.doc.govt.nz/nature/habitats/drylands/</a>
Check-list of Indigenous Vascular Plants recorded from Tongariro National Park New Zealand Plant Conservation Network	<a href="http://www.nzpcn.org.nz/publications/Tongariro%20National%20Park.pdf">http://www.nzpcn.org.nz/publications/Tongariro%20National%20Park.pdf</a>
Heads in the Clouds New Zealand Geographic	<a href="https://www.nzgeo.com/stories/heads-in-the-clouds/">https://www.nzgeo.com/stories/heads-in-the-clouds/</a>
Story: Alpine Plants Te Ara – the Encyclopaedia of New Zealand	<a href="http://www.teara.govt.nz/en/alpine-plants">http://www.teara.govt.nz/en/alpine-plants</a>
New Zealand alpine plants Department of Conservation	<a href="http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/nz-alpine-plants-lowres.pdf">http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/nz-alpine-plants-lowres.pdf</a>

**Also see Section 5 – Ecology, pages 2–8, for supporting information.**

<p><b>Conditions of assessment</b></p>	<p><b>Biology 2.6</b> <b>AS 91158 Version: 2</b> <b>4 credits</b> <b>Investigate a pattern in an ecological community, with supervision.</b></p>	<p><b>Clarification Document Feb 2014</b></p>						
<p>Assessment against this standard may be based on a stand-alone or an individual investigation that can contribute findings to a larger group or class investigation. In a group or class investigation, individual findings may be discussed and individual students may interpret their own findings in the light of other students' investigations and findings. Findings from outside the group or class such as published information or historical findings relevant to the investigation may also be used.</p> <p><b>It is intended that this investigation be carried out with supervision.</b></p> <p>This means that the teacher provides guidelines for the investigation such as the context for the investigation, instructions that specify the requirements for a comprehensive investigation, and broad conditions such as the availability of equipment and/or resource material. Students then develop and complete the</p>	<p>This achievement standard involves investigating a pattern in an ecological community, with supervision.</p> <table border="1" data-bbox="304 611 459 1659"> <thead> <tr> <th data-bbox="304 1317 347 1659"><b>Achievement</b></th> <th data-bbox="304 972 347 1317"><b>Achievement with Merit</b></th> <th data-bbox="304 611 347 972"><b>Achievement with Excellence</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="347 1317 459 1659">Investigate a pattern in an ecological community, with supervision.</td> <td data-bbox="347 972 459 1317">Investigate in-depth a pattern in an ecological community, with supervision.</td> <td data-bbox="347 611 459 972">Comprehensively investigate a pattern in an ecological community, with supervision.</td> </tr> </tbody> </table> <p>This achievement standard is derived from <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, Level 7 Living World achievement objective: Ecology</p> <p>Explore ecological distribution patterns and explain possible causes for these patterns and is related to the material in the <i>Teaching and Learning Guide for Biology</i>, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p>This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the <a href="#">Papa Whakaako</a> for the relevant learning area.</p> <p><b>At achieved level:</b> Investigate involves: Describing observations or findings, and using those findings to identify the pattern (or absence of a pattern) in an ecological community, relating this pattern to an environmental factor, and describing how the environmental factor might affect chosen species within the community.</p> <p><b>At merit level:</b> Investigate in depth: Providing a reason for how or why the biology of one of the chosen species relates to the pattern (or absence of a pattern). The biology involves structural, behavioural or physiological adaptations of the organism which are related to the environmental factor and to an interrelationship with an organism of another species (eg competition, predation, or mutualism).</p> <p><b>At excellence level:</b> Investigate comprehensively: Using an environmental factor and the biology of interrelated organisms of different species to explain the pattern (or absence of a pattern). The explanation may involve elaborating, applying, justifying, relating, evaluating, comparing and contrasting, and analysing.</p> <p><b>Notes</b> A community pattern may include: succession, zonation, stratification, or another distribution pattern in response to an environmental factor.</p>	<b>Achievement</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>	Investigate a pattern in an ecological community, with supervision.	Investigate in-depth a pattern in an ecological community, with supervision.	Comprehensively investigate a pattern in an ecological community, with supervision.	<p>The intent is for students to investigate an identified pattern (or absence) in a NZ ecological community by an 'analysis and interpretation' of data and/or information from primary or secondary sources.</p> <p>While primary data and/or information can still be collected and processed by the student, this aspect is not assessed. The standard can be assessed as a written research assignment using secondary data and/or information.</p> <p><b>The data and/or information</b> can be: from direct observations, the shared collection of group field data, provided in tables, graphs, historical data, resource sheets, photographs, videos, websites, and/or reference texts.</p> <p>Students must relate data and/or information on at least two species chosen from the community in a quantitative description, explanation, or discussion of the pattern (or absence).</p> <p><b>A community pattern</b> may include succession, zonation, stratification, or another distribution pattern in response to a significant environmental factor.</p> <p>While teachers can suggest a range of appropriate organisms from within the community that have interrelationships, students must choose specific pairs of organisms themselves. The student's selection of data and/or information relevant to named organisms contributes to the evidence judged at each level.</p> <p><b>Analysis and interpretation</b> should be at the 'species' level (e.g. acorn barnacles) rather than at the 'group' level (e.g. mussels, barnacles or green algae). Using group level information makes it difficult to describe the pattern with reference to</p>
<b>Achievement</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>						
Investigate a pattern in an ecological community, with supervision.	Investigate in-depth a pattern in an ecological community, with supervision.	Comprehensively investigate a pattern in an ecological community, with supervision.						

<p>investigation from the initial guidelines given by the teacher. Supervision may involve discussion between teachers and individual students in order to clarify the students' ideas and may also involve teachers managing the process of sharing findings.</p> <p>Investigation involves analysing, and interpreting information about the ecosystem. The information may come from direct observations, collection of field data, tables, graphs, resource sheets, photographs, videos, websites, and/or reference texts.</p>	<p>Organisms can be the same or different species including humans.</p> <p>Environmental factors likely to affect patterns in a community include abiotic and/or biotic factors.</p> <p>Biology of the organisms refers to any adaptations of organisms that relate to the pattern being investigated and may include interrelationships such as competition, predation, or mutualism.</p>	<p>species specific adaptations and environmental factors.</p> <p><b>Dual Assessment with 91.153</b> requires a task and assessment schedule for each investigation. Students need to know how the requirements of each standard are met at each level. Reference to dual assessment must be clearly specified in the conditions of each assessment task.</p> <p><b>For further information on this see NZQA website: Biology Clarifications Level 2.</b></p>
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## AS 91158 v2 (Biology 2.6)

### Investigate a pattern in an ecological community as applied to the Tongariro National Park

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Investigate a pattern in an ecological community (with supervision) within the Tongariro National Park.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate in depth, a pattern in an ecological community (with supervision) within the Tongariro National Park</li> </ul>	<ul style="list-style-type: none"> <li>Investigate comprehensively, a pattern in an ecological community (with supervision) within the Tongariro National Park</li> </ul>

The emphasis in this AS is on:

- Carrying out an investigation looking at a pattern, or lack of, in an ecological community in the Tongariro National Park. This could involve investigating factors such as:
  - The distribution of plants under the forest canopy and species adaptation.
  - Comparing plant species adaptation with altitude within the Park.
  - Looking at a comparison of the distribution of plants (or insects) in between areas of the Park that have remained unaltered by human intervention with areas that have been altered. (DOC transects at Iwakau will allow students to go off the paths to do their own quadrats)
- Identifying the environmental factor, which may be biotic or abiotic.
- Identifying the evidence for the pattern or lack of pattern and its effect on two species.
- Reporting on the evidence and its relationship to the biology of the species.

#### The teacher's role is to:

Ensure that for the selected investigation, the student has opportunity through either a field trip, along with the use of photographic evidence, relevant data and accessible written materials to develop an understanding of the distribution pattern and the underlying factors that directly relate to the supposed pattern.

Clarify with the student that they understand the nature of the investigation and how the evidence will provide for understanding the pattern being investigated.

Students will need an understanding of the ecology and the biology of the organisms within the Park's alpine and sub alpine communities. This may involve a generic description of the types of patterns that could be found in these regions.

Students will need an understanding of abiotic factors and how measurements can be collected.

Students may need an understanding of the climatic conditions at the various altitudes in order to appreciate distribution patterns in some cases.

Students can use internet links, written materials, and field trip worksheets provided as their source material. Students should also be able to add to this. A sample list of websites is given with some information.

Give one reassessment opportunity as appropriate.

Apply school-based authenticity policies and procedures.

Determine the time allowance for the assessment, e.g. 2 - 3 weeks including field work, as this is dependent on the situation.

**The student is expected to:**

Provide clear evidence that this information been taken from another source, has been processed and understood. Simply copying or closely paraphrasing material from other sources does not contribute evidence of understanding.

Gather primary and/or secondary data cooperatively but record information independently.

Students may present their findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form.

**Assessment templates:**

<http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Biology/Level-2-Biology>

**Information websites:**

Habitat information Department of Conservation	<a href="http://www.doc.govt.nz/nature/habitats/alpine/">www.doc.govt.nz/nature/habitats/alpine/</a> <a href="http://www.doc.govt.nz/nature/habitats/drylands/">http://www.doc.govt.nz/nature/habitats/drylands/</a>
Tongariro Alpine Crossing Department of Conservation	<a href="http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/things-to-do/tracks/tongariro-alpine-crossing/">http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/things-to-do/tracks/tongariro-alpine-crossing/</a> <a href="http://www.teara.govt.nz/en/alpine-plants">http://www.teara.govt.nz/en/alpine-plants</a>
Story: Alpine plants Te Ara – the Encyclopedia of New Zealand	<a href="http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/nz-alpine-plants-lowres.pdf">http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/nz-alpine-plants-lowres.pdf</a>
New Zealand alpine plants Department of Conservation	<a href="http://www.doc.govt.nz/documents/about-doc/concessions-and-permits/conservation-revealed/podocarp-hardwood-forests-lowres.pdf">http://www.doc.govt.nz/documents/about-doc/concessions-and-permits/conservation-revealed/podocarp-hardwood-forests-lowres.pdf</a>
Podocarp-hardwood forests Department of Conservation	<a href="http://www.nzpcn.org.nz/page.aspx?ecosystems_plant_communities_forests">http://www.nzpcn.org.nz/page.aspx?ecosystems_plant_communities_forests</a>
Forests New Zealand Plant Conservation Network	

**Also see Section 5 – Ecology, pages 2-8, for supporting information.**

<p><b>Conditions of assessment</b></p> <p>Collecting information will require cataloguing in the form of a logbook.</p> <p>The information may come from direct observations, collection of field data, tables, graphs, resource sheets, photographs, videos, websites, and/or reference texts.</p> <p>Material e.g. interviews, videos, and photos gathered for this standard may well be also used in preparation for AS 90813</p>	<p><b>Education for Sustainability 2.2</b>  <b>AS 90811 Version: 2</b>  <b>4 credits</b>  <b>Explain how human activity in a biophysical environment has consequences for a sustainable future.</b></p> <p>This achievement standard involves explaining how human activity in a biophysical environment has consequences for a sustainable future.</p> <table border="1" data-bbox="336 427 520 1783"> <thead> <tr> <th data-bbox="336 1323 379 1783">Achievement Criteria</th> <th data-bbox="336 875 379 1323">Achievement with Merit</th> <th data-bbox="336 427 379 875">Achievement with Excellence</th> </tr> </thead> <tbody> <tr> <td data-bbox="379 1323 520 1783"> <ul style="list-style-type: none"> <li>Explain how human activity in a biophysical environment has consequences for a sustainable future.</li> </ul> </td> <td data-bbox="379 875 520 1323"> <ul style="list-style-type: none"> <li>Explain in depth how human activity in a biophysical environment has consequences for a sustainable future.</li> </ul> </td> <td data-bbox="379 427 520 875"> <ul style="list-style-type: none"> <li>Comprehensively explain how human activity in a biophysical environment has consequences for a sustainable future.</li> </ul> </td> </tr> </tbody> </table> <p>This achievement standard is derived from <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, and is aligned with <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, and is related to learning objective 7.1 in the <i>Teaching and Learning Guide for Education for Sustainability</i>, Ministry of Education, at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p>This standard is also derived from <i>Te Marautanga o Aotearoa</i>. For details of <i>Te Marautanga o Aotearoa</i> achievement objectives to which this standard relates, see the <a href="#">Papa Whakaako</a> for the relevant learning area.</p> <p><b>At achieved level:</b> <i>Explaining involves:</i></p> <ul style="list-style-type: none"> <li>The characteristics of a biophysical environment, including the ecological system and a physical system it interacts with. This will involve data collection and the use of measurement methods</li> <li>Outlining the human activity being undertaken in the biophysical environment and investigating the consequences of the activity for the sustainability of the environment</li> <li>Drawing conclusions about the consequences of the human activity</li> </ul> <p><b>At merit level:</b> <i>Explaining in depth:</i></p> <ul style="list-style-type: none"> <li>Drawing informed conclusions about why human activity in a biophysical environment has consequences for a sustainable future.</li> <li>Conclusions are based on a clear, logical argument and supported by evidence.</li> </ul> <p><b>At excellence level:</b> <i>Explaining comprehensively:</i></p> <ul style="list-style-type: none"> <li>Drawing informed conclusions about why human activity in a biophysical environment has consequences for a sustainable future.</li> <li>Conclusions are based on a clear, logical argument and supported by evidence.</li> </ul>	Achievement Criteria	Achievement with Merit	Achievement with Excellence	<ul style="list-style-type: none"> <li>Explain how human activity in a biophysical environment has consequences for a sustainable future.</li> </ul>	<ul style="list-style-type: none"> <li>Explain in depth how human activity in a biophysical environment has consequences for a sustainable future.</li> </ul>	<ul style="list-style-type: none"> <li>Comprehensively explain how human activity in a biophysical environment has consequences for a sustainable future.</li> </ul>	<p><b>Clarification Document</b>  <b>May 2015</b></p> <p><b>Biophysical environment</b>  Students are required to explain the biophysical systems that affect or are affected by the human activity. This means that the ecosystems of the area must be described to cover the "bio" part.  For example:  fish farming - describe the food web that would normally occupy that part of the harbour, hydrological systems (water flow, clarity etc.) and/or probable geology and/or land use farming - describe ecosystems affected by the farm and whatever systems impacted most on the farm. This would be different for a Canterbury dairy farm compared to an East Coast North Island sheep station.</p> <p>Active and on-going monitoring of sites helps to inform good explanations of the biophysical environment. Reporting of the biodiversity of the system, e.g. streams and/or the riparian margins, including the animal species present, may be found from</p>
Achievement Criteria	Achievement with Merit	Achievement with Excellence						
<ul style="list-style-type: none"> <li>Explain how human activity in a biophysical environment has consequences for a sustainable future.</li> </ul>	<ul style="list-style-type: none"> <li>Explain in depth how human activity in a biophysical environment has consequences for a sustainable future.</li> </ul>	<ul style="list-style-type: none"> <li>Comprehensively explain how human activity in a biophysical environment has consequences for a sustainable future.</li> </ul>						



	<p><b>Definitions</b></p> <ol style="list-style-type: none"> <li>1 A <i>sustainable future</i> requires the development of ways of thinking and acting to meet the needs of the present generation without compromising the ability of future generations (of all living things) to meet their own needs. In Aotearoa New Zealand, a sustainable future reflects, wherever possible, consideration of Māori concepts and values relating to the environment, which may vary between hapū and between iwi.</li> <li>2 <i>Consequences</i> for a sustainable future are the result of human activity that promotes or disrupts the sustainability of an environment.</li> <li>3 A <i>biophysical environment</i> relates to the interactions between a physical environment and the biological life forms within the environment. The biophysical environment could be a natural environment or a built environment, or some combination of the two. The physical environment may be a geological, atmospheric, hydrological or climatic system.</li> <li>4 An <i>environment</i> refers to a definable area such as a stream, estuary, bush, urban community, national park, business, home or farm.</li> <li>5 <i>Human activity</i> refers to activities that change the biophysical environment, for example: land use; industrial development; transport; housing; waste management; recreation; tourism; establishment of marine reserves; energy production and consumption; extractive industries such as fishing, mining or forestry; water use or introduction of exotic species.</li> </ol>	<p>resources available from the Department of Conservation and the Regional Council.</p> <p><b>Consequences for a sustainable future</b> The ability to move beyond explaining, to discussing consequences, would be facilitated by using resources from different interested parties, e.g. from iwi and conservation groups such as Forest and Bird, as well as from government and industry organisations. Such sources are not required, but may give more diversity of resource material to increase student ability to discuss consequences to Excellence level.</p>
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**AS 90811 v2 (EfS 2.2)**  
**Explain how human activity in a biophysical environment has consequences for a sustainable future as applied to the Tongariro National Park**

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Explain how human activity in a biophysical environment has consequences for a sustainable future, within the Tongariro National Park.</li> </ul>	<ul style="list-style-type: none"> <li>Explain in depth how human activity in a biophysical environment has consequences for a sustainable future, within the Tongariro National Park</li> </ul>	<ul style="list-style-type: none"> <li>Comprehensively explain how human activity in a biophysical environment has consequences for a sustainable future, within the Tongariro National Park</li> </ul>

The emphasis in this AS is on:

- Explaining the effects human activities (e.g. skiing, tramping, tourism) have on the Tongariro National Park's biophysical environment, and the consequences these have for the Park's sustainable future. This could involve investigating factors such as:
  - The effect of walkways on the immediate ecological communities, compared with off track.
  - Looking at the effect of tourist facilities on the mountain in terms of landscape, ecology and geology etc.
  - Looking at the impact of the ski fields and facilities on their immediate physical and biological environment.
  - Investigating the impact of the ski village on the immediate physical and biological environment.
  - Researching the impact of night skiing on the local animals.

- In all cases it is important that the focus is on the impact of these human influenced factors on the sustainable future of the National Park and its plants, animals and landscape.

**The teacher's role is to:**

Ensure that for the selected discussion, the student has opportunity through field work, along with the use of photographic evidence, relevant data and accessible written materials, to develop an understanding of the Park's cultural heritage and value, as well as the expectations of today's society. This will assist in students gaining an understanding of the conflicting requirements for managing the Park.

Provide students with access to the following documents:

- [Tongariro National Park Management Plan \(2006-2016\)](#)
- [Tongariro National Park Management Plan \(Partial review 2017\)](#)

Clarify with the students that they understand the nature of the issues and the conflicting needs caused by human activities, and their potential impact on the environment both immediate and wider.

Apply school-based authenticity policies and procedures.  
Give one reassessment opportunity as appropriate.

Students can use internet links, written materials, and field trip worksheets provided as their source material. Students should also be able to add to this.

A log book is essential for recording research and observations.

### **Prior student knowledge**

Students will need an understanding of the ecological communities that exist within the Park. This includes the role many animals play in maintaining an ecological balance and propagation of plant species.

Students may need an understanding of the geological terrain of the Park

Students may need an understanding of the climatic conditions throughout the year.

### **The student is expected to:**

Provide clear evidence that this information been taken from another source has been processed and understood. Simply copying or closely paraphrasing material from other sources does not contribute evidence of understanding.

Gather primary and/or secondary data cooperatively but record information independently.

Students may present their findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form.

### **Assessment templates:**

- <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Social-sciences/Education-for-sustainability/Level-2-Education-for-sustainability>
- Education for Sustainability 2.2 (AS 90811): Walking Tracks on Tongariro (to request a copy of the editable student task assessment templates, email conserved@doc.govt.nz)

**Also see Section 5 – Ecology, pages 2-8, and Tourism and Sustainability, pages 16-21 for supporting information**

<p><b>Conditions of assessment</b></p> <p>Collecting information will require cataloging in the form of a logbook.</p> <p>The information may come from direct observations, interviews, collection of field data, tables, graphs, resource sheets, photographs, videos, websites, and/or reference texts.</p> <p>Material e.g. interviews, videos, and photos gathered for this standard may well be also used in preparation for AS 90811</p>	<p><b>Education for Sustainability 2.3</b>  <b>AS 90813 Version: 2</b>  <b>3 credits</b></p> <p><b>Demonstrate understanding of how different personal values have implications for a sustainable future.</b></p> <p>This achievement standard involves demonstrating understanding of how different personal values have implications for a sustainable future.</p> <table border="1" data-bbox="379 443 564 1715"> <thead> <tr> <th data-bbox="379 1285 424 1715"><b>Achievement Criteria Achievement</b></th> <th data-bbox="379 864 424 1285"><b>Achievement with Merit</b></th> <th data-bbox="379 443 424 864"><b>Achievement with Excellence</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="424 1285 564 1715">Demonstrate understanding of how different personal values have implications for a sustainable future.</td> <td data-bbox="424 864 564 1285">Demonstrate in-depth understanding of how personal values have implications for a sustainable future.</td> <td data-bbox="424 443 564 864">Demonstrate comprehensive understanding of how personal values have implications for a sustainable future.</td> </tr> </tbody> </table> <p>This achievement standard is aligned with <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, and is related to learning objective 7.3 in the <i>Teaching and Learning Guide for Education for Sustainability</i>, Ministry of Education, at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p>This standard is also derived from <i>Te Marautanga o Aotearoa</i>. For details of <i>Te Marautanga o Aotearoa</i> achievement objectives to which this standard relates, see the <a href="#">Papa Whakaako</a> for the relevant learning area.</p> <p><b>At achieved level:</b> <i>Demonstrating understanding involves:</i></p> <ul style="list-style-type: none"> <li>• using examples to examine the characteristics of different personal values (own and others') and the behaviours associated with them</li> <li>• drawing conclusions about the implications of certain personal values (own and others') and behaviours for a sustainable future.</li> </ul> <p><b>At merit level:</b> <i>Demonstrating in depth understanding involves:</i></p> <ul style="list-style-type: none"> <li>• drawing informed conclusions based on examples and evidence about why certain personal values (own and others') and behaviours have implications for a sustainable future.</li> </ul> <p><b>At excellence level:</b> <i>Demonstrating comprehensively understanding involves:</i></p> <ul style="list-style-type: none"> <li>• drawing justified conclusions based on examples and evidence about how or why some different personal values (own and others') and behaviours are more likely to lead to a sustainable future than others.</li> </ul> <p><b>The conclusions may include projections of future impacts and discussion of how and why values could be adapted to support a more sustainable future.</b></p>	<b>Achievement Criteria Achievement</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>	Demonstrate understanding of how different personal values have implications for a sustainable future.	Demonstrate in-depth understanding of how personal values have implications for a sustainable future.	Demonstrate comprehensive understanding of how personal values have implications for a sustainable future.	<p><b>Clarification Document</b>  <b>May 2015</b></p> <p><b>Personal values</b></p> <p>The aligned version 2 of this standard requires students to demonstrate understanding of how different people's values, and the behaviours associated with them, have implications for a sustainable future. Students generally need to be prompted to discuss these links. Learners need to examine their own and others' characteristics of different personal values in response to information on sustainability during the assessment process. They need to consider their own values in terms of the particular context at the beginning of the assessment, as these may change, and this change may directly inform the analysis. It would therefore be advisable to record the original value position.</p> <p><b>Values versus behaviours and linking to the sustainable future concept</b></p> <p>Learners need guidance to differentiate between</p>
<b>Achievement Criteria Achievement</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>						
Demonstrate understanding of how different personal values have implications for a sustainable future.	Demonstrate in-depth understanding of how personal values have implications for a sustainable future.	Demonstrate comprehensive understanding of how personal values have implications for a sustainable future.						

	<p><b>Definitions</b></p> <ol style="list-style-type: none"> <li>1 <i>A sustainable future</i> requires the development of ways of thinking and acting to meet the needs of the present generation without compromising the ability of future generations (of all living things) to meet their own needs. In Aotearoa New Zealand, a sustainable future reflects, wherever possible, consideration of Māori concepts and values relating to the environment, which may vary between hapū and between iwi.</li> <li>2 <i>Values</i> are deeply-held beliefs that influence the way people think, feel and act.</li> <li>3 Behaviors in this context are actions in a given situation that arise from people's values.</li> <li>4 <i>Implications</i> for a sustainable future are the potential result of behaviours that promote or disrupt the sustainability of an environment.</li> </ol>	<p>values and behaviours. They have to firstly examine the values and then consider how the associated behaviours/actions have implications for the sustainable future concept. They may state what they currently do and what behaviours they would now modify, giving reasons for the change. The implications for a sustainable future need to be more specific than: "If I did this...then it would meet the needs of the future generations". They need to clearly say how their behaviours would or would not support a sustainable future.</p>
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AS 90813 v2 (EfS 2.3)

Demonstrate understanding of how different personal values have implications for a sustainable future, as applied to the Tongariro National Park

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Demonstrate understanding of how different personal values have implications for a sustainable future.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of how personal values have implications for a sustainable future.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of how personal values have implications for a sustainable future.</li> </ul>

The emphasis in this AS is on:

- Showing an understanding of the values we that we personally hold, and how our associated activities can impact on the sustainability of the Tongariro National Park. Activities could involve tramping, skiing, camping, etc.

**The teacher's role is to:**

Ensure that for the selected discussion, the student has opportunity through field work, along with the use of photographic evidence, relevant data and accessible written materials to develop an understanding of the Park's cultural heritage and value as well as the expectations of today's society. This will assist in students gaining an understanding of the conflicting requirements for managing the Park.

Provide students with access to the following documents:

- [Tongariro National Park Management Plan \(2006-2016\)](#)
- [Tongariro National Park Management Plan \(Partial review 2017\)](#)

Clarify with the student that they understand the nature of the issues and the conflicting needs caused by human activities and its potential impact on the environment both immediate and wider.

Teachers will need to assist students to understand the difference between values and behaviours.

Apply school-based authenticity policies and procedures.

Give one reassessment opportunity as appropriate.

Students can use internet links, written materials, and field trip worksheets/questionnaire as their source material. Students may seek advice on developing a suitable questionnaire.

A log book is essential for recording research, data and observations

**Prior student knowledge**

Students will need to establish their own personal values associated with the topic as well as establishing an awareness of other people's particular value positions.

It is important that students are able to differentiate between those behaviours that will enable a sustainable future for the Park, and those which will not. They should be able to qualify these with examples.

**The student is expected to:**

Provide clear evidence that this information been taken from another source has been processed and understood. Simply copying or closely paraphrasing material from other sources does not contribute evidence of understanding.

Gather primary and/or secondary data cooperatively, but record information independently.

Students may present their findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form.

**Assessment templates:**

<http://ncea.kiwi.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Social-sciences/Education-for-sustainability/Level-2-Education-for-sustainability>

**Also see Section 5 – Sustainability, pages 18-21, for supporting information.**

Conditions of assessment	Earth and Space Science (ESS) 2.3 AS 91189 Version: 2 4 credits Investigate geological processes in a New Zealand locality.	Clarification Document May 2015						
<p>A New Zealand locality is considered to be anywhere within the Zealandia continent.</p> <p>Geological processes will include:</p> <ul style="list-style-type: none"> <li>• plate tectonics and the rock cycle</li> <li>• erosion.</li> </ul> <p>This investigation involves collecting information about a minimum of two rocks in a particular locality. The rocks need not be named but the type has to be clearly identified.</p> <p>The description not only relates to the physical processes that have shaped their appearance on the surface in the area found but also the internal processes that have brought about its formation. This requires linking the identified rock to the rock cycle and plate tectonics for that particular region.</p> <p>The information could come from a variety of sources such as direct observations, a field trip, resource sheets, photos, videos, websites, and reference texts.</p> <p>Students can work on information gathering collaboratively but the teacher has to be sure of the authenticity.</p> <p>Assessment evidence could be collected by, but is not limited to, the following methods:</p> <ul style="list-style-type: none"> <li>• written report</li> <li>• oral presentation</li> </ul>	<p>This achievement standard involves investigating geological processes in a New Zealand locality.</p> <table border="1" data-bbox="335 548 494 1500"> <thead> <tr> <th data-bbox="335 1209 494 1500">Achievement Criteria</th> <th data-bbox="335 907 494 1198">Achievement with Merit</th> <th data-bbox="335 548 494 896">Achievement with Excellence</th> </tr> </thead> <tbody> <tr> <td data-bbox="335 1209 494 1500">Investigate geological processes in a New Zealand locality.</td> <td data-bbox="335 907 494 1198">Investigate in depth geological processes in a New Zealand locality.</td> <td data-bbox="335 548 494 896">Investigate comprehensively geological processes in a New Zealand locality.</td> </tr> </tbody> </table> <p><b>Explanatory Notes</b> This achievement standard is derived from <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, Level 7 Planet Earth and Beyond achievement objective: Earth Systems and Interacting Systems; and is related to the material in the <i>Teaching and Learning Guide for Science</i>, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a></p> <p>This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the <a href="#">Papa Whakaako</a> for the relevant learning area.</p> <p><b>At achieved level:</b> Investigate involves:</p> <ul style="list-style-type: none"> <li>• selecting and processing information</li> <li>• identifying the types of rock(s) found in the locality</li> <li>• describing the plate tectonic and rock cycle processes that have formed the types of rocks in the locality</li> <li>• describing the erosional processes that have shaped the current landforms in the locality.</li> </ul> <p><b>At merit level:</b> Investigate in depth is further developed by:</p> <ul style="list-style-type: none"> <li>• explaining the plate tectonic and rock cycle processes that have formed the types of rocks in the locality</li> <li>• explaining the erosional processes that have shaped the current landforms in the locality.</li> </ul> <p><b>At excellence level:</b> Investigate comprehensively is further developed by:</p> <ul style="list-style-type: none"> <li>• discussing the link between the plate tectonic processes and the rock cycle processes that have formed the types of rocks in the locality</li> <li>• discussing the link between the erosional processes with the shape of the current landforms in the locality.</li> </ul>	Achievement Criteria	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.	<p>To reach Achieved, students must:</p> <p>identify the types of rock(s) found in the locality</p> <p>describe the plate tectonic and rock cycle processes that have formed the types of rocks in the locality</p> <p>describe the erosional processes that have shaped the current landforms in the locality.</p> <p>The locality can be anywhere within New Zealand, the Cook Islands or Niue.</p> <p>The geological processes described must reflect the current geological knowledge of the chosen locality. For example, a general description of how marble is formed as part of the rock cycle would not be sufficient for explaining the Takaka marble in Nelson.</p> <p>Actual rock names (e.g. rhyolite) are not required, although this may be useful for describing the relationships between plate tectonics and the rock cycle.</p> <p>What is required is an identification of the correct rock type(s) (e.g. igneous rocks).</p> <p>Students are required to carry out an investigation to collect primary and/or secondary evidence. They will then use their findings to describe the</p>
Achievement Criteria	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.						



<ul style="list-style-type: none"> <li>• multimedia presentation</li> <li>• poster</li> </ul> <p>One reassessment opportunity would be appropriate.</p> <p>School-based authenticity policies and procedures will apply.</p> <p>The assessor can determine the time allowance for the assessment, as this is dependent on the situation.</p>	<p>geological processes in a New Zealand locality.</p> <p>The investigation may include a field trip.</p> <p>The critical component of this standard is the requirement of the student to report on geological processes in a New Zealand locality and demonstrate understanding of how these processes contribute to the geology of the chosen locality. Information, research, experiments, videos, etc., may be supplied by the teacher, and can include primary and/or secondary information.</p>
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AS 91189 v2 (ESS 2.3)

Investigate geological processes as applied to the Tongariro National Park

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Investigate geological processes within the Tongariro National Park.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate in depth, geological processes within the Tongariro National Park</li> </ul>	<ul style="list-style-type: none"> <li>Investigate comprehensively, geological processes within the Tongariro National Park</li> </ul>

The emphasis in this AS is on:

- Carrying out an investigation into the nature of rocks found within the confines of Tongariro National Park.
- Reporting on the processes that gave rise to its physical appearance on the surface and the internal forces within the Earth that were involved in this formation.
- The rock material should be identified and related to its source, e.g. pumice from volcanic eruption. The physical nature of the rock in terms of appearance needs to link the erosion and weathering processes as well as those involved in its formation. This is then linked to the rock cycle and its identification, which will be igneous.
- The rock material may be the result of explosive forces or lava flow, and this should be identified. The mineral balance of the rock is another important consideration as this influences many of its properties and identifies the likely source from within the Earth's crust.
- The selected rock material has to link to the processes that occur within the Earth's crust. In this scenario the materials should relate to the volcanic behaviour that is attributed to the park lying above the subducting plate boundaries of the Pacific and Australian plates.

**The teacher's role is to:**

Ensure the student has opportunity through either a field trip, the use of photographic evidence, relevant data and accessible written materials to develop an understanding of the rock materials selected. Understanding of the weathering and erosion processes on the mountain will need to be developed through observation and interpretation. The role plate tectonic processes take beneath the volcanoes should be studied and linked to the rock types commonly found in the region.

Work can be undertaken collaboratively but the teacher has to ensure authenticity.

Students can use internet links, written materials, and field trip worksheets provided as their source material. Students should also be able to add to this. A sample list of websites is given with some information.

Give one reassessment opportunity as appropriate.  
 Apply school-based authenticity policies and procedures.  
 Determine the time allowance for the assessment, as this is dependent on the situation.

**The student is expected to:**

Provide clear evidence that this information been taken from another source has been processed and understood. Simply copying or closely paraphrasing material from other sources does not contribute evidence of understanding.  
 Gather primary and/or secondary data cooperatively but record information independently.  
 Students may present their findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form.

**Assessment templates**

- <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Science/Earth-and-space-science/Level-2-Earth-and-Space-Science>
- The Taupo Volcanic Zone (to request a copy of the editable student task assessment templates, email conserved@doc.govt.nz)

**Information websites:**

Tongariro Geology Tongariro Crossing NZ	<a href="http://www.tongarirocrossing.org.nz/national-park/geology">http://www.tongarirocrossing.org.nz/national-park/geology</a>
Central North Island Volcanoes Department of Conservation	<a href="http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/about-tongariro-national-park/central-north-island-volcanoes/">http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/about-tongariro-national-park/central-north-island-volcanoes/</a>
Historic volcanic activity - Tongariro and Ngāuruhoe Te Ara The Encyclopaedia of New Zealand	<a href="http://www.teara.govt.nz/en/historic-volcanic-activity/page-3">http://www.teara.govt.nz/en/historic-volcanic-activity/page-3</a>
New Zealand Volcanoes GNS Science	<a href="https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/New-Zealand-Volcanoes">https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/New-Zealand-Volcanoes</a>
Tongariro GeoNet NZ	<a href="http://info.geonet.org.nz/display/volc/Tongariro">http://info.geonet.org.nz/display/volc/Tongariro</a>

**Information text:**

*The Reed Field Guide to New Zealand Geology. Jocelyn Thornton.*

**Also see Section 5 – Geology, pages 8-14, for supporting information.**

Conditions of assessment	<p><b>Earth and Space Science (ESS) 2.4</b>  <b>AS 91190 Version: 2</b>  <b>4 credits</b>  <b>Investigate how organisms survive in an extreme environment</b></p> <p>This achievement standard involves investigating how organisms survive in an extreme environment.</p> <table border="1" data-bbox="343 539 531 1570"> <thead> <tr> <th data-bbox="343 1263 531 1346">Achievement Criteria</th> <th data-bbox="343 929 531 1263">Achievement with Merit</th> <th data-bbox="343 539 531 929">Achievement with Excellence</th> </tr> </thead> <tbody> <tr> <td data-bbox="343 1263 531 1346">Investigate how organisms survive in an extreme environment.</td> <td data-bbox="343 929 531 1263">Investigate in depth how organisms survive in an extreme environment.</td> <td data-bbox="343 539 531 929">Investigate comprehensively how organisms survive in an extreme environment.</td> </tr> </tbody> </table> <p>This achievement standard is derived from <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, Level 7 Living World achievement objective: Life Processes; and is related to the material in the <i>Teaching and Learning Guide for Science</i>, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p>This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the <a href="#">Papa Whakaako</a> for the relevant learning area.</p> <p><b>At achieved level:</b> Investigate involves:</p> <ul style="list-style-type: none"> <li>• selecting and processing information</li> <li>• using the processed information: <ul style="list-style-type: none"> <li>- describing why the conditions of the extreme environment require special biological adaptations or technological modifications for survival</li> <li>- describing how the biological adaptations or technological modifications allow the organism(s) to survive in the extreme environment</li> </ul> </li> <li>• recording sources of information used in a traceable format.</li> </ul> <p><b>At merit level:</b> Investigate in depth is further developed by:</p> <ul style="list-style-type: none"> <li>• selecting and processing information that provides links between conditions of the extreme environment and biological adaptations or technological modifications</li> <li>• explaining, using the processed information, how the biological adaptations or technological modifications allow the organism(s) to survive the conditions of the extreme environment.</li> </ul>	Achievement Criteria	Achievement with Merit	Achievement with Excellence	Investigate how organisms survive in an extreme environment.	Investigate in depth how organisms survive in an extreme environment.	Investigate comprehensively how organisms survive in an extreme environment.	Clarification Document May 2015
Achievement Criteria	Achievement with Merit	Achievement with Excellence						
Investigate how organisms survive in an extreme environment.	Investigate in depth how organisms survive in an extreme environment.	Investigate comprehensively how organisms survive in an extreme environment.						
<p>This investigation involves collecting information about the particular adaptations that are made for an organism to survive in extreme environment conditions.</p> <p>The information could come from a variety of sources such as direct observations, a field trip, collection of experimental data, resource sheets, photos, videos, websites, and reference texts.</p> <p>Organisms can be the same or different species including humans.</p> <p>An extreme environment can be selected from, but is not restricted to: outer space, deep oceans, deep sea trenches, extremes of temperature or salinity, anaerobic conditions, excess exposure to radiation or toxic chemicals, geothermal vents.</p> <p>Assessment evidence could be collected by, but is not limited to, the following methods:</p> <ul style="list-style-type: none"> <li>• written report</li> <li>• oral presentation</li> <li>• multimedia presentation</li> <li>• poster</li> </ul> <p>One reassessment opportunity would be appropriate.</p>		<p>To reach Achieved standard students must:</p> <ul style="list-style-type: none"> <li>select and process information to describe an extreme environment</li> <li>select and process information to describe adaptations that allow an organism to survive in an extreme environment.</li> </ul> <p>The extreme environment can be any environment as long as the student can describe why it is an extreme environment. This description of why an environment is extreme is essential to achieving this standard.</p> <p>Adaptations can be biological for an organism, or technological for humans.</p> <p>Students must identify and describe the critical adaptations that allow survival in an extreme environment.  <b>This description of the key adaptations is essential to achieving this standard.</b></p> <p>Students are required to carry out research to collect secondary evidence. This evidence will then form the basis of their report. Students must ensure they have covered why an environment is extreme and how an organism overcomes this extreme environment.</p>						

<p>School-based authenticity policies and procedures will apply.</p> <p>The assessor can determine the time allowance for the assessment, as this is dependent on the situation.</p>	<p><b>At excellence level:</b> Investigate comprehensively <i>is further developed by:</i></p> <ul style="list-style-type: none"> <li>• selecting and processing information that provides integrated links between conditions of the extreme environment and biological adaptations or technological modifications</li> <li>• justifying, using the processed information, how the biological adaptations or technological modifications allow the organism(s) to survive the conditions of the extreme environment.</li> </ul>	<p>Background information to the research may be supplied by the teacher, and can include primary and/or secondary information. The teacher can set the broad outline for a research topic or the students may develop their own.</p> <p>The research may include a field trip</p>
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AS 91190 v2 (ESS 2.4)

Investigate how organisms survive in an extreme environment as applied to the Tongariro National Park

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Investigate how organisms survive in an extreme environment. within the Tongariro National Park.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate in depth, how organisms survive in an extreme environment. within the Tongariro National Park</li> </ul>	<ul style="list-style-type: none"> <li>Investigate comprehensively, how organisms survive in an extreme environment. within the Tongariro National Park</li> </ul>

The emphasis in this AS is on:

- Carrying out an investigation into the biological adaptation of a particular plant that enables its survival within the confines of the National Park.
- Identifying the nature of the extreme environment.
- Reporting on the organism’s adaptations and why they are successful.

**The teacher’s role is to:**

Ensure that for the selected plant, the student has opportunity through either a field trip, the use of photographic evidence, relevant data and accessible written materials to develop an understanding of how the organism can survive in the mountain environment.

Examples of plants noted for their survival abilities the mosses and lichens that are found in the high alpine regions, tussock grasses in the desert areas and plants found in the alpine wetlands.

Students will need an understanding of the climatic conditions at the various altitudes in order to appreciate the adaptations that have enabled the plant’s survival.

Students can use internet links, written materials, and field trip worksheets provided as their source material. Students should also be able to add to this. A sample list of websites is given with some information.

Give one reassessment opportunity as appropriate.

Apply school-based authenticity policies and procedures.

Determine the time allowance for the assessment, as this is dependent on the situation.

**The student is expected to:**

Provide clear evidence that this information been taken from another source has been processed and understood. Simply copying or closely paraphrasing material from other sources does not contribute evidence of understanding.

Gather primary and/or secondary data cooperatively but record information independently.

Students may present their findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form.

**Assessment templates:**

<http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Science/Earth-and-space-science/Level-2-Earth-and-Space-Science>

**Information websites:**

Alpine Habitats Department of Conservation	<a href="http://www.doc.govt.nz/nature/habitats/alpine/">www.doc.govt.nz/nature/habitats/alpine/</a>
Drylands Department of Conservation	<a href="http://www.doc.govt.nz/nature/habitats/drylands/">http://www.doc.govt.nz/nature/habitats/drylands/</a>
Tongariro Alpine Crossing Department of Conservation	<a href="http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/things-to-do/tracks/tongariro-alpine-crossing/">http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/things-to-do/tracks/tongariro-alpine-crossing/</a>
Alpine plants Te Ara The Encyclopedia of New Zealand	<a href="http://www.teara.govt.nz/en/alpine-plants">http://www.teara.govt.nz/en/alpine-plants</a>
New Zealand Alpine plants Department of Conservation, 2005	<a href="http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/nz-alpine-plants-lowres.pdf">http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/nz-alpine-plants-lowres.pdf</a>
Alpine Ecosystems New Zealand Plant Conservation Network	<a href="http://www.nzpcn.org.nz/page.aspx?ecosystems_plant_communities_alpine">http://www.nzpcn.org.nz/page.aspx?ecosystems_plant_communities_alpine</a>
Heads in the Clouds NZ Geographic	<a href="https://www.nzgeo.com/stories/heads-in-the-clouds/">https://www.nzgeo.com/stories/heads-in-the-clouds/</a>
Adaptations of the Alpine Plants Victoria University of Wellington, 2016	<a href="http://nzetc.victoria.ac.nz/tm/scholarly/tei-CocNewZ-ti-bodyt-d6-d6.html">http://nzetc.victoria.ac.nz/tm/scholarly/tei-CocNewZ-ti-bodyt-d6-d6.html</a>

**Also see Section 5 – Ecology, page 2-8, for supporting information.**

<p><b>Format of assessment</b></p> <p>There will be ONE question with multiple parts.</p> <p>Candidates will be required to complete <b>fully annotated sketch maps and/or diagrams</b>, which may or may not be accompanied by a <b>written explanation</b>, OR complete a longer written response, which may also be supported by sketch maps and/or diagrams.</p>	<p><b>Geography 2.1</b> <b>AS 91240</b> <b>4 credits</b> <b>Demonstrate geographic understanding of a large natural environment</b></p> <p>This achievement standard involves demonstrating geographic understanding of a large natural environment.</p> <table border="1" data-bbox="360 506 520 1574"> <thead> <tr> <th data-bbox="360 1218 408 1574"><b>Achievement Criteria</b></th> <th data-bbox="360 864 408 1218"><b>Achievement with Merit</b></th> <th data-bbox="360 506 408 864"><b>Achievement with Excellence</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="408 1218 520 1574">Demonstrate geographic understanding of a large natural environment.</td> <td data-bbox="408 864 520 1218">Demonstrate in-depth geographic understanding of a large natural environment.</td> <td data-bbox="408 506 520 864">Demonstrate comprehensive geographic understanding of a large natural environment.</td> </tr> </tbody> </table> <p>This achievement standard is derived from the Level 7 Geography achievement objectives from the Social Sciences learning area of The New Zealand Curriculum, Learning Media, Ministry of Education, 2007; and is related to the material in the Teaching and Learning Guide for Geography, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p>This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the Papa Whakaako for the relevant learning area.</p> <p><b>At Achieved Level:</b> <i>Demonstrating geographic understanding of a large natural environment involves:</i></p> <ul style="list-style-type: none"> <li>• Explaining aspects of a large natural environment.</li> <li>• Including supporting case study evidence.</li> </ul> <p><b>At Merit Level:</b> <i>Demonstrating in-depth geographic understanding of a large natural environment involves:</i></p> <ul style="list-style-type: none"> <li>• Explaining in detail, aspects of a large natural environment.</li> <li>• Including supporting case study evidence.</li> </ul> <p><b>At Excellence Level:</b> <i>Demonstrating comprehensive geographic understanding of a large natural environment involves:</i></p> <ul style="list-style-type: none"> <li>• Fully explaining aspects of a large natural environment including the use of geographic terminology and concepts showing insight.</li> <li>• Integrating comprehensive supporting case study evidence.</li> </ul>	<b>Achievement Criteria</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>	Demonstrate geographic understanding of a large natural environment.	Demonstrate in-depth geographic understanding of a large natural environment.	Demonstrate comprehensive geographic understanding of a large natural environment.	<p><b>Clarification Document</b></p> <p><b>Aspects are selected from:</b></p> <ul style="list-style-type: none"> <li>• Characteristics of a large natural environment.</li> <li>• How the elements and processes of the large natural environment interact.</li> <li>• How a large natural environment is formed and changes over time.</li> <li>• How people interact with a large natural environment.</li> <li>• How people's perceptions of a large natural environment change over time.</li> </ul>
<b>Achievement Criteria</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>						
Demonstrate geographic understanding of a large natural environment.	Demonstrate in-depth geographic understanding of a large natural environment.	Demonstrate comprehensive geographic understanding of a large natural environment.						



Vocabulary Clarifications.	Key Geographic Concepts / Vocabulary
<p><b>A large natural environment</b> means a distinctive part of the Earth's surface defined by its common natural characteristics (e.g. mountain, desert, forest, river valley) that occurs at a national, regional, or continental scale. The environment can be in New Zealand or overseas.</p> <p><b>Natural characteristics</b> (elements) of an environment include landforms (relief), climate, soils, and vegetation.</p> <p><b>Processes</b> include climatic processes; tectonic and other internal processes; erosion, transportation, deposition, and other surface processes.</p> <p><b>Interaction of people with the natural environment</b> may include cultural, economic, or political interaction.</p>	<p><b>Change</b> - Involves any alteration to the natural or cultural environment. Change can be spatial and/or temporal. Change is a normal process in both natural and cultural environments. It occurs at varying rates, at different times and in different places. Some changes are predictable, recurrent or cyclic, while others are unpredictable or erratic. Change can bring about further change.</p> <p><b>Environment</b> - May be natural and/or cultural. They have particular characteristics and features which can be the result of natural and/or cultural processes. The particular characteristics of an environment may be similar to and/or different from another.</p> <p><b>Interaction</b> - Involves elements of an environment affecting each other and being linked together. Interaction incorporates movement, flows, connections, links and interrelationships. Landscapes are the visible outcome of interactions. Interaction can bring about environmental change.</p> <p><b>Iwi</b> - a tribe that has particular geographical boundaries outlining the region in which they have mana whenua status.</p> <p><b>Kaitiakitanga</b> - to "care for" the environment; sustainable use, management and control of natural and physical resources that are carried out to the mutual benefit of people and resources.</p> <p><b>Kōrero pūrākau</b> - a legend or story that explains an event or activity.</p> <p><b>Processes</b> - A sequence of actions, natural and/or cultural, that shape and change environments, places and societies. Some examples of geographic processes include erosion, migration, desertification and globalisation.</p> <p><b>Taonga</b> - is a resource either physical or cultural that can be found in the environment (including features within the environment e.g. lakes, mountains, rivers, also including people, te reo, whakapapa, etc.).</p>

**Information websites:**

Volcanoes Factsheets Department of Conservation	<a href="http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/volcanoes-lowres.pdf">http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/volcanoes-lowres.pdf</a>
Factsheets on Ngauruhoe, Ruapehu, Taupo and Tongariro GNS	<a href="https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/New-Zealand-Volcanoes">https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/New-Zealand-Volcanoes</a>
Alpine Vegetation Information Department of Conservation	<a href="http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/nz-alpine-plants-lowres.pdf">http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/nz-alpine-plants-lowres.pdf</a>

**Also see Section 5 – Ecology, pages 2–8, Geology, pages 8–14, and Sustainability, pages 18–21, for supporting information.**

Format of assessment	<p><b>Geography 2.5</b>  <b>AS 91244</b>  <b>5 credits</b>  <b>Conduct geographic research with guidance.</b></p>	<p><b>Clarification Document Dec 2016</b></p>								
<p>A sample of student guidelines is linked to this standard.</p> <p>It follows traditional Geography conventions and is in line with TKI expectations.</p> <p>Please note these guidelines have not been NZQA moderated for the purpose of this resource.</p>	<p>This achievement standard involves conducting geographic research with guidance.</p> <table border="1" data-bbox="331 528 464 1704"> <thead> <tr> <th data-bbox="331 1312 376 1704">Achievement Criteria</th> <th data-bbox="331 920 376 1312">Achievement</th> <th data-bbox="331 528 376 920">Achievement with Merit</th> <th data-bbox="331 114 376 528">Achievement with Excellence</th> </tr> </thead> <tbody> <tr> <td data-bbox="376 1312 464 1704">Conduct geographic research with guidance.</td> <td data-bbox="376 920 464 1312">Conduct geographic research with guidance.</td> <td data-bbox="376 528 464 920">Conduct in-depth geographic research with guidance.</td> <td data-bbox="376 114 464 528">Conduct comprehensive geographic research with guidance.</td> </tr> </tbody> </table> <p>This achievement standard is derived from the Level 7 Geography achievement objectives from the Social Sciences learning area of The New Zealand Curriculum, Learning Media, Ministry of Education, 2007; and is related to the material in the Teaching and Learning Guide for Geography, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p>This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the Papa Whakaako for the relevant learning area.</p> <p><b>At Achieved Level:</b> <i>Conduct geographic research with guidance involves;</i></p> <ul style="list-style-type: none"> <li>• Identifying the aim of the research.</li> <li>• Planning the research.</li> <li>• Collecting and recording data relevant to the aim for the research.</li> <li>• Presenting, using the correct conventions, a combination of spatial, statistical and visual data.</li> <li>• Explaining findings incorporating the relevance of geographic concepts</li> <li>• Providing a conclusion(s) that relates to the aim of the research</li> <li>• Providing an evaluation of the research that describes the strength(s) and/or weakness(es) of the research process and how this affects the validity of the research findings.</li> </ul> <p><b>At Merit Level:</b> <i>Conduct in-depth geographic research with guidance involves;</i></p> <ul style="list-style-type: none"> <li>• Accurately presenting a combination of spatial, statistical, and visual data, using the correct conventions.</li> <li>• Explaining findings, in detail, incorporating the relevance of geographic concepts.</li> <li>• Providing a conclusion, in detail, that relates to the aim of the research.</li> <li>• Explaining, in detail, the strength(s) and weakness(es) of the research process and how this impacts on the validity of the research findings and/or conclusions.</li> </ul>	Achievement Criteria	Achievement	Achievement with Merit	Achievement with Excellence	Conduct geographic research with guidance.	Conduct geographic research with guidance.	Conduct in-depth geographic research with guidance.	Conduct comprehensive geographic research with guidance.	<p><b>Primary data</b> MUST be collected from the field. The collection of data may be done individually or in a group.</p> <p>The <b>collection of data</b> MUST include a combination of the following methods:  observing, measuring, précis sketching, photographing, surveying, using questionnaires, interviewing, accessing secondary sources.</p> <p>The data MUST be <b>presented</b> using a combination of visuals such as graphs, maps, tables, photographs, or diagrams, following appropriate conventions.</p>
Achievement Criteria	Achievement	Achievement with Merit	Achievement with Excellence							
Conduct geographic research with guidance.	Conduct geographic research with guidance.	Conduct in-depth geographic research with guidance.	Conduct comprehensive geographic research with guidance.							

	<p><b>At Excellence Level: Demonstrating comprehensive geographic understanding of a large natural environment</b> involves:</p> <ul style="list-style-type: none"> <li>• Accurately and effectively presenting a combination of spatial, statistical, and visual data, using the correct conventions and geographic terminology.</li> <li>• Fully explaining findings, incorporating the relevance of geography concepts.</li> <li>• Fully explaining the strength(s) and weakness(es) of the research process, and how this impacts on the validity of the research findings and/or conclusions.</li> <li>• Discussing ways the research process could be improved.</li> </ul>	
<p><b>Vocabulary Clarifications.</b></p> <p><b>Geographic research</b> refers to any fieldwork activity that has a spatial component, and that considers aspects of a natural or cultural environment, and/or the interaction of people with that environment.</p> <p><i>With guidance</i> refers to candidates being supported to identify the aim(s) and methods of collecting, recording, and presenting data.</p>	<p><b>Key Geographic Concepts / Vocabulary</b></p> <p><b>Change</b> - Involves any alteration to the natural or cultural environment. Change can be spatial and/or temporal. Change is a normal process in both natural and cultural environments. It occurs at varying rates, at different times and in different places. Some changes are predictable, recurrent or cyclic, while others are unpredictable or erratic. Change can bring about further change.</p> <p><b>Environment</b> - May be natural and/or cultural. They have particular characteristics and features which can be the result of natural and/or cultural processes. The particular characteristics of an environment may be similar to and/or different from another.</p> <p><b>Interaction</b> - Involves elements of an environment affecting each other and being linked together. Interaction incorporates movement, flows, connections, links and interrelationships. Landscapes are the visible outcome of interactions. Interaction can bring about environmental change.</p> <p><b>Kaitiakitanga</b> - to “care for” the environment; sustainable use, management and control of natural and physical resources that are carried out to the mutual benefit of people and resources.</p> <p><b>Processes</b> - A sequence of actions, natural and/or cultural, that shape and change environments, places and societies. Some examples of geographic processes include erosion, migration, desertification and globalisation.</p> <p><b>Sustainability</b> - Involves adopting ways of thinking and behaving that allow individuals, groups, and societies to meet their needs and aspirations without preventing future generations from meeting theirs. Sustainable interaction with the environment may be achieved by preventing, limiting, minimizing or correcting environmental damage to water, air and soil, as well as considering ecosystems and problems related to waste, noise, and visual pollution.</p> <p><b>Taonga</b> - is a resource either <i>physical or cultural</i> that can be found in the environment (including features within the environment e.g. lakes, mountains, rivers, also including people, te reo, whakapapa, etc.)</p>	

<p><b>Format of assessment</b></p> <p>The sample assessment attached to this standard is an in class test comprising of a student booklet and resource booklet.</p>	<p><b>Geography 2.6</b> AS 91245 3 credits</p> <p><b>Explain aspects of a contemporary New Zealand geographic issue.</b></p> <p>This achievement standard involves explaining aspects of a contemporary geographic issue.</p> <table border="1" data-bbox="308 589 437 1666"> <thead> <tr> <th data-bbox="308 1312 352 1666"><b>Achievement Criteria</b></th> <th data-bbox="308 965 352 1312"><b>Achievement with Merit</b></th> <th data-bbox="308 589 352 965"><b>Achievement with Excellence</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="352 1312 437 1666">Explain aspects of a contemporary New Zealand geographic issue.</td> <td data-bbox="352 965 437 1312">Explain, in-depth, aspects of a contemporary New Zealand geographic issue.</td> <td data-bbox="352 589 437 965">Explain, comprehensively, aspects of a contemporary New Zealand geographic issue.</td> </tr> </tbody> </table> <p>This achievement standard is derived from the Level 7 Geography achievement objectives from the Social Sciences learning area of The New Zealand Curriculum, Learning Media, Ministry of Education, 2007; and is related to the material in the Teaching and Learning Guide for Geography, Ministry of Education, 2010 at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a></p> <p>This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the Papa Whakaako for the relevant learning area.</p> <p><b>At Achieved Level:</b> Explain aspects of a contemporary New Zealand geographic issue involves;</p> <ul style="list-style-type: none"> <li>• Describing the nature of the contemporary geographic issue.</li> <li>• Explaining the different viewpoints individuals (or groups) hold in relation to the issue.</li> <li>• Describing how those viewpoints change over time.</li> <li>• Explaining the strength(s) and weakness(es) of different courses of action to address the issue.</li> <li>• Providing a recommended course of action with a reason(s).</li> </ul> <p><b>At Merit Level:</b> Explain, in-depth, aspects of a contemporary New Zealand geographic issue involves;</p> <ul style="list-style-type: none"> <li>• Explaining, in detail, the different viewpoints individuals (or groups) hold in relation to the issue using specific information.</li> <li>• Explaining how those viewpoints change over time</li> <li>• Explaining, in detail, the strength(s) and weakness(es) of different courses of action</li> <li>• Justifying a recommended course of action with detailed reasons.</li> </ul> <p><b>At Excellence Level:</b> Explain, comprehensively, aspects of a contemporary New Zealand geographic issue involves;</p> <ul style="list-style-type: none"> <li>• Fully explaining the different viewpoints individuals (or groups) hold in relation to the issue using specific information and incorporating beliefs, values, and/or perspectives. This includes the use of geographic terminology and concepts.</li> </ul>	<b>Achievement Criteria</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>	Explain aspects of a contemporary New Zealand geographic issue.	Explain, in-depth, aspects of a contemporary New Zealand geographic issue.	Explain, comprehensively, aspects of a contemporary New Zealand geographic issue.	<p><b>Clarification Document Dec 2016.</b></p>
<b>Achievement Criteria</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>						
Explain aspects of a contemporary New Zealand geographic issue.	Explain, in-depth, aspects of a contemporary New Zealand geographic issue.	Explain, comprehensively, aspects of a contemporary New Zealand geographic issue.						
		<p>The contemporary geographic issue <b>MUST</b> be a local or national issue within New Zealand.</p> <p>The New Zealand geographic issue needs to be <b>contemporary, unresolved and still causing concern</b>. The issue must also be clearly geographic in nature and have a <b>spatial dimension</b>. The spatial dimension can range from a relatively small local issue, e.g. stream pollution, to larger regional or national issues. It is important that students can comprehensively explain aspects of the issue from a geographic perspective.</p> <p>Student's descriptions should show how <b>the location is significant to the issue</b> and define the spatial dimension. <b>Natural and/or cultural features</b> relevant to the issue should be identified and the effects of the issue on people and the environment described.</p> <p>Students need to demonstrate a relatively complex understanding of different viewpoints. This will require access to a <b>range of detailed resources. Two or three</b> different viewpoints would be sufficient to meet the requirements of the standard.</p> <p>The approach to 'how viewpoints change over time' will be determined by the issue selected. If the issue is in its very early stages and viewpoints show no evidence of change, students could explain factors</p>						

	<ul style="list-style-type: none"> <li>• Explaining, in detail, how those viewpoints change over time.</li> <li>• Fully explaining the strength(s) and weakness(es) of different courses of action.</li> <li>• Fully justifying a recommended course of action giving detailed reasons</li> <li>• Demonstrating why the chosen course of action is better than any other course of action.</li> </ul>	<p>that may result in change. Alternatively they could focus on which groups/individuals are likely to change their viewpoint; in this sense they will be providing a hypothetical answer.</p> <p>The focus of understanding is that viewpoints can and do change over time for a variety of reasons.</p>
<p><b>Vocabulary Clarifications</b></p> <p><b>Aspects of a geographic issue</b> refers to the nature of the contemporary geographic issue, viewpoints that relate to the issue (and how they change over time), and evaluation of courses of action relating to the issue.</p> <p><b>Contemporary issue</b> refers to an issue that is affecting people or places now or in the near future.</p> <p><b>Geographic issue</b> refers to a topic, concern, problem, debate, or controversy related to a natural or cultural environment, which also includes a spatial dimension.</p>	<p><b>Key Geographic Concepts / Vocabulary</b></p> <p><b>Change</b> - Involves any alteration to the natural or cultural environment. Change can be spatial and/or temporal. Change is a normal process in both natural and cultural environments. It occurs at varying rates, at different times and in different places. Some changes are predictable, recurrent or cyclic, while others are unpredictable or erratic. Change can bring about further change.</p> <p><b>Environment</b> - May be natural and/or cultural. They have particular characteristics and features which can be the result of natural and/or cultural processes. The particular characteristics of an environment may be similar to and/or different from another.</p> <p><b>Interaction</b> - Involves elements of an environment affecting each other and being linked together. Interaction incorporates movement, flows, connections, links and interrelationships. Landscapes are the visible outcome of interactions. Interaction can bring about environmental change.</p> <p><b>Mana whenua</b> - the right to use, manage and control land depends on the protection of mana whenua. Mana whenua is based on Ahikā (lwi maintaining residence in a particular place) and is an important part of tino rangatiratanga (self-determination).</p> <p><b>Kaitiakitanga</b> - to “care for” the environment; sustainable use, management and control of natural and physical resources that are carried out to the mutual benefit of people and resources.</p> <p><b>Sustainability</b> Involves adopting ways of thinking and behaving that allow individuals, groups, and societies to meet their needs and aspirations without preventing future generations from meeting theirs. Sustainable interaction with the environment may be achieved by preventing, limiting, minimizing or correcting environmental damage to water, air and soil, as well as considering ecosystems and problems related to waste, noise, and visual pollution.</p> <p><b>Taonga</b> - is a resource either physical or cultural that can be found in the environment (including features within the environment e.g. lakes, mountains, rivers, also including people, te reo, whakapapa, etc.).</p>	

<p><b>Format of assessment</b></p> <p>Collecting information will require cataloguing in the form of a logbook.</p> <p>The information may come from direct observations, collection of field data, tables, graphs, resource sheets, photographs, videos, websites, and/or reference texts. It is suggested that this assessment activity take place over an extended period of time, for example 8-10 weeks of in- and out-of-class time.</p> <p>Material e.g. interviews, videos, and photos gathered</p>	<p><b>Education for Sustainability 3.2</b>  <b>AS 91735 Version: 1</b>  <b>4 credits</b>  <b>Evaluate measures that may be taken to sustain and/or improve a biophysical environment</b></p> <p>This achievement standard involves evaluating measures that may be taken to sustain and/or improve a biophysical environment.</p> <table border="1" data-bbox="341 450 453 1760"> <thead> <tr> <th data-bbox="341 1323 368 1760"><b>Achievement Criteria</b></th> <th data-bbox="341 898 368 1323"><b>Achievement with Merit</b></th> <th data-bbox="341 450 368 898"><b>Achievement with Excellence</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="368 1323 453 1760">Evaluate measures that may be taken to sustain and/or improve a biophysical environment</td> <td data-bbox="368 898 453 1323">Evaluate, in depth, measures that may be taken to sustain and/or improve a biophysical environment.</td> <td data-bbox="368 450 453 898">Critically evaluate measures that may be taken to sustain and/or improve a biophysical environment.</td> </tr> </tbody> </table> <p>This achievement standard is derived from <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, This achievement standard is aligned with <i>The New Zealand Curriculum</i>, Learning Media, Ministry of Education, 2007, and is related to learning objective 8.1 in the <i>Teaching and Learning Guide for Education for Sustainability</i>, Ministry of Education, at <a href="http://seniorsecondary.tki.org.nz">http://seniorsecondary.tki.org.nz</a>.</p> <p>This standard is also derived from <i>Te Marautanga o Aotearoa</i>. For details of <i>Te Marautanga o Aotearoa</i> achievement objectives to which this standard relates, see the <a href="#">Papa Whakaako</a> for the relevant learning area.</p> <p><b>At achieved level:</b> <i>Evaluate measures</i> - carrying out research and/or a practical inquiry to: analyse the characteristics of a biophysical environment analyse the nature of the relationship between humans and the biophysical environment in relation to aspects of sustainability. analysing the potential of possible measures that sustain and/or improve the biophysical environment now and for the future drawing conclusions about which measure(s) may be most effective in terms of sustaining and/or improving the biophysical environment.</p> <p><b>At merit level:</b> <i>Evaluate, in depth</i> - drawing informed conclusions based on examples and evidence about which measure(s) may be most effective in terms of sustaining and/or improving a biophysical environment.</p> <p><b>At excellence level:</b> <i>Critically evaluate</i>- drawing insightful conclusions about the effectiveness of the measures with reference to aspects of sustainability. The conclusions may include projections of future impacts and discussion of wider implications of the measures.</p> <p><b>Definitions</b>  <i>Sustainability</i> involves the development of ways of thinking and acting to meet the needs of the present generation without compromising the ability of future generations (of all living things) to meet their own needs. In Aotearoa New Zealand, sustainability reflects, wherever possible, consideration of Māori concepts and values relating to the environment, which may vary between hapū and between iwi.</p>	<b>Achievement Criteria</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>	Evaluate measures that may be taken to sustain and/or improve a biophysical environment	Evaluate, in depth, measures that may be taken to sustain and/or improve a biophysical environment.	Critically evaluate measures that may be taken to sustain and/or improve a biophysical environment.	<p><b>Clarification Document</b>  <b>May 2015</b></p> <p>Biophysical environment  Analyse: The description needs to include the natural processes in the physical environment and the associated life forms, for example explaining that the presence or absence of species is linked to the physical environment, and/or explaining that the distribution of the species is related to the physical environment and processes that operate.  Analysing goes beyond listing and describing the biophysical context.  Analysis involves giving reasons for patterns and interrelationships between the humans and the biophysical environment. It may be useful to consider a range of criteria for the analysis of the potential/possible measures.  For example, analysis can involve:  the characteristics of the physical environment as they are related to the species habitat  the nature of the relationship between humans and the habitat, and the interactions</p>
<b>Achievement Criteria</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>						
Evaluate measures that may be taken to sustain and/or improve a biophysical environment	Evaluate, in depth, measures that may be taken to sustain and/or improve a biophysical environment.	Critically evaluate measures that may be taken to sustain and/or improve a biophysical environment.						

<p>for this standard may well be also used in preparation for AS 90828 and 90832</p>	<p>The aspects of sustainability are:  environmental  social  cultural  economic.</p> <p><i>Measures</i> may be social, cultural, economic, and/or technological. They are put in place to resolve a sustainability issue and may be evaluated for their effectiveness in addressing aspects of sustainability.</p> <p>A <i>biophysical environment</i> relates to the interactions between a physical environment and the biological life forms within the environment. The biophysical environment could be a natural environment or a built environment, or some combination of the two. The physical environment may be a geological, atmospheric, hydrological or climatic system</p> <p>An <i>environment</i> refers to a definable area such as an urban community, estuary, national park, or farm, or a larger area such as an island, country or planet Earth.</p> <p>Relationship between humans and the biophysical environment refers to the nature of the interactions between humans and a biophysical environment and the implications for a sustainable future. Interrelationships may be those that promote or disrupt the sustainability of an environment.</p>	<p>between them in relation to aspects of sustainability. Interrelationships may be those that promote or disrupt the sustainability of the environment the potential of different measures to sustain and/or improve the habitat, both now and in the future. In-depth evaluation for Merit</p> <p>Several reasons need to be given in terms of the effectiveness of the measures to sustain or improve the biophysical environment and examples and evidence are given to support them.</p> <p>Critical evaluation for Excellence</p> <p>Evidence for insightful conclusions may include:  innovative ideas for measures that go beyond the immediate context  creative, plausible projections  a synthesising of the information that has resulted in new and visionary ideas  implications for further measures in local or wider contexts  connections made between the biophysical environment, the measures and wider implications.</p>
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**AS 91735 v2 (Efs 3:2)**  
**Evaluate measures that may be taken to sustain and/or improve a biophysical environment**

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Evaluate measures that may be taken to sustain and/or improve a biophysical environment.</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate, in depth, measures that may be taken to sustain and/or improve a biophysical environment.</li> </ul>	<ul style="list-style-type: none"> <li>Critically evaluate measures that may be taken to sustain and/or improve a biophysical environment.</li> </ul>

This assessment activity is based on the assumption that students have an in-depth understanding of: the principles and aspects of sustainability; sustainable futures; research methods and data analysis; evaluation; and wherever possible Māori concepts and values relating to the environment as well as a familiarity with Article 2 of the Treaty of Waitangi.

**The emphasis in this AS is on:**

- Analysing the natural processes and linking the distribution of species to the environment.
  - Giving reasons for patterns and interrelationships between the humans and the biophysical environment
  - Explaining the effects human activities (e.g. skiing, tramping, tourism) have on the Tongariro National Park's biophysical environment, related to aspects of sustainability
- This could involve investigating factors such as:
- The effect of walkways on the immediate ecological communities, compared with off track.
  - Looking at the effect of tourist facilities on the mountain in terms of landscape, ecology and geology etc.
  - Looking at the impact of the ski fields and facilities on their immediate physical and biological environment.
  - Investigating the impact of the ski village on the immediate physical and biological environment.
  - Researching the impact of night skiing on the local animals.

- In all cases it is important that the focus is on the impact of these human influenced factors on the sustainable future of the National Park and its plants, animals and landscape and the potential of different measures to sustain and/or improve the habitat, both now and in the future.



**The teacher's role is to:**

Ensure that for the selected discussion, the student has opportunity through field work, along with the use of photographic evidence, relevant data and accessible written materials, to develop an understanding of the Park's cultural heritage and value, as well as the expectations of today's society. This will assist in students gaining an understanding of the conflicting requirements for managing the Park.

Provide students with access to the following documents:

- [Tongariro National Park Management Plan \(2006-2016\)](#)
- [Tongariro National Park Management Plan \(Partial review 2017\)](#)

Clarify with the students that they understand the nature of the issues and the conflicting needs caused by human activities, and their potential impact on the environment both immediate and wider.

Apply school-based authenticity policies and procedures.  
Give one reassessment opportunity as appropriate.

Students can use internet links, written materials, and field trip worksheets provided as their source material. Students should also be able to add to this.

A log book is essential for recording research and observations.

**Prior student knowledge**

Students will need an understanding of the ecological communities that exist within the Park. This includes the role many animals play in maintaining an ecological balance and propagation of plant species.

Students will need an understanding of the geological terrain of the Park

Students may need an understanding of the climatic conditions throughout the year.

**The student is expected to:**

Provide clear evidence that this information been taken from another source has been processed and understood. Simply copying or closely paraphrasing material from other sources does not contribute evidence of understanding.

Gather primary and/or secondary data cooperatively but record information independently.

Students may present their findings/evidence as a written report, oral presentation, multimedia presentation, poster or other form.

**Assessment templates:**

<http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards/Social-sciences/Education-for-sustainability/Level-3-Education-for-sustainability>

**Information websites**

Habitat information Department of Conservation	<a href="http://www.doc.govt.nz/nature/habitats/alpine/">www.doc.govt.nz/nature/habitats/alpine/</a>
Background on Tongariro Park with associated activities	<a href="http://www.doc.govt.nz/nature/habitats/drylands/">http://www.doc.govt.nz/nature/habitats/drylands/</a> <a href="http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/">http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/</a>
Tongariro Alpine Crossing Department of Conservation	<a href="http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/things-to-do/tracks/tongariro-alpine-crossing/">http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/things-to-do/tracks/tongariro-alpine-crossing/</a>
Story: Alpine plants Te Ara – the Encyclopedia of New Zealand	<a href="http://www.teara.govt.nz/en/alpine-plants">http://www.teara.govt.nz/en/alpine-plants</a>
New Zealand alpine plants Department of Conservation	<a href="http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/nz-alpine-plants-lowres.pdf">http://www.doc.govt.nz/Documents/about-doc/concessions-and-permits/conservation-revealed/nz-alpine-plants-lowres.pdf</a>
Podocarp-hardwood forests Department of Conservation	<a href="http://www.doc.govt.nz/documents/about-doc/concessions-and-permits/conservation-revealed/podocarp-hardwood-forests-lowres.pdf">http://www.doc.govt.nz/documents/about-doc/concessions-and-permits/conservation-revealed/podocarp-hardwood-forests-lowres.pdf</a>
Forests New Zealand Plant Conservation Network	<a href="http://www.nzpcn.org.nz/page.aspx?ecosystems_plant_communities_forests">http://www.nzpcn.org.nz/page.aspx?ecosystems_plant_communities_forests</a>
Impacts on alpine plants	<a href="https://www.stuff.co.nz/environment/94513051/humans-climate-change-risk-killing-new-zealands-unique-alpine-plants">https://www.stuff.co.nz/environment/94513051/humans-climate-change-risk-killing-new-zealands-unique-alpine-plants</a>

Also see Section 5 – Ecology, pages 2-8, Geology, pages 8-14, and Sustainability, pages 18-21, for supporting information.

<p><b>Format of assessment</b></p> <p>Descriptions and explanations can be presented in a number of ways that may include oral presentations, visual presentations, written presentations, whakaari, haka, whaikōrero and waiata.</p> <p><i>Kaitiakitanga</i> activities may include endeavours such as access, harvest and use of: pingao (golden sedge) and harakeke (flax) for weaving; rivers to catch tuna (eels); feathers for garments such as a korowai (feather cloaks); and whale bone for carving; replenishment and re-stocking of pāua beds; or sustainable harvesting and management of harakeke.</p> <p>Kaitiakitanga may include the protection, care, use and management of animate or inanimate objects. However, <b>there must be a clear evidence of a person exercising kaitiakitanga for a selected taonga.</b></p>	<p><b>Māori Environmental Practices</b> <b>US 6142</b> <b>4 credits</b> <b>Explain kaitiakitanga in relation to the way Māori interact with the natural environment</b></p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> <li>- explain kaitiakitanga in terms of how Māori relate to the natural environment; and</li> <li>- explain the use of tikanga Māori as part of exercising kaitiakitanga.</li> </ul> <p><b>Available grade:</b> Achieved</p> <p><b>Explanatory notes</b></p> <p>1 Where local rohe are also occupied by a number of other iwi or hapū, the tangata whenua or mana whenua view will take precedence. Other iwi or hapū views should be encouraged in order to enrich and enhance understanding of key Māori concepts and practices.</p> <p><b>Outcomes and evidence requirements</b></p> <p><b>Outcome 1</b> Explain kaitiakitanga in terms of how Māori interact with the natural environment.</p> <p><b>Evidence requirements</b></p> <p>1.1 The explanation describes kaitiakitanga in terms of the roles and responsibilities tangata whenua/mana whenua undertake in protecting, caring, using and managing taonga in the natural environment.</p> <p>1.2 The explanation identifies other concepts relevant to kaitiakitanga.</p> <p>Examples may include, but are not limited to: mana, rangatiratanga, whakapapa and manaakitanga; evidence of <b>three</b> concepts is required.</p> <p><b>Outcome 2</b> Explain the use of tikanga Māori as part of exercising kaitiakitanga.</p> <p><b>Evidence requirements</b></p> <p>2.1 The explanation provides examples of the use of tikanga Māori by tangata whenua/mana whenua in carrying out roles and responsibilities under kaitiakitanga.</p>	<p><b>Important Māori concepts applicable to this unit standard include:</b></p> <p><i>Kaitiakitanga</i> - is the obligation arising from kin relationships, to act as <i>kaitiaki</i> (a guardian, a person obliged to exercise kaitiakitanga) of <i>taonga</i>;</p> <p><i>Taonga</i> - is anything that is treasured, including: tangible things (land, waters, plants and wildlife); and intangible things (language, identity and culture, and mātauranga Māori).</p> <p><i>Mauri</i> - literally meaning <i>life force</i> or <i>life principle</i>, acknowledges the need to respect and care for all things, both animate and inanimate objects (including: plants, rivers, mountains and people) based on the way in which all things on earth are inter-related and dependent on each other.</p> <p><i>Mana</i> - implies <i>authority, influence</i> and <i>prestige</i>, which is bestowed upon an individual or group by others. An individual, whānau, hapū or iwi can exercise mana (rangatiratanga) in recognition of their accomplishments, expertise, knowledge, obligations or association to a person, people, place or thing.</p> <p><i>Tangata whenua</i> - literally <i>people of the land</i>, refers to a group of people who, through a long association to a particular place, are recognised by others as having authority over a specific area. This notion also underpins the concept of <i>mana whenua</i>; i.e.: recognised spiritual authority in a given area.</p>
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	<p>Examples may include, but is not limited to concepts and practices including: whakapapa; tangata whenua; mana whenua; rāhui; taunaha whenua; karakia; kōhātu mauri; taiāpure; and mātaītai; evidence of <b>three</b> local examples is required.</p> <p>2.2 The explanation describes the effects of local kaitiakitanga practices on local taonga of the natural environment.</p>	<p><i>Tapu and noa</i> - as concepts that complement each other, tapu often informed a code of social conduct emphasising safety and avoiding risk. For example, through tapu, a tohunga could place a particular location or resource under a rāhui (sanction) to ensure its sustainability. Noa on the other hand, defined as <i>ordinary or free from restriction</i>, enabled a return to everyday, ordinary human activity.</p>
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<p><b>Format of assessment</b></p> <p>Descriptions and explanations can be presented in a number of ways that may include oral presentations, visual presentations, written presentations, whakaari, haka, whaikōrero and waiata.</p> <p><i>Kaitiakitanga</i> activities may include endeavours such as access, harvest and use of: pingao (golden sedge) and harakeke (flax) for weaving; rivers to catch tuna (eels); feathers for garments such as a korowai (feather cloaks); and whale bone for carving; replenishment and re-stocking of pāua beds; or sustainable harvesting and management of harakeke.</p> <p>Kaitiakitanga may include the protection, care, use and management of animate or inanimate objects. However, <b>there must be a clear evidence of a person exercising kaitiakitanga for a selected taonga.</b></p>	<p><b>Māori Environmental Practices</b> <b>US 6143</b> <b>6 credits</b> <b>Carry out a local kaitiakitanga activity with direction</b></p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> <li>- plan a local kaitiakitanga activity;</li> <li>- carry out a local kaitiakitanga activity; and</li> <li>- evaluate a local kaitiakitanga activity.</li> </ul> <p><b>Available grade:</b> Achieved</p> <p><b>Explanatory notes</b></p> <p>1 Where local rohe are also occupied by a number of other iwi or hapū, the tangata whenua or mana whenua view will take precedence. Other iwi or hapū views should be encouraged in order to enrich and enhance understanding of key Māori concepts and practices.</p> <p><b>Outcomes and evidence requirements</b></p> <p><b>Outcome 1</b> Plan a local kaitiakitanga activity.</p> <p><b>Evidence requirements</b></p> <p>1.1 The plan describes a kaitiakitanga activity appropriate to the local natural world.</p> <p>1.2 The planned actions are consistent with local tikanga.</p> <p>1.3 The planned actions are consistent with local maramataka.</p> <p><b>Outcome 2</b> Carry out a local kaitiakitanga activity.</p> <p><b>Evidence requirements</b></p> <p>2.1 The local kaitiakitanga activity is carried out according to the plan.</p> <p>2.2 Individual participation within the group contributes to the purpose of the activity.</p> <p>2.3 Individual participation within the group is consistent with local tikanga.</p> <p><b>Outcome 3</b> Evaluate a local kaitiakitanga activity.</p>	<p><b>Important Māori concepts applicable to this unit standard include:</b></p> <p><i>Kaitiakitanga</i> - is the obligation arising from kin relationships, to act as <i>kaitiaki</i> (a guardian, a person obliged to exercise kaitiakitanga) of <i>taonga</i>;</p> <p><i>Taonga</i> - is anything that is treasured, including: tangible things (land, waters, plants and wildlife); and intangible things (language, identity and culture, and mātauranga Māori).</p> <p><i>Mauri</i> - literally meaning <i>life force</i> or <i>life principle</i>, acknowledges the need to respect and care for all things, both animate and inanimate objects (including: plants, rivers, mountains and people) based on the way in which all things on earth are inter-related and dependent on each other.</p> <p><i>Mana</i> - implies <i>authority, influence</i> and <i>prestige</i>, which is bestowed upon an individual or group by others. An individual, whānau, hapu or iwi can exercise mana (rangatiratanga) in recognition of their accomplishments, expertise, knowledge, obligations or association to a person, people, place or thing.</p> <p><i>Tangata whenua</i> - literally <i>people of the land</i>, refers to a group of people who, through a long association to a particular place, are recognised by others as having authority over a specific area. This notion also underpins the concept of <i>mana whenua</i>; i.e.: recognised spiritual authority in a given area.</p> <p><i>Tapu and noa</i> - as concepts that complement each other, tapu often</p>
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	<p><b>Evidence requirements</b></p> <p>3.1 The evaluation identifies any variations from the plan, and their effect.</p> <p>3.2 The evaluation identifies aspects of the activity that meet kaitiakitanga practices.</p> <p>3.3 The evaluation identifies the effectiveness of group co-operation in the exercise of kaitiakitanga.</p>	<p>informed a code of social conduct emphasising safety and avoiding risk. For example, through tapu, a tohunga could place a particular location or resource under a rāhui (sanction) to ensure its sustainability. Noa on the other hand, defined as <i>ordinary</i> or <i>free from restriction</i>, enabled a return to everyday, ordinary human activity.</p>
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