

**Field** Māori  
**Field** Sciences

**Review of Level 1 *Pūtaiao* achievement standards**  
**Revised Level 1 *Science* achievement standards**  
**New Level 1 *Pūtaiao* achievement standards**

#### Unit standards

Subfield	Domain	ID
General Education Māori	Pūtaiao	15984,15989, 19530, 19534

#### Achievement standards

Subfield	Domain	ID	Subject reference
Science	Biology	90925-90929	Biology 1.1-1.5
	Chemistry	90930-90934	Chemistry 1.1-1.5
	Physics	90935-90939	Physics 1.1-1.5
	Science	90940-90955	Science 1.1-1.16

The Ministry of Education and NZQA Māori Qualifications Services have completed a revision/review of the achievement and unit standards listed above.

**New Registration date** December 2013

**Date new versions published** December 2013

#### Summary of review and consultation process

In 2010 the Ministry of Education, in association with the New Zealand Qualifications Authority and subject working groups, began to develop achievement standards derived from outcomes in *Te Marautanga o Aotearoa* (TMoA). This development also addressed duplication of outcomes, credit parity, fairness, consistency and coherence. The development was guided by the direction of *Te Marautanga o Aotearoa* and the Standards Review Guidelines. A copy of TMoA is available at: <http://tmoa.tki.org.nz/Nga-Marautanga-o-Aotearoa/Te-Marautanga-o-Aotearoa>

Teacher subject working groups were involved in the development, and draft achievement standards were the focus of wide consultation, especially with wharekura (secondary programmes in Māori-medium schools) and kaiako (teachers). Resources were also developed to support these standards.

The review of unit standards included the assessment of continued relevance and likely future use of the standards. Unit standards that duplicate achievement standard outcomes and those without the likelihood of future tertiary use were recommended for expiry. The remaining standards from the Māori > General Education Māori > Pūtaiao domain are being moved to a new classification because they do not relate to TMoA and are not specifically for use by wharekura.

The English language Science learning area achievement standards listed above were revised to show that they also align with outcomes in the Marautanga o Aotearoa.

The development of these Level 1 achievement standards was completed in time for implementation in schools in 2014.

## Main changes resulting from the review

- All TMoA Level 1 (NZQF Level 6) outcomes are now assessed using achievement standards.
- Grading criteria for achievement standards were reviewed in accordance with the Standards Review Guidelines.
- Five new standards were created for *Pūtaiao* that align to TMoA outcomes.
- Unit standards that recognised similar outcomes as achievement standards, or had minimal usage, were recommended for expiry (see [table](#) below).
- The English language versions of the standards have been amended to show that they also derive from achievement objectives in TMoA, and their review date has been changed to December 2016.

For a detailed description of the review of, and the changes to, the *Pūtaiao* standards see the appendix at the end of this report.

Current consent for			Consent extended to		
Nature of consent	Classification or ID	Level	Nature of consent	Classification or ID	Level
<b>Subfield</b>	General Education Māori	Any	<b>Subfield</b>	Te Marautanga o Aotearoa	Same
<b>Domain</b>	General Education Māori >Pūtaiao	Any	<b>Domain</b>	Te Marautanga o Aotearoa > Pūtaiao	Same

## Impact on Consent and Moderation Requirements (CMR)

All new achievement standards have been registered on CMR 0233.

## Impact on registered qualifications

None.

## Impact of changes on [Exclusions List](#)

None.

## Review Categories and changes to classification, title, level, and credits

The following summary shows the changes made to the standards as a result of the review. All changes are in **bold**. Where a new or a new version of an externally assessed achievement standard is registered, the following designation appears after the title **[Externally Assessed]**.

Key to review category	
<b>A</b>	Dates changed, but no other changes are made - the new version of the standard carries the same ID and a new version number
<b>B</b>	Changes made, but the overall outcome remains the same - the new version of the standard carries the same ID and a new version number
<b>C</b>	Major changes that necessitate the registration of a replacement achievement standard with a new ID
<b>D</b>	Achievement standard will expire and not be replaced

<b>Internally assessed unit standards categorised as category D expire at the end of</b>	<b>December 2014</b>
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<b>The last date for assessment of superseded versions of internally assessed achievement standards categorised as category B is end of</b>	<b>December 2014</b>
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**UNIT STANDARDS**

Māori &gt; General Education Māori &gt; Pūtaiao

<b>ID</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
15984	Demonstrate knowledge of the use of kohatu Māori	1	2	D
15989	Demonstrate knowledge of a native mammal and its significance to Māori	1	2	D
19530	Investigate the aerodynamics of a nititeka	1	2	D
19534	Investigate the aerodynamics of manu aute or tukutuku	1	2	D

**REVISED ACHIEVEMENT STANDARDS**

Science &gt; Sciences

<b>Domain</b>	<b>ID</b>	<b>Ref</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
Biology	90925	1.1	Carry out a practical investigation in a biological context, with direction	1	4
	90926	1.2	Report on a biological issue	1	3
	90927	1.3	Demonstrate understanding of biological ideas relating to micro-organisms [Externally assessed]	1	4
	90928	1.4	Demonstrate understanding of biological ideas relating to the life cycle of flowering plants [Externally assessed]	1	4
	90929	1.5	Demonstrate understanding of biological ideas relating to a mammal(s) as a consumer(s) [Externally assessed]	1	3
Chemistry	90930	1.1	Carry out a practical chemistry investigation, with direction	1	4
	90931	1.2	Demonstrate understanding of the chemistry in a technological application	1	2
	90932	1.3	Demonstrate understanding of aspects of carbon chemistry [Externally assessed]	1	4
	90933	1.4	Demonstrate understanding of aspects of selected elements	1	4
	90934	1.5	Demonstrate understanding of aspects of chemical reactions [Externally assessed]	1	4
Physics	90935	1.1	Carry out a practical physics investigation that leads to a linear mathematical relationship, with direction	1	4

Domain	ID	Ref	Title	Level	Credit
	90936	1.2	Demonstrate understanding of the physics of an application	1	2
	90937	1.3	Demonstrate understanding of aspects of electricity and magnetism	1	4
	90938	1.4	Demonstrate understanding of aspects of wave behaviour	1	4
	90939	1.5	Demonstrate understanding of aspects of heat	1	4
Science – Core	90940	1.1	Demonstrate understanding of aspects of mechanics [Externally assessed]	1	4
	90941	1.2	Investigate implications of electricity and magnetism for everyday life	1	4
	90942	1.3	Investigate implications of wave behaviour for everyday life	1	4
	90943	1.4	Investigate implications of heat for everyday life	1	4
	90944	1.5	Demonstrate understanding of aspects of acids and bases [Externally assessed]	1	4
	90945	1.6	Investigate implications of the use of carbon compounds as fuels	1	4
	90946	1.7	Investigate the implications of the properties of metals for their use in society	1	4
	90947	1.8	Investigate selected chemical reactions	1	4
	90948	1.9	Demonstrate understanding of biological ideas relating to genetic variation [Externally assessed]	1	4
	90949	1.10	Investigate life processes and environmental factors that affect them	1	4
	90950	1.11	Investigate biological ideas relating to interactions between humans and micro-organisms	1	4
	90951	1.12	Investigate the biological impact of an event on a New Zealand ecosystem	1	4
	90952	1.13	Demonstrate understanding of the formation of surface features in New Zealand	1	4
	90953	1.14	Demonstrate understanding of carbon cycling	1	4
	90954	1.15	Demonstrate understanding of the effects of astronomical cycles on planet Earth	1	4
	90955	1.16	Investigate an astronomical or Earth science event	1	4

## NEW ACHIEVEMENT STANDARDS

Māori > Te Marautanga o Aotearoa > Pūtaiao

<b>ID</b>	<b>Ref</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
	<b>1.1</b>	<b>Te whakatairite i ngā āhuatanga e pā ana ki te kaupapa pūtaiao kua tohua, mai i te tirohanga o ngā mātauranga Māori o nehe, i tō ngā mātauranga o tauwiwi hoki</b>	<b>1</b>	<b>3</b>	<b>New</b>
	<b>1.2</b>	<b>Te whakaatu māramatanga ki ētahi āhuatanga o te rauropi</b>	<b>1</b>	<b>4</b>	<b>New</b>
	<b>1.3</b>	<b>Te tūhura i ētahi āhuatanga o tētahi pūnaha-hauropi i Aotearoa</b>	<b>1</b>	<b>3</b>	<b>New</b>
	<b>1.4</b>	<b>Te whakaatu māramatanga ki ētahi āhuatanga e pā ana ki a Papatūānuku</b>	<b>1</b>	<b>4</b>	<b>New</b>
	<b>1.5</b>	<b>Te whakaatu māramatanga ki ētahi āhuatanga e pā ana ki a Ranginui</b>	<b>1</b>	<b>4</b>	<b>New</b>

## Appendix

### Development of Pūtaiao Level 1 Achievement Standards

#### Process of aligning standards with Te Marautanga o Aotearoa (TMoA)

The Pūtaiao Level 1 achievement standards have been developed to align the outcomes with the level 6 Te Ao Tūroa (The Natural World) and Ngā Tautake Pūtaiao me ngā Kōrero o Mua (Philosophy and History of Science) strands of the Pūtaiao learning area of TMoA. The Ō Ahupūngao (The Physical World) and Ō Kawekawe (The Material World) strands are covered by existing Science achievement standards.

The process of aligning achievement standards with TMoA was informed by a series of audits across all learning areas commissioned by the Ministry of Education from Māori-medium subject specialists in 2007. The audit made three recommendations for the Pūtaiao learning area:

- phase out the translated Science achievement standards
- rationalise the number of Pūtaiao unit standards
- explore the possibility of developing unique new achievement standards for Pūtaiao.

It was subsequently determined that translating the Science standards would not reflect the whāinga paetae within the Pūtaiao learning area of TMoA and so the decision was taken to develop some new achievement standards. The reasons for taking this approach included:

- to reflect the differences between the two curricula (i.e., Pūtaiao and Science) – the different grouping of knowledge in two of the four strands, namely Te Ao Tūroa and Ngā Tautake Pūtaiao. There is no equivalent to the latter of these in the Science curriculum.
- to reflect the distinct nature of wharekura/senior secondary Māori-medium school programmes and the difference between these and English-medium Science, and to meet aspirations for contextually appropriate assessment of Pūtaiao. Pūtaiao is science education in contexts where the language of the school is Māori, which is an endangered indigenous language that has little in common with English, the dominant global language of science. Minority-language science education is almost non-existent globally, and the language task Pūtaiao represents cannot be over-emphasised. Innovative and specific modes of assessment are therefore required, as are new achievement standards to make these possible.

A specialist Pūtaiao writing panel, consisting of subject specialists working in wharekura, was convened by the Ministry of Education to develop the new suite of standards informed by the recommendations from the audit report. In aligning the standards to the new marautanga, the panel was guided by three principles:

- learners need to be exposed to a wide range of Pūtaiao skills and knowledge
- the current form and features of NCEA Pūtaiao need to be changed
- coherent assessment programmes need to be provided to guide kaiako pūtaiao, based on central concepts.

Further, the panel considered that the development of new standards provided an opportunity to improve participation and access for Māori-medium students in NCEA Pūtaiao qualifications by:

- developing Pūtaiao-specific standards with assessment activities written for and from a Māori-medium perspective;

- employing assessment forms other than language-based questions, i.e., increased use of symbolic language and visual representations of science concepts;
- addressing the key issue of the criteria used for grade distinctions.

Accordingly, the panel developed a set of five new internally assessed Pūtaiao Level 1 achievement standards (XXYYY–ZZAAA) that are robust and challenging, bring together knowledge from science, and acknowledge direct experience of the natural world and relevant Māori traditions.

Conditions of Assessment have been developed to assist in the interpretation of achievement standards and the development of teaching and learning programmes.

### **Addressing Duplication**

Careful consideration was given to ensuring that the Pūtaiao standards were differentiated from the Science standards and accordingly new standards were not developed within the Ō Ahupūngao (The Physical World) and Ō Kawekawe (The Material World) strands, as they would have been too similar to Science achievement standards.

The new standards have been developed to be complementary to existing Science achievement standards. Wharekura will have opportunities to build their own assessment programmes from a selection of achievement standards available in both Pūtaiao and Science.

### **Addressing Credit Parity**

The credits allocated to the standards reflect the time required for the teaching and learning involved. Four standards carry a credit value of 5 and one, a research standard, is worth 4 credits.

### **External and Internal Assessment**

The method of assessment for each standard best reflects the teaching and learning involved for each standard.

Internal assessment was considered the most appropriate medium for all the Pūtaiao standards.

### **What has changed (summary)?**

At Level 1 the five new achievement standards (XXYYY–ZZAAA) cover the following areas:

- Four of these standards assess Te Ao Tūroa, utilising the Māori organisation of that strand, and drawing on content from Ō Kawekawe and Ō Ahupūngao as required. Each assesses a range or eclectic mixture of knowledge including science knowledge, Māori/indigenous symbolism and local knowledge/experience relating to the natural world.
- Each of these Achievement Standards assesses competence in the generic skills contained in the overarching āhuatanga whānui, Te Reo Matatini. The standards vary in the focus they place on Rauropi, Taiao, Papatūānuku and Ranginui, and in the balance between the remaining two āhuatanga whānui (Te Tūhuratanga and Te Whakamahinga o te Pūtaiao) in each.
- The fifth standard, which assesses the new strand Ngā Tautake me ngā Kōrero o Mua (History and Philosophy of Science), is basically a research standard, set at 4 credits.