

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

Outline of interpretation process

The interpretations were undertaken by subject and language specialists contracted by the Ministry of Education, and were quality assured by Ministry of Education staff and an externally contracted critique group comprised of language specialists.

Main changes resulting from the review

- All TMoA Level 6 (NZQF Level 1) outcomes are now assessed using achievement standards (there are no longer any unit standards linked to TMoA).
- Grading criteria for achievement standards were reviewed in accordance with the Standards Review Guidelines.
- Mathematics and Statistics achievement standards aligned with outcomes from the New Zealand Curriculum (NZC), 1.1–1.13 (91026-91038), were re-interpreted in te reo Māori in line with the standard template for Māori-medium achievement standards.
- Two new, unique Pāngarau achievement standards (not translated from existing standards) were developed to reflect the cross strands Te Reo Matatini o te Pāngarau (maths literacy) and Te Whakamahinga o te Pāngarau (the use of mathematics):
1.14 (91655) *Te whakaoti rangahau pāngarau*
1.15 (91656) *Te whakaatu mōhiotanga ki te reo matatini o te pāngarau.*
- All the Level 1 unit standards recognised outcomes similar to those in achievement standards, or had minimal usage; they were therefore designated expiring (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.
- Mathematics and Statistics 1.4 (91029) – the descriptors for ‘extended thinking’, which is part of the criterion for the Excellence grade, have been amended to match the other Level 1 standards that use the term in the Excellence criterion.

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

Impact on existing organisations with consent to assess

Current consent for			Consent extended to		
Nature of consent	Classification or ID	Level	Nature of consent	Classification or ID	Level
Subfield	Mathematics	Any	Domain	Te Marautanga o Aotearoa > Pāngarau	Same
Subfield	Statistics and Probability	Any	Domain	Te Marautanga o Aotearoa > Pāngarau	Same
Domain	General Education Māori > Pāngarau	Any	Domain	Te Marautanga o Aotearoa > Pāngarau	Same

Impact on Consent and Moderation Requirements (CMR)

All new and review category B achievement standards have been registered on CMR 0233.

Impact on registered qualifications

None.

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

Achievement standard	Existing unit standards
AS91655	18306, 18307, 18308

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	
A	Dates changed, but no other changes are made - the new version of the standard carries the same ID and a new version number
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
C	Major changes that necessitate the registration of a replacement achievement standard with a new ID
D	Achievement standard will expire and not be replaced

Unit standards categorised as category C or D expire at the end of	December 2014
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(Ordinarily at least two years from the date the review is completed to allow time for tertiary providers to change their programmes)

Māori > Te Marautanga o Aotearoa > Pāngarau (Achievement standards)

Māori > General Education Māori > Pāngarau (Unit standards)

ID	Ref	Title	Level	Credit	Review Category
18306		Use Māori concepts of space in a mathematical context	1	2	C
18307		Use Māori concepts of time in a mathematical context	1	2	
18308		Apply Māori methods of quantification	1	2	
91655	1.14	Te whakaoti rangahau pāngarau	1	3	New
18309		Apply transformation geometry to define traditional, and develop new Māori style patterns	1	2	D
91656	1.15	Te whakaatu mōhiotanga ki te reo matatini o te pāngarau	1	3	New

Interpretations

Sciences > Mathematics > Number

ID	Ref	Title	Level	Credit
91026	1.1	Apply numeric reasoning in solving problems Te whakamahi whakaaro tau whitake hei whakaoti rapanga	1	4

Sciences > Mathematics > Algebra

ID	Ref	Title	Level	Credit
91027	1.2	Apply algebraic procedures in solving problems Te whakamahi tikanga taurangi hei whakaoti rapanga [Externally Assessed]	1	4
91028	1.3	Investigate relationships between tables, equations and graphs Te tūhura i ngā hononga o te tūtohi, te whārite me te kauwhata [Externally Assessed]	1	4
91029	1.4	Apply linear algebra in solving problems Te whakamahi tikanga taurangi rārangi hei whakaoti rapanga	1	3

Sciences > Mathematics > Measurement

ID	Ref	Title	Level	Credit
91030	1.5	Apply measurement in solving problems Te whakamahi tikanga ine hei whakaoti rapanga	1	3

Sciences > Mathematics > Geometry

ID	Ref	Title	Level	Credit
91031	1.6	Apply geometric reasoning in solving problems Te whakamahi whakaaro āhuahanga hei whakaoti rapanga [Externally Assessed]	1	4

Sciences > Mathematics > Trigonometry

ID	Ref	Title	Level	Credit
91032	1.7	Apply right-angled triangles in solving measurement problems Te whakamahi tikanga tapatoru hāngai hei whakaoti rapanga ine	1	3

Sciences > Mathematics > Geometry

ID	Ref	Title	Level	Credit
91033	1.8	Apply knowledge of geometric representations in solving problems Te whakamahi whakaahuahanga āhuahanga hei whakaoti rapanga	1	3
91034	1.9	Apply transformation geometry in solving problems Te whakamahi āhuahanga panoni hei whakaoti rapanga	1	2

Sciences > Statistics and Probability > Statistics

ID	Ref	Title	Level	Credit
91035	1.10	Investigate a given multivariate data set using the statistical enquiry cycle Te whakamahi i ngā tikanga tūhuratanga tauanga hei tūhura huinga raraunga matatini	1	4
91036	1.11	Investigate bivariate numerical data using the statistical enquiry cycle Te whakamahi i ngā tikanga tūhuratanga tauanga hei tūhura raraunga tau matarua	1	3
91037	1.12	Demonstrate understanding of chance and data Te whakaatu māramatanga ki te tūponotanga me te raraunga [Externally Assessed]	1	4

Sciences > Statistics and Probability > Probability

ID	Ref	Title	Level	Credit
91038	1.13	Investigate a situation involving elements of chance Te tūhura pūāhua tūponotanga	1	3

Appendix

Development of Level 1 Pāngarau Standards

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

The Level 1 Pāngarau achievement standards align with the outcomes of the Level 6 Te Tau me te Taurangi (Number and Algebra); Te Ine me te Āhuahanga (Measurement and Geometry); and Te Tauanga (Statistics) strands of the Pāngarau learning area of TMoA.

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.

A specialist Pāngarau writing panel, consisting of subject specialists working in wharekura, was convened by the Ministry of Education to develop a new suite of standards informed by the recommendations from the audit report. In aligning the standards to the new marautanga (curriculum), the writing panel noted the following:

- Levels 6, 7 and 8 of the Pāngarau learning area of TMoA align very closely with Mathematics and Statistics in the New Zealand Curriculum (NZC).
- The one significant point of difference between Pāngarau in TMoA and Mathematics and Statistics in the NZC are the whāinga paetae relating to the two cross strands 'Te Reo Matatini o te Pāngarau', which focuses on literacy in Pāngarau and 'Te Whakamahinga o te Pāngarau', which focuses on the use of Pāngarau.
- It is in the best interests of students in Māori-medium schooling studying Pāngarau at this level to have access to the full range of achievement standards offered in Mathematics and Statistics. This will ensure that senior students from wharekura are not disadvantaged if they wish to study Mathematics and Statistics at university level, or take courses which require the study of Mathematics and Statistics to some extent.

Accordingly, Pāngarau achievement standards were developed as follows:

- Mathematics and Statistics achievement standards 1.1–1.13 (91026-91038) were re-interpreted in te reo Māori in line with the standard template for Māori-medium achievement standards.
- Two new, unique Pāngarau achievement standards 1.14 (91655) and 1.15 (91656) were developed to reflect the cross strands Te Reo Matatini o te Pāngarau and Te Whakamahinga o te Pāngarau.

In addition, the decision was taken to designate the three unique Pāngarau unit standards (18306, 18307 and 18308) expiring, because the knowledge and skills from one of these unit standards may form the basis for the research study required for the new achievement standard 1.14 (91655).

Supporting documents were developed to assist in the interpretation of achievement standards and the development of teaching and learning programmes.

Addressing Duplication

Issues of duplication for the Pāngarau standards 1.1–1.13 (91026-91038) were dealt with during the alignment of these standards with the NZC.

As indicated above and depending on the research topic selected, it would be possible for a student to meet the requirements of the new achievement standard 1.14 (91655) and of

one of the expiring unit standards (18306, 18307 and 18308) with the same assessment evidence. Pāngarau 1.14 (91655) has therefore been designated a C category review standard replacing 18306, 18307 and 18308. There is a mutual exclusion between the achievement standard and the unit standards that it replaces.

Consideration was given as to whether the new standard, 1.15 (91656) *Te whakaatu mōhiotanga ki te reo matatini o te pāngarau*, duplicated the requirements in most of the existing standards for students to communicate their mathematical thinking. There was a strong consensus of opinion that because te reo Māori was such a central ethos and prime focus of Māori-medium schooling, this should be recognised by the availability of a standard, and therefore credits towards the National Certificates of Educational Achievement (NCEAs) and other qualifications, to acknowledge students' proficiency in the discourse of Pāngarau.

Addressing Credit Parity

The credits allocated to the standards reflect the time required for the teaching and learning involved. Issues of credit parity for the Pāngarau standards 1.1–1.13 (91026–91038) were dealt with during the alignment of these standards with the NZC. Decisions regarding credit parity for the proposed new standards 1.14 and 1.15 (91655 and 91656) were based on the basis of one credit equalling ten notional hours of learning and assessment time.

External and Internal Assessment

The method of assessment for each standard best reflects the teaching and learning involved for each standard. Issues regarding the balance and appropriateness of internal and external assessment for standards 1.1–1.13 (91026–91038) were dealt with during the alignment of these standards with the NZC. Internal assessment was considered the most appropriate form of assessment for the two new standards, and this is consistent with similar standards (research and literacy) in other learning areas.

What has changed (summary)?

Pāngarau 1.14 (91655) *Te whakaoti rangahau pāngarau* reflects the cross strand Te Whakamahinga o te Pāngarau, which aims to ensure that students are aware of the uses of Pāngarau, the origins of the ideas, and are able to critically evaluate its use across a range of contexts.

Pāngarau 1.15 (91656) *Te whakaatu mōhiotanga ki te reo matatini o te pāngarau*, reflects the cross strand Te Reo Matatini o te Pāngarau, which focuses on the skills of communicating in Pāngarau in order to develop higher order thinking skills such as critical thinking, logical reasoning and creativity.

Pāngarau 1.15 (91656) is based on an alignment of the Pāngarau achievement objectives and the Literacy Progressions for Māori-medium students, and evidence of meeting the standard therefore is focussed on the three elements of Āheinga Reo, Puna Reo and Rautaki Reo.

It is intended that these two new standards have follow-on standards at Level 2, but not through to Level 3. It was felt that students studying Pāngarau at Level 3 would be doing so in preparation for tertiary study in mathematics and statistics, and would gain most benefit therefore by choosing from standards that allow for follow-on to such study.