Technical Report # 38
Assessment Tools for Teaching and Learning

Pāngarau Curriculum Framework & Map:

Levels 2—6

Submitted by the Assessment Tools for Teaching and Learning team,

Auckland UniServices Ltd

University of Auckland

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This report reviews the Level 2-4 asTTle Pängarau framework and identifies and discusses changes that need to be made in order to extend the framework to curriculum Levels 5 and 6 and provides a detailed breakdown of curriculum achievement objectives by curriculum level within the context of the revised asTTle Pängarau framework. AsTTle is funded by the Ministry of Education to Auckland Uniservices at the University of Auckland to research and develop an assessment application for Reading, Writing, Mathematics, Pänui, Pängarau, and Tuhituhi for Years 5-7 (Levels 2-4) for New Zealand schools. We acknowledge this funding, and thank the Ministry of Education for their continued assistance in the development of this project.

We especially acknowledge the input of Mr Uenuku Fairhall in outlining his interpretation of how curriculum achievement objectives proceed from levels 2 to 4, and for providing the first pängarau overview map (Fairhall, 2002). Uenuku informed us that the pängarau curriculum has its genesis in the equivalent mathematics curriculum and that the achievement objectives and curriculum frameworks are in most cases near equivalent translations.

Dr. Ian Christensen (Massey University) and Mr Tony Trinick (Auckland College of Education) provided feedback and critiques on Uenuku’s work. Ian has carefully examined the pängarau map, comparing it with other current work in Pängarau including the Pängarau exemplar project and the Pängarau numeracy projects. Mr. Peter Keegan has worked closely with the development team, responding to their ideas, providing details on the asTTle development, and reflecting on how the curriculum map affects the asTTle development.

This report is the latest in a series of reports on the Pängarau Curriculum to which a wide range of curriculum experts have responded, whom I would also like to thank for readily providing feedback and analysis.

John Hattie
Project Director, asTTle
June, 2003

The bibliographic citation for this report is:

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Background

The Pāngarau Curriculum Framework and Map derive from work undertaken in the mapping of mathematics for use in asTTle. Uenuku Fairhall, who developed the first framework (Fairhall, 2002) consulted Ell’s (2001) analyses of the strands and achievement objectives of levels 2 to 4 of Mathematics in the New Zealand Curriculum (1992). This produced a framework with 8 major categories and 13 key themes. Ell’s work was in turn was revised by an independent expert advisory panel prior to the item signature study research (Thomas, Tagg, Holton, & Brown, 2002).

The major concern for developing a Pāngarau Framework was the lack of any research detailing differences between teaching of mathematics and pāngarau in terms of both the classroom practice and curriculum implementation. The writers of pāngarau curriculum attempted to introduce Māori perspectives on mathematics, as do Māori classroom teachers in everyday practice. However, this is an area that requires further research before definitive claims can be made on pāngarau in the classroom.

The Pāngarau Curriculum Framework began with Uenuku’s map and overview (see technical report 13). This was revised in light of feedback from external review, especially recommending that the vocabulary should reflect the pāngarau curriculum framework (Ministry of Education, 1996). The revised version appears in the v2 of the asTTle CD-Rom. Following the release of asTTle V2 further revisions were recommended by Dr. Ian Christensen and Mr. Tony Trinick based on their work in the Ministry of Education’s Pāngarau Exemplar Project and (Māori implementations) of the Numeracy Project(s). In addition, the Pāngarau Curriculum Framework remains cognizant of insights and improvements suggested by work in asTTle mathematics.

Before detailing the Pāngarau Curriculum Framework is necessary to provide some background on the development of the pāngarau curriculum framework (Ministry of Education, 1996). This document has provided a unique set of challenges for the team working on the Pāngarau Framework.

The Pāngarau Curriculum

Pāngarau developments prior to the release of the Pāngarau Curriculum, were ad-hoc, uncoordinated and undertaken by range of groups, some of which were sponsored by the Ministry of Education and its predecessor the Department of Education. As expected in any nascent development, there was a dearth of resources and those available were poorly disseminated. Many teachers developed their own resources and literally their own pāngarau vocabulary and language based on the available documentation and input from various groups including other teachers. Two important aspects of Pāngarau, variation and changes in vocabulary and language use have plagued developments and continue to do so today (see Barton and Fairhall, 1995; Barton et al. 1998, Christensen, 1998).

The Pāngarau Curriculum statement for Māori medium schools was published in 1996, following a trial in 1995. The Minister of Education requested that the Curriculum to contain at least the same achievement objectives as the Mathematics Curriculum for mainstream schools. While this caused some dissension and concern that Māori knowledge was being ignored, the passage of time has perhaps resulted in more acceptance that while the document does not

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1 This section is based on the curriculum description in technical report 13.
make Māori knowledge explicit as part of the curriculum, it does not discount it, and allows communities to include this where they consider it appropriate, according to the environment, context and ability of the school.

The statement was written in a *neo-meta-language* and contained hundreds of new academic and technical Māori vocabulary items. The writers had to create a meta-language, that is a language to describe language itself (and its associated neologisms) to describe technical aspects of the curriculum that had never been written about before in Māori. Not surprisingly, the writers also attempted to standardize some of the existing Pāngarau vocabulary, in particular the academic vocabulary (used by students) currently being promoted in Māori-medium classrooms. The writers worked in isolation from other groups developing Māori curriculum statements. This has resulted in some variation in vocabulary between statements; for example, pāngarau uses the term *taumata* for levels, while te reo Māori statement uses the term *kōeke*. In addition, the pāngarau curriculum statement uses alternative Māori terms for the same concept, for example, both *tau whakahau kore* and *tau kewha* are terms for irrational numbers. Several terms were used for practical problems, (e.g., *hopanga tūwaenga*, *hōpara wā*, *rapanga whaitake*). The statement (as were all Māori curriculum statements) was finally reviewed by Te Taura Whiri, which resulted in further vocabulary changes, some of which the writers did not agree with. Te Taura Whiri published *Te Matatiki: Contemporary Māori Words* in 1996. Some of the mathematic terms in Te Matatiki were different to the pāngarau statement, for example, line of symmetry *tuaka hangarite* (curriculum), *rārangi hangarite* (Te Matatiki).

The statement has other quirks and inconsistencies, for example, *tauanga* ‘statistics has 10 taumata ‘levels’; all the other strands have eight. This inconsistency has not been explained in the statement itself.

The Pāngarau statement, with its meta-language, inconsistencies, and large numbers of new vocabulary items had not been well received by classroom teachers. It is difficult to read, which results in teachers referring to the equivalent English mathematics curriculum. Some teachers, who had been teaching Pāngarau prior in the introduction of the curriculum, continue to use their own preferred vocabulary items. Uenuku Fairhall is an example of a teacher with a long experience and a good rationale for rejecting some of curriculum terminology. More recently trained teachers who have had some background in the new curriculum statements and have not had exposure to earlier developments may more readily accept curriculum recommendations. Finally, the Ministry of Education had commissioned Massey University to review the current curriculum vocabulary. This will result, no doubt, in further changes.

**Development and Description of the Pāngarau Curriculum Framework**

As mentioned, the asTTle V2 Pāngarau Framework and Map was developed by Uenuku Fairhall (2002). The framework was based primarily on work undertaken in mathematics. The Pāngarau Map was Uenuku’s interpretation of the curriculum and its achievement objective progression from levels 2 to 4. Uenuku used a number of different terms than recommended by the curriculum and wrote in a more traditional style of Māori. The asTTle team then revised some of Uenuku’s terms in line with curriculum recommendations. The revised version was completed in late 2002 and appears in the asTTle v2 CD-Rom.
The asTTle team met with the Pāngarau Exemplar Team in early 2003. Dr. Ian Christensen made a comparison of v2 Pāngarau Framework and Pāngarau Exemplar Map. This highlighted several errors and inconsistencies. Further errors were discovered by the asTTle team. One concern raised was asTTle collapsing of two strands number and algebra in the v2 framework. This was simply done to accommodate a small number of items in both strands. It was agreed that both strands should be made separate in v3.

Under Uenuku’s advice the v2 pāngarau framework had followed asTTle mathematics in dividing the both number and geometry strands into mātauranga ‘knowledge’ and paheko ‘application/processes’. Both teams acknowledged that some objectives clearly have a knowledge and application/process component. It was considered that the distinction is useful and should be retained in Pāngarau in asTTle V3.

The third level groupings in v2 were different to the curriculum classification and derive from asTTle mathematics. Takotoranga ‘position’ appears in measurement in the Pāngarau Framework, but comes under geometry in the curriculum. Although located in measurement within the curriculum, the asTTle team prefer the view advocated by Ell (2001) and supported by Fairhall (2002) that issues of place (e.g., distance, size, area, volume, etc.) are more to do with geometry than measurement.

As with mathematics the Pāngarau Framework contains a number of objectives and details (e.g., understanding simple angles 90°, 180°; 30°, 45°, 60°) not given in the curriculum. Both teams agreed that the additional objectives were valid, especially as asTTle had successfully trialled items based on those objectives. Nevertheless, this may raise concerns about the place of asTTle to implement a curriculum revision, albeit a minor one.

The asTTle team updated the framework to cover the additional levels of 5 and 6 required for v3 and include insights gained from asTTle mathematics. The Pāngarau v3 framework is presented in Table 1. In addition to providing a one-page summary, which includes summarised objectives in short sentences; we have listed the same sentences in full form, to add clarification on the following pages. The vocabulary and language use attempts to follow curriculum prescriptions.
<table>
<thead>
<tr>
<th>Te Tau</th>
<th>Te Taurangi</th>
<th>Te Āhuahanga</th>
<th>Te Inenga</th>
<th>Te Tauanga</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mātauranga</td>
<td>Paheko Taurangi</td>
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<tr>
<td>Tau Oti, Tau Tōpū</td>
<td>Taurangi</td>
<td>Āhuahanga ahu-2, -3</td>
<td>Kōrero, tuhi, hanga tauira āhuahanga ahu-2, -3</td>
<td>Whakamātau</td>
</tr>
</tbody>
</table>
| - Whai, whakamārama, whakaraupapa tau oti | - Raupapa, Tāruarua | - Tautuhi āhu, ka kōrero ai i ngā āhuatanga ahu-2, -3 | - Tātai paenga, horahanga, āhuanga āhuangi
Te Tau

Mātauranga Tau
Tau Oti, Tau Tōpū
Ka pānui, ka whakamārama, ka whakaraupapa i ngā tau oti. Ka whakamārama i ngā tau tōraro. Ka whakamārama, ka tātari i ngā pū tau oti.

Hautau, Ōrau, Tau-ā-ira, Tau Whakahau-Kore
Ka whakamārama i te tikanga o ngā mati whaiira e toru. Ka whakaraupapa i ngā mati whaiira e toru. Ka whakamārama tau whakahau-kore.

Paheko Tau
Tau Oti, Tau Tōpū
Ka mahara, ka whakamahi i ngā tikanga (meka) tāpirihanga, tangoihanga, wehewehe, me te whakarau (whakarea). Ka tāpiri ka tango, ka wehewehe, ka whakarau (whakarea) i ngā tau oti. Ka tuhi, ka whakaoti i ngā rapanga paki tau oti, i ngā rapanga whakarite tau oti ki ngā momo paheko e hāngai ana.

Hautau, Ōrau, Tau-ā-ira, Tau Whakahau-Kore
Ka whakamahi, ka kimi, ka whakaatu i ngā hautau rānei, i ngā ōrau rānei, i ngā tau-ā-ira rānei mai i te tau oti. Ka tito, ka whakaoti i ngā rapanga whai tau-ā-ira rānei, whai hautau rānei. Ka kimi, ka hurihuri i ngā hautau ōrite rānei, i ngā tau-ā-ira ōrite rānei, i ngā ōrau ōrite rānei ki ngā momo paheko. Ka whakamahi i ngā tikanga paheko.

Whakatau tata
Ka whakatau tata, ka whakamātau i aua whakatau.

Te Taurangi
Tauira Raupapa, Tauira Tāruarua
Ka kimi, ka whakaroa, ka whakamārama, ka tito ture mō ngā tauira tau, mō ngā tauira āhua. Ka whakamahi ture hei matapae i ngā tauira.

Whawhe Taurangi
Ka whakaoti i ngā whārite māmā. Ka mōhio ki te raupapa paheko. Ka whakarūnū, ka whakatauwehe, ka whakawhānui i ngā kāinga taurangi. Ka whakaoti i ngā whārite tukutahi.

Kauwhata, Pānga
Ka whakamahi, ka whakaoti i ngā whārite rārangi māmā. Ka whakamahi, ka tuhi, ka whakamāori i ngā kauwhata.
Te Ähuahanga
Mätauranga Ähuahanga
Ähuahua ahu-2, ahu ahu-3
Ka tautuhi, ka körero i ngä ähuatanga o ngä ähua ahu-2 o ngä ähua ahu-3.
Ka tätai i te paenga i te horahanga i te kitanga.
Ka körero i ngä momo hangarite.
Koki
Ka möhio ki te huringa-ä-karaka ki te huringa kōaro, ki te huringa kotahi hau
hauwhā, ki te huringa kotahi haurua.
Ka möhio ki ngä koki mämä (90°, 180°; 30°, 45°, 60°).

Paheko Ähuahanga
Hangarite & Panoni
Ka körero, ka tuhi, ka hanga i ngä tauira ähuahanga e mau ana i te whakaatatanga, i te nekehanga, i te huringa.
Ka whakanui, ka whakaiti i te ähua ahu-2.
Koki
Ka whakamahi i ngä huringa.
Ka whakamahi i te ine-koki hei ine i ngä koki.
Hanga & Tuhi
Ka tautuhi, ka körero, ka hanga, ka whakatauira, ka tuhi i ngä ähua ahu-2, i ngä ähua ahu-3.
Ka tuhi raumata hei hanga i ngä matarau mämä.

Te Inenga
Inenga
Ngahuru
Ka ineine, ka whakatau tata i te ine roa, i te papatipu, i te mahana.
Ka ineine, ka möhio ki te inenga āwhata ki te tauwhata tata rawa.
Wä
Ka whai, ka huri i te wä ringarua, i te wämati.
Ka tätai wä ki te karaka 12 ngä hāora, ki te karaka e 24 ngä hāora.
Ka möhio ki ngä inenga wä.
Ka whai, ka whakamāori, ka hanga i ngä körero āwhata, i ngä wātaka, i ngā tūtohi wä.
Takotoranga
Ka körero ka whakamāori, ka tuhi, ka tautuhi i te takotoranga ki te ahunga, ki te tawhiti, ki te mahere āwhata, ki te taonga tukutuku.
Development of the Pāngarau Curriculum Map

The Pāngarau Exemplar Map was referred to for the development of the Pāngarau Curriculum Map. The Exemplar Map lists all achievement objectives, sometimes in summarized form, by strand from level one to level five. Dr. Ian Christensen added the level six objectives and the NCEA objectives. He also allocated the relevant achievement objectives in both number and geometry in both knowledge and application/process subcategorises. Some objectives clearly belong to one category; others cover both and therefore appear in both categories.

The asTTle team added the additional achievement objectives and ensured the second level subcategorization matched the curriculum framework and made further changes based on insights gained in asTTle mathematics developments.

Description of the Pāngarau Curriculum Map

The Pāngarau Curriculum Map outlines the content of the five strands of the Pāngarau curriculum statement from Levels 2 to 6, and also shows the progressions across these levels. This is done primarily though summarising and mapping the achievement objectives. Some of the achievement objectives have quite a narrow focus and lend themselves well to being included with other achievement objectives in one summary statement. A small number of achievement objectives are very wide in focus and require two summary statements in the map. Sometimes achievement
objectives have been moved from their curriculum strands into other strands that the asTTle teams believe are more appropriate. It was mentioned that achievement objectives relating to takotoranga ‘position’, listed in āhuahanga ‘geometry’ in the curriculum, were moved to inenga ‘measurement’. Some inenga achievement objectives concerning graphs and their interpretation have been moved to taurangi ‘algebra’. Other inenga achievement objectives concerning the calculation of the perimeters and areas of geometric shapes have been moved to āhuahanga.

Achievement objectives are shown by the numbers that appear after each summary statement which refer to the strand, the level, and achievement objective number in curriculum. These are given below by their English equivalents to save space and to avoid using two letter equivalents to distinguish between Māori strand names.

- a (algebra) taurangi
- g (geometry) āhuahanga
- m (measurement) ine
- n (number) tau
- s (statistics) tūponotanga

The number following the strand designation indicates the curriculum level; the number following the hyphen indicates the achievement objective number in the curriculum statement, e.g.,

N2-1 means the first level two number achievement objective.

A further designation ‘ep’ is used to indicate achievement objectives that derive from the Exemplar project. These are listed below:

- Make quarter and half turns (EP-1);
- Know about simple angles including 90º (right angle) and 180º, 30º, 45º and 60º (EP-2);
- Be able to use a protractor to measure angles to the nearest gradation (EP-3);
- Assign numerical probability values to simple events (EP-4);
- Use possible outcomes to assign probabilities (EP-5);
- Accurately describe aspects of the statistical situation represented by a statistical data display drawn by others (EP-6).

Achievement objectives are sometimes given in the map in two strands or in two sub categories (but never in two content areas). This was often due to it being difficult to separating the knowledge and application component without substantially re-writing the achievement objective.

Conclusion

The asTTle V3 Curriculum Map and Framework outlined in this report is adequate to meet the needs of teachers and represent the curriculum document. It should be used as the basis for developing asTTle V3 Pāngarau assessment materials for curriculum levels 2 to 6. This framework represents a revision and modification of
the asTTle V2 Pāngarau Framework to bring greater consistency of terminology with the curriculum, numeracy project, and exemplar project. The splitting of number and algebra content is permitted by the present asTTle structure and further refinement of content into Knowledge and Operations/Application is possible within the present asTTle structure if desired, provided sufficient items are created to support the creation of such tests.

There are a number of wider issues that this report has identified that merit further discussion at a much broader level. Specifically, differences in language, differences in structural alignment, and creation of additional achievement objectives suggest that further work needs to take place in the context of the present curriculum stocktake.

References


### Appendix 1 asTTle Pāngarau Curriculum Map Levels 2-6

#### TE MĀTAURANGA TAU

<table>
<thead>
<tr>
<th>Kaupapa Matua</th>
<th>Taumata 2</th>
<th>Taumata 3</th>
<th>Taumata 4</th>
<th>Taumata 5</th>
<th>Taumata 6</th>
<th>NCEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Te tau oti me te tau tōpū</td>
<td>ka pānuī, ka tuhi, ka raupapa, ka whakamārama i ngā tauoī matitoru (n2-1, n2-2, n2-3)</td>
<td>ka whakamārama i ngā tauoī katoa (n3-1)</td>
<td>ka whakamārama tau tōraro (n4-1)</td>
<td>ka huri: tau noa ↔ tau tānga ngahuru (n5-1)</td>
<td>ka mōhio ki ngā momo tau, arā, te tauoī, te tau tōpū, te tau whakahau me te tau whakahau-kore (n6-2)</td>
<td>Pāngarau 1.7</td>
</tr>
<tr>
<td></td>
<td>ka whakarite i te wāwāhanga moni, i tētahi tapeke moni rānei (ki te uka me te tāra) (n2-2, n2-3)</td>
<td>ka whakamārama, ka kimi i ngā tauoī (n4-2)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Te hautau, te tau-ā-ira, te ōrau, me te tau whakahau-kore</td>
<td>ka tuhi, ka whakaoī raupapa hautau (haurua, hautoru, hauwā, haurima) (n2-5)</td>
<td>ka whakamārama, ka raupapa i ngā tau-ā-ira (e3 ngā mati-ā-ira) (n3-2, n3-3)</td>
<td>ka huri: tau noa ↔ tau tānga ngahuru (n5-1)</td>
<td>ka huri: tau noa ↔ tau tānga ngahuru (n5-1)</td>
<td>ka huri: tau noa ↔ tau tānga ngahuru (n5-1)</td>
<td></td>
</tr>
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</table>
### TE PAHEKO TAU

<table>
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<th>Kaupapa Matua</th>
<th>Taumata 2</th>
<th>Taumata 3</th>
<th>Taumata 4</th>
<th>Taumata 5</th>
<th>Taumata 6</th>
<th>NCEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Te tau oti me te tau töpū</td>
<td>ka tuhi, ka whakaoti rapanga whakatairite (n2-4)</td>
<td>ka whakamahi i ngā meka whakarau matua (n3-5)</td>
<td>ka whakamārama harepe mō te tāpiri, te tango me te whakare (n4-10)</td>
<td>ka whakaoti rapanga e whai wāhi mai ana te tau-ā-ira me te orau (n5-5, n5-7, n5-8)</td>
<td>ka whakaoti rapanga e whai wāhi mai ana ngā paheko e whā (n2-10, n2-11)</td>
<td>ka tuhi, ka whakaoti rapanga tauoti e whai wāhi mai ana ngā paheko e whā (n2-10, n2-11)</td>
</tr>
<tr>
<td></td>
<td>ka whakaoti rapanga tauoti e whai wāhi mai ana ngā paheko e whā (n2-10, n2-11)</td>
<td>ka tuhi, ka whakaoti rapanga tauoti, tau-ā-ira e whai wāhi mai ana ngā paheko e whā (n3-6)</td>
<td>ka whakamārama i ngā tikanga raupapa paheko (n4-11)</td>
<td>ka whakaoti rapanga e whai wāhi mai ana ngā paheko e whā (n2-10, n2-11)</td>
<td>ka tuhi, ka whakaoti rapanga tauoti e whai wāhi mai ana ngā paheko e whā (n2-10, n2-11)</td>
<td>ka whakaoti rapanga e whai wāhi mai ana ngā paheko e whā (n2-10, n2-11)</td>
</tr>
<tr>
<td></td>
<td>ka whakaoti à-hinengaro tātaitanga tāpiri, tango hoki (n2-8)</td>
<td>ka whakamahi meka matua mō te tāpiri, te tango, me te whakarea (n2-7, n2-9)</td>
<td>ka kimī hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka whakaoti rapanga e whai wāhi mai ana te tau-ā-ira me te ōrau (n5-5, n5-7, n5-8)</td>
<td>ka whakaoti rapanga e whai wāhi mai ana ngā paheko e whā (n2-10, n2-11)</td>
<td>ka whakaoti rapanga e whai wāhi mai ana ngā paheko e whā (n2-10, n2-11)</td>
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<td></td>
<td>ka whakarite i te wāwāhanganga moni, i tētahi tapeke moni rānei (ki te uka me te tāra) (m2-2, m2-3)</td>
<td>ka whakamārama i ngā tikanga raupapa paheko (n4-11)</td>
<td>ka whakaoti rapanga e whai wāhi mai ana te tau-ā-ira me te ōrau (n5-5, n5-7, n5-8)</td>
<td>ka whakaoti rapanga e whai wāhi mai ana ngā paheko e whā (n2-10, n2-11)</td>
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<tr>
<td><strong>Te hautau, te tau-ā-ira, te ōrau, me te tau whakahau-kore</strong></td>
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<tr>
<td>ka tuhi, ka whakaoti rapanga hautau (haurua, hautoru, hauwhā, haurima) (n2-5)</td>
<td>ka tuhi, ka whakaoti rapanga tauoti, tau-ā-ira e whai wāhi mai ana ngā paheko e whā (n3-6)</td>
<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
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<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka whakaoti rapanga e whai wāhi mai ana te tau torunga me te tau tōraro (n5-6)</td>
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<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka whakaoti rapanga e whai wāhi mai ana te tau-ā-ira me te ōrau (n5-5, n5-7, n5-8)</td>
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<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka whakamārama, ka whakamahi ōwehenga (n5-9)</td>
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<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka whakaawhirihi, ka tātai pūtakerua (n5-3)</td>
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<tr>
<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka kimi rautaki hei whakaoti rapanga tau (n6-3)</td>
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<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka kimi hautau o tētahi tauoti, tau-ā-ira rānei hei whakaoti rapanga (n3-7)</td>
<td>ka whakatutuki i ngā paheko matua mō ngā hautau me ngā tau hanummi (n6-1)</td>
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| **Te whakatau tata** |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n2-6) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n3-4) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n4-7) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n5-4) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n6-4) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n6-4) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n6-4) |

| **Te whakatau tata** |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n2-6) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n3-4) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n4-7) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n5-4) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n6-4) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n6-4) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n6-4) |

| **Te whakatau tata** |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n2-6) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n3-4) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n4-7) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n5-4) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n6-4) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n6-4) |
| ka whakatau tata, ka tirotiro i te tika o tētahi otinga (n6-4) |
### TE TAURANGI

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<tr>
<th>Kaupapa Matua</th>
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<th>NCEA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Te tauira raupapa, te tauira tāruarua</strong></td>
<td>ka whakaoti whārite māmā pēnei (x + 14 = 38) (a3-5)</td>
<td>ka whakaoti whārite māmā pēnei (2x + 4 = 16) (a4-5)</td>
<td>ka whakamahihikanga whakauru (a5-5)</td>
<td>ka hanga, ka whakaoti whārite rārangi, whārite tukutahi, whārite pūrua māmā (a6-5)</td>
<td>ka hanga, ka whakaoti whārite rārangi, whārite tukutahi, whārite pūrua māmā (a6-5)</td>
<td><strong>Pāngarau 1.1</strong> Ka whawhe i ngā kīanga taurangi, ka whakaoti i ngā whārite rārangi, whārite pūrua hoki.</td>
</tr>
<tr>
<td><strong>Whawhenga taurangi</strong></td>
<td>ka whakaroa tauira raupapa, ka whakahaupure mo te tauira raupapa (a2-1)</td>
<td>ka kimi, ka whakamahi ture hei hanga tauira raupapa (a3-2)</td>
<td>ka kimi, ka whakamahi ture hei hanga tauira raupapa (a3-2)</td>
<td>ka kimi, ka whakamahi ture hei hanga tauira raupapa (a3-2)</td>
<td>ka kimi, ka whakamahi ture hei hanga tauira raupapa (a3-2)</td>
<td>ka mōhio ki te pāpātanga e whakaatua ana ki te kauwhata, ki te papatatauranga (m6-4)</td>
</tr>
<tr>
<td>Pāngarau Curriculum Framework &amp; Map</td>
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| Te kauwhata, Te pānga | ka whakaatu pānga ki te kauwhata (a2-2) | ka whakaatu pānga ki te kauwhata (a3-4) | ka tuhi, ka whakamāori kauwhata (a4-3) | ka tuhi whārite mō te kauwhata rārangī (te rōnaki me te haukoti) (a5-3, a5-4) | ka whakamāori, ka whakamahi pāpātanga (m5-3) | ka hanga, ka whakamāori kauwhata (a6-1) | ka tuhi kauwhata pānga rārangī, pānga pūrua, pānga taupū, pānga porowhita, pānga pūwerewere (a6-4) | ka whakaatu raraunga ki te āwhata ahu-2 (m6-2) | ka mōhio ki te rōnaki o tētuhi kauwhata, me te hononga ki te pāpātanga o te whāti (m6-3) | ka mōhio ki te pāpātanga e whakaaturia ana ki te kauwhata, ki te papatau rānei (m6-4) |

| Pāngarau 1.2 | Ka tuhi, ka whakamārama hoki i ngā āhuatanga o te kauwhata rārangī me te kauwhata pūrua.
### TE MĀTAURANGA ĀHUAHANGA

<table>
<thead>
<tr>
<th>Kaupapa Matua</th>
<th>Taumata 2</th>
<th>Taumata 3</th>
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<th>Taumata 5</th>
<th>Taumata 6</th>
<th>NCEA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Te koki</strong></td>
<td>ka whakaatu i te huri whakatekaraka me te huri kōaro (g2-4)</td>
<td>ka mōhio ki ngā koki māmā (30°, 45°, 60°, 90°, 180°) (ep-2)</td>
<td>whakamahi ine-koki hei ine koki ki te putu e tata rawa ana (ep-3)</td>
<td>ka whakamahi, ka whakamārama i ngā āhuatanga koki o ngā rārangī whakarara (g5-1)</td>
<td>ka kimi i ngā koki me ngā roa i roto i ngā rapanga whaitake ka taea te whakatauira ki te tapatapu (hoahoa āwhata, āhuatanga koki o te tapatapu, Pythagoras, őwehenga pākoki, ture aho, ture whenu) (g6-2)</td>
<td>Pāngarau 1.8</td>
</tr>
<tr>
<td></td>
<td>ka mōhio ki ngā huri kia kotahi haurua, kia kotahi hauwhā (ep-1)</td>
<td></td>
<td></td>
<td>ka whakamahi i ngā tikanga koki o te porowhita (rārangī pātata - pūtoto, koki porowhita weherua) (g5-3)</td>
<td>ka kimi i ngā koki me ngā tapa o tētahi tapatapu hāngai kāore e mōhio ana.</td>
<td></td>
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</tbody>
</table>

| **Te āhua ahu-2, ahu-3** | ka hanga, ka whakaitingoa, ka whakaaahua (āna ake kupu me ngā kupu Āhuahanga) i ngā āhua me ngā taonga o ia rā (g2-1) | ka whakaaahua i ngā taonga ahu-2, ahu-3 (reo Āhuahanga) (g3-1) | ka whakaaahua, ka hanga taurite e kītea mai ana he panoni (whakaata, hurihanga, nekehanga) (g3-6, g3-7) | ka whakaaahua, ka hanga taurite e kītea mai ana he panoni (whakaata, hurihanga, nekehanga) (g3-6, g3-7) | ka whakaaahua i ngā āhua māmā ki te pepa tukutuku (g3-8) | ka whakaaahua i ngā āhua māmā ki te pepa tukutuku (g3-8) |
|               | ka whakaaahua i ngā āhua māmā ki te pepa tukutuku (g3-8) | ka whakaaahua i ngā āhua māmā ki te pepa tukutuku (g3-8) | ka whakaaahua i ngā āhua māmā ki te pepa tukutuku (g3-8) | ka whakaaahua i ngā āhua māmā ki te pepa tukutuku (g3-8) | ka whakaaahua i ngā āhua māmā ki te pepa tukutuku (g3-8) | ka whakaaahua i ngā āhua māmā ki te pepa tukutuku (g3-8) |

**Pāngarau 1.8**

Ka whakamahi i te ture a Pythagoras me ngā pāpātanga pākoki hei kimi i te rahi o ngā koki me ngā tapa o tētahi tapatapu hāngai kāore e mōhio ana.
### TE PAHEKO ĀHUAHANGA

<table>
<thead>
<tr>
<th>Kaupapa Matua</th>
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<tbody>
<tr>
<td><strong>Te koki</strong></td>
<td>ka whakaatu i te huri whakatetaraka me te huri kōaro (g2-4)</td>
<td>whakamahi ine-koki hei ine koki ki te putu e tata rawa ana (ep-3)</td>
<td>ka whakamahi, ka whakamārama i ngā āhuatanga koki o ngā rārangi whakarara (g5-1)</td>
<td>ka kimi i ngā koki me ngā roa i roto i ngā rapanga whaitake ka taea te whakatauira ki te tapatoru (hoahoa āwhata, āhuatanga koki o te tapatoru, Pythagoras, ōwehenga pākoki, ture aho, ture whenu) (g6-2)</td>
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<td><strong>Pāngarau 1.4</strong></td>
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<td></td>
<td>ka mōhio ki ngā huri kia kotahi haurua, kia kotahi hauwhā (ep-1)</td>
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<td>ka whakamahi i ngā tikanga koki o te porowhita (rārangi pātapa - pūtoro, koki porowhita weherua) (g5-3)</td>
<td>ka kimi i ngā koki me ngā roa i roto i ngā rapanga whaitake ka taea te whakatauira ki te tapatoru (hoahoa āwhata, āhuatanga koki o te tapatoru, Pythagoras, ōwehenga pākoki, ture aho, ture whenu) (g6-2)</td>
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</table>

<p>| <strong>Te hangarite, te panoni</strong> | ka whanga i te whakaahua i te tauira e whai wāhi mai ana te nekehanga, te hangarite huri, me te hangarite whakaata (g2-3) | ka whakaahua, ka hanga tauri e kitea mai ana he panoni (whakaata, hurihanga, nekehanga) (g3-6, g3-7) | ka whakamahi i ngā tikanga hangarite o te taparau rite (g4-6) | ka whakamahi i ngā āhuatanga koki o ngā taparau (g5-2) | ka tuhi, ka whakaahua i ngā āhuatanga o te porowhita (g6-5) | | <strong>Pāngarau 1.9</strong> | Ka tirotiro i ngā āhuatanga o te taparau me te rārangi, hei kimi i ngā mea käore e mōhiotia ana, hei tātari hoki i ngā āhua. |
|               | ka whakanui i ngā āhua māmā ki te pepa tukutuku (g3-8) | | ka whakamahi i ngā hangarite me ngā āhuatanga koki o ngā taparau (g5-9) | ka kimi, ka whakamahi tauri (g5-8) | ka whakaahua i te otinga e ētahi panoni e rua ruku atu rānei (g6-8) | | | |</p>
<table>
<thead>
<tr>
<th>Te hanga, te tuhi</th>
<th>ka hanga, ka whakaingoa, ka whakaahua (āna ake kupu me ngā kupu Āhuahanga) i ngā āhua me ngā taonga o ia rā (g2-1)</th>
<th>ka hoahoa, ka hanga pouaka (g3-2)</th>
<th>ka whakamahi ruri, ine-koki, tāporowhita ki te tuhi āhua (g4-1)</th>
<th>ka hanga koki āhangai, rārangi whakarara, rārangi āhangai, porowhita, taparau ngāwari, weherua tapatoru, rārangi weherua āhangai, teitei, weherua koki (g5-4)</th>
<th>ka tuhi, ka whakamārama i ngā whakaahu-2-tanga o ngā mea āhu-3 (g6-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Te āhua āhu-2, āhu-3</td>
<td>ka tātai paenga (porowhita, tapawhā āhangai, tapatoru) (m4-2)</td>
<td>ka tātai āhu (tapawhā āhangai) (m4-2)</td>
<td>ka kimi i te paenga, te horahanga me te rōrahi, ka whakautau i te tika (ngā tepe) o te otinga (m5-1)</td>
<td>ka kimi i ngā koki me ngā roa i roto i ngā rapanga whatakite ka taea te whakatauira ki te tapatoru (hoahoa āwhata, āhuatanga koki o te tapatoru, Pythagoras, āwehenga pākoki, ture aho, ture whenu) (g6-2)</td>
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<td></td>
<td>ka tātai horahanga (tapawhā āhangai) (m4-2)</td>
<td>ka tātai rōrahi (mataono) (m4-2)</td>
<td>ka whakamaiori, ka whakamahi pāpātanga (m5-3)</td>
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<tr>
<td>Kaupapa Matua</td>
<td>Taumata 2</td>
<td>Taumata 3</td>
<td>Taumata 4</td>
<td>Taumata 5</td>
<td>Taumata 6</td>
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<tr>
<td><strong>Te wā</strong></td>
<td>ka pānui ka whakamahi i te meneti, te hāora, te rā, te wiki, te marama me te tau (m2-4)</td>
<td>ka pānui, ka whakamāori kōrero mō te wā (m3-3)</td>
<td>ka pānui, ka hanga wātaka (m4-3)</td>
<td>ka whakaoti tātaiāngā mō te wā (ine te whai wāhi mai o te pūnaha wā 24) (m4-5)</td>
<td>ka whakaoti rapanga ine (m5-2)</td>
</tr>
<tr>
<td><strong>Te ngahuru</strong></td>
<td>ka whakamahi waeine ngahuru mō te roa, te papatipu me te kītanga (m2-1)</td>
<td>ka whakatau tata i te roa, te papatipu, te horahanga, te kītanga me te mahana (m3-1)</td>
<td>ka ine āwhata ki te tawhata tata rawa (m4-1)</td>
<td>ka pānui, ka hanga āwhata, tūtahi hoki (m4-3)</td>
<td>ka whakaoti rapanga ine (m5-2)</td>
</tr>
<tr>
<td><strong>Te takotoranga</strong></td>
<td>ka whakaahua, ka whakamāori i te takotoranga (ngā kupu ake mō te ahunga me te tawhiti) (g2-2)</td>
<td>ka tuhi, ka whakamāori mahere āwhata māmā (g3-5)</td>
<td>ka whakamahi i te ahunga me te taunga (g4-5)</td>
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Pāngarau 1.3
Ka whakaoti rapanga e whai wāhi mai ana ngā kaupapa ine o ia rā, tae atu hoki ki ngā āhua me ngā tūporo māmā.
### TE TŪPONOTANGA

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<tr>
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<th>NCEA</th>
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<tbody>
<tr>
<td>Te whakamāori</td>
<td>ka whakarite tūhuratanga tauanga mō tētahi tāpae tanga kōrero (s3-1)</td>
<td>ka kohikohi raraunga e hāngai ana (s4-2, s4-4)</td>
<td>ka kimi tūponotanga (s5-8, s5-9, s5-11)</td>
<td>ka matapae, ka whakamātau, ka whakamārama putanga o tētahi whakamātau tūponotanga māmā (s5-10)</td>
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<td></td>
<td>ka matapae putanga (s3-6)</td>
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<td></td>
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<td></td>
<td>ka kohikohi raraunga e hāngai ana (s4-2, s4-4)</td>
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<tr>
<td></td>
<td>ka matapae putanga (s3-6)</td>
<td></td>
<td>ka kimi tūponotanga (s5-8, s5-9, s5-11)</td>
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<td></td>
<td>Tuhia he tau tūpono mō ngā pāpono māmā (ep-4)</td>
<td></td>
<td>ka whakatau tata i te auau, ka whakaatu ki te āwhata (s4-8)</td>
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<tr>
<td></td>
<td>ka matapae putanga (s3-6)</td>
<td>ka whakamahi hoahoa rākau (s4-9)</td>
<td>ka matapae, ka whakamātau, ka whakamārama putanga o tētahi whakamātau tūponotanga māmā (s5-10)</td>
<td>ka whakamahi papa raraunga taurangi-rau, ka kimi tūponotanga (s6-8)</td>
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<td></td>
<td>Tuhia he tau tūpono mō ngā pāpono māmā (ep-4)</td>
<td>Whakamahi i te hua tērā pea ka puta mai hei tuhi i te tūpono. (ep-5)</td>
<td></td>
<td>ka whakatau tūponotanga mai i tētahi mahinga ĭātuke, motuhake hoki (s6-9)</td>
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<td></td>
<td>ka kimi tūponotanga whakawhirinaki mā te whakamahi hoahoa rākau (s6-10)</td>
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<td></td>
<td>ka kimi tūponotanga whakawhirinaki mā te whakamahi hoahoa rākau (s6-10)</td>
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</tbody>
</table>

| Pāngarau 1.6 | Ka whakamahi raraunga hei tātai auau ōwehe, hei whakatau tata anō i te tūponotanga, he tātai hoki i te tūponotanga pāngarau. |

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Christensen. I., Trinick, T., & Keegan, P. J.
### TE TAUANGA

<table>
<thead>
<tr>
<th>Kaupapa Matua</th>
<th>Taumata 2</th>
<th>Taumata 3</th>
<th>Taumata 4</th>
<th>Taumata 5</th>
<th>Taumata 6</th>
<th>NCEA</th>
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</thead>
<tbody>
<tr>
<td>Te horapa, Te whakaari</td>
<td>ka kohikohi, ka whakaatu raraunga ki te kauwhata whakaahua, ki te tūrohi tatau, ki te kauwhata pou rānei (s2-1)</td>
<td>ka whakarite ōhurutanga tauanga mō tētahi ōhure ō ūrātanga kōrero (s3-1)</td>
<td>ka kohikohi raraunga motumotu, ka whakaatu ki te kauwhata rau-tō, kauwhata ira, kauwhata tāhei rānei (s3-2)</td>
<td>ka whakarite, ka whakututuki ōhurutanga tauanga – ka whirihirihī e ngā tauarangi he tiroiro, ka kēwhihī i te ōhure ō ūrātanga, ka parahau i te ūrātanga (s5-1, s5-2)</td>
<td>ka whakarite ōhurutanga tauanga (s4-1)</td>
<td>ka whakatakoto pātaia tauanga, ka tauhui tikanga kohi raraunga, ka kohi raraunga, ka whakaatu raraunga ki ngā whakaaari raraunga e hāngai ana (s6-1)</td>
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<td>ka kōwhihī, ka hanga i te whakaaari raraunga tūtika (tūrohi aua, kauwhata pou, kauwhata pouhere, kauwhata ārangi) (s4-3, s4-4)</td>
<td>ka kimi inenga raraunga (tōhārite, tau waenga, tau tānūi, inē-whānui) (s5-3)</td>
<td>ka hoahoa, ka whakamāhi āwhata mō te raraunga kounga (m4-4)</td>
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<td>ka hoahoa, ka whakamāhi āwhata mō te raraunga kounga (m4-4)</td>
<td>ka hoahoa, ka whakamāhi āwhata mō te raraunga kounga (m4-4)</td>
<td>ka whakatakoto pātaia tauanga, ka tauhui tikanga kohi raraunga, ka kohi raraunga, ka whakaatu raraunga ki ngā whakaaari raraunga e hāngai ana (s6-2)</td>
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<td>Te whakamāori</td>
<td>ka whakamārama i āna whakaaari raraunga (s2-2) ka matapaki whakaaari raraunga (s2-3)</td>
<td>ka whakamārama (ki āna ake kupa) i ngā āhuatanga kōhure o tētahi whakaaari raraunga (s3-3)</td>
<td>ka matapaki i ngā hua ka puta i te ōhurutanga tauanga (s3-4)</td>
<td>Āta whakaatu i ngā āhuatanga kōhure o te whakaaari raraunga (i tuhia ai e ētahi atu) (ep-6)</td>
<td>ka whakapa whakaaaro ki ngā hua o tētahi ōhurutanga tauanga (s4-7)</td>
<td>ka matapaki raraunga motumotu, motukore hoki (s5-4)</td>
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<td>ka whakamārama i ngā āhuatanga kōhure o tētahi whakaaari raraunga (mōwaho, rāpo, tuaritanga) (s4-5)</td>
<td>ka whakamāhi whakatauranga tauanga he i whakatairite raraunga (s5-5)</td>
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<td>ka arotake whakaaari raraunga (s4-6)</td>
<td>ka whakaputa whakaaaro ki ngā taurangi tanga houanga, ngā hē me ngā aukati o tētahi ōhurutanga tauanga (s5-5)</td>
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<td>ka tāpae whakaaaro ki ngā hua o tētahi ōhurutanga tauanga (s4-7)</td>
<td>ka whakatakoto whakaaaro e pai ake ai ngā āhuatanga o tētahi ōhurutanga tauanga (s6-7)</td>
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<td>ka tāpae, ka parahau whakatau e pā ana ki ngā tauarangi o tētahi ōhurutanga tauanga (s6-5)</td>
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<td>ka whakatahia tauanga motuhake o ngā raraunga tauanga tauanga (s6-6)</td>
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</tbody>
</table>

### Pāngarau 1.5

Ka whakamahi i ngā tikanga tauanga māmā he i whakai i te tātai pāia mō ngā raraunga tauarangi rāua, hei whakamāorihinui i tētahi pūrongo tauanga.