

Pāngarau

Unit standard	32412
Title	Te whakamahi pāngarau hei whakatutuki i ngā hiahia tātai o ngā pūāhua whai take / Use mathematics and statistics to meet the numeracy demands of a range of situations
Domain	[TBC]
Number of credits	10

There are two alternative methods of assessment for this standard, Option One or Option Two.

EITHER: OPTION ONE

Method of assessment	Common assessment activity (CAA)
Assessment medium	<ul style="list-style-type: none">• Online / web-based• Paper-based (by exception)
Period of assessment	20–24 September 2021
Session duration	60 minutes (but extra time allowed if necessary – see below)

Assessment format

A “common assessment activity” (CAA) is developed and marked by NZQA, and administered by a kura / tertiary provider in a single session on a date they are to nominate during the period of assessment specified above. The assessment is designed to be completed in 60 minutes by most ākonga, but kura may allow as much time as necessary for ākonga to complete the assessment in one session.

Ākonga will be required to respond to questions based on real-world contexts that relate to a range of experiences relevant to everyday life, such as home, whānau, workplace, community and personal activities and projects.

The questions will be presented in te reo Māori with a translation in English. Definitions of pāngarau terminology that may be unfamiliar to ākonga will be supplied, in te reo Māori, from the [Paekupu](#) glossary. Responses must use Māori language and terminology where this is appropriate, but ākonga will not be penalised for using English-language terms where they are not familiar with Māori terminology.

Questions will sample combinations of the four process ideas (outcomes) and seven content ideas identified in the Pāngarau Learning Matrix, and will require multiple-choice or short-answer responses.

Equipment required

Ākonga must have a ruler and a calculator. A standard (non-scientific or non-graphing) calculator will suffice, but any calculator on the [Approved Calculator List](#) may be used.

Conditions of assessment

Ākonga must complete their assessment individually under kaiako supervision, in accordance with the NCEA [Assessment and Examination Rules and Procedures](#). Ākonga are not permitted to access any resources other than those supplied in the assessment.

Other information

See at end of Option Two.

OR: OPTION TWO

Method of assessment	Portfolio
Assessment medium	Digital submission (PDF, and / or digital audio or video file)
Period of assessment	Kura must submit portfolios to NZQA by 24 September 2021

Assessment format

Ākonga will present a collection of naturally occurring evidence from activities relating to a range of situations relevant to their everyday life. The range of evidence included in the portfolio must meet the requirements of the performance criteria in all four outcomes in the standard:

All resource materials and tasks must be presented in te reo Māori.

Ākonga evidence must be in te reo Māori and include at least TWO of the following three forms: written, oral, or visual.

The activities must:

- be completed independently by the ākonga
- allow the ākonga to formulate a pāngarau approach to problem-solving in a given situation, making their own decisions about how they use the information supplied in order to do this
- provide opportunities for the ākonga to independently identify the relevant socio-cultural practices underpinning the situation
- allow the ākonga to provide evidence from each of the seven content ideas identified in the Pāngarau Learning Matrix (evidence from more than one content idea may come from a single activity)

Portfolio specifications

The evidence can be presented as a digital audio or video file, or as a PDF, or as a combination of both. (Paper-based evidence must be scanned and submitted as a PDF.)

A *Portfolio of Evidence Cover Sheet* must be completed by the kaiako for each ākonga portfolio submitted for assessment.

Conditions of Assessment

Ākonga must complete their work for assessment independently, in accordance with the NCEA [Assessment and Examination Rules and Procedures](#). A portfolio must be entirely the work of the ākonga, and the kaiako should take care to limit their discussion of and feedback on the work itself to avoid compromising the authenticity of the evidence presented by the ākonga and therefore the validity of the assessment.

Other information

As well as *Te Marautanga o Aotearoa*, assessors of this standard should be familiar with:

- The Unit Standard US32412
- The NCEA Pāngarau Learning Matrix

These and other documents can be found on the [Pāngarau](#) page of the [NCEA website](#).

Portfolio Cover Sheet

Standard 42412: Te whakamahi pāngarau hei whakatutuki i ngā hiahia tātai o ngā pūāhua whai take

Level 1, Credits 10, Version 1

This cover sheet **must** accompany each **portfolio** of evidence submitted for assessment.

Ākonga: _____ Education organisation: _____

ASSESSMENT TASK SUMMARY	Confirm (Y/N) that each task requires evidence of:					
Clearly identify: <ul style="list-style-type: none"> • the activity from which the evidence was generated, and • the content idea(s) covered by the task 	Task involves a meaningful situation	Formulating the situation	Employing mathematics and statistics	Interpreting the reasonableness of responses	Communicating mathematically appropriate to the situation	Identifying the socio-cultural practices underpinning the situation
e.g.						
1.						
2.						
3.						
4.						
5.						

Insert extra rows if needed.

Attach the activities used to generate evidence and the ākonga evidence.

Attestation by kaiako:

I attest that: the information given in this cover sheet is accurate; the ākonga produced the evidence him/herself, without undue assistance.

_____ date: _____

Checklist for portfolio evidence

Standard 42412: Te whakamahi pāngarau hei whakatutuki i ngā hiahia tātai o ngā pūāhua whai take

Standard requirements	Check that the ākonga has:	✓/x and page/ task reference
Outcome 1	Formulated mathematical and/or statistical approaches to solving problems in a range of meaningful situations from a sample of the seven content ideas in the Pāngarau Learning Matrix.	
1.1	Selected an appropriate operation, representation, variable and/or method to solve the problem(s).	
Outcome 2	Used mathematics and statistics to address the demands of a range of meaningful situations and explained the reasonableness of mathematical and statistical responses to situations.	
2.1	Selected and used mathematical/statistical procedures that are appropriate to the situation.	
2.2	Described whether the outcomes and/or approaches were reasonable in the situation.	
Outcome 3	Communicated mathematically in te reo Māori appropriate to the situation.	
3.1	Communicated pāngarau ideas using specialised terms, syntax and semantics (pragmatics) appropriate to the situation.	
3.2	Communicated pāngarau ideas in a variety of ways (e.g. written, spoken, visual, using technology)	
Outcome 4	Identified the relevant socio-cultural practices underpinning the mathematical situation.	
4.1	Contextualised mathematics/statistics in a socio-culturally relevant situation.	
4.2	Communicated the impact or goal of mathematical/statistical response to situations.	
4.3	Identified the values, beliefs, relationships, and social practices that underpin numeracy situations.	

Portfolio Sample Activities

Pāngarau Pilot 2021

Pāngarau 32412

Option Two: Portfolio

1. Teacher guidelines

1.1 Introduction

Unit Standard: Pāngarau 32412: Te whakamahi pāngarau hei whakatutuki i ngā hiahia toi tātai o ngā pūāhua whai take

Credits: 10

The four sample assessment activities supplied in this document are intended to enable kaiako to collect valid evidence against the Pāngarau standard. Kaiako may use their own assessment activities if wished.

These sample activities may be adapted to a range of other mathematical situations and contexts using the Pāngarau learning matrix.

Kaiako need to be very familiar with:

- Pāngarau Unit Standard 32412. The outcomes and performance criteria, and the guidance information contain definitions and requirements that are crucial when interpreting the standard.
- Pāngarau Learning Matrix. This document outlines the benchmark ākonga should reach in each of the Pāngarau content areas and clarifies content that is beyond the benchmark.
- Pāngarau Assessment Specifications. These outline the format and conditions of the assessment.
- Pāngarau submission checklist. This must be completed and submitted with portfolio assessment material for each ākonga.

1.2 Context/setting

Ākonga will be assessed on their numeracy knowledge and how well they use mathematics and statistics to meet the numeracy demands of meaningful situations within a Māori context. The intention is that ākonga will be assessed on mathematics and statistics knowledge that they have encountered as part of the teaching and learning programme.

Kaiako will need to select or create numeracy tasks in te reo Māori that ensure that achievement of the standard is possible.

The sample assessment activities provided are only examples to show how numeracy evidence can be collected. They have been designed to ensure that ākonga will communicate their Pāngarau ideas in a variety of ways.

These sample activities assessments do not cover the full range of important learning required in a pāngarau teaching programme.

1.3 Conditions

Ākonga need to be given written notification about the way that assessment will be carried out.

Ākonga must undertake these assessment tasks individually.

Responses must be in te reo Māori, where this is appropriate, but ākonga will not be penalised for using English-language terms where they are not familiar with Māori terminology.

Portfolio submissions must each be accompanied by the Pāngarau portfolio checklist and authenticity statement.

Follow your kura internal guidelines for storing ākonga work for assessment purposes.

2. Tohotohu mā te Ākonga

2.1 Introduction/He Whakatakinga

He mahi takitahi tēnei aromatawai ā-akomanga. E whā ngā ngohe o tēnei aromatawai ā-kōpaki. Ko te take o ia ngohe ko te whakamahi i te pāngarau me te tauanga hei whakaoti rapanga tātai mō ngā pūāhua kei roto i ngā horopaki Māori.

This assessment is to be completed individually and is designed for in-class work. This assessment has four tasks:.

- Ngohe 1: Ngā Tauanga Hākinakina
- Ngohe 2: Te Haere ki Rarotonga
- Ngohe 3: Te ahunga ki ngā moutere
- Ngohe 4: Te Peita Whare

You may present your work using software such as excel, word (or similar) and computer aided design software. Alternatively, you may use lined and grid paper to create your portfolio evidence.

Ngohe 1: Ngā Tauanga Hākinakina

2.2 Te Horopaki

Ko tāu mahi i tēnei ngohe aromatawai he whakatutuki tūhuratanga tauanga e hāngai ana ki tētahi whakataetae hākinakina, pērā i te Ki-ō-Rahi, ki te Waka Ama rānei.

Rauemi: He ripanga tauanga o te waka ama, o tētahi whakataetae hākinakina rānei.

2.3 Hei Mahi 1

1. Mā te kaiako e hoatu ki a koe ngā raraunga e hāngai ana ki te whakataetae e tūhura ana koe. Āta tirohia ngā raraunga ka whakaaro ai i ētahi pātai tauanga e rua hei tūhura māu.
2. Ko te take o ngā pātai, ko te whakatairite i ētahi o ngā rōpū raraunga. Tēnā pea he raraunga whakarōpū (category data), he raraunga tau (numerical data).
3. Tuhia kia rua ngā pātai. He pātai whakatairite, he pātai pānga, he pātai tūhura whakarāpopoto.
4. Mō ia pātai, me tuhi anō hoki:
5. Te taurangi e tūhuratia ana;
6. Ngā rōpū raraunga e whakatairitea ana.
7. Hoatu āu pātai hei tiroiro mā tō pouako. Mēnā e tika ana te āhua o ngā pātai, ka tukuna koe ki te wā mahi tuarua. Ki te kore e tika te āhua o tētahi o ngā pātai, mā tō pouako koe e paku āwhina.

2.4 Papakupu

Pātai whakatairite – comparison question

Pātai tūhura whakarāpopoto – summary investigative question

Pātai pānga – relationship question

Raraunga whakarōpū – category data

Raraunga tau – numerical data

2.5 Hei Mahi 2

Whāia ngā tikanga tūhuratanga tauanga hei whakaputa whakataunga e hāngai ana ki te pātai. Arā:

1. Kōwhiria tētahi o ngā pātai i oti ai i a koe i te wā mahi tuatahi, hei tūhura māu.

Te tātari i ngā raraunga

2. Tuhia kia kotahi te kauwhata (nui ake rānei) e hāngai ana ki tāu pātai hei whakaatu i ētahi āhuatanga rerekē o ngā raraunga.
3. Whakaaturia ngā tātaitanga tauanga e hāngai ana ki te tūhuratanga.
4. Whakamāramatia, whakatairitea ngā āhuatanga e kitea mai ana i ngā tuari raraunga, pērā i te ia o ngā raraunga, ngā tauira, ngā āhuatanga kōhure, me te āhua o ngā tuari raraunga.
5. Ko te aha te painga o tēnei whakataetae ki ngā ākonga?
6. Ko te aha ngā tikanga, ngā uara Māori kei ngā whakataetae nei?

Te whakataunga

7. Tuhia he whakataunga hei whakarāpopoto i ngā whakakitenga o tāu tūhuratanga.

[Ākonga evidence: Excel Spreadsheet and Word doc summary or insert lined paper here]

3. Ngohe 2: Te Haere ki Rarotonga

3.1 Te Horopaki

Hei tēnei tau kei te tū te whakataetae waka ama o Te Moana-nui-a-Kiwa ki Rarotonga. Kei te whakarite a Mahina rāua ko Kahu o te kura o te Tihi o Manono kia kohia pūtea kia haere ai rāua ki te whakataetae i te taha o tētahi kapa o te kura. E rua wiki te roa ki Rarotonga noho ai, ā, ko tētahi wāhanga o te haerenga, ko te haere ki ngā takiwā motuhake e 3 o Rarotonga tiro tiro ai. Ka noho ki te taha o te iwi kāinga o ia takiwā motuhake o reira mō tētahi pō.

E \$875 hei utu i te waka rererangi mō te tangata kotahi kia haere ki Rarotonga me te hoki mai ki Aotearoa. Ko te whakahekenga utu mō te haerenga ā-tira ko te 15%.

\$95 te utu ia rā mō te hotera mō te tangata kotahi. Ka tuku koha ki ngā whānau o te hau kāinga mō ngā nohonga ki ngā takiwā motuhake. Māhau e whiriwhiri te rahi o te koha mō te tira me te rahi mā Mahina rāua ko Kahu.

Ka hiahia pūtea hoki hei utu i ngā mea noa o ia rā, pērā i te hua rākau, inu wai, te aha. Māhau e whiriwhiri te rahi o te putea hei hokohoko rawa.

E \$850 i te wiki te utu ka riro i a Mahina i tana mahi. Ka penapena ia i te $\frac{2}{5}$ o tēnei moni i ia wiki, hei utu i tana haere ki te whakataetae.

E \$790 i te wiki te utu ka riro i a Kahu i tana mahi. Ka penapena ia i te 35% o tēnei moni i ia wiki, hei utu i tana haere ki te whakataetae.

3.2 Hei Mahi 1

1. Whiriwhiria te rahi o te pūtea mā rāua hei utu i tā rāua haerenga.
2. Whiriwhiria te roa o te wā hei penapena rāua i tēnei pūtea.
3. Whakaaturia ngā whiriwhiringa katoa, me ngā whakamārama i te taha ki te reo Māori.
4. Ko te aha te whanaungatanga kei waenganui i ngā moutere o Rarotonga me Aotearoa?
5. Whakaingotia ētahi takiwā motuhake o Rarotonga e whai pānga ki Aotearoa, he aha i motuhake ai?
6. Rangahaua ngā ritenga, ngā rerekētanga kei waenganui i ngā kawa me ngā tikanga o ngā moutere o Rarotonga me tōu ake hapū/iwi pērā i te koha, te whakaeke ki ngā marae, ngā wāhi motuhake, te aha kē atu.

3.3 Hei Mahi 2

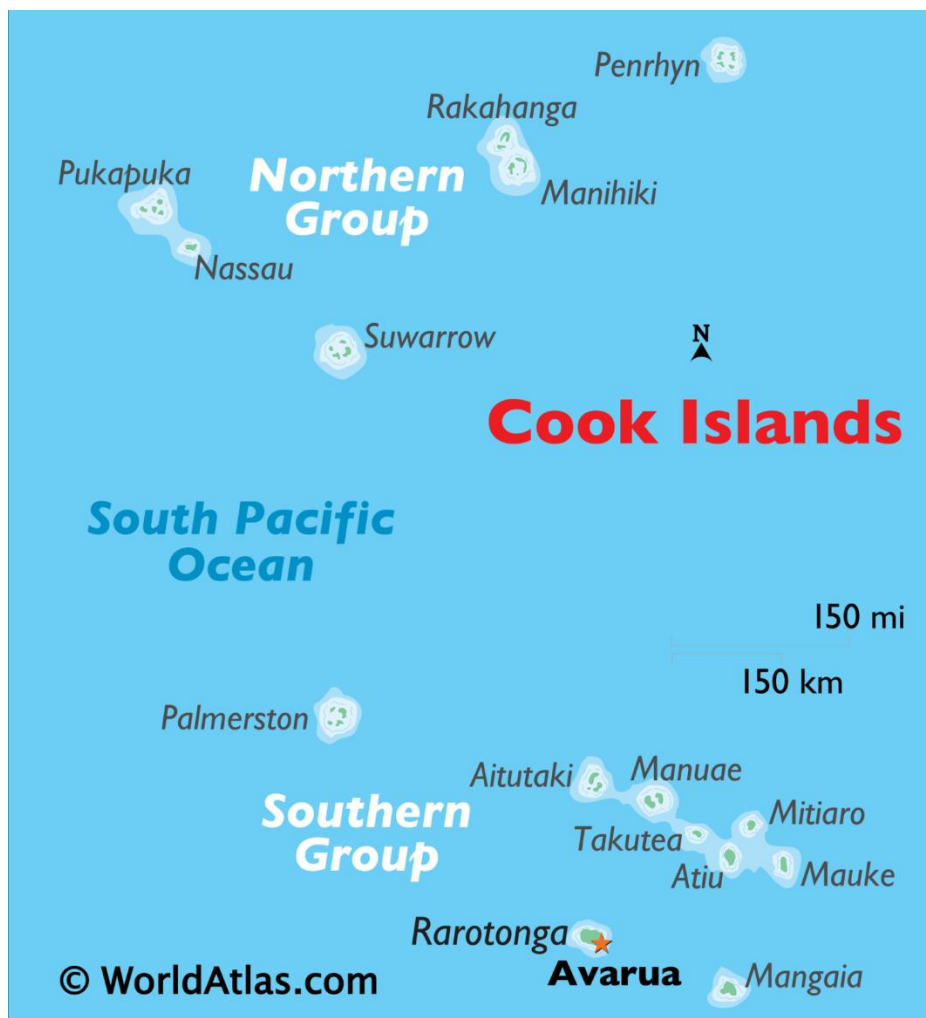
1. 10 hāora te tōmua atu o te wā i Rarotonga i te wā i Aotearoa. Ka wehe atu a Mahina rāua ko Kahu i te 2130 hāora i te 1 o Poutū-te-rangi, ki te haere ki Rarotonga. E 4 hāora te roa o te haerenga mā runga waka rererangi. He aha te taima ka tau mai tō rāua waka ki Rarotonga?
2. Ka taea te kawe 20kg te taumaha o te kawenga (luggage) mā tēnā, mā tēnā ki runga i te waka rererangi. Heoi, kei a Mahina 24.50kg. \$10.50 te utu mō ia kg kei runga ake i te 20kg. Pēhea te utu ake mō Māhina?

[Ākonga evidence: excel spreadsheet of cost per person and word doc for cost summary and justification or insert lined paper here]

4. Ngohe 3: Te Ahunga ki ngā moutere

4.1 Hei Mahi 1

He tohunga rawa ngā mātua tīpuna ki te whakaterere waka – he tikanga ā rātou hei whakaatu i te ahunga me te taunga o tētahi haere. Heoi, i te rōpū i Rarotonga ka whakaritea kia haere ki ngā wāhi rongonui ki te moutere o Aitutaki, Mauke, me Mangaia. Ka koha mai tētahi kamupene o Aotearoa i te utu mō te poti e kawē ana rātau ki tēnā moutere ki tēnā. Ka riro i a Mahina rāua ko Kahu i te mahi whakariterite he ahunga (ara haere) kia tae atu ki ngā moutere e 3. Mā te hau kāinga o ia moutere e manaakitia rātau, heoi ka tuku koha. Ko tō rātau koha ki Mauke ko te whakarākei whare. Whakakāia te ahunga kei roto i te tūtohi o ia moutere kia tae tika mai ki tēnā moutere ki tēnā me te parahautia he aha i whai i tēnā ahunga.



4.2 Hei mahi 2

Ko te mahi tuarua a Māhina rāua ko Kahu ko te whakamōhio atu ki te rōpū te roa o ia whakawhitinga moana ki waenganui i ngā moutere. Ka 9 tere moana (knots) te tere o te haere o te pōti ka kawē i te rōpū. He rite te 1 tere moana (knot) ki 1.85 km/h. Whakamahia te āwhata i runga i te mahere ki te whakatautata i te roa o ia whakawhitinga.

4.3 Tūtohi Whakautu

[student evidence: word doc or filled in table below]

<i>Mai i ...</i>	<i>Ki...</i>	<i>Ko te ahunga kapehu, te ahunga tākiri, te taunga</i>	<i>Te roa o te whakawhitinga</i>
Rarotonga	<i>te Motu o aitutaki</i>		
	<i>Mauke</i>		
	<i>Mangaia</i>		

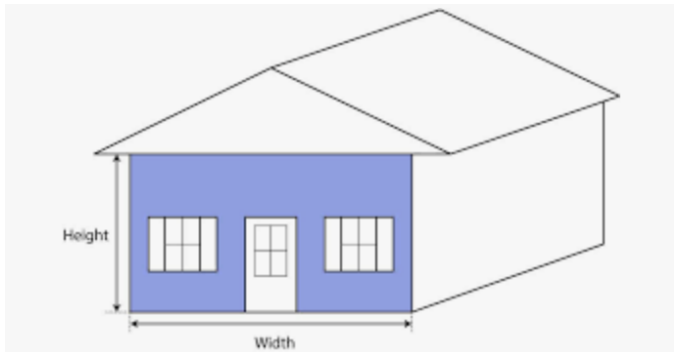
<i>Aitutaki</i>	<i>Rarotonga</i>	
	<i>Mauke</i>	
	<i>Mangaia</i>	

Mauke	<i>Rarotonga</i>	
	<i>Aitutaki</i>	
	<i>Mangaia</i>	

5. Ngohe 4: Te Haere ki Mauke

5.1 Hei Mahi 1

Ā te wā ka tae atu te kapa waka ama ki Mauke, he peita whare te mahi tākoha ki te hāpori. Tirohia tēnei hoahoa whare kei runga i te moutere o Mauke.



2m te teitei, 3m te whānui,

1. Tuhia he pikitia āwhata o te whare
2. Tuhia ngā tirohanga mua, tirohanga mauī, tirohanga-ā-manu
3. Kei te hiahia te whānui ki te paeta i te whare. Kimihia te horahanga o te tuanui me ngā pakitara

1l peita = 3.5 m pūrua

Kimihia te maha o ngā rita ka hokona e te rōpū hei tākoha ki te moutere. Ka hokonga ki Rarotonga ki mua mai i te haere ki Mauke. He peita whero mō te tuanui, he peita mā mo ngā pakitara. Kauga e wareware ki te tāpiri i tēnei koha ki te tapeke pūtea mō te haerenga.

[student evidence: CAD drawing or insert grid paper for scale drawing and different perspectives of the house]

5.2 Hei Mahi 2 Te Whakarite tohu

1. Ki mua mai i te haerenga o te kapa ki Mauke, i whakaaro rātau kia whakarite he tohu maumahara kia hoatu ki te hau kāinga o Mauke.
2. Nā reira, whakaritea he tohu maumahara e whiwhi ai kia 2 nui ake rānei ngā momo panoni, arā te whakaatahanga, te nekehanga, te huringa, te whakarahinga rānei.

[student evidence: CAD drawing or insert grid paper for transformation geometry-based design]