

## Achievement Standard

<b>Subject Reference</b>	Mathematics and Statistics 1.10		
<b>Title</b>	Investigate a given multivariate data set using the statistical enquiry cycle		
<b>Level</b>	1	<b>Credits</b>	4
		<b>Assessment</b>	Internal
<b>Subfield</b>	Statistics and Probability		
<b>Domain</b>	Statistics		
<b>Status</b>	Registered	<b>Status date</b>	9 December 2010
<b>Planned review date</b>	31 December 2018	<b>Date version published</b>	20 November 2014

This achievement standard involves investigating a given multivariate data set using the statistical enquiry cycle.

### Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Investigate a given multivariate data set using the statistical enquiry cycle.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate a given multivariate data set using the statistical enquiry cycle, with justification.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate a given multivariate data set using the statistical enquiry cycle, with statistical insight.</li> </ul>

### Explanatory Notes

- This achievement standard is derived from Level 6 of *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, and is related to the material in the *Teaching and Learning Guide for Mathematics and Statistics*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>. The achievement standard is aligned to the following achievement objectives taken from the Statistical Investigation thread of the Mathematics and Statistics learning area:
  - plan and conduct surveys and experiments using the statistical enquiry cycle
    - determining appropriate variables
    - cleaning data
    - using multiple displays, and re-categorising data to find patterns, variations, in multivariate data sets
    - comparing sample distributions visually, using measures of centre, spread, and proportion
    - presenting a report of findings;

- plan and conduct investigations using the statistical enquiry cycle
  - justifying the variables used
  - identifying and communicating features in context (differences within and between distributions), using multiple displays
  - making informal inferences about populations from sample data
  - justifying findings, using displays and measures.

This standard is also derived from *Te Marautanga o Aotearoa*. For details of the *Marautanga* achievement objectives to which this standard relates, see the [Māori version](#) of the standard.

- 2 *Using the statistical enquiry cycle* involves using each component of the statistical enquiry cycle to make comparisons.

*Using the statistical enquiry cycle with justification* involves linking aspects of the statistical enquiry cycle to the context and the population and making supporting statements which refer to evidence such as summary statistics, data values, trends or features of visual displays.

*Using the statistical enquiry cycle with statistical insight* involves integrating statistical and contextual knowledge throughout the statistical enquiry cycle, and may involve reflecting on the process or considering other explanations for the findings.

- 3 Students need to be familiar with the statistical enquiry cycle to investigate a given multivariate data set, which involves:
- investigating data that has been collected from a survey situation
  - posing an appropriate comparison question using a given multivariate data set
  - selecting and using appropriate display(s)
  - giving summary statistics such as the five summary values (minimum, maximum, median, quartiles)
  - discussing features of distributions comparatively, such as shape, middle 50%, shift, overlap, spread, unusual or interesting features
  - communicating findings, such as informal inference and supporting evidence, in a conclusion.
- 4 Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards>.

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### Replacement Information

This achievement standard and AS91036 replaced unit standard 5240 and AS90193.

**Quality Assurance**

- 1 Providers and Industry Training Organisations must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.
- 2 Organisations with consent to assess and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Consent and Moderation Requirements (CMR) reference

0233

## Paerewa Paetae

<b>Aronga</b>	Pāngarau 1.10		
<b>Ingoa</b>	Te whakamahi i ngā tikanga tūhuratanga tauanga hei tūhura huinga raraunga matatini		
<b>Kaupae</b>	1	<b>Whiwhinga</b>	4
		<b>Aromatawai</b>	Ā-roto
<b>Marau akoranga</b>	Te Marautanga o Aotearoa		
<b>Kokonga akoranga</b>	Pāngarau		
<b>Mana rēhita</b>	Kua rēhitatia	<b>Te rā i mana ai</b>	9 Hakihea 2010
<b>Te rā e arotakengia ai</b>	31 Hakihea 2016	<b>Te rā i puta ai</b>	12 Hakihea 2013

### Te Hononga ki te Marautanga

I ahu mai tēnei paerewa paetae i te Taumata 6 o *Te Marautanga o Aotearoa*, i whakaputaina e Te Pou Taki Kōrero i te tau 2008.

### Whāinga Paetae

*Te Tauanga, Te Tūhuratanga Tauanga*

1 *Ka whai i ngā tikanga mō te tūhuratanga tauanga ki te whakamahere, ki te whakatutuki tūhuratanga:*

- *ka parahau i ngā taurangi me ngā waeine;*
- *ka whakatau i ngā pūtakenga o te taurangitanga, pērā i te whakamahi tīpako matapōkere;*
- *ka whakamahi whakaari tauanga matatini ki te tautohu, ki te whakawhiti whakaaro mō ngā āhuatanga horopaki, pērā i te ia, ngā hononga taurangi, me ngā taurangitanga o roto, o waenganui hoki i ngā tuari raraunga;*
- *ka whakaputa hīkaro ōpaki mō te taupori ka hua ake i ngā raraunga;*
- *ka whakamahi whakaari raraunga me ngā waeine ki te parahau i ngā whakakitenga ka hua ake i te tūhuratanga;*
- *ka mārama ki ngā tikanga matatika e hāngai ana.*

E hono ana ki te Papa Whakaako mō Pāngarau kei te pae ipurangi nei:

<http://tmoa.tki.org.nz/Te-Marautanga-o-Aotearoa/Taumata-Matauranga-a-Motu-Ka-Taea>.

### Te Hononga ki *The New Zealand Curriculum* (NZC)

I ahu mai hoki tēnei paerewa paetae i *The New Zealand Curriculum*. Mō ngā kōrero e pā ana ki ngā whāinga paetae o te NZC e hāngai ana ki tēnei paerewa, tirohia te [putanga reo Pākehā](#) o te paerewa.

## Te Hononga ki ngā Tikanga Aromatawai

Kei tēnei pae ipurangi ngā Tikanga Aromatawai mō tēnei paerewa paetae:

<http://tmoa.tki.org.nz/Te-Marautanga-o-Aotearoa/Taumata-Matauranga-a-Motu-Ka-Taea>.

### Paerewa Paetae

<p><b>Paetae</b> Te whakamahi i ngā tikanga tūhuratanga tauanga hei tūhura huinga raraunga matatini</p>	<p>Hei tohu i te paetae:</p> <ul style="list-style-type: none"> <li>• ka whakamahi i ia wāhanga o ngā tikanga tūhuratanga tauanga hei whakaputa whakatairitenga.</li> </ul>
<p><b>Kaiaka</b> He kaiaka te whakamahi i ngā tikanga tūhuratanga tauanga hei tūhura huinga raraunga matatini</p>	<p>Hei tohu i te kaiaka:</p> <ul style="list-style-type: none"> <li>• Ko te parahau i ngā wāhanga o roto i ngā tikanga tūhuratanga tauanga te mea nui. Nō reira, ka kitea ēnei:             <ul style="list-style-type: none"> <li>– ka tūhono i ngā wāhanga o roto i ngā tikanga tūhuratanga tauanga ki te horopaki me te taupori</li> <li>– ka whakaputa kōrero taunaki, hei tauira:                 <ul style="list-style-type: none"> <li>○ ko ngā tātaitanga tauanga whakarāpopoto pērā i te toharite me te tau waenga</li> <li>○ ko ngā uara raraunga</li> <li>○ ko ngā ia me ngā āhuratanga kōhure o roto i ngā whakaari raraunga.</li> </ul> </li> </ul> </li> </ul>
<p><b>Kairangi</b> He kairangi te whakamahi i ngā tikanga tūhuratanga tauanga hei tūhura huinga raraunga matatini</p>	<p>Hei tohu i te kairangi:</p> <ul style="list-style-type: none"> <li>• Ko te whakaatu aroā tauanga hōhonu te mea nui. Nō reira, ka kitea ēnei:             <ul style="list-style-type: none"> <li>– ka kōtuitui i te mātauranga tauanga me te mārama ki te horopaki, i roto i ngā wāhanga katoa o te tūhuratanga tauanga</li> <li>– ka arohaehae i te tukanga tauanga me ngā whakamārama e hāngai ana ki ngā whakakitenga.</li> </ul> </li> </ul>

### Kōrero Āpiti

Kia taunga te ākonga ki ngā tikanga mō te tūhuratanga tauanga hei tūhura i tētahi huinga raraunga matatini, arā:

- te tūhura i ngā raraunga kua hua mai i tētahi tirohanga tauanga
- te whakatakoto i tētahi pātai whakatairite e hāngai ana ki te huinga raraunga matatini
- te whiriwhiri me te whakamahi i ngā whakaari raraunga e hāngai ana
- te whakaputa i ngā tātaitanga tauanga whakarāpopoto pērā i te mōkito, te mōrahi, te tau waenga me ngā hauwhātanga
- te whakawhiti kōrero hei whakatairite i ngā tuari raraunga, pērā i te hanga o ngā raraunga, ngā rohe hauwhātanga, te neke, te inaki, te hora o ngā raraunga, me ngā āhuratanga kōhure
- te whakamārama i ngā whakakitenga, me te whai wāhi mai o te hīkaro ōpaki me ngā taunakitanga.

Kuputaka:  
kōtuitui integrate, connect  
aroā tauanga hōhonu statistical insight/understanding  
parahau justify

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### He Kōrero mō te Whakakapi

Koinei me te paerewa paetae 91036 hei whakakapi i te paerewa 5240 me te paerewa paetae 90193.

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### Tātari Kounga

- 1 Me mātua whakamana ngā Kaituku Akoranga me ngā Whakahaere Whakangungu Ahumahi e te Mana Tohu Mātauranga o Aotearoa ka rēhita ai i ngā hua ka puta mai i ngā aromatawai ki ngā paerewa paetae.
- 2 Ko ngā Kaituku Akoranga me ngā Whakahaere Whakangungu Ahumahi kua mana, ā, e aromatawai ana i ā rātou hōtaka ki ngā paerewa paetae, me uru rātou ki ngā pūnaha whakarite e tika ana mō aua paerewa paetae.

Ko te tohutoro ki te Mahere Whakamana, Whakaōritenga hoki 0233