# Achievement Standard

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| **Subject Reference** | Statistics and Modelling 3.5 | | | | |
| **Title** | Select and analyse continuous bi-variate data | | | | |
| **Level** | 3 | **Credits** | 3 | **Assessment** | Internal |
| **Subfield** | Statistics and Probability | | | | |
| **Domain** | Statistics | | | | |
| **Status** | Expiring | | | **Status date** | 4 December 2012 |

**This achievement standard is expiring. Assessment against the standard must take place before the expiry date set out below.**

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| **Expiry date** | 31 December 2013 | **Date version published** | 4 December 2012 |

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This achievement standard involves completing a statistical analysis of continuous bi-variate data.

| | Achievement Criteria | Explanatory Notes |
|---|---|---|
| **Achievement** | • Select and analyse continuous bi-variate data. | • Data may be collected by candidates or provided. It should be data for which a linear model is appropriate. Where the data is provided it will involve more than one pair of variables from which the candidate selects a pair.<br>• The analysis will involve:<br>– developing a purpose statement from the data selected<br>– graphing data<br>– using regression to establish a linear relationship between a pair of variables<br>– describing the relationship between at least one pair of variables in context. |

| | Achievement Criteria | Explanatory Notes |
|---|---|---|
| **Achievement with Merit** | • Carry out an in-depth analysis of bi-variate data. | • The analysis will include some of the following:<br>– comparing the relationship between more than one pair of variables<br>– discussing the appropriateness of the model<br>– interpreting correlation coefficients, r, and coefficients of determination, $R^2$, when appropriate<br>– making predictions from regression equations (interpolation and/or extrapolation)<br>– use of residuals<br>– discussing the difference between correlation and causality when appropriate. |
| **Achievement with Excellence** | • Report on the validity of the analysis. | • The report will include justified comments on some of the following:<br>– method(s) of analysis<br>– assumptions made<br>– limitations<br>– improving regression models eg discussing the effect of outliers, fitting piecewise or non-linear models<br>– alternative approaches<br>– data source or data collection method if the student collects own data<br>– potential sources of bias<br>– relevance and usefulness of evidence<br>– how widely the findings can be applied. |

**Explanatory Notes**

1 This achievement standard is derived from *Mathematics in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1992, and *Mathematics in the New Zealand Curriculum*, *Addendum to Level 8*, Learning Media, Ministry of Education, 1995:
- achievement objectives p. 204, addendum p. 9
- suggested learning experiences p. 205, addendum p. 9
- suggested assessment activities p. 208, addendum pp. 10–11
- mathematical processes p. 23–29.

2 The use of appropriate technology is expected.

3 Students will select a pair of variables from a dataset. This dataset may be supplied or collected by the student.

4 Where the data is supplied, background information about the data collection or source of the data must be provided by the assessor.

5 This achievement standard does not assess sampling concepts or the use of confidence intervals (see AS90288, Mathematics 2.5, and AS90642, Statistics and Modelling 3.2).

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**Replacement Information**
This achievement standard and unit standard 11119 have been replaced by AS91581.

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**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 0226