

## Achievement Standard

**Subject Reference** Statistics and Modelling 3.7

**Title** Use a mathematical model involving curve fitting to solve a problem

**Level** 3      **Credits** 3      **Assessment** Internal

**Subfield** Mathematics

**Domain** Algebra

**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.**

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

This achievement standard involves using a mathematical model involving curve fitting to solve a problem.

	Achievement Criteria	Explanatory Notes
<b>Achievement</b>	<ul style="list-style-type: none"> <li>Use a mathematical model involving curve fitting to solve a problem.</li> </ul>	<ul style="list-style-type: none"> <li>Model will involve:               <ul style="list-style-type: none"> <li><math>y = ax^n</math> or <math>y = am^x</math> or <math>y = Ae^{kt}</math>.</li> </ul> </li> <li>Data will be provided and the form of the model will be given.</li> </ul>
<b>Achievement with Merit</b>	<ul style="list-style-type: none"> <li>Use curve fitting to determine an appropriate model and solve a practical problem.</li> </ul>	<ul style="list-style-type: none"> <li>Data will be raw data generated by a practical situation.</li> <li>The choice of model will be either a power function or an exponential function or a piecewise function involving a combination of both, and will require:               <ul style="list-style-type: none"> <li>selecting a model to test</li> <li>constructing an appropriate graph</li> <li>determining the equation of the model.</li> </ul> </li> <li>Candidates are to collect their own data and determine the form of the model.</li> </ul>

	Achievement Criteria	Explanatory Notes
Achievement with Excellence	<ul style="list-style-type: none"> <li>Justify the choice of mathematical model to solve a problem.</li> </ul>	<ul style="list-style-type: none"> <li>Justification within the context will include some of the following: <ul style="list-style-type: none"> <li>relating the solution to the problem</li> <li>considering the nature of the underlying variables</li> <li>considering the possibility of more than one model</li> <li>relating the theory to the model</li> <li>discussing limitations of the model.</li> </ul> </li> </ul>

### General Explanatory Notes

- This achievement standard is derived from *Mathematics in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1992:
  - achievement objectives pp. 158, 164
  - suggested learning experiences pp. 159, 165
  - sample assessment activities pp. 160–162, 166–167
  - mathematical processes pp. 23–29.
- The use of appropriate technology is expected.

### Quality Assurance

- Providers and Industry Training Organisations must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.
- 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