

## Achievement Standard

**Subject Reference** Science 1.1

**Title** Demonstrate understanding of aspects of mechanics

**Level** 1      **Credits** 4      **Assessment** External

**Subfield** Science

**Domain** Science - Core

**Status** Registered      **Status date** 30 November 2010

**Planned review date** 31 December 2016      **Date version published** 12 December 2013

This achievement standard involves demonstrating understanding of aspects of mechanics and may include using methods when solving related problems.

### Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Demonstrate understanding of aspects of mechanics.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of aspects of mechanics.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of aspects of mechanics.</li> </ul>

### Explanatory Notes

- This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 6. It is aligned with the Physical Inquiry and Physics Concepts achievement objectives in the Physical World strand and the Communicating in Science achievement objective in the Nature of Science strand, and is related to the material in the *Teaching and Learning Guide for Science*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>.

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

- Demonstrate understanding of aspects of mechanics* typically involves providing evidence that shows awareness of how simple facets of phenomena, concepts or principles relate to given situations. This may include using methods for solving problems involving aspects of mechanics.

- 3 *Demonstrate in-depth understanding of aspects of mechanics* typically involves providing evidence that shows how or why phenomena, concepts or principles relate to given situations.
- 4 *Demonstrate comprehensive understanding of aspects of mechanics* typically involves providing evidence that shows how or why phenomena, concepts and principles are connected in the context of given situations. Statements must demonstrate understanding of connections between concepts.
- 5 Evidence may be written, mathematical, graphical or diagrammatic.
- 6 Aspects of mechanics will be limited to a selection from the following:
- Distance, speed, interpretation of distance and speed time graphs, average acceleration and deceleration in the context of everyday experiences such as journeys, sport, getting going. The relationships  $v = \frac{\Delta d}{\Delta t}$   $a = \frac{\Delta v}{\Delta t}$ .
  - Mass, weight and the acceleration due to gravity, balanced and unbalanced forces, in the context of everyday experiences such as being stationary, moving at constant speed, accelerating. The relationship  $F_{\text{net}} = ma$ .
  - Force and pressure in the context of everyday experiences. The relationship  $P = \frac{F}{A}$ .
  - Work and power, gravitational potential energy, kinetic energy, and the conservation of mechanical energy in free fall situations in the context of everyday experiences such as sports performance, dropping things, tossing balls. The relationships  $\Delta E_P = mg\Delta h$   $E_K = \frac{1}{2}mv^2$   $W = Fd$   $P = \frac{W}{t}$ .
- 7 Assessment Specifications for this achievement standard can be accessed through the Science Resources page found at [www.nzqa.govt.nz/ncea/resources](http://www.nzqa.govt.nz/ncea/resources).
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## Quality Assurance

- 1 Providers and Industry Training Organisations must be accredited by NZQA before they can register credits from assessment against achievement standards.
- 2 Accredited providers and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Accreditation and Moderation Action Plan (AMAP) reference

0233