

## Achievement Standard

<b>Subject Reference</b>	Physics 1.3		
<b>Title</b>	Demonstrate understanding of aspects of electricity and magnetism		
<b>Level</b>	1	<b>Credits</b>	4
		<b>Assessment</b>	External
<b>Subfield</b>	Science		
<b>Domain</b>	Physics		
<b>Status</b>	Registered	<b>Status date</b>	30 November 2010
<b>Planned review date</b>	31 December 2016	<b>Date version published</b>	12 December 2013

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

***Mutual exclusion exists between this standard and AS90941.***

### Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Demonstrate understanding of aspects of electricity and magnetism.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of aspects of electricity and magnetism.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of aspects of electricity and magnetism.</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 objectives in the Nature of Science strand, and is related to the material in the *Teaching and Learning Guide for Physics*, 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 electricity and magnetism* 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 electricity and magnetism.

- 3 *Demonstrate in-depth understanding of aspects of electricity and magnetism* typically involves providing evidence that shows how or why phenomena, concepts or principles relate to given situations.
- 4 *Demonstrate comprehensive understanding of aspects of electricity and magnetism* typically involves providing evidence that shows how or why phenomena, concepts, or 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 electricity and magnetism* will be selected from the following:

Static Electricity: positive and negative charge, conductors and insulators, uniform and non-uniform charge distributions, earthing, electrical discharge in air, separation of charge by friction, charging by contact.

DC Electricity: voltage, current, resistance, power, series circuits and simple parallel circuits, circuit diagrams, the relationships

$$V = IR, P = IV, P = \frac{E}{t}, R_T = R_1 + R_2 + \dots$$

Magnetism: magnetic field directions, interactions and the result of interactions (including magnetic field of bar magnets, the earth's magnetic field, magnetic fields due to currents in straight wires and solenoids), right-hand grip rule, electromagnet,

the relationship  $B = \frac{\mu_0 I}{2\pi d}$ .

- 7 Assessment Specifications for this achievement standard can be accessed through the Physics 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