

Achievement Standard

Subject Reference	Physics 2.6				
Title	Demonstrate understanding of electricity and electromagnetism				
Level	2	Credits	6	Assessment	External
Subfield	Science				
Domain	Physics				
Status	Registered	Status date	17 November 2011		
Planned review date	31 December 2018	Date version published	20 November 2014		

This achievement standard involves demonstrating understanding of electricity and electromagnetism.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Demonstrate understanding of electricity and electromagnetism. 	<ul style="list-style-type: none"> Demonstrate in-depth understanding of electricity and electromagnetism. 	<ul style="list-style-type: none"> Demonstrate comprehensive understanding of electricity and electromagnetism.

Explanatory Notes

- This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 7; and is related to the material in the *Teaching and Learning Guide for Physics*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>. The standard is aligned to the achievement objectives *Physical Inquiry and Physics Concepts* in the Physical World strand and *Communicating in Science* in the Nature of Science strand.

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](#) for the relevant learning area.

- Demonstrate understanding* involves writing statements that show an awareness of how simple facets of phenomena, concepts or principles relate to a described situation.

Demonstrate in-depth understanding involves writing statements that give reasons why phenomena, concepts or principles relate to a described situation. For

mathematical solutions, the information may not be directly usable or immediately obvious.

Demonstrate comprehensive understanding involves writing statements that demonstrate understanding of connections between concepts.

- 3 Written statements include mathematical solutions and/or descriptions. Descriptions may include graphs or diagrams.
- 4 Assessment is limited to a selection from the following:

Static Electricity:

- uniform electric field
- electric field strength
- force on a charge in an electric field
- electric potential energy
- work done on a charge moving in an electric field.

DC Electricity:

- parallel circuits with resistive component(s) in series with the source
- circuit diagrams
- voltage
- current
- resistance
- energy
- power.

Electromagnetism:

- force on a current carrying conductor in a magnetic field
- force on charged particles moving in a magnetic field
- induced voltage generated across a straight conductor moving in a uniform magnetic field.

Relationships:

$$E = \frac{V}{d} \quad F = Eq \quad \Delta E_p = Eqd \quad E_k = \frac{1}{2} mv^2$$

$$F = BIL \quad F = Bqv \quad V = BvL$$

$$I = \frac{q}{t} \quad V = \frac{\Delta E}{q} \quad V = IR \quad P = IV \quad P = \frac{\Delta E}{t}$$

$$R_T = R_1 + R_2 + \dots \quad \frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \dots$$

- 5 Assessment Specifications for this achievement standard can be accessed through the Physics Resources page found at <http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/ncea-subject-resources/>.

Replacement Information

This achievement standard replaced AS90257.

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