Title	**Demonstrate knowledge of voltage, power and energy, and DC circuits**		
Level	**3**	**Credits**	**6**

Purpose	People credited with this unit standard are able to demonstrate knowledge of: – voltage, power and energy; and – DC circuits.

Classification	Electrical Engineering > Core Electrical

Available grade	Achieved

Guidance Information

1 Unit standard or equivalent prior knowledge and skills recommended:
Unit 32609, *Demonstrate knowledge of mathematical principles, conductors and insulators*.

2 Definition
DC – direct current.

3 Where needed, sketches and drawings may be used to aid explanations.

4 This unit standard can be used together with other relevant unit standards, additional learning and workplace training to meet the requirements of the Electrical Workers Registration Board (EWRB) core competencies, available at https://www.ewrb.govt.nz.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of voltage, power, and energy.

Performance criteria

1.1 State Ohm’s law and the formulae associated with it.

Range $V = I \times R$, $I = V \div R$, $R = V \div I$.

1.2 State the formulae for power.

Range $P = V^2 \div R$, $P = I^2 \times R$, $P = V \times I$.

1.3 Explain the relationship between power and energy.

1.4 Calculate electrical values with given parameters.

Range current, voltage, resistance, power, energy.

1.5 Calculate resistance, voltage, current and power and compare with measured values.

Range parallel, series, series-parallel.

Outcome 2

Demonstrate knowledge of DC circuits.

Performance criteria

2.1 Explain the purpose and configuration of electric circuit components.

Range conductors, switches, protection, load.

2.2 Describe how to connect instruments into a circuit to take electrical measurements.

Range two different instrument connections;
measurements may include – voltage, resistance, current, power.

2.3 Explain the operation and characteristics of DC circuits.

Range parallel, series, series-parallel.

Planned review date	31 December 2026

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 March 2022	N/A

Consent and Moderation Requirements (CMR) reference	0003

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council at qualifications@waihanga.nz if you wish to suggest changes to the content of this unit standard.