Achievement Standard

Subject Reference	Digital Technologies 2.5				
Title	Use advanced techniques to develop an electronics outcome				
Level	2	**Credits**	6	**Assessment**	Internal
Subfield	Technology				
Domain	Digital Technologies				
Status	XX	**Status date**	XX		
Planned review date	XX	**Date version published**	XX		

This achievement standard involves using advanced techniques to develop an electronics outcome.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
Use advanced techniques to develop an electronics outcome.	Use advanced techniques to develop an informed electronics outcome.	Use advanced techniques to develop a refined electronics outcome.

Explanatory Notes

1 This achievement standard is derived from the Technology learning area in *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007; and is related to the material in the *Teaching and Learning Guide for Technology*, Ministry of Education at http://seniorsecondary.tki.org.nz.

Further information can be found at http://www.technology.tki.org.nz/.

Appropriate reference information is available in *Safety and Technology Education: A Guidance Manual for New Zealand Schools,* Ministry of Education at http://technology.tki.org.nz/Technology-in-the-NZC/Safety-in-Technology-Education-revised-2017, and the Health and Safety at Work Act 2015.

This standard is also derived from *Te Marautanga o Aotearoa*. For details of *Te Marautanga o Aotearoa* outcomes to which this standard relates, see the Papa Whakaako for the relevant learning area.

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2 *Use advanced techniques to develop an electronics outcome* involves*:*
- using appropriate resources and techniques to develop a functional outcome that performs to specifications
- testingand debugging to ensure that the outcome performs to specifications
- describing the interfaces and functions of components and systems used in the development of the outcome
- explaining relevant implications.

Use advanced techniques to develop an informed electronics outcome involves*:*
- explaining why the interfaces and functions of components and systems were used in the development of the outcome
- explaining the behaviour and function of the electronics outcome
- testing and modifying to ensure reliability
- determining the costs of the components and systems used
- addressing relevant implications.

Use advanced techniques to develop a refined electronics outcome involves*:*
- undertaking iterative improvement throughout the design, development and testing process to produce a high quality outcome
- justifying the choice and costs of components and systems used.

3 Examples of *advanced techniques* include:
- embedded software
- subsystem level design
- remote control
- advanced printed circuit board development (PCB)
- data storage (EEPROM)
- analogue to digital conversion (ADC).

4 Examples of testing, modifying and debugging include:
- using testing devices and testing strategies
- testing expected, boundary and invalid inputs
- changing board layout
- commenting software effectively
- improving component selection.

5 Examples of relevant implications include:
- social
- cultural
- legal
- ethical
- intellectual property
- privacy
- accessibility
- usability
- functionality
- aesthetics

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- sustainability and future proofing
- end-user considerations
- health and safety.

Conditions of Assessment related to this achievement standard can be found at http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards.

Replacement Information

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

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