Achievement Standard

Subject Reference	Digital Technologies 1.5				
Title	Develop an electronics outcome				
Level	1	**Credits**	6	**Assessment**	Internal
Subfield	Technology				
Domain	Digital Technologies				
Status	Registered	**Status date**	23 November 2017		
Planned review date	31 December 2020	**Date version published**	23 November 2017		

This achievement standard involves developing an electronics outcome.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Develop an electronics outcome.	• Develop an informed electronics outcome.	• Develop a refined electronics outcome.

Explanatory Notes

1 This achievement standard is derived from Level 6 of 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.

2 *Develop an electronics outcome* involves:
- using appropriate resources and techniques when developing a functional combination of hardware and software that performs to specifications
- modifying and debugging embedded software
- undertaking testing procedures to debug and diagnose the electronic system
- describing the interfaces and functions of components and systems used

- describing relevant implications.

Develop an informed electronics outcome involves:
- modifying, debugging and commenting software so that the program is logical and readily understandable
- undertaking testing procedures to debug and diagnose the electronic system to improve the reliability
- explaining the behaviour and function of the electronics outcome
- addressing relevant implications.

Develop a refined digital electronics outcome involves:
- undertaking testing procedures to debug and diagnose the electronic system to ensure it is fit for purpose
- iterative improvement throughout the development and testing process
- justifying the choice of components and systems used in the development of the electronics outcome.

3 *An electronics outcome* refers to an outcome developed using electronic components and appropriate software.

4 Examples of relevant implications include:
- social
- cultural
- legal
- ethical
- intellectual property
- privacy
- accessibility
- usability
- functionality
- aesthetics
- sustainability and future-proofing
- end-user considerations
- health and safety

5 Examples of concepts that may be present in the electronics outcome include:
- the function of the electronic components
- a circuit as a complete path
- voltage as an energy level
- current as rate of flow of charge
- distribution of voltage and current through a circuit (series and parallel circuits)
- conduction (limited to the macroscopic behaviour of conductors, insulators and semiconductors)
- circuit subsystems, symbolic conventions and schematics
- hardware (e.g. components and combinations of components).

6 Examples of developing electronics outcomes may include:
- selecting the best type and value of components
- selecting the best arrangement of components
- adjusting hardware input and/or output parameters
- adjusting software parameters
- using a multimeter to measure and report voltage and/or current levels at indicated points.

7 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
This achievement standard replaced AS91077, AS91078 and AS91079.

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