



National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Exemplar for Internal Achievement Standard

Digital Technologies Level 2

This exemplar supports assessment against:

Achievement Standard 91894

Use advanced techniques to develop an electronics outcome

An annotated exemplar is an extract of student evidence, with a commentary, to explain key aspects of the standard. It assists teachers to make assessment judgements at the grade boundaries.

New Zealand Qualifications Authority

To support internal assessment

	Grade: Excellence
1.	<p>For Excellence, the student needs to use advanced techniques to develop a refined electronics outcome.</p> <p>This involves:</p> <ul style="list-style-type: none"> • undertaking iterative improvement throughout the design, development and testing process to produce a high-quality electronics outcome, and • justifying the choice of components and systems used. <p>There is no student work currently available at this grade.</p> <p>The student showed iterative improvement by trialling and testing alternative components and software code, and adding new features. Iterative improvement involves employing deliberate cycles and focusing on the reliability and functionality of the outcome, resulting in a high-quality electronics outcome. For example, the student showed multiple instances of ongoing design, development and testing within the process of constructing the electronics outcome.</p> <p>The student justified their choice of components and systems. For example, they justified the choice of components by investigating and comparing alternative components and interfaces.</p>

	Grade: Merit
2.	<p>For Merit, the student needs to use advanced techniques to develop an informed electronics outcome.</p> <p>This involves:</p> <ul style="list-style-type: none"> • identifying the behaviour and function of the electronics outcome • testing and modifying to ensure reliability of the electronics outcome • evaluating the choice of components and systems used • addressing relevant implications. <p>There is no student work currently available at this grade.</p> <p>The student has identified the behaviour and function of the electronics outcome. For example, the student explained what the system will do and how the components work together to make this happen.</p> <p>The student has thoroughly tested the electronics outcome and made significant improvements to its behaviour and function as a result. This is more than correcting errors, as the student has tested and revised the software, changed components, and reorganised the circuit board layout in order to make the outcome more reliable.</p> <p>The student has evaluated the choice of components and systems used within the electronics outcome by comparing these with other options and providing reasons for why they were chosen.</p> <p>The student has shown how their electronics outcome addresses at least two relevant implications. This could include how they have addressed functionality concerns and met end-user considerations.</p>

	Grade: Achieved
3.	<p>For Achieved, the student needs to use advanced techniques to develop an electronics outcome.</p> <p>This involves:</p> <ul style="list-style-type: none"> • using appropriate resources and techniques to develop a functional electronics outcome • testing and debugging to ensure that the electronics outcome performs to specifications • explaining the interfaces and functions of components and systems • explaining relevant implications. <p>There is no student work currently available at this grade.</p> <p>The student has used appropriate resources and techniques to develop a functional electronics outcome. The outcome has used a programmable microprocessor and additional components, e.g. resistors, sensors and input/output devices.</p> <p>The electronics outcome meets specifications, each interface works, and the student can demonstrate a working system. They have used at least two advanced techniques from the list in Explanatory Note 3.</p> <p>The student's testing and debugging shows that the electronics outcome functions as intended. For example, they have:</p> <ul style="list-style-type: none"> • tested the input interface on expected analogue/digital inputs • tested the output interfaces to show system status and/or actuator control • modified code beyond any template or teacher-supplied code samples. <p>The student has explained the interfaces and functions of components and systems. This could include explaining:</p> <ul style="list-style-type: none"> • functions of at least three interfaces/components within their outcome • reasons for why they selected input/output interfaces, or reasons for using specific embedded software code. <p>The student has explained at least two identified relevant implications for their electronics outcome. This could include end-user considerations and functionality. They have explained what the relevant implication is, why it is relevant to their electronics outcome, and how they might address the implication in the actual outcome produced.</p>