



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

## **Exemplar for Internal Achievement Standard**

### **Technology Level 3**

This exemplar supports assessment against:

**Achievement Standard 91618**

**Undertake development and implementation of a green manufacturing process**

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 undertake comprehensive development and implementation of a green manufacturing process.</p> <p>This involves:</p> <ul style="list-style-type: none"> <li>• discussing how and why quality management procedures have been important in changing manufacturing practices to better support green considerations</li> <li>• justifying the level of success the manufacturing process has attained in meeting green considerations.</li> </ul> <p>There is no student work currently available at this grade.</p> <p>A student would typically compare and contrast changes in manufacture to ensure that products embrace good design judgement criteria, for example, sustainability, accessibility, functionality (see Explanatory Note 4).</p> <p>The student could refer to business case studies where various aspects of good design judgement criteria have been addressed, and changes have been made in manufacturing processes to better support the green considerations.</p> <p>The student would typically justify the level of success of their manufacturing by referring to the limitations they took into account, and the opportunities they made the most of, as they established their green manufacturing process.</p>

	Grade: Merit
2.	<p>For Merit, the student needs to undertake in-depth development and implementation of a green manufacturing process.</p> <p>This involves:</p> <ul style="list-style-type: none"><li>• discussing how green considerations are having an increasing influence on technological outcomes and their manufacture</li><li>• monitoring the manufacturing process and refining as required</li><li>• evaluating the success of the manufacturing process in meeting green considerations.</li></ul> <p>There is no student work currently available at this grade.</p> <p>A student would typically refer to at least one case study and discuss the growing importance society now places on green considerations.</p> <p>The student would typically show the monitoring of their manufacturing process and the refinements that happened as a result of that monitoring.</p> <p>Their green manufacturing process would typically be evaluated in terms of how well it met green manufacturing criteria, which they would establish through their case-study research.</p>

	Grade: Achieved
4.	<p>For Achieved, the student needs to undertake development and implementation of a green manufacturing process.</p> <p>This involves:</p> <ul style="list-style-type: none"> <li>• explaining how green considerations impact on design decisions</li> <li>• analysing a technological outcome to determine its suitability</li> <li>• making design changes as required for the technological outcome</li> <li>• establishing specifications, including tolerances, required of the outcome that is to be manufactured</li> <li>• selecting a green manufacturing process and quality control organising resources and ensuring procedures are carried out accurately</li> <li>• overseeing the manufacturing process and discussing its success.</li> </ul> <p>There is no student work currently available at this grade.</p> <p>A student would typically explain how a relevant green manufacturing process has been utilised, identify the strategies used and explain how they impact on design decisions and manufacture.</p> <p>The student may analyse their proposed technological product and consider its suitability for green manufacture, and give reasons for their design decisions for their product based on green considerations with reference to good design judgement criteria.</p> <p>The student should look at industry practice, modify this to the available facilities, resources and equipment, develop a specification sheet for manufacturing and a process flow chart that identifies quality control points.</p> <p>The student would typically identify the resources required to make their product and ensure that these are available. They would trial various techniques to establish their manufacturing process following workplace codes of practice, and discuss the success of their green manufacturing process.</p>