2023 NCEA Assessment Report

Subject: Generic Technology

Level: Level 3

Achievement standards: 91612, 91613, 91614, 91617

General commentary

Responses that exceeded the recommended report length typically included a significant amount of information not relevant to the assessment. Candidates whose response demonstrated an authentic viewpoint or reflected their own technological practice were more likely to be awarded the higher grades.

Report on individual achievement standards

Achievement standard 91612: Demonstrate understanding of how technological modelling supports technological development and implementation

Assessment

The assessment was a digitally submitted report.

Commentary

Candidates should identify their context early in the report because this provides coherence to the marker. If using case studies, they need to be relatable to the modelling in the report otherwise they confuse rather than reinforce the candidate's submission. Competing and contestable factors must be the focus of the modelling to enable defensible decisions to be made. Competing factors should show evidence of how and why they are competing and how they have impacted technological development and implementation.

Generally, the functional modelling section was stronger than prototyping. It is critical to explain and justify prototyping, including prototype construction / manufacturing, in situ testing, and evaluation of the prototype. Portfolio work images can be used to strengthen or provide context but should be legible and relevant.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- differentiated between functional modelling and prototyping
- explained competing and contestable factors
- explained how their modelling influenced their decision-making during the making and implementation of a prototype outcome.

Candidates who were awarded **Achievement with Merit** commonly:

- provided detail about how relevant competing and contestable factors were addressed by technological modelling in their practice during the technological development and implementation of an outcome
- reflected clearly on what was changed in their development due to their functional modelling and prototyping.

Candidates who were awarded **Achievement with Excellence** commonly:

- based their submission around a comprehensive and reflective discussion that showed how technological modelling can be used to defend and validate responsive decisions made at certain stages during their own technological development
- clearly showed how key factors were resolved through evidence gained from modelling processes and a clear understanding of the difference between competing and contestable factors
- included evidence of applied synthesis of technological modelling throughout the development and implementation of the prototype outcome.

Candidates who were awarded **Not Achieved** commonly:

- did not explain, or had a surface explanation only, of how modelling informed their decision-making for an outcome
- did not mention competing and contestable factors
- included sketches, diagrams, photos, or screenshots of modelling but did not refer to them to help explain modelling choices
- described technological modelling without identifying how it was used to address competing and or contestable factors in relation to their outcome
- explained how modelling can manage and mitigate risk in technological development without explaining contestable and competing factors
- submitted reports that appeared over-templated, leading to little evidence of actual student knowledge and voice.

Achievement standard 91613: Demonstrate understanding of material development

Assessment

The assessment was a digitally submitted report.

Commentary

Most candidates demonstrated an adequate understanding of material development.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- clearly described a material and how it was developed
- described how material properties can enhance a product
- described one or more implications of material development on product design, development, implementation, maintenance, or disposal.

Candidates who were awarded **Achievement with Merit** commonly:

- used examples to explain how material properties enhanced the product
- related material properties to a product's intended function
- clearly outlined how material choice impacted product design, development, implementation, maintenance, and disposal.

Candidates who were awarded **Achievement with Excellence** commonly:

- reflected extensive research and a deep understanding of concepts and processes employed in the development of a material
- included good relational links between material and product
- discussed future developments of a material and how it could impact a product or products
- synthesised information used to establish an authentic viewpoint.

Candidates who were awarded **Not Achieved** commonly:

- focused just on describing the material and not how it enhances the performance of a product
- showed limited understanding
- discussed sustainability without directly addressing product disposal
- structured their report poorly and / or used a lot of repetition
- appeared to have used a template.

Achievement standard 91614: Demonstrate understanding of operational parameters in complex and highly complex technological systems

Assessment

The assessment was a digitally submitted report.

Commentary

This paper has a small cohort that increased by 33% over last year's entries. This is a highly specialist area and candidates who submit this assessment tend do well.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- distinguished between complex and highly complex technological systems
- provided an example of a complex system and identified the operational parameters within this system as a measurable range of values, for example 10°C minimum to 25°C maximum temperature in an air-conditioning system
- identified and explained one or more concepts that lead to the establishment of operational parameters, for example the concept of optimum ambient temperature for humans
- explained the implications that these concepts had on the design as well as the development of the system
- provided an accurate explanation of how the operational parameters allow the system to function

- provided an accurate explanation of how the operational parameters enable maintenance in the system; maintenance was clearly linked to operational parameters
- identified a highly complex system that is self-regulating and / or intelligent as well as the operational parameters associated with this highly complex system.
- explained social factors that influenced the establishment of the operational parameters in a highly complex system
- explained technical factors that influenced the establishment of the operational parameters in a highly complex system.

Candidates who were awarded **Achievement with Merit** commonly:

- explained in detail, with examples, how a highly complex system operated within its parameters, for example air fuel ratio in fuel injection systems operates between 12:1 to 17:1
- discussed, taking into account different ideas, why social and technical factors influenced the establishment of operational parameters in a highly complex system.

Candidates who were awarded **Achievement with Excellence** commonly:

- discussed, by comparing and contrasting different ideas, how operational parameters influenced the design, development, and maintenance of systems that were both complex and highly complex.

Candidates who were awarded **Not Achieved** commonly:

- chose simple technological systems as opposed to complex and highly complex systems
- produced information that was technically inaccurate
- failed to identify operational parameters associated with a complex system
- wrote about concepts used in the design and development of technological systems, but failed to link these to operational parameters
- wrote about maintenance in a technological system but failed to link these to operational parameters.

Achievement standard 91617: Undertake a critique of a technological outcome's design

Assessment

The assessment was a digitally submitted report.

Commentary

A few candidates critiqued a technological design's outcome by exploring how the product had changed over time. The depth of the critiques produced meant that they were at the level of appraisals. This approach, in effect, limited the candidate's ability to access higher grades.

Several candidates selected products that have been featured in popular social media platforms. However, since they had no personal knowledge of the product, it often meant that they lacked sufficient information to be able to provide an adequate critique.

A few candidates chose to critique their own technological product outcomes developed as part of their course of study. Where this was done well, it reinforced their understanding. Where it was done poorly, it was an evaluation of fitness for purpose, often without criteria.

Some candidates misunderstood what was meant by ‘accessibility’ and typically interpreted this to mean widespread retail availability. Some misunderstood ‘influence’ to mean social media influencers. Some candidates misunderstood ‘design’ and interpreted it to mean marketing.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- structured their report to reflect all the requirements of the standard, including the use of good headings relating to the Explanatory Notes of the standard
- explained the concept of good design
- explained different recognised designers’ views of design
- explained judgement criteria used to determine the quality of the design of technological outcomes
- recognised that different judgement criteria can be used to judge good design depending on time, tastes, and societal values, and used contemporary judgement criteria
- explained how ideas about good design have shifted to cater to new societal demands; for example, sustainability
- critiqued the design of a technological outcome
- selected and used recognised and appropriate design judgement criteria to a level that reflected appraisal.

Candidates who were awarded **Achievement with Merit** commonly:

- discussed the importance of contemporary judgement criteria for design decision-making
- evaluated the quality of a selected technological outcome using judgement criteria which were relevant to that technological outcome
- proportioned evidence within the report to ensure that the critique was the focus of the report.

Candidates who were awarded **Achievement with Excellence** commonly:

- selected judgment criteria appropriate to the chosen technological outcome and articulated the reasoning behind their selection
- explored and discussed the impact of choosing specific judgement criteria over others
- explored the role of compromise in design decision-making and discussed alternative approaches
- personalised the judgement criteria to be used and used personal voice
- justified the evaluation of a technological outcome’s design
- identified areas where future enhancements to a technological outcome might be possible, as well as justifying why these should be considered.

Candidates who were awarded **Not Achieved** commonly:

- appraised a generic product type
- focused on defining good design but did not complete the critique in sufficient depth or detail
- misinterpreted appraisal to be broadly describing and explaining the function and / or appearance of a technological outcome rather than judging it against recognised judgement criteria

- produced a limited critique
- chose a technological outcome that had limited scope
- chose a technological outcome that was overly complex
- chose a technological outcome that had yet to be developed.