

2024 NCEA Assessment Report

Subject:	Generic Technology
Level:	3
Achievement standard(s):	91612, 91613, 91614, 91617

General commentary

Candidates whose response demonstrated an authentic viewpoint or reflected their own technological practice were more likely to be awarded the higher grades. In contrast, candidates whose responses appeared to rely heavily on templates, or whose technological practice seemed less student-led, tended to struggle. Responses that exceeded the recommended report length typically included a significant amount of information not relevant to the assessment.

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

A considerable number of submissions were incomplete or did not sufficiently address the prototype / prototyping requirements of the standard. Generally, the functional modelling section was far stronger than prototyping, and some candidates seemed confused about what prototyping actually is. It is important that candidates are able to explain and justify prototyping properly and how it was used to determine implementation of the outcome.

Candidates should provide photographic evidence of their prototype as well as photographic evidence to support other stages of modelling. Images that are not relevant to the response should not be included.

Many responses included lengthy discussions and explanations of risk management. Candidates are encouraged to avoid this, except where it is used as evidence to justify decision making.

There was a lot of confusion around what competing and contestable factors are. Competing and contestable factors must be the focus or reasoning of candidate modelling to enable informed, responsive, and defensible decisions to be made.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- differentiated between functional modelling and prototyping
- correctly identified, categorised, and explained competing and contestable factors
- explained how their own experience of technological modelling influenced their decision-making to develop and implement an outcome.

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

- provided evidence of how competing and contestable factors were utilised to justify decision-making
- provided detail about how relevant competing and contestable factors were addressed by technological modelling
- explained the changes that took place during the development stage of their technological outcome due to the results from functional modelling
- reflected on what was changed, based on evidence, in their development due to 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 during their own technological development at certain stages
- 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
- gave responses that were concise, well-organised, and adhered to specifications.

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

- did not have a final technological outcome
 - did not differentiate between functional modelling and prototyping during their discussion
 - did not explain how prototyping was used to inform decision-making
 - did not explain, or gave only a superficial explanation of, how modelling informed their decision-making for an outcome
 - described technological modelling without identifying how it was used to address competing and / or contestable factors in relation to their outcome or failed to categorise competing and contestable factors correctly
 - explained how modelling can manage and mitigate risk in technological development but did not connect this explanation to competing or contestable factors
 - included sketches, diagrams, photos, or screenshots of modelling but did not effectively use these to support their response.
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Achievement standard 91613: Demonstrate understanding of material development

Assessment

The assessment was a digitally submitted report.

Commentary

Overall, most candidates met the requirements of the standard, some with comprehensive / in-depth understanding of material development and how this enhances the performance of a product(s).

Responses consisting of a bulleted list with no commentary to support answers limited candidates' opportunities to achieve. Some candidates focussed heavily on the history of the material rather than its development and performance. Some candidates focused on the material only and did not apply their response to product(s).

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(s)
- synthesised information used to establish an authentic viewpoint.

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

- did not describe the development of a material or how this enhanced its performance, instead focusing on its history
 - did not describe the implications of the material on the design, development, implementation, maintenance or disposal of products
 - did not demonstrate understanding of material development.
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Achievement standard 91614: Demonstrate understanding of operational parameters in complex and highly complex technological systems

Assessment

The assessment was a digitally submitted report.

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 (e.g. 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 is 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 a highly complex system.

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

- explained in detail with examples of how a highly complex system operates 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 (both complex AND highly complex systems).

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 did not link them to operational parameters
 - wrote about maintenance in a technological system but did not link it to operational parameters
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Achievement standard 91617: Undertake a critique of a technological outcome's design

Assessment

The assessment was a digitally submitted report.

Commentary

Candidates should focus on critiquing the outcome, rather than suggesting changes, and avoid relying on overused case studies. All work must be original and distinct.

Candidates who achieved with Excellence explained why they chose specific criteria and how the criteria fit the product, context, and target market. Candidates should avoid replacing contemporary criteria with others unless justified, as this limits opportunities to achieve higher grades.

Some candidates did not demonstrate understanding of terminology and concepts central to the standard. The standard requires that candidates have a broad understanding of different views of design as well as design judgement criteria.

An understanding of contemporary judgement criteria is required for higher achievement levels. For example, addressing how such criteria reflect current societal values, ethical considerations, sustainability, user needs, or advancements in technology.

Candidates are encouraged to use images, plans, or drawings to support their response. Responses should also be supported by a description of the product being critiqued. Assuming the reader has prior knowledge of the product may make interpreting it challenging for the marker.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- explained the concept of good design, why some criteria for judging the quality of design change over time, and how we see it today
- explained views of design and judgment criteria used to determine the quality of the design of technological outcomes
- provided specific examples to illustrate their points
- provided informative images of the outcome they critiqued
- selected criteria that were appropriate for and relevant to the outcome they were critiquing
- critiqued in an objective and balanced way using appropriate design judgement.

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

- discussed the importance of contemporary judgment criteria
- clearly explained why modern standards and frameworks are essential for evaluating technological outcomes. For example, using criteria such as environmental impact, accessibility, and usability ensures the critique remains relevant and meaningful in today's context
- selected relevant judgment criteria for the technological outcome
- chose evaluation standards that aligned specifically with the purpose, function, and context of the selected technological outcome. For example, assessing an electric vehicle might focus on energy efficiency, charging infrastructure, and carbon footprint, while critiquing a smartphone might prioritise criteria such as user interface, durability, and data security. This demonstrated an understanding of the unique aspects of the technology being critiqued
- balanced evidence to emphasise the critique as the core of the report
- structured the report so that the majority of the content revolved around analysing and evaluating the technological outcome against the selected criteria. For example presenting clear evidence

such as data, user feedback, or case studies and connecting it directly to the judgment criteria, so the critique was the central focus, rather than simply describing the outcome or providing unrelated background information.

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

- examined how applying certain criteria influenced the evaluation process and outcomes. For example, when critiquing a smart thermostat, the use of energy efficiency and user-friendliness as criteria highlighted its sustainability and accessibility
- considered what might be overlooked by focusing on specific criteria, such as affordability or aesthetic design, and justified the emphasis placed on the chosen criteria
- acknowledged that judgment criteria can vary depending on cultural, societal, and personal values. For example, a critique might explain that environmental impact is critical in regions prioritising green technology, whereas cost-effectiveness might hold more weight in economically constrained areas
- demonstrated an awareness of how personal biases or experiences could influence the importance assigned to different criteria
- provided a logical rationale for each criterion selected, tying it directly to the purpose and users of the technological outcome. For example, if critiquing an e-reader, the report could justify focusing on readability, battery life, and portability because these are key factors for frequent readers and travellers, who are the primary target audience
- effectively adapted the general judgment criteria by integrating personal insights and experiences, which made their critique more relatable and authentic. For example, when evaluating a standing desk, prioritising ergonomic benefits and adaptability in the context of a school prototyping project. Such unique perspectives enhance the evaluation, making it more engaging and informative.

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

- did not focus on a single technological outcome or were too generic
- used large amounts of uncontextualised material copied from other sources
- chose outcomes that were too broad or complex for example, cars, boats, motorbikes, museums, or parks
- focussed on general product categories for example, shoes or remote controls, or future technologies not yet developed
- discussed unrelated design movements, eras, or designers
- used criteria that were unsuitable for the chosen outcome
- lacked depth or detail in the critique
- produced reports limited to descriptions of specifications, aesthetics, or functions
- misunderstood appraisal as merely describing features rather than evaluating against set criteria
- did not provide evidence for one or more assessment criteria, showing a lack of understanding
- critiqued based on design elements instead of recognised design evaluation criteria.