NZQA
New Zealand Qualifications Authority
Mana Tohu Matauranga O Aotearoa

Assessment Report

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Level 2 Technology 2021

Standards 91358 91359 91363

Part A: Commentary

Commentary is not provided for Technology standards.

Part B: Report on standards

91358: Demonstrate understanding of how technological modelling supports risk management

Examinations

Many candidates started their reports by defining the different modelling concepts such as functional reasoning and prototyping. This process clearly assists in setting up the candidate's understanding of the assessment criteria.

Candidates who used their own practice to define what modelling is were more successful than candidates who used case studies to help illustrate their introductions and definitions.

Reports that clearly outlined the brief, specifications, and stakeholders at the beginning of the report were more likely to be able to describe what the modelling aims were and explain more authentically what “should” decisions were being made.

Candidates who established early on in their reports who their stakeholders were, what role, expertise, and relevance they had were more able to access the Merit and Excellence criteria. Where obvious structures to approaching the report were employed these generally worked very well providing access to all achievement levels.

Where reports were procedural in nature this limited the candidate’s potential success significantly.

Reports that focussed on the individual practice of the candidate, allowed for informed decisions based on modelling processes.

Reports that placed the decision-making elements (could and should) front and centre, set the candidates up for success to Merit and above. For example, many reports this year started with research as a form of modelling, however, many candidates did not take the opportunity to explain from the analysis the various feasible options (could).

Candidates were successful when they considered the needs of potential end-users and were able to target stakeholders’ feedback to take advantage of their particular expertise for different forms of modelling.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- described a range of modelling activities and identified what type of risk they were managing with each type of modelling
- included their brief and specifications allowing them to make informed (should) decisions and to identify the decisions made because of modelling
- identified what they were measuring their judgements (should) decisions against
- used authentic stakeholders in the modelling process to meet all components of the standard
- made regular reference to stakeholder feedback and explained why particular stakeholders were selected for different forms of modelling

- described and discussed what opportunities a form of modelling could provide in establishing what is either functionally or practically feasible
- included stakeholder feedback in “should” decisions and referred to end user needs.

Candidates whose work was assessed as **Not Achieved** commonly:

- described modelling processes in a procedural way rather than how they were managing risks, describing their intentions, and discussing decisions as result on the modelling
- did not use an iterative design process
- used a limited range and forms of modelling
- used generic terminology to describe modelling rather than using specific examples
- provided little or no descriptions or explanations of specific risks given i.e. “there is a risk that it will not be fit for purpose”
- missed the opportunity to describe the decisions made where the evidence of their practice was procedural or overly directed
- showed predefined judgements about their design and therefore were not considering different possibilities - no ‘could’ or ‘should’ decisions
- referred to a "stakeholder" rather than providing more detail as to who the stakeholder was and their role in the development of the product
- misunderstood the could and should criteria.

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

- used their own words and were not limited by preset phrases and writing templates that limited their responses
- understood the criteria for “could” and “should” clearly
- made and explained key judgements as their context and brief specifications included wider social implications
- explained the decision-making process relating to broader scenarios and technically feasibility
- identified the probability and likelihood of different types of risks happening

- judged the severity of risks
- explained and discussed how they judged the severity of risks
- distinguished between different stakeholders and discriminated between the forms of modelling they sought feedback for
- discussed the forms of modelling they were using and what purpose they provided in terms of making decisions and what risks they were identifying and eliminating
- considered alternative technical ways they could achieve the same specifications points
- related decisions to the environment in which the product is intended for and identified what type of end user the prototype was designed for
- included stakeholder feedback that was sympathetic to the end user.

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

- discussed and compared the feedback stakeholder feedback to determine that it was valid and reliable
- explained why particular modelling processes were used with specific stakeholders
- selected a range of different stakeholders including ones that could provide a high degree of expertise
- established early in the development of their designs a range of stakeholders
- avoided repetition in explaining the same validity reasons
- explained why they chose different forms of modelling and discussed how it enabled reliable testing and feedback
- explained and showed evidence of how decisions made in one form of modelling provided authentic further development
- drew upon their own technological practice and experience rather than following a predefined process
- used a range of modelling processes which provided a balance of relevant opportunities to further develop their designs. Each one providing the opportunity to explore possibilities and their associated risks and include feedback from different stakeholders.

91359: Demonstrate understanding of the role of material evaluation in product development

Examinations

Candidates who discussed relevant testing and evaluation techniques achieved higher grades than those who selected testing at random.

Successful candidates demonstrated the relationship between the material, the outcome and the impact of testing by using reasoned argument to make a decision regarding selection of material(s) after evaluative techniques were applied. This may have included:

- testing more than one feasible component, ingredient, or material and
- making a reasoned choice that related to the performance properties required of the end product (fitness for purpose)
- including the maintenance and disposal implications of using a specific material within the product.
- using downloaded materials sparingly with understanding and throught given to its relative content

Grade awarding

Candidates who were awarded **Achievement** commonly:

- explained the relationship between the performance specs of the product and the performance properties of materials
- described the performance specifications of their technology outcome they were creating to allow for evaluation against criteria
- described relevant and safe testing and trialling techniques to evaluate the performance of a material within their product to judge its fitness for purpose and suitability in relation to the performance specs
- included the use of knowledge relating to composition, changes in composition and structure of the material described the use of fair tests and trials

- tested hypotheses regarding the suitability of a material evaluated components/ ingredients/materials for inclusion
- made decisions or judgements about a particular material relative to the performance specifications required in the product i.e. concluded to the use of the material in relation to the outcome and its performance specifications
- demonstrated they understood the purpose of the types of testing and trialling they were using to make decisions

Candidates whose work was assessed as **Not Achieved** commonly:

- described generic knowledge relating to a group of products or general descriptions without relating this knowledge to the specific subjective and objective testing
- focussed on techniques and processes for the material and product rather than evaluating material used
- demonstrated little knowledge of the actual product, material or evaluation processes
- used an initial brief as performance specifications that did not allow for the demonstration of knowledge
- focussed on the development or trialling of an outcome without referring to the evaluation procedures used to select the materials
- described the process of their technological practice without demonstrating understanding of material evaluation
- focussed on testing a whole product rather than aspects of an incorporated material to be selected for use in the product.

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

- explained the selection of material(s) after a process of evaluation – testing and trialling in various forms
- explained the knowledge and techniques used in the evaluation processes
- made the decisions and rationale for selection clear
- explained why tests were used to determine the suitability of the material to be used.

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

- discussed the relationship between the performance properties of the material, the design of the outcome and the performance specifications of the outcome
- used a reasoned argument to decide the selection of material(s) after evaluative techniques were applied
- developed a conclusion relating to suitability of a material in relation to the product's design
- included the maintenance and disposal implications of using a specific material within the product.

91363: Demonstrate understanding of sustainability in design

Examinations

Successful candidates explored Life Cycle Analysis (LCA) and used the Sustainability Venn Diagram to identify areas where economic, environment and societal related factors could be influenced and resolved by innovative design decisions to increase the sustainability of a product. They used the Venn Diagram to identify viable, bearable, equitable and sustainable considerations that impact on a designer's decision-making process, and on the life cycle of the product. Some candidates were able to identify alternatives that would increase the sustainability of a product, both within their own technological practice and/or in the practice of others.

A considerable number of candidates reported on LCA without showing evidence of understanding of life cycle assessment as a method for assessing the environmental aspect of a product through its life cycle. A common issue was candidates stating, inaccurately, that the product meets the LCA, where LCA is an assessment of all the outputs and inputs into a product's life from raw materials to its disposal.

It is essential that the candidate's chosen context enables the candidate to demonstrate an in-depth understanding of sustainability in design. Reports that followed a template often enabled candidates to gain achieved grades, but this

did, however, often limit higher achievement. Candidates would benefit from a report structure that included, innovation, competing priorities, compromises, and relevance to either their practice or the practice of others.

Candidates would benefit from proof-reading their reports for consistency and to ensure that all report writing guidelines are adhered to, as there were instances of PowerPoint formats, decreased font sizes and margins being extended.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- explained a Sustainability Venn Diagram, life cycle analysis (LCA) model cradle to cradle, cradle to grave, or 3 pillars diagram which then informed their own technological practice or analyse a product / practice of others
- explained how design decisions or interventions could increase the sustainability of the product
- explained how LCA of an outcome enabled them to identify innovative practices, which addressed social, economic, and environmental concerns and was able to contribute to and enhance product sustainability.

Candidates whose work was assessed as **Not Achieved** commonly:

- included models of LCA, cradle to cradle and/or the Sustainability Venn Diagram but had no descriptors and showed limited understanding
- described LCA, but with limited evidence of how the relationship of LCA and innovation and how that informed the considerations to determine the focus for design interventions
- focused on Fairtrade and ethics rather than sustainability in design
- produced a report that was limited to how and why materials may be produced, recycled, or reused with limited explanations on how to prolong the life of an outcome
- copied and pasted large extracts with no candidate voice or discussion of own technological practice.

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

- explained how LCA influenced innovations made by designers in case studies

- submitted evidence derived from their own technological practice
- conducted an LCA of an existing product and explained the focus for design innovation. This knowledge was often applied within their own development of a sustainable technological outcome
- explained how the competing priorities and compromises were managed within the development and lifecycle of a sustainable technological outcome
- showed an in-depth understanding of sustainability in design, in particular design decisions that impacted on the sustainability of the outcome (both positive and negative).

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

- emphasised the competing priorities and compromises made as a result of LCA in the development of a sustainable technological outcome. This was often evident within naturally occurring evidence where a candidate was required to address dilemmas and balance in different aspects of the LCA, conflicting social, environmental and economic factors and demands within their own practice
- discussed how LCA can influence a technologist's design decisions to improve the social, economic or environmental sustainability of an outcome
- discussed their own technological practice, and that of another technologist (s), in relation to sustainability in design
- included a high level of independent voice and reflective comments of their practice that justified the compromises made and illustrated and demonstrated an understanding of sustainability in design.

Technology subject page

Previous years' reports

2020 (PDF, 280KB)

2019 (PDF, 412KB)

2018 (PDF, 174KB)

2017 (PDF, 75KB)

2016 (PDF, 246KB)