NZQA
New Zealand Qualifications Authority
Mana Tohu Matauranga O Aotearoa

Assessment Report

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Level 1 Technology 2018

Standards 91048 91049 91050 91053 91070 91074

Part B: Report on standards

91048: Demonstrate understanding of how technological modelling supports decision-making

Candidates who were awarded **Achievement** commonly:

- identified a technological outcome they had developed
- provided evidence of the modelling by identifying one or more methods of functional modelling they had undertaken
- identified and described the decision(s) made as a result of reviewing the evidence of their own modelling
- stated how the decision(s) were used and linked to the development of their own technological outcome
- provided some evidence from their portfolios.

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

- wrote about technological outcomes developed by others without applying the knowledge to their own practice.
- did not identify the technological outcome
- wrote generic responses
- wrote about the process not their modelling
- undertook modelling that was not relevant to their own outcome
- undertook relevant modelling but did not link it to any decision(s)
- provided no evidence from their portfolios
- wrote in terms of advantages and disadvantages or pros and cons, without demonstrating understanding of the purpose of modelling, the evidence gained and the subsequent decision(s)
- were limited by scaffolded questions which did not meet the requirements of the standard.

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

- explained why they had selected the form(s) of modelling used and how the evidence influenced the subsequent decision(s)
- undertook modelling that was relevant to the developing outcome
- provided evidence of modelling for technical feasibility, making decisions that would lead to an outcome that could be realised and/or provided evidence of

modelling for social acceptability, i.e., should the outcome be happening in the intended social environment and why

- provided legible extracts of their work to support their report
- conducted sound functional modelling but did not undertake prototyping to establish the full potential of the outcome.

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

- were guided by a 'real world' brief that allowed for sound modelling around social and technical aspects
- focussed the report on one technological outcome
- provided a robust discussion of the purpose of technological modelling - both functional modelling and prototyping - in relation to their own developing outcome and how the modelling prevented or identified potential problems
- conducted modelling that was logical, sequential and linked to the developing outcome.
- discussed the technical feasibility of the outcome through the modelling/ evidence and subsequent decision(s)
- provided clear photographic evidence of the modelling and prototyping that had been undertaken and evaluated the results of both.
- discussed the social acceptability of the outcome during development and as a completed outcome.
- embedded risk management in their student practice
- provided photographic evidence showing that the technological outcome actually existed and was evaluated in situ.

Standard specific comments

Establishing an authentic context and issue with stakeholders who will interact with the end-product (technological outcome) is the key to success in achieving this standard. If the function and aesthetics of the intended outcome are predetermined this restricts the candidate's ability to gather a wide range of evidence.

Candidates that reported on the development of more than one outcome were at a disadvantage as they demonstrated unrelated aspects of their modelling and failed to show how the decisions made as a result of modelling contributed to their

evolving outcome. Similarly, candidates who relied on class modelling examples rather than conducting their own relevant modelling were disadvantaged.

The understanding of risk management is often limited to generic statements around saving time, money and safety issues. Potential risk should be focussed on the developing outcome and how it meets the needs of the brief.

Technical feasibility is the key driver in the majority of reports with little understanding demonstrated as to the social acceptability. “Should it be happening’ during stages of development and in the intended environment.

It is important that in writing a report for this standard the candidate links all aspects of modelling to their own practice.

91049: Demonstrate understanding of how materials enable technological products to function

Candidates who were awarded **Achievement** commonly:

- described what they were designing and highlighted their required specifications, which helped to link the chosen material(s) and their performance properties to the project
- described the material(s) they had used, the performance properties of the material (s) and how these were useful in developing a technological outcome
- described the composition, structure and performance properties of their material (s), but understanding of how materials could be manipulated to allow their technological product to function was only just sufficiently demonstrated.

OR

- explained how the material(s) could be manipulated but provided only basic information related to composition, structure and performance properties

- used diagrams or written text to describe the composition and structure of the basic material(s) being used
- based their report on their own technological experience, i.e. linked the material(s) being researched to their own project work
- presented a clearly-structured report
- completed a bibliography or referenced as appropriate
- used their own words to demonstrate their understanding of how their chosen material(s) enabled their outcome to function.

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

- described the performance properties of a material but did not address how the material was used or how it would be useful in the development of a technological outcome
- included a step-by-step description of how their project was made but did not cover the performance properties of the material which made it suitable to use
- presented irrelevant material e.g. the history of materials; how forests are cultivated, and the timber harvested; how cotton fields are managed and who grows the most; how chickens are raised
- did not describe one or more of the composition, structure and performance properties
- did not include the manipulation of material in relation to their own practice
- did not explain how the material(s) used had been manipulated.

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

- explained a material(s) in terms of its structure and composition, and how these determine its performance properties, allowing the material to be manipulated to perform its function and contribute to developing an outcome
- presented evidence of interaction with their project specifications, material(s) research, and how they related to each other
- presented examples from their own projects
- presented work that was clearly student voice
- presented clear, structured responses explained but did not discuss.

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

- discussed a material(s) in terms of its properties, composition and structure, and how its structure allows it to be manipulated to perform its function and contribute to developing a functioning outcome
- provided a discussion, justifying material selection and how the individual properties of the material(s) combine with other materials to ensure the outcome functions as intended
- based the report on their own experiences whilst developing their own project, through the use of trialling and testing of different materials and communication with experts in the chosen field
- compared and discussed in depth the composition, structure, and performance properties of different types of material that enabled their project to function as intended, as required by the performance specifications provided
- used complex sentence structures such as “because of ... this then leads to ... which will then ...”.
- demonstrated understanding of the material(s) they used throughout their discussion
- were very clear and structured in their responses.

Standard specific comments

The intent of the standard is clear; however, too often candidate responses did not address this as clearly as they should. Successful candidates showed understanding of the functional needs of an outcome, a range of appropriate materials and their properties, and how these could be manipulated to achieve the required outcome.

Candidates who provided evidence for each part of the achievement criteria in the form of a clearly structured report related to their own practice were advantaged. Candidates are encouraged to use headings to structure their reports.

91050: Demonstrate understanding of the role of subsystems in technological

systems

Candidates who were awarded **Achievement** commonly:

- selected at least one technological system
- identified at least two subsystems within the technological system
- described the roles of at least two subsystems within a system
- described using accurate technical terms how these subsystems worked together to make the overall system function
- Limited their report to simple descriptions of the purposes of the subsystems and did not give detailed or in-depth explanations of the subsystem or its specific function.

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

- misunderstood what a subsystem is referring to components as subsystems e.g. LEDs and resistors
- submitted lengthy explanations of how their own circuit worked at a component level but did not identify the subsystems within their system.
- identified subsystems but did not describe the roles of the subsystems
- did not relate how the various subsystems they described worked together to achieve the objective of the system
- gave general, inaccurate or vague descriptions of subsystems within a system
- often used incorrect terminology about systems
- described non-technological systems such as biological, managerial or organisational systems.

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

- explained how specific control functions were performed between various subsystems in a technological system
- had a correct understanding of feedback and explained how control information was taken from an output subsystem back to an input subsystem to control, adjust or regulate the behaviour of the system

- explained at least two advantages and two disadvantages of at least one subsystem within the technological system.
- Included some explanations of design, development and maintenance but did not extend these with discussion points such as detailed comparisons, contrasting aspects and/or justifications to lift their grade to an excellence.

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

- discussed both the advantages and disadvantages of at least one subsystem within a particular technological system through comparisons or by evaluating specific decisions made by technologists
- discussed all three aspects of design, development, and maintenance decisions made by technologists regarding subsystems and their implications on a particular technological system.

Standard specific comments

Candidates were required to demonstrate their understanding of the role of subsystems in technological systems. Candidates chose from a number of alternatives and wrote reports that communicated their understanding often using diagrams or pictures to assist their explanations.

A significant number of candidates limited their report to only the achieved criteria and did not attempt to explain feedback or control within a technological system. This was particularly evident when students described their own project (e.g. a railway crossing barrier arm) which had no feedback but only control.

Some candidates who used computer systems as their systems incorrectly confused the concept of self-regulation with automation. For example, when a microprocessor in a computer reads instructions this is not an example of self-regulation, it is simply an automatic process.

Some candidates failed to gain merit or excellence grades as their explanations of feedback, and in some cases control, were incorrect.

Feedback in technological systems does not include how the system gives information about its operation to users of the system; technological feedback is a self-regulating feature of technological systems and occurs without human interaction or intervention.

91053: Demonstrate understanding of design elements

Candidates who were awarded **Achievement** commonly:

- identified and described how design elements had been applied within their own technological outcome, or those of others
- identified and described both the subjective and objective considerations within a specified context
- described how the design elements contributed positively and/or negatively to the quality of the design.

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

- interpreted design elements incorrectly and in turn showed limited understanding
- provided design element definitions without commenting on how they had been applied within a Technological Outcome
- identified the relevant design elements present within a product but did not describe the effect these elements had on the quality of the specified context
- submitted large quantities of ‘supplied and/or non-referenced information’ that the candidate had not processed/personalised or applied to a Technological outcome or context
- did not provide images.

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

- identified, described and explained how design elements had been applied to the Technological Outcome(s) chosen
- compared, contrasted and evaluated the application of design elements, either within their own practice or the practices of others
- explained how specific elements had been applied to improve the aesthetics and/or function of a product (objective/subjective)
- reflected on the development of a product and how the application of design elements impacted on the product

- illustrated the application of design elements throughout the development of their outcome throughout their report.

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

- demonstrated independent research, design, and on-going and reflective analysis within their practice
- compared, contrasted and evaluated the application of design elements, either within their own practice and/or the Technological Outcomes and often discussed how the interaction of different design elements impacted on the quality of the design
- placed an emphasis on how the application of design elements impacted on their own practice and discussed how it impacted on design decisions.

Standard specific comments

In this standard candidates are required to demonstrate their understanding of design elements. This involves commenting on where and how design elements have been utilised within a technological outcome(s). The most common format is to explore existing products and then compare the application of design elements within the candidate's own technological outcome.

The focus of candidate reports should be how the different design elements have been utilized, and how this has impacted on the quality of the design. Often a design that improves the aesthetics of a product can impact on functionality. It is these areas that candidates need to explore in order to access the higher grades. This was often evident as a conclusion or summary in which the candidate explained and justified the prioritization of factors and design decisions within their own technological practice.

When choosing existing products, wherever possible the products chosen should complement a candidate's own practice. Candidates who accessed a wide range of contexts, or chose existing products that were unrelated to their technological practice were often unable to articulate in-depth understanding.

Comprehensive understanding was often characterised by candidates commenting on how the application of one element can impact and influence other design elements. Candidates who used writing frames that promoted this integrated approach to the use and application of design elements were often advantaged.

91070: Demonstrate understanding of basic concepts of information

Candidates who were awarded **Achievement** commonly:

- demonstrated only a limited understanding of Operating Systems and Application Software (they were able to describe two or three features)
- described file management techniques and provided some screenshots of their structures
- described how they used file compression and how they managed threats to their own practices of information management
- described at least two ethical issues in relation to their own practices
- completed one section strongly but had other weak or incomplete sections.

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

- relied on teacher provided templates or answered questions without demonstrating their own understanding
- lacked student voice or made little reference to their own use of computers and operating systems
- produced incomplete or very short reports
- listed the features of either the Operating system or Application Software and not a relevant description on how it is used in practice
- provided detailed descriptions of hardware used in school or at home, which is not required by this standard
- provided screenshots of their files/folder system without annotations or did not refer to them in their reports
- copied and pasted material without demonstrating any understanding.

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

- showed an in-depth understanding of some of the concepts

- related their report to their own use of operating systems and information management throughout the year
- supported their answers with relevant annotated screenshots
- explained the drives/devices used to store and backup data in relation to their own practice.

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

- explained their own practices throughout the year
- used detailed relevant annotated screenshots to expand/support their explanations
- explained how application software and operating system software interact to perform specific information management tasks
- fully understood and could justify the selection of the software by intended use
- provided evidence that they used a range of different file types in their practice and therefore could compare and contrast for different purposes.

Standard specific comments

Some candidates had a whole page referring to standards that they completed throughout the year. This is not required and impacted on the length of their report.

Although some candidates remained within the page limit, text size and margins were clearly outside specification. Any pages after 8 were not considered.

Most candidates showed individuality, excellent supporting material and a comprehensive understanding of information-management in their reports.

Some candidates used very structured templates; this meant candidate reports looked very similar.

The best results seemed to have come from candidates that were familiar with worked directly with the most recent examiners' reports.

91074: Demonstrate understanding of basic concepts from computer science

Candidates who were awarded **Achievement** commonly:

- used their own words to describe the key concepts and acknowledged sources when appropriate
- described formal and informal language and the role each language plays in the operation of a computer
- described the purpose and key features of an algorithm and gave an example of an algorithm's cost
- described the roll of higher and lower level languages and the role of a complier, using appropriate higher-level programming languages e.g Python, Java, C not Scratch or HTML
- described the role of both an interpreter and compiler in the development of software
- described the concept of HCI and reviewed heuristics of a device or software package.

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

- did not attempt all three sections
- used templates and completed these with short answers
- copied answers from the Computer Science Field Guide or Wikipedia without showing any understanding
- did not describe the role of a compiler or interpreter
- discussed the usability of a given device without showing any understanding of HCI concepts
- used graphs and charts with no labels or annotations and had no understanding of what the graph and/or image was intended to convey
- included images that were not discussed or irrelevant
- did not determine the cost of an algorithm.

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

- outlined the key features of an algorithm and explained their importance
- explained the cost of an algorithm
- compared the cost of two different algorithms for the same task
- used their own programmes for comparisons and provided images with explanation
- gave examples of and showed understanding of the role of higher level, lower level languages and the function of a compiler
- gave a clear explanation of HCI concepts and were able give examples of these using specific devices
- made comparisons of the usability functions between two devices with reference to HCI concepts
- covered all three topic areas with some depth and understanding.

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

- related the concepts of their own projects and classwork
- compared the cost of different algorithms for a set task and discussed the results in detail, with justifications of opinions presented
- answered all sections clearly, but links were also made between concepts which showed clear understanding and comprehension
- used clearly labelled and relevant graphs, charts and images
- discussed in some detail the differences between high and low-level languages giving examples of their own work as justification
- explained the role of a compiler and interpreter with appropriate examples and discussed the relative merits of each
- explained HCI concepts with examples and compared two different hardware or software interfaces discussing the relative merits of each in relation to concepts of heuristics.
- provided images as evidence to support discussion and comparisons of user interfaces.

Standard specific comments

None issued.

Technology subject page

Previous years' reports

2017 (PDF, 71KB), 2016 (PDF, 241KB)