

2023 NCEA Assessment Report

Subject:	Digital Technologies and Hangarau Matihiko
Level:	Level 2
Achievement standard(s):	91898, 91899

General commentary

Candidates who read the previous year's Assessment Report and the current year's Assessment Specifications were well-prepared for the assessment. These documents publish the concepts that that will be assessed as this changes year on year.

Candidates who read all the questions before starting were able to avoid repetition of evidence in their answers.

Report on individual achievement standard(s)

Achievement standard 91898: Demonstrate understanding of a computer science concept

Assessment

Candidates had a choice of answering questions on artificial intelligence (AI), encryption, or computer security. There was an even spread amongst the topics chosen to answer. Candidates did equally well on all topics.

Commentary

Some candidates used subject-specific language successfully. This was particularly apparent in the artificial intelligence question about chatbots, where terms such as "natural language processing" should have been used.

Candidates disadvantaged themselves by not answering the more difficult "Merit" or "Excellence" questions, because markers look at the response holistically when awarding grades.

Though most schools have a spread of grades, it was observed that some schools only had Merit and Excellence grades this year.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- gave some ideas on the topic but lacked specifics
- used some technical vocabulary but were vague or incorrect in their understanding, for example when giving the difference between symmetric and asymmetric
- provided limited evidence of understanding.

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

- read all questions first and chose their topic based on what would enable them to show a breadth of understanding
- added more detail to questions and demonstrated knowledge of the difference between password encryption and public / private keys
- added detail around HTTPSs and HTTP
- (for artificial intelligence): related to human factors such as bias, ethics, data protection, and ownership
- (for computer security): discussed human factors such as human error or lack of understanding and upskilling of staff
- (for encryption): discussed human factors such as informing customers.

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

- showed a breadth of understanding
- provided detailed responses to all questions
- demonstrated a very good understanding of encryption
- used language associated with their chosen topic e.g. neural networks, RSA algorithm
- provided specific details of the company they researched.

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

- made a statement but did not support it with examples to demonstrate their understanding
 - provided answers which lacked in detail and technical vocabulary (particularly evident in responses to the artificial intelligence questions)
 - did not provide technical details of the topic (for example, neural networks for artificial intelligence)
 - did not discuss machine learning or other techniques used by chatbots and / or driverless cars
 - did not answer some questions or wrote very little.
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Achievement standard 91899: Present a summary of developing a digital outcome

Assessment

When the candidate produced a physical outcome, they needed to make sure they discussed the digital component of it.

Candidates worked at Level 7 of the New Zealand Curriculum, and in their projects they demonstrated more than simple use of existing online generation tools and platforms to put together an outcome. They wrote their own code and made branding by creating their own logos, and included these in their outcomes. They took their own photographs and created their own media content.

While candidates were not expected to create the whole digital outcome from scratch, it was not acceptable to simply use a Wix or Google site, a design of an app or website in Adobe XD, a very basic logo, a poster or brochure using existing material or online-generated images, or infographics made in Canva, alone with no other authentic content in the outcome.

It was pleasing to see a wide range of outcomes being developed with more in-depth knowledge and understanding.

Commentary

Candidates who completed a digital outcome at this level enjoyed success in this standard, and those who attained a higher grade had sufficient depth in their projects for them to demonstrate their knowledge, understanding, and process, to meet the requirements. Where projects were not at this level, responses were often repetitive or lacked detail.

There was less use of unsuitable software this year, however despite using suitable software there were still some digital outcomes that were borderline or not at Level 7 of the New Zealand Curriculum. In particular, there are still a number of outcomes seen in the programming, website, print (logo / poster), and electronics areas that are far too simple. This was signalled in the Assessment report for 2022.

For Level 7, outcomes should be advanced and the skill-level should be evident. Where this is not the case, responses were at a surface level and didn't give a well-rounded insight into the outcome which was developed. For example, there were a high number of responses focused on having a navigation bar, using a good colour palette, using WASD, having no bugs, and making sure links were working. There is so much more that can be discussed and using better examples would allow students to go into the depth required.

Candidates who had freedom to complete a project based on their own interests, or who had the freedom as to what their outcomes could look like, with some say in the requirements and specifications, developed projects in which they understood the choices and decisions they made more clearly.

Candidates whose projects followed a tight template, those worked through an existing step-by-step resource, or those who completed one of the internal outcome standards (in particular the database, programming, or electronics standards) as a standalone assessment to meet the standard, often showed little understanding of the development process. Their own personal decision-making was lacking and they met a requirement because they were told they had to, and did so by including it in the outcome.

Candidates with a larger project that used a range of the standards to work through an authentic design / development process tended to achieve higher grades. Their understanding

of developing an outcome was often extensive, and this allowed them to reach the criteria for Merit and Excellence. These candidates sourced their own content, rather than using only what was provided to them. This allowed them to discuss it in a meaningful way, such as how it met the requirements of the outcome, addressed relevant implications, and complemented the design.

Candidates who worked on smaller projects with limited digital components tended to receive lower grades as they did not demonstrate the depth of knowledge required to support their answers. The development process can include research, design, and the development, or just the 'sprints' of the development.

Candidates who worked as part of a group to develop their outcomes should ensure that their report focuses clearly on the digital component of the project that they individually contributed to. Each candidate should work on a separate digital component. For instance, if they created the models / graphics for a game, then this aspect is what they should be writing about. They should give specific examples of the models they had to create, how they made them, whether they needed to have animations, how they tested by exporting / saving the models in certain formats for the programmer to then incorporate into the game, and any issues they had to address.

Teachers and candidates need to understand the intent of "explain", "address", "discuss", and "evaluate" as used in the Achievement Standard, noting that these words may not be used in the assessment itself.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- summarised how they developed a digital outcome
- had an actual purpose for the outcome they created
- described their digital outcome and the purpose of it
- used suitable software to develop their outcome
- explained how they used the software to create their digital outcome
- briefly explained their development process with details of what they did in each stage
- explained one or two decisions that were made during the development of the outcome in regards to a decision that had a positive impact and a decision based on testing and trialling
- repeated answers in the decision questions when describing requirements and / or relevant implications
- when working as part of a group, focussed on the project as a whole and used terminology such as "we" and "us" rather than focusing on the digital component they individually contributed to the project
- followed a very structured program of teaching and learning, with a common theme / topic and multiple candidates developing the same outcome
- did not provide some specific details that explored the outcome in greater depth.

Candidates who were assessed as **Achieved with Merit** commonly:

- provided specific examples
- stated two requirements, one of which related to functionality and the other relating to aesthetics, and discussed how their digital outcome met these requirements

- explained requirements specific to their context, conventions, end users, and stakeholders, rather than requirements of the Achievement Standard, requirements that related to the development process, or requirements that are a necessity to create that type of outcome, or simply stating the requirement as functionality / aesthetics
- explained why their requirements were important outside of achieving a particular outcome in their assessment
- discussed different examples to show how they met the criteria of the requirements and the implications
- understood what functionality was in their digital outcome / component and gave specific examples (more in-depth than “I checked it worked” and “I fixed the bugs”).
- discussed how their digital outcome addressed relevant implications of:
 - End users:
 - understood who their end users were and explained this in more detail than just “people my age”
 - gave an example of the feedback received from the end users that related to the outcome being developed (rather than planning or documentation)
 - gave specific examples of what they changed in the outcome based on the end user feedback.
 - Intellectual property:
 - understood that intellectual property is about protecting their work and explained how they have executed this within their outcome
 - explained how they could benefit in the future, for example by using a streaming platform and making money.

Candidates who were assessed as **Achieved with Excellence** commonly:

- worked through a structured development process to create an authentic outcome that they were genuinely interested in
- made it clear whether the decisions were an advantage or disadvantage, and the effect / impact they had on the outcome, when evaluating both of the decisions made during the development process
- made links between the satisfaction of the end users and the use of materials, tools, software, testing, feedback, and the performance and / or quality of the outcome
- understood the aspects they learnt during the process and how these impacted on the overall development process
- included examples that related back to the digital outcome and how they had created it, supported by specific examples
- considered their development process and explained changes they would make to it, rather than changes they would make to their outcome
- considered changes to their development process beyond “working harder” or “using my time better”
- wrote about different examples when discussing what they could have done differently to improve the outcome, thereby building on their prior comments so this was not just a repetition of the evaluation (or a contradiction of what was said in the evaluation).

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

- created a digital outcome that used suitable software but was not at Level 7 of the New Zealand Curriculum
- created an outcome that breached copyright laws
- did not create the digital components of their outcome themselves
- omitted evidence that related to one or more of the assessment criteria for Achievement
- chose to write about a digital outcome that had limited scope
- did not describe the digital outcome they created and / or its purpose
- did not write about the software used to create the digital component, but rather software used to manage the development (Trello), software used in the internal assessment (Google Docs, Microsoft Word, and Microsoft Powerpoint), or design software (Figma or Canva)
- did not answer any questions in the development process section
- did not write about any of the stages in the development process
- did not explain the decisions they worked through in the development process
- misread or misinterpreted “a decision based on testing and trialling”
- did not understand the development process, so the decisions were irrelevant
- described the non-digital part of an outcome but not the digital part.