Assessment Report

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Level 3 Digital Technologies 2021

Standards 91908 91909

Part A: Commentary

The Assessment Specifications for individual achievement standards provide information on the topics to be assessed and also highlight concepts that will be covered.

Candidates' knowledge and understanding of content, and of the skills and complexities involved in project management, should reflect the capabilities expected at Level 8 of the New Zealand Curriculum.

Candidates who were able to answer the questions and were able to refer back to the underlying computer science fundamentals achieved higher grades than those who went off track commenting on social impacts.

Accurate use of key vocabulary also contributes toward demonstrating understanding.

Candidates who lacked confidence with the material tended to repeat a variation of the same answer in multiple parts of the question without adding new information.

Candidates who were able to give clear explanations and make links to examples studied in class to support their answers achieved higher grades than those who cited indirectly or loosely associated examples.

Candidates who wrote concise answers tended to achieve higher grades than those who attempted to get as much information down on the page as possible. Candidates that were discerning and succinct in their responses often answered the question more accurately. Many longer responses served only to highlight a limited understanding of the topic, and candidates who attempted to write as much as they could around an answer often ended up with so much conflicting and irrelevant information that they effectively wrote themselves into a lower grade.

Part B: Report on standards

91908: Analyse an area of computer science

Examination

Candidates were required to choose a question on one of three areas of computer science (Formal Languages, Big Data, and Network and Communication Protocols). Resource materials were provided to support the questions.

Candidates need to understand the computer science components of the topics they intend to answer on, and to become familiar with how to explain these computer science fundamentals in terms of the resource materials that may be provided. Candidates who appeared unfamiliar with the underlying computer science concepts demonstrated this by misinterpreting the resource information.

Candidates who referred to examples from the resource materials did better than those who answered generally and widely around their topic or who could not relate the questions to the resource materials.

Each question followed the same general format:

- the initial parts required candidates to accurately apply their understanding of the basic concepts of each topic, either by determining sequence outcomes or concisely explaining relevant concepts and then demonstrating how they determined their answer

- the later parts required candidates to consider the impact of the concept on humans, and perspectives around the concepts, using resource materials provided
- the final parts asked candidates to consider a resource and then to use it to discuss future uses and implications.

Teachers should refer to accurate guidance resources to support their candidates' learning. For example, The Computer Science Field Guide is an online interactive resource for high school candidates learning about computer science. https://www.csfieldguide.org.nz/.

Observations

Candidates are expected to know the information signposted in the Assessment Specifications. The Computer Science Field Guide gives a good indication of the depth required in candidate responses.

Candidates need to ensure that they understand the fundamental concepts and can explain them in an assessment environment.

Candidates should be aware of the "danger points" where they may go off topic in their responses, and prepare themselves against showing a simplistic or generalised understanding. An example of this in the Big Data question was in regards to privacy, where some candidates' discussion veered into "big corporation conspiracy theories" rather than the effect on the big data collected through variety, velocity, or volume.

Candidates may use examples that they have prepared or learnt in class to support their answers in "compare and contrast"-type responses.

Questions require candidates to refer to resource materials in their answers. Candidates need to be prepared to look at an unfamiliar resource and be able to interpret it accurately – they will be disadvantaged if they are asked to comment specifically on a resource but fail to do so. Candidates need to be able to explain the computer science concept in terms of both their own and provided examples, so they should be comfortable using examples covered in class.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- were able to clearly explain their reasoning and followed logical sequencing
- could use key vocabulary accurately
- could accurately apply answers to specific questions (e.g., for Formal Languages, could determine whether a supplied string was valid, and explain their reasoning)
- answered the questions asked and were able to refer back to the underlying computer science fundamentals rather than going off track commenting on social impacts.

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

- failed to specifically refer to the provided resource material in their responses
- did not relate their answer to inferences gained from the resource material when they were prompted / required to
- went off-topic in their responses and / or showed simplistic and generalised understanding
- were unable to clearly show understanding of the fundamental computer science concepts
- commented on social impacts rather than linking back to the fundamental computer science concepts.

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

- were able to provide more in-depth responses, considering limitations and benefits and linking these back to the underlying concepts
- were able to interpret the diagrams, graphs, and illustrations provided and use these to support their responses
- drew accurate conclusions from the resource materials and compared this against examples that they had studied themselves (e.g. for Network communication protocols, investigated the capabilities and limitations of the protocols by explaining the structural fundamentals and then linked this to their own understanding of a multiplayer gaming environment).

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

- were able to look at unfamiliar examples and interpret them to show their wider understanding and the reasoning for their responses

- accurately used key vocabulary
- accurately used key concepts and related these to their examples and the resource materials
- were able to concisely explain the underlying computer science concepts and then apply them in their responses (e.g. explaining that big data can reveal valuable information that only becomes identifiable once the data is effectively processed and analysed, and discussing the difficulties with achieving this.

91909: Present a reflective analysis of developing a digital outcome

Examination

The assessment comprised a single task in three parts, requiring candidates to present a summary of developing a digital outcome.

Candidates need to have followed a rigorous and identifiable development process to create an outcome which meets the requirements of the New Zealand Curriculum at Level 8. This is in order to ensure the process involves sufficient complexity that it will require candidates to have to authentically consult, and to make decisions on tools and techniques and to then explain how these choices were implemented in the final outcome.

Observations

Candidates whose outcome is not itself digital must focus on the digital components of the outcome. For example, for 3D printing or electronics, they must focus on the 3D modelling and design, or the programming within the electronics, rather than on material or component selections.

Candidates are encouraged to test and evaluate their prototypes to gain feedback to further improve the outcome. Candidates must ensure that the outcomes they are developing allow enough scope for personal decision-making, – for example, using a drag-and-drop environment to design a website minimises the scope of tools and techniques that can be effectively used.

Candidates must be able to identify and effectively utilise stakeholder feedback and to make explicit rather than implicit how this contributed to the development process. Candidates who develop a project in a team environment are not disadvantaged by this standard, but they must be able to identify and explain clearly and concisely the component of the project to which they contributed. For example, if three candidates worked on a game development outcome, one could be responsible for the programming, one for the 3D modelling and graphics, and one for level design. In that case each candidate would have independent decisions to make about their digital component, would seek and receive unique stakeholder feedback, and would be able to clearly show what development work they did themselves.

This approach could be used for candidates working on the front- and back-end parts of a web design outcome.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- explained what they had done, but gave only a limited reflection on, or reasons for, why they had done it
- explained their work or decision-making without reflecting sufficiently on the information gathered
- if they had worked in a team environment, were able to give some evidence of decisions and tasks for which they were individually responsible, and some evidence of decision-making.
- demonstrated that they were working at Level 8 of the New Zealand Curriculum.

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

- wrote about the importance of stakeholder feedback, or how an outcome had to meet a need,
- or how important aesthetics were, but did not actually link this to their own outcome
- showed insufficient reasoning behind their decisions
- showed insufficient breadth or depth in their responses

- presented insufficient evidence of authentic stakeholders or their genuine needs, and consequently presented very shallow work
- were unable to clearly explain their responsibility in a team environment
- did not demonstrate that they were working at Level 8 of the New Zealand Curriculum.

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

- demonstrated a deep knowledge of an authentic issue to be addressed
- communicated clear reasoning about significant issues they dealt with
- explained the tools or techniques that made significant differences to their outcomes, and discussed why these were important in terms of the issue/opportunity/need they dealt with
- if they had worked in a team environment, were able to show the separation of tasks and discuss those for which they were responsible.

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

- discussed a non-trivial outcome, one which demanded significant development work and decision making from them
- presented an insightful reflective analysis of the development of the digital outcome
- revealed a deep understanding of the importance of stakeholder relationships, and clearly communicated the significant aspects of these that guided their work
- had deep knowledge of practice, and communicated insightful reasons for the decisions they made
- evaluated in great detail decisions they made, explaining not only what was done, but also the reasoning behind choices made, and how the outcome could have been improved.
- if they had worked in a team environment, had clearly separate areas of responsibility, and were able to show how they worked effectively within that team with regard to project management and decision-making.

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Previous years' reports

2020 (PDF, 153KB)

2019 (PDF, 110KB)