

Assessment Specifications

Level 3 Digital Technologies 2027

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General information

Domain:	Technology
Standards:	91908, 91909
Assessment method:	Examination, end of year
Assessment medium:	Online digital examination

[Digital Technologies subject page](#)

[National secondary examinations timetable](#)

Information relating to all achievement standards

Further information about digital external assessment can be found on the NZQA website:

[Digital external assessment](#)

Special assessment conditions

Refer to the NZQA website for further information.

[Aromatawai special assessment conditions](#)

Equipment required

Laptop or desktop computer.

Specific information for individual achievement standards

Standard:	91908
Title:	Analyse an area of computer science
Version:	1
Number of credits:	3

Candidates will be required to respond in short and /or extended answers (800–1500 words in total) to questions relating to their choice of ONE of the following areas of computer science:

- complexity and tractability
- computer graphics
- communication protocols.

For **complexity and tractability**, questions may cover:

- polynomial and non-polynomial time complexity, including the difference between tractable and intractable problems
- Big O notation, including $O(1)$, $O(\log n)$, $O(n)$, $O(n^k)$, $O(2^n)$, and $O(n!)$
- best-case, worst-case, and average-case time complexity, including how algorithm performance can change depending on the input
- complexity classes such as P, NP, and NP-complete, including the relationship between problems that can be solved efficiently and problems where solutions can be checked efficiently
- example complex problems such as travelling salesperson, knapsack, scheduling, route optimisation, and resource allocation
- brute force approaches, including why they may become impractical as input size increases
- approximation algorithms and heuristics, including how they can provide “good enough” solutions when optimal solutions are too costly to find
- algorithm design and optimisation, including reducing unnecessary work, choosing better data structures, and improving scalability
- evaluation of optimal, approximate, and heuristic solutions in different contexts such as logistics, timetabling, network routing, artificial intelligence, game strategies, data analysis, and real-world decision-making systems.

For **computer graphics**, questions may cover:

- bitmap/raster and vector graphics, including how images are represented, stored, scaled, and displayed
- pixels, resolution, colour depth, file size, compression, aliasing, and anti-aliasing
- coordinate systems and the representation of 2D and 3D objects using points, lines, curves, polygons, triangles, and meshes

- matrices and transformations, including translation, scaling, rotation, reflection, projection, and the order in which transformations are applied
- line and circle drawing algorithms such as Bresenham's line algorithm and the midpoint circle algorithm, including how pixels are selected efficiently
- rendering techniques such as rasterisation and ray tracing, including trade-offs between speed, realism, computational cost, and hardware requirements
- texture mapping, lighting, shading, shadows, reflections, transparency, perspective, and hidden surface removal
- graphics pipelines, GPUs, shaders, and real-time rendering
- evaluation of graphics techniques for different contexts such as games, animation, film, CAD, architecture, product design, simulation, virtual reality, augmented reality, medical imaging, education, advertising, and AI-generated or AI-assisted graphics.

For network **communication protocols**, questions may cover:

- the internet protocol suite and layered abstraction model, including application, transport, internet, and link layers; encapsulation and de-encapsulation
- application layer protocols such as HTTP/HTTPS
- transport layer protocols such as TCP and UDP, including packetisation, sequencing, checksums, acknowledgements, timeouts, retransmission, reliability, latency, and efficiency trade-offs
- internet and link layer protocols such as IP addressing, routing, packet switching, ports, Ethernet/Wi-Fi frames, and MAC addresses
- supporting protocols such as DNS and DHCP; network security, including SSL/TLS, HTTPS, certificates, encryption, authentication, and threats such as interception, spoofing, denial-of-service, and insecure protocols
- traffic analysis and network optimisation, including bandwidth, latency, congestion, packet size, overhead, caching, load balancing, queuing, and quality of service
- evaluation of protocol choices for different contexts such as web browsing, streaming, online gaming, video calls, school networks, IoT devices, cloud services, and AI/data-intensive systems.

Special notes

Teachers are encouraged to help their candidates to develop answering techniques to ensure that they are able to respond clearly and concisely within the total recommended word limit of 1500 words.

Teachers are strongly encouraged to prepare candidates to be able to apply their understanding of computer science to unfamiliar contexts.

Teachers should prepare candidates to identify and articulate instances where overlap with various areas of computer science occurs, e.g. with artificial intelligence.

Standard:	91909
Title:	Present a reflective analysis of developing a digital outcome
Version:	1
Number of credits:	3

Candidates will be required to respond in short and /or extended answers (800–1500 words in total) to questions relating to a digital outcome they have developed within the past 12 months. Candidates must have developed the outcome themselves. It must not be selected or sourced from AI, the internet, or anyone else's digital product or work.

The digital outcome must be based on Level 8 of The New Zealand Curriculum (see the Teaching and Learning Guide for Digital Technologies). Outcomes at this level demonstrate complexity, depth, and independence in both design and technical implementation.

Examples include but are not limited to:

- a fully functional and content-rich website with custom HTML / CSS / JavaScript components
- an interactive game with original assets and coded mechanics
- a manufactured product developed as a parametric CAD model, and validated through digital testing within software and /or physical testing
- a multimedia package with integrated digital assets
- a film / video / animation with original footage, editing, and post-production techniques
- an electronic device with custom-programmed microcontroller code, circuit design, and a purpose-built housing.

Each outcome should include at least one substantial digital component that has been created, tested, and refined by the candidate using appropriate tools and techniques.

The questions will require candidates to discuss the decisions and considerations made during the development of the digital outcome and evaluate both the outcome and the development process (see Explanatory Notes 4 and 5 of the standard).

The discussion will require candidates to focus on how the following considerations were considered during development of the digital outcome:

- selection of tools and techniques
- ways of addressing implications and end-user considerations
- influence of stakeholder feedback.

Relevant implications include: cultural, legal, ethical, intellectual property, privacy, accessibility, usability, functionality, aesthetics, sustainability, end-user requirements, health and safety.

Special notes

As this is an online digital examination, candidates are **not required** to prepare or submit images.

The school may be required to provide a link to evidence of the candidate's digital outcome (e.g. working files), to show the development process undertaken to create the digital outcome in the software used.

Teachers are encouraged to help their candidates to develop answering techniques to ensure they are able to respond clearly and concisely within the total recommended word limit of 1500 words.