Queensland Government | QCAA Queensland Curriculum & Assessment Authority

Queensland Curriculum and Assessment Authority

Digital Solutions 2025 v1.3

IA2: Sample assessment instrument

This sample has been compiled by the QCAA to assist and support teachers in planning and developing assessment instruments for individual school settings.

Student name	sample only
Student number	sample only
Teacher	sample only
Issued	sample only
Due date	sample only

Marking summary

Criterion	Marks allocated	Provisional marks
Determining and Synthesising	7	
Generating	9	
Evaluating	7	
Communicating	2	
Overall	**25**	

Conditions

Technique	Digital solution
Unit	Unit 3: Digital innovation
Topic/s	Topic 1: Interactions between users, data and digital systems Topic 2: Real-world problems and solution requirements Topic 3: Innovative digital solutions
Duration	Approximately 15 hours of class time
Mode / length	• Visual and written (including mind maps, models, sketches, diagrams, tables, images, screenshots, schemas): up to 10 A4 pages, including annotations of up to 1500 words • Visual and spoken video: up to 2 minutes, demonstrating functionality of – the user interface – data and programmed components.
Individual/group	Individual
Other	Students can develop their responses in class time and their own time.

Context

In an era where climate change and environmental awareness are paramount, there is a growing need for accessible and reliable data on natural phenomena, particularly in marine environments. Surfers, marine researchers, and environmentalists increasingly rely on technology to provide real-time data and predictive analyses to make informed decisions, whether for recreational, research, or conservation purposes.

Task

You will apply the problem-solving process to develop a prototype digital solution for a web application that can be useful to surfers, marine researchers or environmentalists. See the attached stimulus for detailed requirements.

To complete this task, you must:

- determine success criteria for the identified real-world problem, considering the identified requirements, profiles or personas, data, and information related to data repositories
- synthesise ideas and information to develop the possible solutions for
  - user interfaces
  - data and data repositories
  - programmed components
- generate
  - programmed components for the prototype digital solution demonstrating selection, iteration, user input, and data output
  - a prototype digital solution by combining the user interface, data and programmed components
- evaluate a prototype of the digital solution against criteria, including
  - the accuracy and maintainability of programmed components
  - user experience
- make refinements and recommendations for current and future improvements, justified by user feedback and testing
- evaluate the personal, social and economic impacts of the generated digital solution within the context of the real-world problem
- communicate the development of ideas and the solution for the identified real-world problem.

Stimulus

See attached.

Checkpoints

☐ Term 2 Week 3: Submit identified real-world problem and success criteria for consultation.

☐ Term 2 Week 7: Submit draft response for feedback.

☐ Term 2 Week 10: Submit final response.

Authentication strategies

- You will be provided class time for task completion.
- Your teacher will conduct interviews or consultations as you develop the response.
- You must acknowledge all sources.

Scaffolding

Ensure that your response includes:

- success criteria
- possible solutions for
  - user interfaces
  - data and data repositories
  - programmed components
- potential and desired impacts
- showcase of the prototype digital solution
- evaluations
- refinements and recommendations (based on user testing and feedback).

Instrument-specific marking guide (IA2): Digital Solution response (25%)

Determining and Synthesising	Marks
The student response has the following characteristics:	
• astute determination of success criteria • logical synthesis of relevant information and ideas to develop the possible solutions for – user interfaces – data and data repositories – programmed components	6–7
• logical determination of success criteria • adequate synthesis of information and ideas to develop the possible solutions for – user interfaces – data and data repositories – programmed components	4–5
• reasonable determination of success criteria • simple synthesis of information or ideas to develop the possible solutions for – user interfaces – data and data repositories – programmed components	2–3
• identification of a requirement or some criteria • unclear combination of information or ideas to develop data, data repositories, user interface or programmed components	1
The student response does not match any of the descriptors above.	0

Generating	Marks
The student response has the following characteristics:	
• proficient generation of a prototype digital solution combining – user interface components – data components – programmed components	8–9
• effective generation of a prototype digital solution combining – user interface components – data components – programmed components	6–7
• adequate generation of a prototype digital solution combining – user interface components – data components – programmed components	4–5
• basic generation of a prototype digital solution combining – user interface components – data components – programmed components.	2–3
• generation of elements of the prototype digital solution	1
The student work does not satisfy any of the descriptors above.	0

Evaluating	Marks
The student work has the following characteristics:	
• critical evaluation of features and components against criteria including – user experience – programmed components • critical evaluation of impacts • effective refinements and recommendations justified by – user feedback – testing	6–7
• feasible evaluation of features and components against criteria including – user experience – programmed components • feasible evaluation of impacts • adequate refinements and recommendations justified by – user feedback – testing	4–5
• superficial evaluation of – user experience – programmed components – impacts	2–3
• identification of a change to an idea or a solution	1
The student work does not satisfy any of the descriptors above.	0

Communicating	Marks
The student response has the following characteristics:	
• effective decision-making about, and fluent use of – visual, written and spoken features to communicate about a solution – language for a technical audience – grammatically accurate language structures – referencing conventions	2
• simple decision-making about, and inconsistent use of – visual, written and spoken features – suitable language – grammar and language structures – referencing conventions.	1
The student response does not match any of the descriptors above.	0

Stimulus

Functional requirements

The app should include:

- user registration
- administrator access for manual data updates via CSV files
- features that meet the needs and wants of end users.

Non-functional requirements

The app should be engaging and informative for surfers, marine researchers or environmentalists.

Usability

Comply with the relevant accessibility standards (see Table 1, under Data).

Visual communication

The app should:

- make effective use of maps, graphs, and visual data representations
- comply with relevant Queensland government website standards (user experience).

End user profile/s

Surfers

Surfers need accurate wave information to make informed decisions about when and where to surf. Understanding tides is crucial as the wave nature depends on the water depth, varying with the tide. Good surf waves are smooth and break in one direction. The ideal wave size varies based on the skill level of the surfer. Real-time data on wave conditions, including height, direction, speed, and tide information, is necessary.

Marine researchers

Marine researchers require detailed oceanographic data such as sea surface temperatures, salinity levels, chlorophyll concentrations, ocean currents, and historical data trends. An application that offers the ability to export data for further analysis and integrates well with other research tools would be highly beneficial.

Environmentalists

Environmentalists are interested in the impact of wave patterns and ocean conditions on coastal ecosystems. They would benefit from features that monitor and report marine pollution, such as oil spills or plastic debris, and information about protected marine areas and the impact of human activities on these zones. Features for tracking environmental impacts and providing educational content about marine conservation would be beneficial.

Data

Data sources

- Queensland Government Open Data Portal
- Wave monitoring sites
- Condition of marine ecosystem health
- Marine pollution data

Data repositories

Must comply with the Australian Privacy Act (1988).

Table 1: Accessibility standards based on WCAG 2.1 and Queensland government web writing and style guide

Accessibility guidelines
Page titles: • must appear in the browser tab for all pages • must be appropriate for the page • must be different for each page
Alt text: • must be used for all content images (except decorative images) • attribute is set to null for decorative images • appropriately describes the content of the image to which it relates • gets larger when pages are zoomed
Headings: • are on every page (at least one) • levels on each page have a meaningful hierarchy
Zooming of pages: • results in correct display of the page with no horizontal scrolling • allows all buttons to remain visible
Non-mouse navigation (keystrokes or tabs): • moves through the page in a logical order • allows access to all page elements
Fields: • in forms and other form controls have a visible label to allow interaction with voice input and increase the clickable area • that are mandatory are clearly indicated and do not rely on colour alone • with required formats, such as dates (year, month, day), are clearly indicated
Error messages (or validation messages): • are clear and specific • do not cause the form to be completely reset

Accessibility guidelines
Accessibility options include: • general instructions for user input at the top of the form or section to which they relate • text transcripts provided for audio and video elements • appropriate contrast ratio between text and background (colour contrast) • a five-second time limit for all moving or flashing content, and the content can be disabled or controlled by the user • do not cause the form to be completely reset

References

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State of Queensland. (2022, June 28). *About wave monitoring*. Queensland Government. https://www.qld.gov.au/environment/coasts-waterways/beach/waves.

State of Queensland. (2025, March 28). *Web writing and style guide*. Queensland Government. https://www.forgov.qld.gov.au/information-and-communication-technology/communication-and-publishing/website-and-digital-publishing/website-standards-guidelines-and-templates/write-for-queensland-government-websites/web-writing-and-style-guide.

World Wide Web Consortium. (2024) *Web Content Accessibility Guidelines (WCAG) 2.1*. https://www.w3.org/TR/WCAG21/#references.