2026 Queensland Quantum Challenge - Curriculum Alignment to Australian Curriculum V9 – Digital Solutions (for Year 11)

The Digital Solutions Rationale is bolded where there is alignment to the 2026 Queensland Quantum Challenge. The Unit/Syllabus Objectives included provide connections to domains where applications of quantum and advanced technologies are being harnessed to solve problems.

Digital Solutions Syllabus Rationale

In Digital Solutions, students learn about algorithms, computer languages and user interfaces through generating digital solutions to problems. **They engage with data, information and applications to generate digital solutions that filter and present data in timely and efficient ways while understanding the need to encrypt and protect data. They understand computing's personal, social and economic impact, and the issues associated with the ethical integration of technology into our daily lives.**

Students engage in problem-based learning that enables them to explore and develop ideas, generate digital solutions, and evaluate impacts, components and solutions. They understand that solutions enhance their world and benefit society. To generate digital solutions, students analyse problems and apply computational, design and systems thinking processes. Students understand that progress in the development of digital solutions is driven by people and their needs.

Learning in Digital Solutions provides students with opportunities to develop, generate and repurpose solutions that are relevant in a world where data and digital realms are transforming entertainment, education, business, manufacturing and many other industries. Australia's workforce and economy requires people who are able to collaborate, use creativity to be innovative and entrepreneurial, and transform traditional approaches in exciting new ways.

By using the problem-based learning framework, students develop confidence in dealing with complexity, as well as tolerance for ambiguity and persistence in working with difficult problems that may have many solutions. Students are able to communicate and work with others in order to achieve a common goal or solution. Students write computer programs to generate digital solutions that use data; require interactions with users and within systems; and affect people, the economy and environments. Solutions are generated using combinations of readily available hardware and software development environments, code libraries or specific instructions provided through programming. Some examples of digital solutions

include instructions for a robotic system, an instructional game, a productivity application, products featuring interactive data, animations and websites.

Digital Solutions prepares students for a range of careers in a variety of digital contexts. It develops thinking skills that are relevant for digital and non-digital real-world challenges. It prepares them to be successful in a wide range of careers and provides them with skills to engage in and improve the society in which we work and play. Digital Solutions develops the 21st century skills of critical and creative thinking, communication, collaboration and teamwork, personal and social skills, and information and communication technologies (ICT) skills that are critical to students' success in further education and life.

Digital Solutions Syllabus objectives

The following Digital Solutions syllabus objectives align to the 2026 Queensland Quantum Challenge.

3. Analyse problems and information.

When students analyse, they breakdown and examine problems and information to ascertain patterns, similarities and differences in order to identify elements, components and features, and their relationship to the structure of problems. They determine the logic and reasonableness of information by using systems thinking and decomposition, pattern recognition, and abstraction computational thinking.

4. Determine solution requirements and criteria.

When students determine solution requirements and success criteria, they establish, conclude or ascertain the interface, algorithm, programming and identified solution needs and constraints.

5. Synthesise information and ideas to develop possible digital solutions.

When students synthesise, they combine and integrate information and ideas, and resolve uncertainties using design, systems and computational thinking to create new understanding and identify and develop possible digital solutions.

7. Evaluate components and solutions against criteria to make refinements and justified recommendations and evaluate impacts.
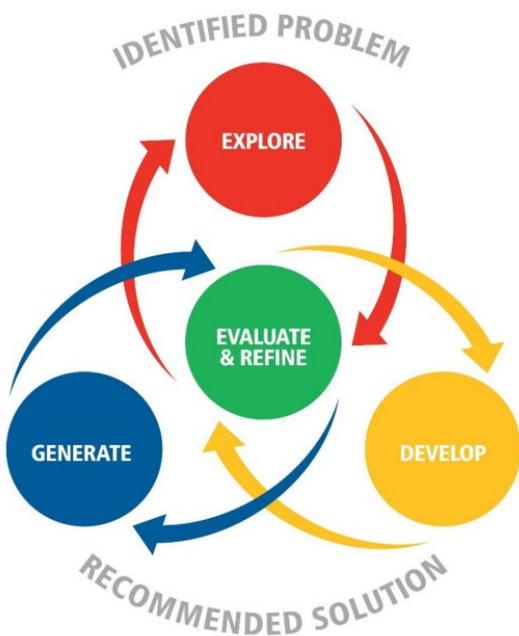
When students evaluate, they appraise components and solutions by weighing up or assessing strengths, implications and limitations against success criteria. They evaluate the possible personal, social and economic impact of solutions to make refinements and recommendations. When students make refinements, they make partial or minor changes to improve the user experience and technical operation

based on criteria. They use testing to evaluate and refine components and solutions based on criteria. When students make justified recommendations, they use supporting evidence to suggest modifications or enhancements.

Digital Solutions Procedural Knowledge

The 2026 Queensland Quantum Challenge aligns with the "Problem-solving process in Digital Solutions" model (Figure 1 below). The process is iterative and involves several phases. Students are required to explore problems, develop ideas, generate components and digital solutions. They evaluate components and the personal, social and economic impacts of their solutions to make refinements and recommendations.

Figure 1: Problem-solving process in Digital Solutions

Digital Solutions	
Unit / Syllabus Objectives	**Subject Matter**
Unit 3: Digital Innovation	• Explore the impact of emerging technologies on innovation, e.g. machine learning, deep learning, neural networks, natural language processing.
Unit 4: Digital impacts	• Recognise and describe how particular algorithms process data differently, e.g. machine learning, deep learning, natural language processing and reinforcement learning algorithms.