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| Year 9/10 Digital Technologies curriculum and assessment plan Example |

# Curriculum overview

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| Band description | Cohort description  |
| Learning in Digital Technologies focuses on further developing understanding and skills in computational thinking such as precisely and accurately describing problems and the use of modular approaches to solutions. It also focuses on engaging students with specialised learning in preparation for vocational training or learning in the senior secondary years.By the end of Year 10, students will have had opportunities to analyse problems and design, implement and evaluate a range of digital solutions, such as database-driven websites and artificial intelligence engines and simulations.In Year 9 and 10, students consider how human interaction with networked systems introduces complexities surrounding access to, and the security and privacy of, data of various types. They interrogate security practices and techniques used to compress data, and learn about the importance of separating content, presentation and behavioural elements for data integrity and maintenance purposes.Students explore how bias can impact the results and value of data collection methods and they use structured data to analyse, visualise, model and evaluate objects and events.They learn how to develop multilevel abstractions, identify standard elements such as searching and sorting in algorithms, and explore the trade-offs between the simplicity of a model and the faithfulness of its representation.When defining problems students consider the functional and non-functional requirements of a solution through interacting with clients and regularly reviewing processes. They consolidate their algorithmic design skills to incorporate testing and review, and further develop their understanding of the user experience to incorporate a wider variety of user needs. Students develop modular solutions to complex problems using an object-oriented programming language where appropriate and evaluate their solutions and existing information systems based on a broad set of criteria including connections to existing policies and their enterprise potential. They consider the privacy and security implications of how data are used and controlled and suggest how policies and practices can be improved to ensure the sustainability and safety of information systems.Students progressively become more skilled at identifying the steps involved in planning solutions and developing detailed plans that are mindful of risks and sustainability requirements. When creating solutions, both individually and collaboratively, students comply with legal obligations, particularly with respect to the ownership of information, and when creating interactive solutions for sharing in online environments. | This band plan has not been developed with a specific cohort in mind. It is provided as an example of the intent of the Australian Curriculum: Digital Technologies, and reflective of QCAA advice and resources. |
| Course organisation  |
| This band plan is written with the consideration that all school contexts for delivery of Digital Technologies are unique. It is written to:* offer units of work that could be adapted to suit multiple contexts as required by the school, including allocated time and resources
* consider different types of assessment that are suitable for the Digital Technologies learning area
* provide examples for schools to adapt to their own contexts.

**Senior pathways**Senior Digital Technologies pathways are extremely diverse. Consideration of these pathways is necessary when designing a course of work — opportunities to develop the knowledge and skills necessary to succeed in these pathways should be evident across a course of study.Senior pathways include: Digital Solutions and Information & Communication Technology. |

# Unit overview

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| Year 9 | Year 10 |
| Semester 1 | Semester 2 | Semester 3 | Semester 4 |
| Unit 1 — Websites | Unit 2 — Gamification  | Unit 3 — Big data | Unit 4 — Internet of Things (IoT) |
| Students will respond to a brief that asks them to ‘Be creative: Develop a website that will advocate for change in the world’. They will learn that websites provide the opportunity for individuals and companies to reach and engage an audience on an unprecedented scale. Students will learn that the creation of websites presents them with the possibility of using their imagination to create innovative solutions to real‑world problems. Students will develop an understanding of the structure of a web page and the workings of the world wide web. They will design the user experience and user interface for a website and develop responsive web pages. Students analyse the website for best practices and evaluate a website focusing on: how they would change it and usability principles, including load times, latency and responsiveness. Students analyse the compression of data (e.g. using HTML forms to obtain information from users) and explain simple data compression and why content data are separated from presentation.  | Students will learn that gamification is an educational approach that can motivate students to learn through the use of interactive media and game elements in learning environments. They will understand that the goal is to capture the interest of learners and inspire them to continue learning by maximising enjoyment and engagement.Students will design a user experience and create and use algorithms in the process. They will implement modular programming — including the use of object-oriented programming — and they will understand temporary and persistent data structures. Students will test and predict results and evaluate their game or quiz, annotating this to demonstrate their understanding of programming concepts. These experiences will enable students to implement gamification concepts in digital solutions. | Students will learn that the collection, representation and interpretation of data is fundamental to organisations throughout the world. They will understand that business intelligence uses software and services to transform data into actionable insights that inform an organisation’s strategic and tactical decisions, and that a database management system (DBMS) forms the underlying structure for the collection and analysis of data.Students will identify a dataset within a set context. They will collect, interpret and analyse databases; analyse simple compression of data and how content data are separated from presentation; develop systems that store structured data; develop systems that check data is correct and meaningful; use and manipulate data to create a digital solution; and consider privacy and security requirements. | Students will learn that everything is connected as technology undergoes a vast transformation due to the addition of networked devices. They will understand that the countless devices being introduced at an accelerated pace promise to generate and exchange enormous amounts of data while pushing the capabilities of our current infrastructure. They will consider that this presents digital creators with a range of unique opportunities and challenges for developing networked solutions.Students will investigate, design, create and explain the control and management of networked digital systems in the context of ‘smart farming’, i.e. infrastructure that uses advanced technology for tracking, monitoring, automating and analysing of farming operations. They will consider the security implications of the interaction between hardware, software and users.  |

# Assessment overview

|  | Year 9 | Year 10 |
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|  | Semester 1 | Semester 2 | Semester 3 | Semester 4 |
|  | Unit 1 — Websites  | Week/s  | Unit 2 —Gamification | Week/s | Unit 3 — Data  | Week/s | Unit 4 — Internet of Things (IoT) | Week/s |
| Assessment | Technique: InvestigationStudents will investigate an existing website and evaluate it against best practices, including safety, social contexts and legal responsibilities, functionality, accessibility, usability and aesthetics.Format: WrittenConditions: * 500–600 words
 | Term 14 weeks | Technique: ProjectStudents will demonstrate the digital design process through the creation of a programmable application (app) to solve the challenge of supporting early years numeracy education.Format: Written and multimodalConditions:* 300–400 words including graphical representations
* 1–2 minutes
 | Term 35 weeks | Technique: ExaminationStudents will respond to topics that could include design of user interfaces, structure of data, structured query language (SQL), using a dataset etc.Format: Written — short response items including answers that are:* single word
* true or false
* multiple choice
* sentences

Conditions: Up to 90 minutes, plus 10 minutes perusal. | Term 1 | Technique: InvestigationStudents will investigate the control and management of networked digital systems in the context of smart farming.Format: WrittenConditions: * 500–600 words
 | Term 34 weeks |
| Technique: ProjectStudents will design and produce a new or reimagined game in the form of a digital solution that solves an educational need for a group of 14–16-year olds. Students will demonstrate the digital design process through an annotated folio.Format: Written and multimodalConditions:* 300–400 words including graphical representations
* 3–4 minutes multimodal
 | Term 26 weeks | Technique: ProjectStudents will create a website using web development software for an event, incorporating images, a storefront, contact details, digital forms, and maps or geolocations. Students will demonstrate the digital design process through an annotated folio.Format: Written and multimodalConditions:* 300–400 words including graphical representations
* 3–4 minutes multimodal
 | Term 48 weeks | Technique: ProjectStudents will identify an open dataset, within a set context, to create a digital solution and collect, interpret and analyse a database. Students will demonstrate the digital design process through a folio.Format: Written and multimodalConditions:* 300–400 words including graphical representations
* 3–4 minutes multimodal
 | Term 28 weeks | Technique: ProjectStudents will design and simulate a digital component of a networked solution, using the smart farming context. This might include the processing of data, such as soil moisture and weather predictions, and the resulting actions triggered in the system.Format: Written and multimodalConditions:* 300–400 words including graphical representations
* 3–4 minutes multimodal
 | Term 4 |
| Achievement standard | By the end of Year 10, students explain the control and management of networked digital systems and the security implications of the interaction between hardware, software and users. They explain simple data compression, and why content data are separated from presentation. Students plan and manage digital projects using an iterative approach. They define and decompose complex problems in terms of functional and non-functional requirements. Students design and evaluate user experiences and algorithms. They design and implement modular programs, including an object-oriented program, using algorithms and data structures involving modular functions that reflect the relationships of real-world data and data entities. They take account of privacy and security requirements when selecting and validating data. Students test and predict results and implement digital solutions. They evaluate information systems and their solutions in terms of risk, sustainability and potential for innovation and enterprise. They share and collaborate online, establishing protocols for the use, transmission and maintenance of data and projects. | By the end of Year 10, students explain the control and management of networked digital systems and the security implications of the interaction between hardware, software and users. They explain simple data compression, and why content data are separated from presentation. Students plan and manage digital projects using an iterative approach. They define and decompose complex problems in terms of functional and non-functional requirements. Students design and evaluate user experiences and algorithms. They design and implement modular programs, including an object-oriented program, using algorithms and data structures involving modular functions that reflect the relationships of real-world data and data entities. They take account of privacy and security requirements when selecting and validating data. Students test and predict results and implement digital solutions. They evaluate information systems and their solutions in terms of risk, sustainability and potential for innovation and enterprise. They share and collaborate online, establishing protocols for the use, transmission and maintenance of data and projects. | By the end of Year 10, students explain the control and management of networked digital systems and the security implications of the interaction between hardware, software and users. They explain simple data compression, and why content data are separated from presentation. Students plan and manage digital projects using an iterative approach. They define and decompose complex problems in terms of functional and non-functional requirements. Students design and evaluate user experiences and algorithms. They design and implement modular programs, including an object-oriented program, using algorithms and data structures involving modular functions that reflect the relationships of real-world data and data entities. They take account of privacy and security requirements when selecting and validating data. Students test and predict results and implement digital solutions. They evaluate information systems and their solutions in terms of risk, sustainability and potential for innovation and enterprise. They share and collaborate online, establishing protocols for the use, transmission and maintenance of data and projects. | By the end of Year 10, students explain the control and management of networked digital systems and the security implications of the interaction between hardware, software and users. They explain simple data compression, and why content data are separated from presentation. Students plan and manage digital projects using an iterative approach. They define and decompose complex problems in terms of functional and non-functional requirements. Students design and evaluate user experiences and algorithms. They design and implement modular programs, including an object-oriented program, using algorithms and data structures involving modular functions that reflect the relationships of real-world data and data entities. They take account of privacy and security requirements when selecting and validating data. Students test and predict results and implement digital solutions. They evaluate information systems and their solutions in terms of risk, sustainability and potential for innovation and enterprise. They share and collaborate online, establishing protocols for the use, transmission and maintenance of data and projects. |
| Moderation | Conferencing: Once marking of folios is completed, the class teacher will select one sample for each level of achievement for review by a teaching colleague. | Conferencing: Once marking of folios is completed, the class teacher will select one sample for each level of achievement for review by a teaching colleague. | Calibration: The HOD will select a sample of students from each class. The class teacher will cross mark sample students’ project portfolios and then meet with teaching colleagues to discuss grading across classes. Once consensus is reached, the class teacher will grade all projects applying understanding gained during calibration process.  | Conferencing: Once marking is completed, the class teacher will provide one sample for each level of achievement for review by a teaching colleague. |

# Teaching and learning focus

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| Content descriptions |
| Knowledge and understanding | Unit 1 | Unit 2 | Unit 3 | Unit 4 | Processes and production skills | Unit 1 | Unit 2 | Unit 3 | Unit 4 |
| Digital systemsInvestigate the role of hardware and software in managing, controlling and securing the movement of and access to data in networked digital systems  |  |  | 🗸 | 🗸 | Collecting, managing and analysing data Develop techniques for acquiring, storing and validating quantitative and qualitative data from a range of sources, considering privacy and security requirements  |  |  | 🗸 | 🗸 |
| Representation of dataAnalyse simple compression of data and how content data are separated from presentation  | 🗸 |  | 🗸 |  | Analyse and visualise data to create information and address complex problems, and model processes, entities and their relationships using structured data  | 🗸 | 🗸 | 🗸 | 🗸 |
|  |  |  |  |  | Investigating and definingDefine and decompose real-world problems precisely, taking into account functional and non-functional requirements and including interviewing stakeholders to identify needs  | 🗸 | 🗸 | 🗸 | 🗸 |
|  |  |  |  |  | Generating and designingDesign the user experience of a digital system by evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics  | 🗸 | 🗸 |  | 🗸 |
|  |  |  |  |  | Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases  | 🗸 |  | 🗸 |  |
|  |  |  |  |  | Producing and implementingImplement modular programs, applying selected algorithms and data structures including using an object-oriented programming language  | 🗸 | 🗸 | 🗸 | 🗸 |
|  |  |  |  |  | EvaluatingEvaluate critically how student solutions and existing information systems and policies, take account of future risks and sustainability and provide opportunities for innovation and enterprise  | 🗸 | 🗸 | 🗸 |  |
|  |  |  |  |  | Collaborating and managingCreate interactive solutions for sharing ideas and information online, taking into account safety, social contexts and legal responsibilities  | 🗸 |  | 🗸 |  |
|  |  |  |  |  | Plan and manage projects using an iterative and collaborative approach, identifying risks and considering safety and sustainability  | 🗸 | 🗸 | 🗸 |  |

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| General capabilities | Year 9/10 |  | Cross-curriculum priorities | Year 9/10 |
| Unit | 1 | 2 | 3 | 4 |  | Unit | 1 | 2 | 3 | 4 |
| Literacy | 🗸 | 🗸 | 🗸 | 🗸 |  | Aboriginal and Torres Strait Islander histories and cultures |  |  | 🗸 |  |
| Numeracy |  |  | 🗸 | 🗸 |  | Asia and Australia’s engagement with Asia | 🗸 |  |  | 🗸 |
| Information and communication technology | 🗸 | 🗸 | 🗸 | 🗸 |  | Sustainability | 🗸 |  |  | 🗸 |
| Critical and creative thinking | 🗸 | 🗸 | 🗸 | 🗸 |  |
| Personal and social capability |  | 🗸 |  |  |  |
| Intercultural understanding |  |  | 🗸 |  |  |
| Ethical understanding |  |  | 🗸 |  |  |

# Planning considerations

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| Prior to implementation the teaching team will consider questions such as:* Where has prior and future learning across the year level/band been reflected in the plan?
* Are there adequate opportunities for students to develop depth of conceptual understanding and sophistication of skills across the year level/band?
* Does the plan ensure adequate opportunities for students to demonstrate the achievement standard/s by the end of the year level/band?
* Are the timing and demands of the planned assessment appropriate in relation to assessment of other learning areas and subjects taught in this year?
* Are there any Indigenous cultural and intellectual property (ICIP) rights to consider? For guidance, see <https://smartcopying.edu.au/guidelines/copyright-basics/indigenous-cultural-and-intellectual-property-rights>.
* Do the assessment techniques and conditions offer a range and balance across the year/band? What strategies for authentication are included?
* What moderation processes will be used? When will assessment and moderation occur?
* Is the planned teaching, learning and assessment sequence appropriate for reporting purposes?
* Do strategies for differentiation and reasonable adjustments complement the teaching, learning and assessment sequence?
* How will planned strategies for differentiation and reasonable adjustments impact other year level/band plans?
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| Following implementation, the teaching team will consider questions such as:* Was the teaching, learning and assessment effective?
* Are there opportunities to improve the effectiveness of the teaching, learning and assessment? If so, what?
* Were there any common student misconceptions that need, or needed, to be clarified?
* How do student outcomes in this year of learning impact on the planning of subsequent year level/band plans?
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