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|  | Years 7 and 8 band plan — Technologies  Overview for planning with the Australian Curriculum: Digital Technologies |

This band plan has been developed in consultation with the Curriculum into the Classroom (C2C) project team.

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| School name: | | | | | |
| Australian Curriculum: Digital Technologies Band: Years 7 and 8 | | | | | |
| Identify curriculum[[1]](#footnote-1) | **Technologies learning area** | The Technologies curriculum provides students with opportunities to consider how solutions that are created now will be used in the future. Students will identify the possible benefits and risks of creating solutions and learn to recognise that views about the priority of the benefits and risks will vary and that preferred futures are contested. They will use critical and creative thinking to weigh up possible short-term and long-term impacts. They develop solutions to meet needs considering impacts on liveability, economic prosperity and environmental sustainability.  The Australian Curriculum: Technologies describes two distinct but related subjects:   * Design and Technologies, in which students use design thinking and technologies to generate and produce designed solutions for authentic needs and opportunities * Digital Technologies, in which students use computational thinking and information systems to define, design and implement digital solutions.   The Australian Curriculum: Digital Technologies empowers students to shape change by influencing how contemporary and emerging information systems and practices are applied to meet current and future needs. A deep knowledge and understanding of information systems enables students to be creative and discerning decision-makers when they select, use and manage data, information, processes and digital systems to meet needs and shape preferred futures.  Digital Technologies provides students with practical opportunities to use design thinking and to be innovative developers of digital solutions and knowledge. The subject helps students to become innovative creators of digital solutions, effective users of digital systems and critical consumers of information conveyed by digital systems.  Digital Technologies provides students with authentic learning challenges that foster curiosity, confidence, persistence, innovation, creativity, respect and cooperation. These are all necessary when using and developing information systems to make sense of complex ideas and relationships in all areas of learning. Digital Technologies helps students to be regional and global citizens capable of actively and ethically communicating and collaborating. | | | |
| **Course organisation** | In the Australian Curriculum: Digital Technologies, the two strands — Knowledge and Understanding, and Processes and Production Skills — are interrelated and inform and support each other. In Digital Technologies students are actively engaged in the process of defining problems and opportunities, designing, implementing and evaluating digital solutions, and creating and sharing information that meets a range of current and future needs. These solutions and information are created through the application of computational and design thinking, and technical skills.  Students will create digital solutions that will use data, require interactions with users and within systems, and will have impacts on people, the economy and environments. Solutions may be developed using combinations of readily available hardware and software applications, and/or specific instructions provided through programming. Some examples of solutions are instructions for a robot, an adventure game, products featuring interactive multimedia including digital stories, animations and websites.  When developing teaching and learning programs teachers should consider:   * the relationship between each of the curriculum components (band descriptions, content descriptions, elaborations and achievement standards) and how they contribute to the development of coherent programs * integrating the two strands, as content in Processes and Production Skills strand frequently draws on understanding of concepts in the Knowledge and Understanding strand, and focus on a digital technologies application in a unit of work * combining aspects of the strands within a subject in different ways to provide students with learning experiences that meet their needs and interests * providing opportunity for ongoing practice and consolidation of previously introduced knowledge and skills as many aspects of Technologies curriculum are recursive * developing a variety of learning experiences that are relevant, rigorous and meaningful and allow for different rates of development, in particular for younger students and for those who need extra support * opportunities for integration of learning between the Technologies subjects and with other learning areas.   Teaching and learning programs should providing opportunities for students to:   * use their knowledge and understanding of data and digital systems to apply processes and production skills as they create digital solutions * engage in learning activities that do not require the full use of the process, particularly in the early years * be safe when they use information systems and create and communicate information online.   The Band plan for Digital Technologies is organised to:   * provide flexibility when making decisions about how the subject will be implemented, based on the local context and needs of students in schools * align with the Australia Curriculum: Digital Technologies, which is organised in bands for the achievement standards and content descriptions * provide a course structure and content that includes a sequence of teaching and learning and identification of opportunities for assessment and feedback, organised in units according to year levels, and developed using the Australian Curriculum: Digital Technologies content descriptions and achievement standards. | | | |
|  |  | The Band plan course organisation allows schools to implement the Australian Curriculum: Digital Technologies in:   * conjunction with other learning areas/subjects * a term * a semester * only one year of a band of years.   Safety  All practical work must be organised with student safety in mind. Identifying and managing risk in Technologies learning addresses the safe use of technologies, as well as risks that can impact on project timelines. It covers all necessary aspects of health, safety and injury prevention and, in any technologies context, the use of potentially dangerous materials, tools and equipment. It includes ergonomics, safety including cyber safety, data security, and ethical and legal considerations when communicating and collaborating online. The current safety requirements are clearly explained on the Queensland Government Education Health and Safety webpage: [http://education.qld.gov.au/health/safety](http://education.qld.gov.au/health/safety/). School must ensure that their practices meet current guidelines.  Animal ethics  Any teaching activities that involve caring, using, or interacting with animals must comply with the Australian code of practice for the care and use of animals for scientific purposes in addition to relevant state or territory guidelines. The *Animal Care and Protection Act 2001* and the accompanying Animal Care and Protection Regulation 2002 govern the treatment and use of all animals in Queensland (see [www.legislation.qld.gov.au](http://www.legislation.qld.gov.au/Acts_SLs/Acts_SL.htm)). The Department of Agriculture, Fisheries and Forestry Queensland (DAFF), through Biosecurity Queensland, is responsible for enforcement of the legislation. | | | |
| **Phase curriculum focus** | Curriculum focus: Years 7 to 10  As students move into adolescence, they undergo a range of important physical, cognitive, emotional and social changes. Students often begin to question established community conventions, practices and values. Their interests extend well beyond their own communities and they develop their concerns about wider social, ethical and sustainability issues. Students in this age range increasingly look for and value learning they perceive as relevant, consistent with personal goals, and leading to important outcomes. Increasingly they analyse and work with more abstract concepts, consider the implications of individual and community actions and are keen to examine evidence prior to developing ideas.  In the Technologies learning area, students use technologies knowledge and understanding; technologies processes and production skills; and systems, design, and/or computational thinking to solve and produce creative solutions to problems, needs or opportunities. They communicate and record their ideas using a range of media and technologies. These specialised problem-solving activities will be sophisticated, acknowledge the complexities of contemporary life and may make connections to related specialised occupations and further study.  Students develop a global perspective; they have opportunities to understand the complex interdependencies involved in the development of technologies and between the developer and user in their solutions, and how these can contribute to preferred futures. Students develop an understanding of the interdependence of technologies development, values, beliefs and environment (systems thinking). Through undertaking technologies processes students develop systems, design and computational thinking; and organisational and project management skills. | | | |
| **Band description** | Learning in Digital Technologies focuses on further developing understanding and skills in computational thinking such as decomposing problems and prototyping; and engaging students with a wider range of information systems as they broaden their experiences and involvement in national, regional and global activities.  By the end of Year 8, students will have had opportunities to create a range of digital solutions, such as interactive web applications or programmable multimedia assets or simulations of relationships between objects in the real world.  In Year 7 and 8, students analyse the properties of networked systems and their suitability and use for the transmission of data types. They acquire, analyse, validate and evaluate various types of data, and appreciate the complexities of storing and transmitting that data in digital systems. Students use structured data to model objects and events that shape the communities they actively engage with. They further develop their understanding of the vital role that data plays in their lives, and how the data and related systems define and are limited by technical, environmental, economic and social constraints.  They further develop abstractions by identifying common elements while decomposing apparently different problems and systems to define requirements, and recognise that abstractions hide irrelevant details for particular purposes. When defining problems, students identify the key elements of the problems and the factors and constraints at play. They design increasingly complex algorithms that allow data to be manipulated automatically, and explore different ways of showing the relationship between data elements to help computation, such as using pivot tables, graphs and clearly defined mark-up or rules. They progress from designing the user interface to considering user experience factors such as user expertise, accessibility and usability requirements.  They broaden their programming experiences to include general-purpose programming languages, and incorporate subprograms into their solutions. They predict and evaluate their developed and existing solutions, considering time, tasks, data and the safe and sustainable use of information systems, and anticipate any risks associated with the use or adoption of such systems.  Students plan and manage individual and team projects with some autonomy. They consider ways of managing the exchange of ideas, tasks and files, and techniques for monitoring progress and feedback. When communicating and collaborating online, students develop an understanding of different social contexts, for example acknowledging cultural practices and meeting legal obligations. | | | |
| **Achievement standard** | By the end of Year 8, students [distinguish](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Distinguish) between different types of networks and defined purposes. They [explain](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Explain) how text, image and audio data can be represented, secured and presented in digital systems.  Students plan and manage digital projects to create interactive information. They define and decompose problems in terms of functional requirements and constraints. Students [design](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Design) user experiences and algorithms incorporating branching and iterations, and test, modify and implement digital solutions. They [evaluate](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Evaluate) information systems and their solutions in terms of meeting needs, innovation and sustainability. They [analyse](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Analyse) and [evaluate](http://www.australiancurriculum.edu.au/glossary/popup?a=F10AS&t=Evaluate) data from a range of sources to model and create solutions. They use appropriate protocols when communicating and collaborating online. | | | |
| Teaching and learning | **Units overview**  The Australian Curriculum assumes that all students will study the two Technologies subjects from Foundation to the end of Year 8.  Schools decide which units of study per subject to complete, and how and when. This band plan provides two potential units. | **Unit 1 — Serious games** | **Unit 2 — DATA (Data Analysis Troubleshooting Agency)** | | |
| Students apply computational and systems thinking to evaluate educational information systems and create digital solutions (a model of real-world system and a game that will educate their peers) using a general-purpose programming language. They apply a range of skills and processes in the production of digital solutions by:   * analysing data to model a real-life object or event, with consideration to gaming mechanics * investigating how data sources such as text, images and sound are represented in binary, and the implications for game design * defining and decomposing real-world problems, considering the functional, technical, social and usability constraints * investigating how game mechanics influence user experience and apply those principles to the user-experience design * using algorithms including flow charts, storyboards and pseudo-code to design their solution * testing algorithms for accuracy * evaluating how well needs are met by digital solutions and information systems, and evaluating them against criteria including innovation, risk and sustainability * learning and applying project management techniques, such as resourcing, time, task identification, considering safety and sustainability, and setting and applying protocols for collaborating online * exploring emerging technologies, such as virtual reality.   Cross-curriculum connections  This unit could complement the concepts taught in the *Year 8 plan: Mathematics exemplar* unit *Planning a holiday*. By working collaboratively, students create a game (using a suitable software package) based on the application of rates, ratios and percentages. Students consider costs, travel time, and other chosen criteria to develop a holiday itinerary and budget.  See [www.qcaa.qld.edu.au/p-10/aciq/p-10-mathematics/year-8-mathematics](https://www.qcaa.qld.edu.au/p-10/aciq/p-10-mathematics/year-8-mathematics) > Planning > *Year 8 plan: Mathematics exemplar* > Term 3: Planning a holiday. | Students transform data into information, explore and analyse the properties and components of networked systems and data transmission and 'joining' a fictional agency to create a range of digital solutions. They apply a range of skills and processes when creating digital solutions by:   * exploring the reliability and speed of transmission through different networks (wired, wireless and mobile), examining the impacts of components and their specification and communication protocols * creating a model of a network for a client * acquiring data from a range of sources and explore techniques for efficient targeted online data collection, including analysing search algorithms and querying databases * evaluating data accuracy, authenticity and timeliness * analysing and manage data using spreadsheets * decomposing real-world problems considering functional requirements and usability, economic, social, environmental and technical constraints * learning basic HTML to modify a website to improve user experience, and comparing and evaluating web designs * evaluate how well developed solutions meet needs and sustainability (e.g. e-waste) * evaluating how well developed solutions meet needs and sustainability (e.g. e-waste).   Cross-curriculum connections  This unit could complement the concepts taught in the *Year 7 plan: Science exemplar* unit *Water: waste not*, *want not*. Students create a model (using a software package of spreadsheeting with graphs) of local water use and management for a local authority to inform improvements to water sustainability.  See [www.qcaa.qld.edu.au/p-10/aciq/p-10-science/year-7-science](https://www.qcaa.qld.edu.au/p-10/aciq/p-10-science/year-7-science) > Planning > *Year 7 plan: Science exemplar >* Term 1: Water: waste not, want not. | | |
| **Content descriptions** | Knowledge and Understanding | | Unit 1 | Unit 2 |
| Investigate how [data](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Data) are transmitted and secured in wired, wireless and mobile networks, and how the specifications of hardware [components](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Components) impact on network activities [(ACTDIK023)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIK023) | |  | ✓ |
| Investigate how [digital systems](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Digital+systems) represent text, image and audio [data](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Data) in [binary](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Binary) [(ACTDIK024)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIK024) | | ✓ | ✓ |
| Processes and Production Skills | | Unit 1 | Unit 2 |
| Acquire [data](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Data) from a range of sources and evaluate authenticity, accuracy and timeliness [(ACTDIP025)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP025) | | ✓ | ✓ |
| Analyse and visualise [data](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Data) using a range of software to create information, and use structured [data](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Data) to [model](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Model) objects or events [(ACTDIP026)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP026) | | ✓ | ✓ |
| Define and [decompose](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Decompose) real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints [(ACTDIP027)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP027) | | ✓ | ✓ |
| Design the user experience of a digital system, generating, [evaluating](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Evaluating) and communicating alternative designs [(ACTDIP028)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP028) | | ✓ | ✓ |
| Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors [(ACTDIP029)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP029) | | ✓ | ✓ |
| Implement and modify programs with user interfaces involving [branching](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Branching), [iteration](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Iteration) and functions in a [general-purpose programming language](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=General-purpose+programming+language) [(ACTDIP030)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP030) | | ✓ | ✓ |
| Evaluate how well developed solutions and existing [information systems](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Information+systems) meet needs, are innovative and take account of future risks and sustainability [(ACTDIP031)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP031) | | ✓ | ✓ |
| Create and communicate interactive ideas and information collaboratively online, taking into account social contexts [(ACTDIP032)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP032) | | ✓ | ✓ |
| Plan and manage projects, including tasks, time and other [resources](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=Resources) required, considering safety and sustainability [(ACTDIP033)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP033) | | ✓ | ✓ |
| **General capabilities** | Literacy    Numeracy    ICT capability    Critical and creative thinking    Personal and social capability    Ethical understanding | | | |
| **Cross-curriculum capabilities** | Description: Description: cc_sust Sustainability | | | |
| Develop assessment | **Assessment**  The *Years 7 to 10 Technologies: Australian Curriculum in Queensland — assessment and reporting advice and guidelines* brings together advice about assessment, making judgments and reporting in a single document.  See [www.qcaa.qld.edu.au/p-10/aciq/p-10-technologies/year-7-technologies](https://www.qcaa.qld.edu.au/p-10/aciq/p-10-technologies/year-7-technologies) > *Years 7 to 10 Technologies: ACiQ.* | Students use their knowledge and understanding of data and digital systems to apply processes and production skills as they create digital solutions. In both teaching and learning and assessment, students undertake projects. A project is a set of activities to address specified content, involving understanding the nature of a problem, situation or need; creating, designing and producing a solution to the project task; and documenting the process. Students progress from managing the independent creation of ideas and information to managing collaborative projects in online environments.  The assessment for each unit provides evidence of student learning and provides opportunities for teachers to make judgments about whether students have met the Australian Curriculum: Digital Technologies Years 7 and 8 Achievement standard. Students should contribute to an individual assessment folio that provides evidence of their learning and represents their achievements. The folio should include a range and balance of assessments for teachers to make valid judgments about whether the student has met the Achievement standard. | | | |
| **Unit 1 — Serious games** | **Unit 2 — DATA (Data Analysis Troubleshooting Agency)** | | |
| The assessment will gather evidence of students ability to:   * plan and manage the development of a game by:   + defining and decomposing problems by describing the functional requirements and constraints of the game   + designing user experience and algorithms incorporating branching and iterations   + implementing a digital solution, namely create a game that educates peers about a topic of interest using a general purpose programming language   + modelling real-world objects using data   + evaluating developed digital solution in terms of meeting user needs   + using protocols when communicating and collaborating online   + explaining how image, sound and text are represented and presented in digital systems. | The assessment will gather evidence of students ability to:   * produce solutions that address client needs in four scenarios, such as:   + designing a model of a networked system for a business by:     - describing the appropriateness of wired, wireless and mobile networks for specific purposes     - evaluating data security   + designing a strategy to help a client gather online data to help their business by:     - evaluating data and data sources in terms of accuracy, authenticity and timeliness     - evaluating information systems that present crowdsourced data   + helping a client extract meaning from their raw data by:     - using software such as spreadsheets to organise, analyse and visualise the data to create information * improving the aesthetics and usability of an existing website by:   + modifying the user interface taking into account functionality and the audience   + amending existing HTML to improve the website. | | |
| Make judgments  and use feedback | **Consistency of teacher judgments** | Identify opportunities to moderate samples of student work at a school or cluster level to reach consensus and consistency. | | | |

1. Source: Australian Curriculum, Assessment and Reporting Authority (ACARA), *Australian Curriculum: Technologies*: [www.australiancurriculum.edu.au/technologies/rationale](http://www.australiancurriculum.edu.au/technologies/rationale) and   
   *Australian Curriculum: Digital Technologies*: [www.australiancurriculum.edu.au/technologies/digital-technologies/curriculum/f-10?layout=1](http://www.australiancurriculum.edu.au/technologies/digital-technologies/curriculum/f-10?layout=1). [↑](#footnote-ref-1)