

Year 9 plan — Australian Curriculum: Digital Technologies

Identify curriculum	Year level description	<p>In Year 9, 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.</p> <p>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.</p> <p>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.</p>			
	Achievement standard	<p>By the end of Year 9, 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.</p> <p>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.</p>			
Teaching and learning	Term overview	<p>Term 1</p> <p>Robot Rescue Students explore remote rescue scenarios, developing a robotic solution that could be used to rescue workers from an inaccessible chemical spill.</p> <p>Student work samples and progress reports are placed into a digital folio for review at the end of the school year.</p>	<p>Term 2</p> <p>Game Programming Shark Tank Students use their design and development experience to create a web site to pitch a new computer App to potential investors. They will use data to address complex problems, interview and survey potential clients and customers and design the user experience.</p> <p>Students develop and manage a project that considers cultural and geopolitical influences as well as legal requirements as they explore solutions to real-world problems.</p>	<p>Term 3</p> <p>Game Programming Prototype Students will work with a language specific to Game creation for HTML5. They will explore the role of hand held computing in modern society, and look at how they change the way we design and develop computer programs between web-based systems and other smaller format devices.</p>	<p>Term 4</p> <p>There's an App for That! Students use algorithms and an object oriented programming language to design and create a responsive web app to solve an identified problem (for example an app to locate the best surfing spots in Queensland). Learning opportunities include examining existing apps, studying agile software development cycles used in real-world projects, and exploring and evaluating solutions and information systems that create information from open data (for example in meteorology, transportation, government).</p>
	General capabilities and cross-curriculum priorities	<p>Opportunities to engage with:</p> 	<p>Opportunities to engage with:</p> 	<p>Opportunities to engage with:</p> 	<p>Opportunities to engage with:</p> 
	Key to general capabilities and cross-curriculum priorities	 Literacy  Numeracy  ICT competence  Critical and creative thinking  Ethical behaviour  Personal and social competence  Intercultural understanding  Aboriginal and Torres Strait Islander histories and cultures ASIA Asia and Australia's engagement with Asia SUST Sustainability			

Develop assessment	Assessment		Teachers and students organise evidence of learning in individual folios. The individual folio is co-constructed as an ongoing process between a teacher, a student, parents/carers and other partners. It becomes a dynamic record of examples of a student's learning and development.															
	Term 1				Term 2				Term 3				Term 4					
	Week	Assessment instrument			Week	Assessment instrument			Week	Assessment instrument			Week	Assessment instrument				
		Folio			9	Digital Presentation – Explaining Science Concepts on the Web.				Folio			9	Project – App Programming Product				
Make judgments and use feedback	Moderation		Teachers moderate folios to ensure consistency of judgments.				Teachers moderate presentations to ensure consistency of judgments.				Teachers moderate folios to ensure consistency of judgments.				Teachers moderate projects to ensure consistency of judgments.			

Year 9 Digital Technologies: review for balance and coverage of content descriptions

Knowledge and Understanding	1	2	3	4
Digital Systems				
Investigate the role of hardware and software in managing, controlling and securing the movement of and access to data in networked digital systems (ACTDIK034)	✓			✓
Representation of Data				
Analyse simple compression of data and how content data are separated from presentation (ACTDIK035)				✓

Processes and Production Skills	1	2	3	4
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 (ACTDIP036)		✓		✓
Analyse and visualise data to create information and address complex problems, and model processes, entities and their relationships using structured data (ACTDIP037)		✓		✓
Investigating and defining				
Define and decompose real-world problems precisely, taking into account functional and non-functional requirements and including interviewing stakeholders to identify needs (ACTDIP038)	✓	✓	✓	✓
Generating and designing				
Design the user experience of a digital system by evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics (ACTDIP039)		✓	✓	✓
Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases (ACTDIP040)	✓		✓	✓
Producing and implementing				
Implement modular programs, applying selected algorithms and data structures including using an object-oriented programming language (ACTDIP041)			✓	✓
Evaluating				
Evaluate critically how student solutions and existing information systems and policies, take account of future risks and sustainability and provide opportunities for innovation and enterprise (ACTDIP042)	✓		✓	✓
Collaborating and managing				
Create interactive solutions for sharing ideas and information online, taking into account safety, social contexts and legal responsibilities (ACTDIP043)		✓	✓	✓
Plan and manage projects using an iterative and collaborative approach, identifying risks and considering safety and sustainability (ACTDIP044)	✓	✓	✓	✓