

# TECHNOLOGIES

## CONSULTATION CURRICULUM

**Digital Technologies – Scope and sequence F–10**

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FOUNDATION TO YEAR 6

Digital Technologies		Foundation	Years 1 and 2
<b>Digital Technologies achievement standard</b>			
		By the end of Foundation students develop familiarity with digital systems and display confidence when using digital systems. They show how digital systems can be used safely to solve problems. Students represent data using objects, pictures and symbols and identify examples of data that is owned by them.	By the end of Year 2 students use basic computational thinking to create simple solutions to known problems or opportunities. They identify digital systems and their components, exploring their purpose. Students represent data using symbols, numbers and words. They identify examples of personal data that may be stored online. Students describe and represent algorithms that involve repetition and decisions.
<b>Technologies achievement standard</b>			
		By the end of Foundation students identify familiar products, services and environments and develop familiarity with and show confidence in using digital systems. They use materials and equipment to safely make a solution for a school-selected context and show how digital systems can be used to solve problems. Students use objects, pictures and symbols to represent data. They identify if data is personal and owned by them.	By the end of Year 2 students describe the purpose of familiar products, services and environments and use basic computational thinking to create simple digital solutions to known problems or opportunities. For each of the two prescribed technologies contexts they identify the features and uses of technologies and create designed solutions. They evaluate their ideas, based on their personal preferences. Students communicate design ideas using models and simple drawings, describe and represent algorithms that involve repetition and decisions, and follow sequenced steps to safely produce designed solutions. They identify examples of personal data that may be stored online.
Strand	Sub-strand	<b>Content description</b>	
<i>Students learn to:</i>			
Knowledge and understanding	Digital systems	recognise and explore digital systems (hardware and software) and how they can be used to solve simple problems (AC9TDIFK01)	identify and explore digital systems and their components for a purpose (AC9TDI2K01)
	Data representation	represent data as objects, pictures and symbols (AC9TDIFK02)	represent data as pictures, symbols, numbers and words (AC9TDI2K02)
Processes and production skills	Acquiring, managing and analysing data		
	Investigating and defining		investigate simple problems for known users that can be solved with digital systems (AC9TDI2P01)

	Generating and designing		follow and describe algorithms involving a sequence of steps, branching (decisions) and iteration (repetition) (AC9TDI2P02)
	Producing and implementing		
	Evaluating		discuss how existing digital systems satisfy known user needs (AC9TDI2P03)
	Collaborating and managing		create and locate content and communicate with others using common tools and their basic functionality (AC9TDI2P04)
			share information with known people following agreed behaviours, supervised by trusted adults (AC9TDI2P05)
Privacy and security	identify some data that are personal and owned by them (AC9TDIFP01)	access their school account with a recorded username and password to access their own information (AC9TDI2P06)	
		discuss that some websites and apps store their personal data online (AC9TDI2P07)	

Technologies		Years 3 and 4	Years 5 and 6
<b>Digital Technologies achievement standard</b>			
		By the end of Year 4 students use computational thinking to create scaffolded digital solutions. They recognise different types of data and identify how they are transmitted by digital systems. They use passphrases and agreed behaviours to safely access and explore digital systems, tools and online or networked environments independently and with others. They define problems and identify opportunities, then design and implement solutions using algorithms and visual programming that involve decision-making, repetition and user input. Students evaluate their solutions against design criteria.	By the end of Year 6 students use computational thinking to create digital solutions. They understand and describe how data is represented and transmitted. Students understand how behaviours and ethics help protect data and describe what effect supplied data can have on their digital footprint. They design digital solutions based on user stories by developing algorithms to address problems or opportunities and implement them as visual programs that involve decision-making, repetition and user input. Students evaluate ideas and solutions against design criteria, using their knowledge of digital systems to communicate ideas to an audience.
<b>Technologies achievement standard</b>			
		By the end of Year 4 students describe how people design products, services and environments to meet the needs of people, including sustainability, and use computational thinking to create scaffolded digital solutions. They recognise different types of data and identify how they are transmitted by digital systems. For each of the two prescribed technologies contexts they describe the features of technologies and create designed solutions. Students evaluate ideas against identified criteria for success. They define problems and identify opportunities, then design and implement solutions using algorithms and visual programming that involve decision-making, repetition and user input. Students use models and drawings including annotations and symbols to plan, sequence and communicate major steps in design and production. They use technologies and techniques to safely produce solutions. Students use passphrases and agreed behaviours to safely access and explore digital systems, tools and online or networked environments independently and with others.	By the end of Year 6 students describe how people design products, services and environments to meet the needs and opportunities of communities, including sustainability. For each of the three prescribed technologies contexts students explain how the features of technologies impact on design decisions and they create designed solutions. They use computational thinking to design and create digital solutions by developing algorithms to address problems or opportunities and implement them as visual programs. They evaluate ideas and solutions against criteria for success. Students use technical terms and graphical representation techniques to communicate ideas to an audience. They record project plans including production processes and select appropriate technologies and techniques to safely produce designed solutions. Students understand and describe how data is transmitted, how behaviours and ethics help protect data and describe what effect supplied data can have on their digital footprint.
Strand	Sub-strand	<b>Content description</b> <i>Students learn to:</i>	
<b>Knowledge and understanding</b>	Digital systems	explore and describe a range of digital systems and their peripherals for a variety of purposes (AC9TDI4K01)	investigate the main internal components of common digital systems and their function (AC9TDI6K01)
		explore transmitting different types of data between digital systems (AC9TDI4K02)	examine how digital systems form networks to transmit data (AC9TDI6K02)
	Data representation	recognise different types of data and explore how the same data can be represented differently depending on the purpose (AC9TDI4K03)	explain how digital systems represent all data using numbers (AC9TDI6K03)
			explore how data can be represented by off and on states (zeros and ones in binary) (AC9TDI6K04)
<b>Processes and production skills</b>	Acquiring, managing and analysing data		

Investigating and defining	define problems with given design criteria and by co-creating user stories (AC9TDI4P01)	define problems using given or co-developed design criteria and by creating user stories (AC9TDI6P01)	
	Generating and designing	follow and describe algorithms involving sequencing, comparison operators (branching), and iteration (AC9TDI4P02)	design algorithms involving multiple alternatives (branching) and iteration (AC9TDI6P02)
			design a user interface for a digital system (AC9TDI6P03)
		generate, communicate and compare designs (AC9TDI4P03)	generate, modify, communicate and evaluate designs (AC9TDI6P04)
	Producing and implementing	implement simple algorithms as visual programs involving control structures, variables and user input (AC9TDI4P04)	implement algorithms as visual programs involving control structures, variables and user input (AC9TDI6P05)
	Evaluating	discuss how existing and student solutions satisfy the design criteria and user stories (AC9TDI4P05)	evaluate existing and student solutions against the design criteria and user stories and their broader community impact (AC9TDI6P06)
	Collaborating and managing	create, locate and edit content and communicate with others selecting and using common tools and their core functionality and following agreed conventions to name files (AC9TDI4P06)	create, locate and edit content for, and communicate with, a specific audience, selecting appropriate tools and using their advanced functionality and storage conventions (AC9TDI6P07)
		share information and collaborate with others demonstrating agreed behaviours, guided by trusted adults (AC9TDI4P07)	share information, plan and collaborate with others demonstrating ethical and agreed behaviours, supported by trusted adults (AC9TDI6P08)
	Privacy and security	access their school account using a memorised password and explain why it should be easy to remember, but hard for others to guess (AC9TDI4P08)	access multiple personal accounts using unique passphrases and explain the risks of password re-use (AC9TDI6P09)
		identify what personal data is stored and shared in their online accounts and discuss any associated risks (AC9TDI4P09)	explain the creation and permanence of their digital footprint and consider privacy when collecting user data (AC9TDI6P10)

YEAR 7 to YEAR 10

Digital Technologies		Years 7 and 8	Years 9 and 10
<b>Digital Technologies achievement standard</b>			
		By the end of Year 8 students use computational thinking to independently and collaboratively create effective digital solutions measured against negotiated success criteria. They design solutions to real-world problems and opportunities by creating a variety of algorithmic designs and implement them using a general-purpose programming language. Students use a range of tools to make predictions and draw conclusions based on acquired, stored and validated data. They explain how digital systems represent, transmit and secure data. Students identify and explain how to protect against cyber security threats, manage the risks of sharing and curate their digital footprint.	By the end of Year 10 students use computational thinking to create innovative digital solutions measured against stakeholder user stories. They plan and manage agile projects, being aware of risks, responsibilities and the effects of curated data on the digital footprint. Students design complex solutions to draw conclusions and make predictions by creating and validating algorithms and modular programs. They model entities and their relationships using structured data. They critically evaluate ideas and solutions against design criteria and user stories. Students design and create online documents using the component parts of text, markup and styling. Students explain how data can be stored; secured; managed; and controlled by hardware, software and encryption. They evaluate cyber security threats and mitigations.
<b>Technologies achievement standard</b>			
		By the end of Year 8 students explain how people design products, services and environments to meet present and future needs. For each of the four prescribed technologies contexts students explain how the features of technologies influence and impact on design decisions and they create designed solutions based on evaluation of needs or opportunities. They use computational thinking to independently and collaboratively design and create effective digital solutions to real-world problems and opportunities by creating a variety of algorithmic designs and implement them using a general-purpose programming language. They use a range of tools to make predictions and draw conclusions based on acquired, stored and validated data. Students develop criteria for success including sustainability and use these to judge the suitability of ideas, processes and solutions. They create, adapt and iterate design ideas and communicate to audiences using suitable technologies, technical terms and graphical representation techniques. Students explain how digital systems represent, transmit and secure data. They independently and collaboratively plan to document and manage production processes and to safely produce effective designed solutions for the intended purpose. Students identify cyber security threats and risks and explain how to protect against threats and manage the risks of sharing and curating their digital footprint.	
Strand	Sub-strand	<b>Content description</b>	
<i>Students learn to:</i>			
Knowledge and understanding	Digital systems	explain how hardware specifications affect performance and select appropriate hardware for particular tasks and workloads (AC9TDI8K01)	
		investigate how data is transmitted and secured in wired and wireless networks including the internet (AC9TDI8K02)	investigate how hardware and software manage, control and secure access to data in networked digital systems (AC9TDI10K01)
	Data representation	investigate how digital systems represent text, image and audio data using integers (AC9TDI8K03)	represent documents online as content (text), structure (markup) and presentation (styling) and explain why such representations are important (AC9TDI10K02)
		explain how and why digital systems represent integers in binary (AC9TDI8K04)	investigate simple data compression techniques (AC9TDI10K03)

Processes and production skills	Acquiring, managing and analysing data	acquire, store and validate data from a range of sources using software, including spreadsheets and databases (AC9TDI8P01)	develop techniques to acquire, store and validate data from a range of sources using software, including spreadsheets and databases (AC9TDI10P01)
		analyse and visualise data using a range of software, including spreadsheets and databases, to draw conclusions and make predictions by identifying trends (AC9TDI8P02)	analyse and visualise data interactively using a range of software, including spreadsheets and databases, to draw conclusions and make predictions by identifying trends and outliers (AC9TDI10P02)
		model and query the attributes of objects and events using structured data (AC9TDI8P03)	model and query entities and their relationships using structured data (AC9TDI10P03)
	Investigating and defining	define and decompose real-world problems with design criteria and by creating user stories (AC9TDI8P04)	define and decompose real-world problems with design criteria and by interviewing stakeholders to create user stories (AC9TDI10P04)
	Generating and designing	design algorithms involving nested control structures and represent them using flowcharts and pseudocode (AC9TDI8P05)	design algorithms involving logical operators and represent them as flowcharts and pseudocode (AC9TDI10P05)
		trace algorithms to predict output for a given input and to identify errors (AC9TDI8P06)	validate algorithms and programs by comparing their output against a range of test cases (AC9TDI10P06)
		design the user experience of a digital system (AC9TDI8P07)	design and prototype the user experience of a digital system (AC9TDI10P07)
		generate, modify, communicate and evaluate alternative designs (AC9TDI8P08)	generate, modify, communicate and critically evaluate alternative designs (AC9TDI10P08)
	Producing and implementing	implement algorithms and modify and debug programs involving control structures and functions in a general-purpose programming language (AC9TDI8P09)	implement, modify and debug modular programs, applying selected algorithms and data structures, including in an object-oriented programming language (AC9TDI10P09)
	Evaluating	evaluate existing and student solutions against the design criteria, user stories and possible future impact (AC9TDI8P10)	evaluate existing and student solutions against the design criteria, user stories, possible future impact and opportunities for enterprise (AC9TDI10P10)
	Collaborating and managing	create, locate and edit content for, and communicate with, a specific audience, selecting from a range of tools and using their advanced functionality and storage conventions (AC9TDI8P11)	create, locate and edit interactive content for a diverse audience (AC9TDI10P11)
		share information publicly online and plan, manage and collaborate on simple agile projects, demonstrating agreed behaviours (AC9TDI8P12)	plan, manage and document individual and collaborative agile projects accounting for risks and responsibilities (AC9TDI10P12)
	Privacy and security	explain how multi-factor authentication protects an account when the password is compromised and identify phishing and malware threats (AC9TDI8P13)	describe cyber security threats and mitigation, including using multi-factor authentication and password managers (AC9TDI10P13)
		investigate and manage the data existing systems and student solutions collect that contributes to a digital footprint and assess if the data is essential to their purpose (AC9TDI8P14)	apply the Australian Privacy Principles to critique and manage the data that existing systems and student solutions collect that contribute to a digital footprint (AC9TDI10P14)