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CURRICULUM ELEMENTS

Foundation

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| **Year level description** |
| Learning in Digital Technologies builds on the Early Years Learning Framework and each student’s prior learning and experiences.By the end of Foundation students should have had the opportunity to experience computational thinking by experimenting with different ways of representing an idea or action with a symbol, object or picture that is understood by others, such as a sun indicating fine conditions in a weather forecast. Through Digital Technologies and Mathematics (*Statistics*), students have opportunities to explore different ways that data can be acquired and recorded, for example using a tablet to take photographs of plants in the school garden. Students have opportunities to develop their confidence with using digital systems by creating content such as simple messages. They become familiar with the difference between data that is owned by them, such as a photo of themselves, and data that is publicly available, such as a photo of their school. Through guided play experiences and tasks, students develop systems thinking by exploring how digital systems, such as tablets, smartphones and laptops can be used for different purposes, at school and at home. In Digital Technologies, students should have frequent opportunities for authentic learning by making key connections with other learning areas. |
| **Digital Technologies Achievement standard** |
| By the end of Foundation students show familiarity with digital systems and use them for a purpose. They represent data using objects, pictures and symbols and identify examples of data that is owned by them. |
| **Learning area Achievement standard** |
| By the end of Foundation students identify familiar products, services and environments and develop familiarity with digital systems, using them for a purpose. They create, communicate and choose design ideas. Students follow steps and use materials and equipment to safely make a designed solution for a school-selected context. They show how to represent data using objects, pictures and symbols and identify examples of data that is owned by them. |

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| **Strand: Knowledge and understanding** | **Foundation** |
| **Sub-strand: Digital systems** |
| **Content descriptions***Students learn to:* | **Content elaborations***This may involve students:* |
| recognise and explore digital systems (hardware and software) for a purpose AC9TDIFK01 | * recognising digital systems that they interact with at home and school, for example smartphone, laptop or programmable toy
* playing with (with guidance) and using different digital systems to explore what they do for a purpose, for example the class speaking to an expert via videoconference
* recording, with permission, audio or video of local community members’ stories to share in class, for example sharing cultural stories of First Nations Australians
* taking photos, with permission, to share with others, for example close-up photos of First Nations Australians’ material culture, such as woven mats or baskets revealing intricate detail
* making a model of a digital system, using it in a role-play scenario and describing its features, for example a cardboard box with a keyboard and screen with app icons
 |
| **Sub-strand: Data representation** |
| represent data as objects, pictures and symbols AC9TDIFK02 | * drawing a picture representing each of their family members and their interests, for example drawing one family member with a surfboard and another with a skateboard
* using coloured blocks to represent an attribute of people, for example representing students and their sports houses with different coloured blocks
* using a symbol to represent an idea, but knowing that the symbol is not the data itself, for example the Australian Aboriginal flag represents First Peoples of Australia, the land and the sun
* using a symbol to represent an idea, but knowing that the symbol is not the data itself, for example the symbols and colour on both the Australian Aboriginal flag and the Torres Strait Islander flag
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| **Strand: Processes and production skills** | **Foundation** |
| **Sub-strand: Privacy and security** |
| **Content descriptions***Students learn to:* | **Content elaborations***This may involve students:* |
| identify some data that is personal and owned by them AC9TDIFP01 | * listing things that contain personal and public data, for example photos of themselves with their family (private) and photos of local community sites (public)
* identifying apps and websites they use where their personal data could be made visible, for example photos of themselves on parents’ or carers’ social media, or their username being shown to others in online games
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Years 1–2

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| **Band level description** |
| By the end of Year 2 students should have had the opportunity to apply computational thinking by describing algorithms that include sequences of instructions and decisions, and by using digital systems to produce simple solutions. Through practice and investigation, they become more familiar with and confident in representing data in different ways. Through Digital Technologies and Mathematics (*Statistics*), students begin to recognise patterns in the data they have acquired, such as identifying common and distinctive features after sorting it, and these generalisations help them make predictions, such as how a pattern might continue. Students develop systems thinking by exploring a range of purposes for using digital systems and their components. They have opportunities to experience and develop their skills in using different hardware components, such as a touchpad and keyboard. They use different software to create content such as writing a message that includes an image and sharing it with classmates. Students become aware of design thinking by discussing and observing how the needs of different people are met through using digital systems. They protect the security of their own data on their school account by using their own username and password and, through discussion, develop an awareness that some websites and apps store their personal data online.In Digital Technologies, students should have frequent opportunities for authentic learning by making key connections with other learning areas. |
| **Digital Technologies Achievement standard** |
| By the end of Year 2 students show how simple digital solutions meet a need for known users. Students represent and process data in different ways. They follow and describe basic algorithms involving a sequence of steps and branching. With assistance, students access and use digital systems for a purpose. They use the basic features of common digital tools to create, locate and share content, and to collaborate, following agreed behaviours. Students recognise that digital tools may store their personal data online. |
| **Learning area Achievement standard** |
| By the end of Year 2 students describe the purpose of familiar products, services and environments, including digital systems. They represent and process data in different ways and follow and describe basic algorithms involving a sequence of steps and branching to show how simple digital solutions meet a need for known users. For each of the 2 prescribed technologies contexts they identify the features and uses of technologies and create designed solutions. Students select design ideas based on their personal preferences. They access and use the basic features of common digital tools to create, locate and share content, and collaborate and communicate design ideas using models and drawings. Students safely produce designed or digital solutions and recognise that digital tools may store their personal data online. |

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| **Strand: Knowledge and understanding** | **Years 1–2** |
| **Sub-strand: Digital systems** |
| **Content descriptions***Students learn to:* | **Content elaborations***This may involve students:* |
| identify and explore digital systems and their components for a purpose AC9TDI2K01 | * exploring digital systems to better understand how they are used to provide communities with essential services, for example looking at the systems and components that allow First Nations Australians in communities classified as remote to watch their favourite television shows
* naming and using digital systems that they interact with at home and school, for example using a touchpad to move the cursor on a laptop, or the keyboard to type a simple message on a tablet
* using different digital systems to explore what they do and how to use them, for example selecting the camera icon allows them to take photos of things that are a familiar shape
 |
| **Sub-strand: Data representation** |
| represent data as pictures, symbols, numbers and words AC9TDI2K02 | * recognising that letter combinations represent different phonemes and that words are spelled the same way regardless of the accent of the speaker
* recognising the equivalence of different representations of numbers, including words, digits and tally marks
* recognising that pictures in First Nations Australians’ seasonal calendars are used to represent and communicate data, such as how the appearance of a flower can signify a connected event or a resource availability, for example how the Gulumoerrgin Peoples from the Darwin region of the Northern Territory understand that the fruiting of freshwater mangrove signifies it is time to harvest magpie geese
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| **Strand: Processes and production skills** | **Years 1–2** |
| **Sub-strand: Investigating and defining** |
| **Content descriptions***Students learn to:* | **Content elaborations***This may involve students:* |
| investigate simple problems for known users that can be solved with digital systems AC9TDI2P01 | * investigating internet-based translation tools and how similar digital tools could promote the use of First Nations Australians’ languages or assist communications, for example responding to cultural stories of Australian First Nations Peoples
* investigating familiar and easily understood problems with few complications or steps needed to solve them, for example deciding what to wear by checking the forecast on a weather app
* identifying how digital systems are used to solve problems at school, for example taking attendance or borrowing a library book
* exploring how a familiar problem could be solved using a robot, for example creating a model robot using cardboard boxes and explaining how it could be used to clean up the classroom floor at the end of the day
 |
| **Sub-strand: Generating and designing** |
| follow and describe algorithms involving a sequence of steps, branching (decisions) and iteration (repetition) AC9TDI2P02 | * following a short, ordered sequence of steps and making decisions to solve a simple problem, for example follow a recipe or directions to reach a location
* describing the steps and decisions (in the correct order) needed to solve a simple problem, for example writing, saying, drawing or photographing the steps needed to make a sandwich
* rearranging into the correct order a series of mixed-up pictures that describe a story, for example stories authored and published by First Nations Australians
* identifying the steps needed to solve a problem, and understanding when their order is important, for example socks must be put on before shoes but a jumper can be put on before or after shoes
* identifying the decisions needed to solve a problem and the next steps to follow in each case, for example if it is raining, take a raincoat, otherwise take a hat
* following algorithms that repeat a single step a fixed number of times, for example practise spelling a word 5 times or throw and catch a ball with a partner 10 times
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| **Sub-strand: Evaluating** |
| discuss how existing digital systems satisfy identified needs for known users AC9TDI2P03 | * describing how familiar digital systems meet the needs of individuals, for example how different family members use a tablet for different needs – to play videos, read the news or follow a recipe
* discussing how we use digital systems to store and access information, and how that information helps us learn about our environment, interactions and leisure activities, for example how interactive versions of stories authored and published by First Nations Australians preserve important cultural expressions
* sharing ideas about how digital systems are used at school for learning, for example sharing a student’s work with the class on an interactive display screen to provide class feedback on their writing
* sharing and describing ways that common digital systems can be used to meet communication needs, for example tablets can be used as phones and tools for communication between families living in different locations
 |
| **Sub-strand: Collaborating and managing** |
| use the basic features of common digital tools to create, locate and communicate content AC9TDI2P04 | * using familiar digital systems to create content with others, for example using presentation software to retell a story
* taking, storing safely and presenting photos of class work, for example locating photos they took of their work to show to parents or carers or for the teacher to upload to the class shared folder
* finding images of (local) Australian flora and fauna or places for use in a story and including First Nations Australians’ names for the items
* using a camera or drawing app to create a picture, for example making a card for a family member that includes a photo and short message
* creating individual pieces of work that contribute to a group task, for example each student contributes a recipe and photo of their favourite food to create a class recipe book
 |
| use the basic features of common digital tools to share content and collaborate demonstrating agreed behaviours, guided by trusted adults AC9TDI2P05 | * taking and sharing photos of class work with parents or carers using classroom messaging software with teacher guidance
* applying agreed standards of behaviour when sharing content with classmates, for example using language that is considered by all students and the teacher to be appropriate when they are writing messages to each other
* considering the need for online safety when sharing information, for example recognising that personal information such as a photo can be used inappropriately
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| **Sub-strand: Privacy and security** |
| access their school account with a recorded username and password AC9TDI2P06 | * using username and password recorded in a private place to access a digital system, for example logging into a school computer using details given on a card by the teacher
 |
| discuss that some websites and apps store their personal data online AC9TDI2P07 | * sharing examples of the data collected by apps and websites they commonly use, for example usernames and email addresses used by school websites and games to log in
* discussing the importance of asking permission from a parent or carer before entering personal details online such as address, phone number and date of birth
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Years 3–4

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| **Band level description** |
| By the end of Year 4 students should have had the opportunity to broaden their computational thinking by creating simple digital solutions, individually and in groups, that involve defining problems, and designing and implementing solutions as visual programs. Students practise defining problems using design criteria given to them, and user stories developed by the class. Through practice, students improve the precision of their algorithms and implement them as visual programs. Students expand their understanding of data representation by exploring how and why the same data can be represented in different ways to meet different purposes. Through Digital Technologies and Mathematics (*Statistics*), students use digital systems to acquire and process data for comparison and interpretation purposes. Students progress in their systems thinking by considering the connections between digital systems and peripherals to meet specific purposes, such as using a headset to participate in an online class discussion. They explore how digital systems interact by transmitting data, such as using a class laptop to stream videos from an online news service. Students apply design thinking techniques to generate multiple ideas for the design of their solutions. They compare their ideas with other ideas, such as those of their classmates. They determine the success of their implemented solutions against given design criteria and co-created user stories. They also judge how well digital systems used by the public meet their needs, such as maps or transport apps to plan a trip. Through frequent practice when completing tasks and projects, students increase their confidence and fluency in using core features of common digital tools to create content individually, and when working in groups they apply agreed behaviours. Students secure their personal data by creating passwords that are hard to guess and begin to understand the risks associated with storing and sharing personal data online. They learn about the importance of protecting private data and consider the positive actions and behaviours they display when engaging with others online.In Digital Technologies, students should have frequent opportunities for authentic learning by making key connections with other learning areas. |
| **Digital Technologies Achievement standard** |
| By the end of Year 4 students create simple digital solutions and use provided design criteria to check if solutions meet user needs. Students process and represent data for different purposes. They follow and describe simple algorithms involving branching and iteration and implement them as visual programs. Students securely access and use digital systems and their peripherals for a range of purposes, including transmitting data. They use the core features of common digital tools to plan, create, locate and share content, and to collaborate, following agreed behaviours. Students identify their personal data stored online and recognise the risks. |
| **Learning area achievement standard** |
| By the end of Year 4 students describe how people design products, services and environments to meet the needs of people, including sustainability. They process and represent data for different purposes, follow and describe simple algorithms involving branching and iteration, and implement them as visual programs. For each of the 2 prescribed technologies contexts they describe the features and uses of technologies and create designed solutions. Students select design ideas against design criteria. Students securely access and use digital systems and their peripherals for a range of purposes, including transmitting data. They communicate design ideas using models and drawings including annotations and symbols. Students plan and sequence steps and use technologies and techniques to safely produce designed solutions. They use the core features of common digital tools to plan, create, locate and share content, and to collaborate, following agreed behaviours. Students identify their personal data stored online and its risks. |

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| **Strand: Knowledge and understanding** | **Years 3–4** |
| **Sub-strand: Digital systems** |
| **Content descriptions***Students learn to:* | **Content elaborations***This may involve students:* |
| explore and describe a range of digital systems and their peripherals for a variety of purposes AC9TDI4K01 | * experimenting with a range of peripherals to perform input, output and storage, for example a keyboard, touch screen, mouse, camera and microphone; a monitor, projector, printer or 3D printer; speaker; or USB drive
* adding peripherals to a digital system to expand its functionality, for example connecting a headset to a digital system to participate in an online lesson more effectively
* exploring how they can use digital systems differently depending on the task, recognising that many digital systems can perform multiple tasks, for example a student can use a tablet to take photos, record audio and find information to create a presentation
 |
| explore transmitting different types of data between digital systems AC9TDI4K02 | * exploring examples of different types of data that can be transferred between digital systems, for example streaming music or making a video call to a friend using a smartphone
* exploring how data (video call) can be transmitted from a remote community to a city location, for example looking at how many First Nations Australian communities in areas classified as remote rely on 3G network coverage, limiting the use of video calls
 |
| **Sub-strand: Data representation** |
| recognise different types of data and explore how the same data can be represented differently depending on the purpose AC9TDI4K03 | * describing different types of data and how they can be used, for example numbers, letters, symbols and pictures
* explaining how the same data can be represented in different ways and why some representations are better than others in certain contexts, for example four vs 4 vs IV vs |||| vs *quatre,* and that numerals are better for calculation than words
* explaining that the same information can be represented differently, for example the term ‘stop’ can also be represented with an octagon-shaped red sign or a hand icon
* identifying rock paintings and other cultural expressions to understand that images are used to encode and represent ethnobotanical knowledge, for example the representation of plant use in the Kimberley cave paintings and ancient engravings including important data on medicinal and food plant classification and their usable parts
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| **Strand: Processes and production skills** | **Years 3–4** |
| **Sub-strand: Investigating and defining** |
| **Content descriptions***Students learn to:* | **Content elaborations***This may involve students:* |
| define problems with given design criteria and by co-creating user stories AC9TDI4P01 | * recognising a range of familiar problems and defining achievable solutions using given design criteria, for example buying presents for family members within a specified budget
* using responses to guiding questions to write a user story, for example a family member wants a way of entertaining their puppy when they are at school to stop it digging holes
* co-creating a user story using a template such as “A <type of user> has <some goal> so that <some reason>”, for example “a sports team wants to access league rankings online so that they can see their progress”
* developing a problem statement for collecting and managing information, for example how First Nations Australian rangers could monitor animal populations, such as local marine turtles, using global positioning systems (GPS)
* co-creating user stories about exploring hard-to-reach locations, for example a school student wants to explore neighbouring countries or communities classified as remote to compare how people live
 |
| **Sub-strand: Generating and designing** |
| follow and describe algorithms involving sequencing, comparison operators (branching) and iteration AC9TDI4P02 | * following the steps and decisions of algorithms and knowing what step they are up to, for example following rules to form the past tense of regular verbs such as ‘create’ to ‘created’, ‘try’ to ‘tried’ and ‘cook’ to ‘cooked’ and checking off items on a list as they are completed
* describing algorithms using representations such as a list of steps or a diagram, for example drawing a diagram of a recipe involving decisions
* understanding there can be more than one sequence of steps to solve a problem, some are better than others, and the steps should be unambiguous, for example describing 2 different ways to get to the same location
* describing the decisions needed to solve a problem, including numerical and text comparisons, for example if the UV index is above 3, put on sunscreen and a hat
* describing algorithms that repeat steps a fixed number of times, for example calculating multiplication using repeated addition, where the sum changes in each iteration
 |
| generate, communicate and compare designs AC9TDI4P03 | * brainstorming possible design ideas and discussing these with their peers, for example sketching different ideas for a computer game
* discussing whether the needs identified from the user story are met by generated design ideas, for example comparing design ideas in pairs for encouraging people to recycle
* ideating multiple design ideas and comparing them against user stories, for example as a class, discussing the needs identified from the user story and brainstorming multiple design ideas (accepting all suggestions as possibilities)
 |
| **Sub-strand: Producing and implementing** |
| implement simple algorithms as visual programs involving control structures and input AC9TDI4P04 | * writing and editing programs to solve simple problems using branching and simple iteration in a visual programming environment, for example helping a user understand multiplication by displaying the repeated addition in order
* writing programs that take input from the user or environment, for example asking the user for their name and displaying it or sensing the temperature from the environment to make a decision
* writing programs that make decisions involving comparison, for example comparing whether the temperature is above 25 degrees Celsius to label the weather hot or cold
* writing programs that repeat one or more steps a fixed number of times, for example writing a program that displays repetitive song lyrics, such as in ‘Ten in the bed’
* running and testing a program to check it performs as expected, for example a character: 1. moves forward 2. turns left 3. moves forward
* implementing a program that demonstrates the strict routines and techniques followed by First Nations Australian ranger groups when caring for or handling specific native animals, for example using IF and THEN statements to create a training manual, such as: IF <insert animal name> is injured THEN the ranger will <insert action>
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| **Sub-strand: Evaluating** |
| discuss how existing and student solutions satisfy the design criteria and user stories AC9TDI4P05 | * describing the way familiar digital systems allow the user to perform tasks, for example discussing how a family member could place an order online for something they cannot buy locally
* discussing how a digital solution meets the different needs of users, for example how maps help people to locate places in the community or interactive store directories help shoppers to find a particular store in a shopping centre
* making judgements on their digital solutions against the design criteria and user stories, for example how high their friends score in the game they created to help them learn what is recyclable
* reflecting on how the systems in the school help it run, for example how the librarian keeps track of books borrowed
 |
| **Sub-strand: Collaborating and managing** |
| use the core features of common digital tools to create, locate and communicate content, following agreed conventions AC9TDI4P06 | * discussing and creating as a class a set of steps they need to follow to safely find information online
* using an online search engine to find suitable sources to create and communicate information, following agreed steps, for example creating a presentation on life cycles
* grouping, naming and itemising objects using a logical hierarchy, for example creating a section of a virtual library or virtual supermarket using folders and files
 |
| use the core features of common digital tools to share content, plan tasks, and collaborate, following agreed behaviours, supported by trusted adults AC9TDI4P07 | * using an agreed folder to make it easy for students to collaborate on shared content in a group project
* demonstrating safe sharing of content with a select audience, for example sharing a holiday adventure without revealing exact dates, specific names or other personal information
* listening to others when participating in online environments to share content, for example respecting the rights of others by taking turns to suggest and add words or images to a factual slide deck to share with the teacher
* interacting cooperatively in a group in an online environment to plan and complete a task, for example writing and responding to others’ views on canteen products
* using digital tools to plan an event as a class, for example jointly creating a class survey to help plan an end-of-year party, where responses conform to the class’s accepted behavioural expectations
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| **Sub-strand: 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 | * recalling their school username and password from memory to login to a school laptop or desktop
* explaining how keeping a password secret prevents others from accessing their data, for example how their work is saved in their account and can only be accessed using their secret password
* exploring techniques to create an easy to remember and hard to guess password, for example creating a password using 3 unrelated but easy to remember words
 |
| identify what personal data is stored and shared in their online accounts and discuss any associated risks AC9TDI4P09 | * identifying the personal data stored in accounts they use at school and at home and who has access to it, for example documents in their school cloud storage are accessible by the teacher, or their nickname in their online gaming accounts is visible to all players
* discussing how personal data stored in online accounts forms a person’s digital identity and can reveal detailed information about people, for example looking at photographs of themselves, friends or fictional characters that reveal details about a person’s location, habits or home
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Years 5–6

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| **Band level description** |
| By the end of Year 6 students should have had the opportunity to apply computational thinking by creating digital solutions that involve defining problems, designing and modifying algorithms, and implementing them as visual programs. Students practise different strategies to develop their abstract thinking, such as thinking out aloud to simplify problems, which is needed when defining them. They represent algorithms involving branching and iteration and implement them as visual programs that include variables and respond to input. Students think in a more abstract way, exploring how on and off states and whole numbers can be used to represent data.They use design thinking techniques to generate multiple ideas about the design of solutions and how people interact with them. Based on given or co-developed design criteria and student-generated user stories, they select, and where appropriate modify, their preferred design ideas for further development. They extend the use of design criteria by evaluating their own and existing solutions, considering the impact of these solutions on their community. Through Digital Technologies and Mathematics (*Statistics*), students develop confidence and competencies in using digital systems to create displays of data, such as visualisations, which assist in interpreting data sets.Students apply systems thinking when investigating the functions and purpose of each component in a digital system and their interactions with others. They examine how data is broken up and sent through networks. Through frequent practice when completing tasks and projects, students develop competence and confidence in creating content that applies agreed conventions, such as heading hierarchies and labelling of charts, and they use a consistent file-naming system. When working in groups, students explore different ways of working collaboratively, such as agreeing on how tasks should be allocated and content shared. Students protect data stored in their personal accounts by creating separate passphrases for each account and explain how their personal data forms their permanent digital footprint.In Digital Technologies, students should have frequent opportunities for authentic learning by making key connections with other learning areas. |
| **Digital Technologies Achievement standard** |
| By the end of Year 6 students develop and modify digital solutions, and define problems and evaluate solutions using user stories and design criteria. They process data and show how digital systems represent data. Students design algorithms involving complex branching and iteration and implement them as visual programs including variables. They securely access and use multiple digital systems and describe their components and how they interact to process and transmit data. Students select and use appropriate digital tools effectively to plan, create, locate and share content, and to collaborate, applying agreed conventions and behaviours. They identify their digital footprint and recognise its permanence. |
| **Learning area achievement standard** |
| By the end of Year 6 students explain how people design products, services and environments to meet the needs of communities, including sustainability. For each of the 3 prescribed technologies contexts students explain how the features of technologies impact on design decisions and they create designed solutions. They process data and show how digital systems represent data, design algorithms involving complex branching and iteration, and implement them as visual programs including variables. They select and justify design ideas and solutions against design criteria. Students share and communicate ideas or content to an audience using technical terms, graphical representation techniques and appropriate digital tools. They develop project plans, including production processes, and select technologies and techniques to safely produce designed or digital solutions. Students securely access and use multiple digital systems and describe their components and how they interact to process and transmit data. They identify their digital footprint and recognise its permanence. |

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| **Strand: Knowledge and understanding** | **Years 5–6** |
| **Sub-strand: Digital systems** |
| **Content descriptions***Students learn to:* | **Content elaborations***This may involve students:* |
| investigate the main internal components of common digital systems and their function AC9TDI6K01 | * explaining how digital systems are made up of parts that perform specific functions, for example the processor controls the tablet, performs calculations and manipulates data
* exploring how the central processing unit (CPU), memory and input/output components work together to perform a simple calculation
* investigating the main components in a video conferencing system and their functions, for example a telehealth system used to access ultrasound and other imagery services by communities in areas classified as remote such as those of some First Nations Australians
 |
| examine how digital systems form networks to transmit data AC9TDI6K02 | * explaining how separate systems can be connected in different ways to exchange data, for example how a laptop can be connected to a network via a cable or radio waves
* describing the way data is structured and transmitted through a network, for example broken up into packets (small pieces) and passed from the source, through multiple devices, to the destination
* investigating the use of satellite phones where mobile phone networks are not available, inaccessible or unreliable, for example many homeland communities of Arnhem Land have limited access to mainstream communication networks
 |
| **Sub-strand: Data representation** |
| explain how digital systems represent all data using numbers AC9TDI6K03 | * representing data using whole numbers and recognising this is how digital systems represent data, for example converting letters in a message to numbers using their position in the alphabet
* explaining how the data type used to represent data changes the operations that can be performed on it, for example adding numbers performs addition whereas adding strings joins them
 |
| explore how data can be represented by off and on states (zeros and ones in binary) AC9TDI6K04 | * making collaboratively a long thread with beads representing binary for the letters that spell the Country/Place name in the local First Nations Australian language and English, and could be displayed as a ‘binary banner’ as an Acknowledgement of Country that we are on the Traditional Lands of the <insert name> Peoples
* demonstrating that an on/off state in a circuit can represent the digits one and zero, and this is how digital systems represent data
* recognising how the answer to a yes/no question can be represented using on/off states, for example switching a light on or off in a circuit or a long or short dash (beep) in Morse code
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| **Strand: Processes and production skills** | **Years 5–6** |
| **Sub-strand: Investigating and defining** |
| **Content descriptions***Students learn to:* | **Content elaborations***This may involve students:* |
| define problems with given or co‑developed design criteria and by creating user stories AC9TDI6P01 | * using provided stimulus to identify an issue and writing a user story in groups, for example using a newspaper article to develop a user story, such as: a family in a bushfire or flood-prone environment needs a way to ensure they are prepared in case of an emergency
* discussing possible design criteria based on a stimulus, for example the cost, sustainability and timeliness for a roadside bushfire or flood risk rating system
* investigating the impact that feral animals have on native flora and fauna and how this problem has led to economic development opportunities for groups such as the Arnhem Land Progress Aboriginal Corporation
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| **Sub-strand: Generating and designing** |
| design algorithms involving multiple alternatives (branching) and iteration AC9TDI6P02 | * designing an algorithm or understanding and modifying an existing algorithm to fix an error or change functionality, for example exploring issues in drought-prone areas to decide when to water a garden, taking into account humidity as well as soil moisture level
* creating the steps, decisions and loops in algorithms and knowing what step they are up to, for example repeating the steps to add 2 digits for each column in multi-digit addition, knowing which column they are adding and when to stop
* constructing more than one sequence of steps that solve the same problem and explaining why one is better than the other, for example specifying the exact route through a maze versus using the right-hand rule that works for all mazes
* modelling a decision that has more than 2 options to select the next step, for example selecting transport IF distance is less than 2 km THEN walk, ELSE IF the distance is less than 5 km THEN ride a bike, ELSE catch the bus
* planning algorithms that repeat until a condition is met, for example keep mixing UNTIL the ingredients are combined or subtracting a number UNTIL the result reaches zero
* designing an algorithm including branching and iteration which responds to data, for example how First Nations Australian rangers use structured procedures to respond to live tracking data that indicates feral buffalo are approaching an environmentally or culturally significant site
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| design a user interface for a digital system AC9TDI6P03 | * designing a user interface on paper or using digital tools, for example drawing the designed layout of the landing page of an app to order lunches from the school canteen
* designing a user interface to address an identified need, for example including customisable font size and colour contrast to help users who are visually impaired
* modelling how user interfaces allow people from different cultures and language backgrounds to access information, for example using consistent symbols to represent common actions such as copy, paste and save
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| generate, modify, communicate and evaluate designs AC9TDI6P04 | * ideating a range of possible design ideas, discussing them and judging them against the design criteria and user stories, for example using the design criteria to put design ideas in order of preference in a group discussion
* suggesting modifications to the preferred design idea if it does not satisfy all design criteria and user stories, for example modifying a game or game controller so that it can be used by a wider range of players
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| **Sub-strand: Producing and implementing** |
| implement algorithms as visual programs involving control structures, variables and input AC9TDI6P05 | * writing and editing programs to solve problems using branching, iteration and variables in a visual programming environment, for example writing a program to draw a rotated shape a given number of times using Turtle Graphics
* writing programs that take input from the user or environment and storing that input in a variable for later use, for example asking the user how many shapes to draw in a circle and using that to calculate the number of iterations and angle to rotate each time
* writing programs that make decisions involving multiple alternatives, for example an interactive quiz that checks if the answer is correct, gives feedback and updates the score, or gives a final grade based on the score
* writing programs that repeat multiple steps based on the user’s input, for example repeatedly drawing a shape a given number of times, shifting the position between each iteration
* stating the expected behaviour of a program, running the program to check it is correct and fixing any errors, for example ‘when I press the left arrow key, the cat should move left, finding the cat moves right, and fixing it by changing the 10 to -10 to alter the direction’
* programming digital systems to perform automated tasks, such as closing gates, for example simulating the work of First Nations Australian rangers attempting to lure and capture feral animals
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| **Sub-strand: Evaluating** |
| evaluate existing and student solutions against the design criteria and user stories and their broader community impact AC9TDI6P06 | * evaluating the effectiveness of their own solutions to address the identified problem from the user stories, for example checking if the information created for the local interactive history walk is relevant and meets the council’s needs
* evaluating how an existing solution provides users with safety tools and features such as those described in the Safety by Design Vision for Young People, for example having a clearly visible button to easily report and block inappropriate behaviour in an app or on a website
* reflecting on the many systems that are used in the wider community to address a range of problems, for example timetables to manage transport and other services through to details such as storing licence information so that police can enforce road rules
* verifying the correctness of AI-generated content against information known to be factually accurate; for example, comparing the output from a generative text model providing a biography of a local leader with the data published on their official website or other authoritative source
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| **Sub-strand: Collaborating and managing** |
| select and use appropriate digital tools effectively to create, locate and communicate content, applying common conventions AC9TDI6P07 | * creating achievable steps and timeframes and identifying digital tools needed to produce a solution to a given problem, for example planning what they need to do to create a report on the effectiveness of the school’s recycling initiatives
* locating content through search engines and in documents by revising queries and using required search terms, for example reviewing search results and modifying search terms to make the query more accurate
* creating appropriate content that reflects planning as well as new external factors, for example uploading a draft of a report on a local government issue to the teacher for feedback as part of an iterative process
* creating content for a school celebration, for example designing a collaborative spreadsheet that can be used by a small group to plan and cost their graduation party, together with a folder of tagged resources which support the planning
* judging the tone and appropriateness for the intended audience of text generated using autocomplete; for example, deciding that the predictive text was too formal for a conversation with a friend and rewriting it in more casual language
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| select and use appropriate digital tools effectively to share content online, plan tasks and collaborate on projects, demonstrating agreed behaviours AC9TDI6P08 | * following a previously created plan to report back to the class on a given problem, using digital tools, for example small groups reporting on the best location for a new skate park in the local government area
* defining and acting collectively using online community standards and valuing the work of others, for example moderating language and behaviour in an online class forum, not deleting the work of collaborators, and respecting others’ intellectual property
* naming, organising and storing files in a way that allows for easy retrieval of shared content, for example labelling the main folders by topic, such as ‘school garden project’, and then creating subfolders for each section of the project, such as ‘plans’, ‘designs’ and ‘implementation’
* demonstrating agreed behaviours; following cultural protocols, including relevant permissions and attributions; acknowledging diversity, capability and strength; and addressing risks and responsibilities such as privacy, security, and accuracy of data; for example when sharing images of First Nations Australians’ cultural artefacts
* using a range of communication tools to share ideas and information with stakeholders, for example presenting content for a school celebration such as a graduation celebration with the parents and citizens association or school executive in an online forum
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| **Sub-strand: Privacy and security** |
| access multiple personal accounts using unique passphrases and explain the risks of password re-use AC9TDI6P09 | * using multiple accounts, each with different passphrases, to access each website or app used for school and home, for example having a different username and password combination for school, gaming and music accounts
* explaining why re-using a password is risky when one of them is found out, for example how a compromised password from one social media account might be able to be used to access their bank or school account if the password is the same and other details are also compromised
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| explain the creation and permanence of their digital footprint and consider privacy when collecting user data AC9TDI6P10 | * describing scenarios where data, images or both that have been posted online can lead to information being resurfaced at a later date, for example how a comment made on a social media post or video associates a person with both their comment and the content
* explaining why collecting the smallest amount of data needed for a purpose is important to protect someone’s privacy, for example how choosing not to collect information about someone’s birthdate when it is not necessary ensures that private data cannot be stolen in a cyber attack
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