

2025 Premier's Coding Challenge

Curriculum Alignment to Australian Curriculum Version 9.0: Digital Technologies

Alignment to Band Descriptions, Achievement Standards (Subject specific and where appropriate Learning area), and Content Descriptions has been provided below. Greyed out text signifies no alignment.

<https://v9.australiancurriculum.edu.au/curriculum-information/understand-this-learning-area/technologies#digital-technologies>

Years 3 and 4

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.

Content Descriptions

- Define problems with given design criteria and by co-creating user stories - AC9TDI4P01
- Follow and describe algorithms involving sequencing, comparison operators (branching) and iteration - AC9TDI4P02
- Generate, communicate and compare designs - AC9TDI4P03
- Implement simple algorithms as visual programs involving control structures and input - AC9TDI4P04
- Discuss how existing and student solutions satisfy the design criteria and user stories - AC9TDI4P05
- Use the core features of common digital tools to create, locate and communicate content, following agreed conventions - AC9TDI4P06
- Use the core features of common digital tools to share content, plan tasks, and collaborate, following agreed behaviours, supported by trusted adults - AC9TDI4P07

Years 5 and 6

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.

Content Descriptions

- Define problems with given or co-developed design criteria and by creating user stories - AC9TDI6P01
- Design algorithms involving multiple alternatives (branching) and iteration - AC9TDI6P02
- Design a user interface for a digital system - AC9TDI6P03
- Generate, modify, communicate and evaluate designs - AC9TDI6P04
- Implement algorithms as visual programs involving control structures, variables and input - AC9TDI6P05
- Evaluate existing and student solutions against the design criteria and user stories and their broader community impact - AC9TDI6P06
- Select and use appropriate digital tools effectively to create, locate and communicate content, applying common conventions - AC9TDI6P07
- Select and use appropriate digital tools effectively to share content online, plan tasks and collaborate on projects, demonstrating agreed behaviours - AC9TDI6P08

Years 7 and 8

Level Description

By the end of Year 8 students should have had the opportunity to apply computational thinking by defining and decomposing real-world problems, creating user experiences, designing and modifying algorithms, and implementing them in a general-purpose programming language. This involves students practising problem decomposition, using approaches such as divide and conquer to more clearly understand a problem by describing its component parts. Students represent and communicate their algorithmic solutions using flowcharts and pseudocode. Students check their solutions meet the specifications by testing and debugging their algorithms before and during implementation. They develop a deeper understanding of abstraction by explaining how and why digital systems represent data as whole numbers, which are then represented in binary.

Students build on their skills from Mathematics (Statistics) in acquiring and interpreting data. In Digital Technologies, students continue to advance these skills and are also given opportunities to validate the data they acquire to ensure it is accurate and consistent. They collect and transform many types of data from a wide range of sources. Students model structured data in meaningful ways using spreadsheets and single-table databases, and analyse and visualise the data to extract meaning from it.

They apply design thinking by using divergent techniques, such as mind mapping, role-play and using graphic organisers, to generate design ideas for user experiences and solution designs. Students review these ideas against design criteria and created user stories throughout their implementation as general-purpose programming by assessing them against current and future needs. They extend the use of these design criteria and user stories to evaluate the future impact of existing solutions.

Students apply systems thinking by exploring the connections between hardware capabilities and tasks users want to perform. They investigate how data is transmitted via wired and wireless networks and explain the need for encryption to protect and secure data. Students use an increasing range of the features of digital tools to improve their efficiency and the consistency of the content they create, locate and communicate. They plan and manage projects individually and collaboratively, improving their control over the quality of their content. Students investigate personal security controls, including multi-factor authentication, to protect their data if passwords are compromised, and they understand the impact of phishing and other cyber security threats on people and data.

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 8 students develop and modify creative digital solutions, decompose real-world problems, and evaluate alternative solutions against user stories and design criteria. Students acquire, interpret and model data with spreadsheets and represent data with integers and binary. They design and trace algorithms and implement them in a general-purpose programming language. Students select appropriate hardware for particular tasks,

explain how data is transmitted and secured in networks, and identify cyber security threats. **They select and use a range of digital tools efficiently and responsibly to create, locate and share content; and to plan, collaborate on and manage projects.** Students manage their digital footprint.

Learning Area Achievement Standard

By the end of Year 8 students explain how people design, innovate and produce products, services and environments for preferred futures. For each of the 4 prescribed technologies contexts students explain how the features of technologies impact on design decisions, and create designed solutions based on analysis of needs or opportunities. They acquire, interpret and model with spreadsheets and represent data with integers and binary. **Students design and trace algorithms; and implement them in a general-purpose programming language. Students create and adapt design ideas, processes and solutions, and justify their decisions against developed design criteria that include sustainability. They communicate design ideas and solutions to audiences using technical terms and graphical representation techniques, including using digital tools.** They select appropriate hardware for particular tasks, explain how data is transmitted and secured in networks, and identify cyber security threats. **They use a range of digital tools to individually and collaboratively document and manage production processes to safely and responsibly produce designed or digital solutions for the intended purpose.** Students manage their digital footprint.

Content Descriptions

- Define and decompose real-world problems with design criteria and by creating user stories - AC9TDI8P04
- Design algorithms involving nested control structures and represent them using flowcharts and pseudocode - AC9TDI8P05
- Trace algorithms to predict output for a given input and to identify errors - AC9TDI8P06
- Design the user experience of a digital system - AC9TDI8P07
- Generate, modify, communicate and evaluate alternative designs - AC9TDI8P08
- Implement, modify and debug programs involving control structures and functions in a general-purpose programming language - AC9TDI8P09
- Evaluate existing and student solutions against the design criteria, user stories and possible future impact - AC9TDI8P10
- Select and use a range of digital tools efficiently, including unfamiliar features, to create, locate and communicate content, consistently applying common conventions - AC9TDI8P11
- Select and use a range of digital tools efficiently and responsibly to share content online, and plan and manage individual and collaborative agile projects - AC9TDI8P12

Years 9 and 10

Level Description

By the end of Year 10 students should have had the opportunity to apply computational thinking by defining and decomposing real-world problems, creating user experiences, designing and modifying algorithms, and implementing them, including in an object-oriented programming language. Students use techniques, including interviewing stakeholders to develop user stories, to increase the precision of their problem definitions and solution specifications. They verify their solutions solve the problem by validating their algorithms, represented as flowcharts and pseudocode, and using test cases to confirm the correctness of their solutions. Students develop their object-oriented programming skills, and apply them to develop, modify and debug programs. They explain the importance of abstraction by representing online documents in terms of content, structure and presentation, as well as exploring simple data compression techniques and comparing their effectiveness.

Students consolidate their skills in data acquisition and interpretation, cleaning and validating data to ensure it is accurate, consistent and domain appropriate. They model multidimensional data in more complex spreadsheets and relational databases, filtering and querying it to give insights into its meaning, and to pose further questions or make conclusions. They visualise this data in customisable ways, allowing greater exploration of trends and outliers to support or challenge their analyses.

Students apply design thinking by using divergent techniques to generate design ideas for user experiences and solutions. They filter and prototype these ideas, developing user stories and applying design criteria based on current and future needs and enterprising opportunities, as well as their created user stories, and revise and further develop their preferred ideas based on their analysis. Students extend on these design criteria and user stories to evaluate the enterprise opportunities and future impact of existing solutions.

Students consolidate their systems thinking by exploring how the hardware and software components of digital systems interact to manage, control and secure access to data. **They increasingly use advanced features of existing and emerging digital tools to create interactive content for a diverse audience. They explore simple tools that help plan tasks, timelines and responsibilities for individual and collaborative projects.** Students extend their knowledge of the importance of security by developing cyber security threat models and exploring an example of a supply chain vulnerability. They critique the digital footprint created by existing systems and their own solutions by applying the Australian Privacy Principles.

In Digital Technologies, students should have frequent opportunities for authentic learning by making key connections to other learning areas.

Digital Technologies Achievement Standard

By the end of Year 10 students develop and modify innovative digital solutions, decompose real-world problems, and critically evaluate alternative solutions against stakeholder elicited user stories. Students acquire, interpret and model complex data with databases and represent documents as content, structure and presentation. **They design and validate algorithms and implement them, including in an object-oriented programming language.** Students explain how digital systems manage, control and secure access to data; and model cyber security threats and explore a vulnerability. **They use advanced features of digital tools to create interactive content, and to plan, collaborate on, and manage agile projects.** Students apply privacy principles to manage digital footprints.

Content Descriptions

- Define and decompose real-world problems with design criteria and by interviewing stakeholders to create user stories - AC9TDI10P04
- Design algorithms involving logical operators and represent them as flowcharts and pseudocode - AC9TDI10P05
- Validate algorithms and programs by comparing their output against a range of test cases - AC9TDI10P06
- Design and prototype the user experience of a digital system - AC9TDI10P07
- Generate, modify, communicate and critically evaluate alternative designs - AC9TDI10P08
- Implement, modify and debug modular programs, applying selected algorithms and data structures, including in an object-oriented programming language - AC9TDI10P09
- Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases - ACTDIP040
- Implement modular programs, applying selected algorithms and data structures including using an object-oriented programming language - ACTDIP041
- Evaluate existing and student solutions against the design criteria, user stories, possible future impact and opportunities for enterprise - AC9TDI10P10
- Select and use emerging digital tools and advanced features to create and communicate interactive content for a diverse audience - AC9TDI10P11
- Use simple project management tools to plan and manage individual and collaborative agile projects, accounting for risks and responsibilities - AC9TDI10P12