

## Australian Curriculum: Digital Technologies Years 7 and 8

### BAND 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.

### CONTENT DESCRIPTIONS

#### Digital Technologies 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

##### *Data representation*

investigate how digital systems represent text, image and audio data using integers AC9TDI8K03

explain how and why digital systems represent integers in binary AC9TDI8K04

#### Digital Technologies 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

analyse and visualise data using a range of software, including spreadsheets and databases, to draw conclusions and make predictions by identifying trends AC9TDI8P02

model and query the attributes of objects and events using structured data AC9TDI8P03

##### *Investigating and defining*

define and decompose real-world problems with design criteria and by creating user stories AC9TDI8P04

##### *Generating and defining*

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

*Producing and implementing* implement, modify and debug programs involving control structures and functions in a general-purpose programming language AC9TDI8P09

##### *Evaluating*

evaluate existing and student solutions against the design criteria, user stories and possible future impact AC9TDI8P10

# Digital

## 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.

### *Collaborating and managing*

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

### *Privacy and security*

explain how multi-factor authentication protects an account when the password is compromised and identify phishing and other cyber security threats AC9TDI8P13

investigate and manage the digital footprint existing systems and student solutions collect, and assess if the data is essential to their purpose AC9TDI8P14

# Digital