



## General Capabilities

### Critical and creative thinking

In Technologies, students develop critical and creative thinking as they imagine, generate, iterate and critically evaluate ideas. Students analyse problems, refine concepts and reflect on the decision-making process by engaging in systems, design and computational thinking.

Students think critically and creatively while considering how data, information, systems, materials, tools and equipment (past and present) impact on our lives, and how these elements might be better designed and managed. Experimenting, drawing, modelling, designing and working with equipment and software helps students to build their visual and spatial thinking and to create solutions, products, services and environments.

### Digital literacy

Technologies gives students the opportunity to become discerning users, productive creators, critical analysts and effective developers of digital solutions. Development of digital literacy allows students to operate and manage digital systems and practise digital safety and wellbeing while investigating, creating and communicating. As students develop digital literacy skills, they build their understanding of how to utilise digital tools when designing digital solutions. Students learn how to operate specific digital tools to help them realise their design ideas. This may occur when investigating needs or opportunities or researching and analysing information. It also occurs when students generate and communicate design ideas, processes and solutions, and when they develop plans, schedules and processes and collaborate online to create innovative and enterprising solutions.

### Ethical understanding

Technologies develops students' capacity to understand and apply ethical and socially responsible principles when managing projects and collaborating with others and creating, sharing and using technologies. Using an ethical lens, they investigate past, current and future local, national, regional and global technological priorities. Understanding the protection of data, intellectual property and individual privacy helps students to be respectful creators.

Students explore complex issues and consider possibilities and ethical implications. They learn about safe and ethical procedures, and consider the rights of others and their responsibilities in using sustainable practices. Students learn to appreciate and value the part they play in the social and natural systems they live in.

### Literacy

In Technologies, students develop literacy by interpreting a wide range of practical texts including technical manuals and specifications. They evaluate content in diverse formats, analyse data and reports and navigate complex information. Students learn to use technical symbols, icons and terminology, adapting language for both general and specialised contexts. They produce purpose-driven texts such as annotated drawings, software guides and project plans tailored to specific needs and audiences.

### Numeracy

In Technologies, students develop the capacity to interpret and use mathematical knowledge and skills in a range of real-life situations. They use numbers to calculate, measure and estimate; interpret and draw conclusions from statistics; measure and record throughout the process of generating and iterating ideas; develop, refine and test concepts; and cost and sequence when making products and managing projects. In using software, materials, tools and equipment, students work with the concepts of numbers, geometry, scale, proportion, measurement and volume. They use three-dimensional models, create accurate technical drawings, work with digital models and use computational thinking in decision-making processes when designing and creating best-fit solutions.

### Personal and social capability

Students develop personal and social capabilities in Technologies through engaging in project management and design activities in a collaborative environment. They show initiative in their learning, apply design thinking skills and make informed decisions independently. Working in teams, they develop cooperation, leadership, conflict resolution and resource-sharing skills. Embracing innovation and risk fosters resilience as they navigate uncertainty.

Students also cultivate social responsibility by considering the impacts of decisions on people, communities and environments. They deepen empathy and respect by understanding diverse user needs and reflect on how digital tools and environments such as social media affect their wellbeing, applying appropriate strategies to both face-to-face and digital environments.

## Year 10

### Year Level Description

In the middle adolescence phase of schooling, teaching and learning programs encourage students to develop an open and questioning view of themselves as active participants in their society and the world.

Digital Technologies further develops student understanding and skills in computational thinking, such as precisely and accurately describing problems, and the use of modular approaches to solutions. They investigate the potential and challenges of increased knowledge and choice of technologies; and an understanding of the relationship between knowledge, technologies and consumer and/or producer values.

In Year 10, students consider how human interaction with networked systems introduces complexities surrounding access to, and the security and privacy of, data of various types. They interrogate security practices and techniques used to compress data. Students explore the role of hardware and software in managing, controlling and securing access to data, in networked digital systems focusing on user or software supply chain vulnerabilities.

Students apply design thinking by using divergent techniques to generate design ideas for user experiences and solutions. They develop and represent documents online as content (text), structure (mark-up) and presentation (styling). Students analyse problems and design, and implement and evaluate a range of solutions, such as database-driven websites, artificial intelligence engines and simulations. They design and implement algorithms involving functions and logical operators and, where appropriate, represent them as flow charts. Students further develop project management skills through developing detailed plans with consideration of time, production processes, social, ethical, economic and sustainability factors, and legal responsibilities.

## *Achievement Standard*

By the end of the year:

Students describe how hardware and software manage, control and secure access to data in networked digital systems with a focus on software supply chain vulnerabilities. They represent documents online as content (text), structure (mark-up) and presentation (styling) and explain the purpose of these distinctions. Students analyse and visualise data interactively using a range of software, including spreadsheets and relational databases, to draw conclusions and make predictions based on identified trends and outliers. They model and query entities and relationships using structured data. Students apply the Australian Privacy Principles to critique systems and manage the digital footprint of individuals.

Students define and decompose real-world problems and use data gathering techniques to create user experiences and user interfaces. They design and prototype the user experience of a digital system and algorithms involving functions, modules and logical operators, and represent them as flow charts and/or pseudocode. Students validate algorithms and programs by comparing their output against a range of test cases. They implement, modify and debug modular programs, applying algorithms and data structures, in a programming language.

In Digital Technologies, students identify the needs of the client or stakeholder to determine the basis for a solution. They develop and critique design briefs for a designed solution. Students investigate components and resources to develop increasingly sophisticated solutions, identifying and considering associated constraints. They apply design thinking, creativity, enterprise skills and innovation to develop, modify and communicate detailed design ideas. Students design possible solutions and analyse designs against criteria, including functionality, accessibility, usability and aesthetics, using appropriate technical terms and technologies. They select, justify, implement and test appropriate technologies and processes to produce designed solutions. They manage projects, using digital technologies with an agile and collaborative approach, while considering time, production processes, social, ethical, economic and sustainable factors, and legal responsibilities.

## *Content Descriptions*

### Digital systems

Hardware and software are used to manage, control and secure access to data in networked digital systems

#### For example:

- public key cryptography, such as TLS, and hashing
- secure storage and transmission of data, such as SHA-1
- private information moves through a system and can be identified as the most likely target of a cyber attack. Data packets can be mapped when moving between the user and server in a web application. Sending data in plain text becomes susceptible to a 'man-in-the-middle' attack
- networks can be configured by using real or simulated hardware where data packets move around the network, with various levels of network efficiency
- data moves through a network based on layers of the TCP/IP model
- cybersecurity threat models are essential tools to identify and understand potential threats to a system, enabling the design and implementation of appropriate security measures
- a cybersecurity threat model should consider assets, threats, attack vectors, vulnerabilities, risk, security controls and the environment

WA10DIGDS1

Digital literacy

### Data representation

Represent documents online as content (text), structure (mark-up) and presentation (styling) and the purpose of these distinctions

#### For example:

- documents are represented by separating content (the text in the document), structure (the document structure, such as headings and paragraphs) and presentation (document layout and style) in digital publications
- correct HTML tags to allow for accessibility, such as screen readers
- maintenance and updating of content and/or style is easier with correct document structure
- HTML (content data) and CSS (presentation data) are used in conjunction to create websites

WA10DIGDR1

Digital literacy

## Acquiring, managing and analysing data

Analyse and visualise data interactively using a range of software, including spreadsheets and/or relational databases, to draw conclusions and make predictions by identifying trends and outliers

### For example:

- interactive visualisations are used for exploring complex data, such as population, life expectancy and fertility rates in motion charts
- explore machine learning, a form of artificial intelligence (AI), where an algorithm is trained using a dataset, such as to classify images into categories

WA10DIGAD1

Numeracy      Digital literacy

Model and query entities and their relationships using structured data

### For example:

- modelling entities and processes, their attributes, and the relationships between them
- creating database tables for a movie, a user and their movie review, where a movie has a title, genre and release date, and a review has a movie, a user and their rating and comments
- interpreting and querying multi-table databases using SQL queries with SELECT, WHERE and simple JOIN/GROUP BY clauses and counting, such as checking that each teacher is only allocated to one class at a time

WA10DIGAD2

Numeracy      Digital literacy

## Privacy and security

Australian Privacy Principles (APP) are used to critique systems and manage the digital footprint of individuals

### For example:

- the APPs are a set of 13 guidelines that form the foundation of Australia's privacy law, specifically the Privacy Act 1988. These principles govern how organisations handle personal information, ensuring it is collected, used, and managed in a way that protects individuals' privacy
- when using the APPs to critique systems such as websites, apps, or online services, individuals or regulators assess whether these systems comply with privacy laws. This involves examining how personal data is collected, stored, used, and shared; for example, a system can be critiqued based on transparency, data minimisation and security

WA10DIGPS1

Ethical understanding      Digital literacy

User or software supply chain vulnerabilities

WA10DIGPS2

Literacy      Digital literacy

## Digital implementation

Define and decompose real-world problems by using data gathering techniques to create the client needs

WA10DIGDI1

Numeracy      Digital literacy

Design and prototype the user experience and user interface (UX/UI) of a digital system based on client needs

WA10DIGDI2

Critical and creative thinking      Digital literacy

Design modular algorithms involving functions and logical operators (AND, OR, NOT) and represent them as flowcharts and/or pseudocode

WA10DIGDI3

Digital literacy

Validate algorithms and programs by comparing output against a range of test cases

WA10DIGDI4

Numeracy    Digital literacy

Implement, modify and debug modular programs, applying algorithms and data structures in a general-purpose programming language

WA10DIGDI5

Digital literacy

## Design thinking skills

### Project management

Manage projects, using suitable technologies, with an agile and collaborative approach. Use project management processes to consider time, production processes, social, ethical, economic and sustainable factors, and legal responsibilities

WA10DIGDTPM1

Numeracy    Critical and creative thinking    Personal and social capability    Ethical understanding

### Investigating and defining

Ideate a problem and define the needs of the client/stakeholder through anecdotal evidence and/or data gathering techniques

WA10DIGDTID1

Literacy    Critical and creative thinking

Develop a design brief for a solution or to innovate an existing product, service or environment

WA10DIGDTID2

Critical and creative thinking

Investigate a range of technologies, resources and/or components to develop ideas and solutions, with consideration of social and ethical factors, legal responsibilities and competing constraints

WA10DIGDTID3

Critical and creative thinking

### Designing

Design alternative solutions considering available technologies, functionality, accessibility, usability and aesthetics, using appropriate technical terms

WA10DIGDTDE1

Critical and creative thinking

### Producing and implementing

Select, justify, implement and test a range of technologies, techniques and processes to produce solutions and/or prototypes

WA10DIGDTPI1

Critical and creative thinking    Personal and social capability    Digital literacy

### Evaluating

Evaluate design processes and solutions against student developed criteria

WA10DIGDTEV1

Literacy    Critical and creative thinking