

Technologies

The Technologies curriculum is written on the basis that all students will study both Technologies subjects from Pre-primary to the end of Year 8. Within Design and Technologies (Engineering principles and systems; Food and fibre production; Food specialisations; Materials and technologies specialisations), students have the opportunity to study at least one of the contexts.

In Years 9 and 10 the study of Technologies is optional.

In Design and Technologies, it is desirable that schools provide students with the opportunity to engage with all contexts across Pre-primary to Year 10.

Design and Technologies

The syllabus is based on the requirement that in Years 9 and 10 the study of Technologies is optional.

Year Level Description

Learning in Design and Technologies builds on concepts, skills and processes developed in earlier years, and teachers will revisit, strengthen and extend them as needed.

In Year 10, students have opportunities to learn about technologies in society at least once in the following technologies contexts: Engineering principles and systems; Food and fibre production; Food specialisations; and Materials and technologies specialisations. Students are provided with opportunities to design and produce products, services and environments.

Students have opportunities to use design and technologies knowledge and understanding, processes and production skills, and design thinking, to produce solutions to identified needs or opportunities. Students work independently and collaboratively. They have opportunities to understand the complex interdependencies involved in the development of technologies and enterprises. The focus is on students designing solutions, taking into account ethics; legal issues; social values; economic, environmental and social sustainability factors; and using more sophisticated strategies. They use creativity, innovation and enterprise skills with confidence, independence and collaboration.

Using a range of technologies, including a variety of graphical representation techniques, students have opportunities to generate and represent original ideas and production plans in two-dimensional and three-dimensional representations using a range of technical drawings, including perspective, scale, orthogonal and production drawings with sectional and exploded views, appropriate to their designs.

Students identify the steps involved in planning the production of designed solutions. They develop detailed project management plans incorporating elements, such as sequenced time, cost and action plans to manage a range of design tasks safely. Students apply management plans, changing direction when necessary, to successfully complete design tasks. They continue to identify and establish safety procedures that minimise risk and manage projects maintaining safety standards and management procedures to ensure success. Learning experiences require students to transfer theoretical knowledge to practical activities across a range of projects.

Content description

Knowledge and understanding

Technologies and society

- Social, ethical and sustainability considerations that impact on designed solutions, complexity of design, and production processes involved
- Impact of emerging technologies on design decisions, and/or economic, environmental and social sustainability

Technologies contexts

Engineering principles and systems

- The process of materials being combined with force, motion and energy to create solutions

Food and fibre production

- The role of emerging research and technology in the design of ethical and sustainable products

Food specialisations

- Healthy eating through the skills and knowledge of nutrients and the application of the principles of food safety, preservation, preparation, presentation and sensory perceptions

Materials and technologies specialisations

- The combination of a range of characteristics and properties of materials, systems, components, tools and equipment to create designed solutions
- Designed solutions within a range of technologies specialisations, using combined technologies

Processes and production skills

Creating solutions by:

Investigating and defining

- Identify the needs of the client/stakeholder to determine the basis for a solution
- Create and critique briefs to solutions
- Investigate components/resources to develop increasingly sophisticated solutions, identifying and considering associated constraints

Designing

- Apply design thinking, creativity, enterprise skills and innovation to develop, modify and communicate design ideas of increasing sophistication
- Design possible solutions, analysing designs against criteria, including functionality, accessibility, usability and aesthetics, using appropriate technical terms and technology

Producing and implementing

- Select, justify, and safely implement and test appropriate technologies and processes, to make solutions

Evaluating

- Analyse design processes and solutions against student-developed criteria

Collaborating and managing

- Work independently, and collaboratively to manage projects, using digital technology and an iterative and collaborative approach. Considers time, cost, risk, safety, production processes, sustainability and legal responsibilities

Digital Technologies

The syllabus is based on the requirement that in Years 9 and 10 the study of Technologies is optional.

Year Level Description

In Year 10, learning in Digital Technologies focuses on further developing understanding and skills in computational thinking, such as precisely and accurately describing problems; and the use of modular approaches to solutions. It also focuses on engaging students with specialised learning in preparation for vocational training or learning in the senior secondary years.

Students have opportunities to analyse problems and design, implement and evaluate a range of solutions, such as database-driven websites, artificial intelligence engines and simulations.

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, and learn about the importance of separating content, presentation and behavioural elements for data integrity and maintenance purposes.

Students explore how bias can impact the results and value of data collection methods, and use structured data to analyse, visualise, model and evaluate objects and events.

Students learn how to develop multilevel abstractions; identify standard elements, such as searching and sorting in algorithms; and explore the trade-offs between the simplicity of a model and the faithfulness of its representation.

When defining problems, students consider the functional and non-functional requirements of a solution through interacting with clients/stakeholders and regularly reviewing processes. They consolidate their algorithmic design skills to incorporate testing and review, and further develop their understanding of the user experience to incorporate a wider variety of user needs. Students develop solutions to complex problems and evaluate their solutions and existing information systems, based on a broad set of criteria, including connections to existing policies and their enterprise potential. They consider the privacy and security implications of how data are used and controlled, and suggest how policies and practices can be improved to ensure the sustainability and safety of information systems.

Students have opportunities to become more skilled at identifying the steps involved in planning solutions and developing detailed plans that are mindful of risks and sustainability requirements. When creating solutions individually, collaboratively and interactively for sharing in online environments, students should comply with legal obligations, particularly with respect to the ownership of information.

Content description

Knowledge and understanding

Digital systems

- Role of hardware and software in managing, controlling and securing access to data, in networked digital systems

Representation of data

- Simple compression of data and how content data is separated from presentation data

Processes and production skills

Collecting, managing and analysing data

- Apply techniques for acquiring, storing and validating quantitative and qualitative data from a range of sources, considering privacy and security requirements
- Analyse, visualise and model processes and entities, and their relationships, using structured data

Digital implementation

- Design algorithms represented diagrammatically and in structured English, including iteration
- Validate algorithms and programs using common acceptable methods
- Implement data storage and organisation techniques within a programming environment
- Create interactive solutions for sharing ideas and information online, taking into account social contexts and legal responsibilities

Creating solutions by:

Investigating and defining

- Identify the needs of the client/stakeholder to determine the basis for a solution
- Create and critique briefs to solutions
- Investigate components/resources to develop increasingly sophisticated solutions, identifying and considering associated constraints

Designing

- Apply design thinking, creativity, enterprise skills and innovation to develop, modify and communicate design ideas of increasing sophistication
- Design possible solutions, analysing designs against criteria, including functionality, accessibility, usability and aesthetics using appropriate technical terms and technology

Producing and implementing

- Select, justify, and safely implement and test appropriate technologies and processes, to make solutions

Evaluating

- Analyse design processes and solutions against student developed criteria

Collaborating and managing

- Work independently, and collaboratively to manage projects, using digital technology and an iterative and collaborative approach. Considers time, cost, risk, safety, production processes, sustainability and legal responsibilities