By the end of Year 4, students explain how products, services and environments are designed to best meet needs of communities and their environments. They describe contributions of people in design and technologies occupations. Students describe how the features of technologies can be used to produce designed solutions and how they impact on the development of new technologies.

Students create designed solutions for each of the prescribed technologies contexts. They explain needs and opportunities and evaluate ideas and designed solutions against identified criteria for success, including environmental sustainability considerations. They develop and expand design ideas and communicate those using models and annotations including symbols and diagrams. Students plan and sequence major steps in design and production. They identify appropriate technologies and techniques and demonstrate safe work practices when producing designed solutions.
Design and Technologies Knowledge and understanding

This strand focuses on developing the underlying knowledge and understanding of technologies (materials, systems, components, tools and equipment) across technologies contexts and developing understanding of the relationship between technologies and society.

Technologies and society

The technologies and society content descriptions focus on how people use and develop technologies taking into account social, economic, environmental, ethical, legal, aesthetic and functional factors and the impact of technologies on individuals, families, local, regional and global communities; the economy, and the environment now and into the future.

Technologies contexts

The technologies contexts content descriptions provide a framework within which students can gain knowledge and understanding about technologies and design across a range of technologies contexts. These content descriptions focus on the characteristics and properties of technologies and how they can be used to create innovative designed solutions.

The technologies contexts content for Foundation to Year 8 are described below. The band descriptions show how many times each technologies context is addressed in a band.

Engineering principles and systems

Engineering principles and systems are focused on how forces can be used to create light, strong, heat, movement, control or support in systems. Knowledge of these principles and systems enables the design and production of sustainable, engineered solutions. Students need to understand how sustainable engineered products, services and environments can be designed and produced as resources diminish. Students will progressively develop knowledge and understanding of how forces and the properties of materials affect the behaviour and performance of engineered solutions.

Food and fibre production

Food and fibre production involves the production or harvested resources used to directly sustain human life and are produced in managed environments such as farms and plantations or harvested from wild stocks. Challenges for world food and fibre production include an increasing world population, an uncertain climate and competition for resources such as land and water. Students need to understand the processes of food and fibre production and challenges by investigating and innovative sustainable ways of supplying agriculturally produced raw materials.

Students will progressively develop knowledge understanding about the managed systems that produce food and fibre through creating designed solutions. (Food and fibre production includes food specialisations from Foundation to Year 10.)

Food specialisations

Food specialisations include the application of nutrition principles (as described in Health and Physical Education) and knowledge about the characteristics and properties of food to food selection and preparation; and contemporary issues about food issues. There are increasing community concerns about food issues, including the nutritional quality of food and the environmental impact of food manufacturing processes. Students need to understand the importance of a variety of foods, sound nutrition principles and food preparation skills when making food decisions to help better prepare them for their future lives.

Students will progressively develop knowledge and understanding about the nature of food and food safety, and how to make informed and appropriate food preparation choices when experimenting with and preparing food in a sustainable manner.

Materials and technologies specialisations

Materials and technologies specialisation is focused on a broad range of traditional, contemporary and emerging materials and technologies areas that typically involve extensive use of technologies. We live in and depend on the human-made environment for communication, housing, employment, medicine, recreation and transport; however, we also face increasing concerns related to sustainability. Students need to develop the confidence to make ethical and sustainable decisions about materials and the processes used to make them. They can do this by learning about and working with materials and production processes. Students will progressively develop knowledge and understanding of the characteristics and properties of a range of materials either in developing the production of products or through producing designed solutions for a technologies specialisation; for example, architecture, electronics, graphics, technologies or fashion.

Types of designed solutions

Across each band from Foundation to Year 8, students will have the opportunity to produce at least three types of designed solutions (product, service and environment) through the technologies contexts identified for a band.

These different designed solutions have been specified to give students opportunities to engage with a broad range of design thinking and production skills. For example, in Year 5–6 students may design and produce an engineered environment, a food and fibre production/ food specialisations environment and a materials or technologies specialisations service. Whereas in another school, students may design and produce an engineered environment, a food and fibre production/ food specialisations service, and a technologies specialisation product. The combination of contexts and types of designed solutions is a school decision.

Design and Technologies processes and production skills

The Design and Technologies processes and production skills strand is based on the major aspects of design thinking and design processes and production skills. The content descriptions in this strand reflect a design process and would typically be addressed through a design brief.

Design and Technologies processes and production skills strand focuses on creating designed solutions by: investigating and defining; designing, producing and implementing; evaluating; and collaborating and managing.

Investigating and defining

Investigating and defining involves students critiquing, exploring and investigating needs, opportunities and information. As creators and consumers they will critically reflect on the intention, purpose and operation of technologies and designed solutions. Critiquing encourages students to examine values, analysis, question and review processes and systems. Students reflect on how decisions they make may have implications for the individual, society and the local and global environment, now and in the future. Students explore and investigate technologies, systems, products, services and environments as they consider the needs of society. They progressively develop effective investigation strategies and consider the contribution of technologies to their lives and make judgements about them. Students may respond to design briefs or develop design briefs in response to needs and opportunities.

Generating and designing

Generating and designing involves students in developing and communicating ideas for a range of audiences. Students create, change, make choices, weigh up options, consider alternatives and document various design ideas and possibilities. They use critical and creative thinking strategies to generate, evaluate and document ideas to meet needs or opportunities that have been identified by an individual, group or wider community. Generating creative and innovative ideas involves thinking differently; it entails proposing new approaches to existing problems and identifying new design opportunities considering preferred futures. Generating and developing ideas involves identifying various competing factors that may influence and dictate the focus of the idea. Students will evaluate, justify and synthesise what they learn and discover. They will use graphical representation techniques when they draw, sketch, model and create innovative ideas that focus on high-quality designed solutions.

Producing and implementing

Students learn and apply a variety of skills and techniques to make products, services or environments designed to meet specific purposes and user needs. They apply knowledge about components, materials and their characteristics and properties to ensure their suitability for use. They learn about the importance of adopting safe work practices. They develop accurate production skills to achieve quality designed solutions. Students develop the capacity to select and use appropriate materials, systems, components, tools and equipment; and use work practices that respect the need for sustainability. The use of modelling and prototyping to accurately develop simple and complex physical models supports the production of successful designed solutions.

Evaluating

Students evaluate and make judgements throughout a design process and about the quality and effectiveness of their designed solutions and those of others. They identify criteria for success. In the early years, the teacher may guide the development of these criteria. Progressively, students develop criteria which become increasingly more comprehensive. Students consider the implications and consequences of actions and decision making. They determine effective ways to test and evaluate designed solutions. They reflect on processes and transfer their learning to other design opportunities.

Collaborating and managing

Students learn to work collaboratively and to manage time and other resources to effectively create designed solutions. Progressively, students develop the ability to communicate and share ideas throughout the process, negotiate roles and responsibilities and make compromises to work effectively as a team. Students work individually and in groups to plan, organise and monitor timelines, activities and the use of resources. Students progress from planning steps in a project through to more complex project management activities that consider various factors such as time, cost, risk and quality control.

Design and Technologies Knowledge and Understanding

Recognise the role of people in design and technologies occupations and explore factors, including sustainability that impact on the design of products, services and environments to meet community needs.

Investigate how forces and the properties of materials affect the behaviour of a product or system.

Investigate food and fibre production and food technologies used in modern and traditional societies.

Investigate the suitability of materials, systems, components, tools and equipment for a range of purposes.

Investigate how forces and the properties of materials affect the behaviour of a product or system. products, services and environments to meet community needs.