Food and wellbeing: Design and Technologies

Design and Technologies

In Design and Technologies, students learn how to apply knowledge of the characteristics of food, along with nutrition principles (as described in HPE) to food selection and preparation through the design and preparation of food for specific purposes and consumers. They will also develop understandings of contemporary technology-related food issues such as 'convenience' foods, highly processed foods, food packaging and food transport. The knowledge and understanding strand and processes and production strand are integrated to enhance learning.

The technologies contexts content descriptions provide a framework within which students can gain knowledge and understanding about technologies and design. 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 in Design and Technologies related to food and wellbeing are:

F–6: Food and fibre production and food specialisations

7–10: Food specialisations, and materials and technologies specialisations.

They provide a progression of learning from Foundation to Year 8 and optionally to Year 9–10 or lead to more specialised Technologies subjects in Years 9 and 10. They also reflect national priorities including workforce needs, food security and sustainable food and fibre production and health and wellbeing priorities.

When learning about food specialisations, students will progressively develop knowledge and understanding about: the characteristics and properties of food to and apply these to food selection and preparation; and contemporary technology-related food issues through creating designed solutions.

Food and wellbeing dimensions

Design and Technologies - Years 9 and 10

Years 9 and 10
Design and technologies knowledge and understanding
Content descriptions with elaborations
Critically analyse factors, including social, ethical and sustainability considerations, that impact on designed solutions for global preferred futures and the complex design and production processes involved (ACTDEK040)

- evaluating design and technology professions and their contributions to society locally, nationally, regionally and globally, for example Aboriginal designers collaborating with international craftspeople for local enterprises
- recognising the impact of past designed solutions and possible future decisions when creating preferred futures (for example, the design of public transport systems that use renewable energy and the design of rural communities to reduce fire risk)
- considering the factors that influence design and professional designers and technologists, including time, access to skills, knowledge, finance, expertise, for example Australian designers working with rapid prototyping manufacturers in China
- explaining how product life cycle thinking can influence decision-making related to design and

technologies, for example rethinking products to provide for re-use, selecting a material for a product that has a lower carbon footprint
- critiquing mass production systems taking into account ethics and sustainability considerations, for example the mass production of food, clothing and shoes and why manufacturers produce different versions of the same product

Explain how products, services and environments evolve with consideration of preferred futures and the impact of emerging technologies on design decisions (ACTDEK041)
- considering how creativity, innovation and enterprise contribute to how products, services and environments evolve for example how designers use biomimicry, the ways plants and animals adaptations can be copied to solve human challenges such as the Japanese building Sendai Mediatheque based on seaweed-like tubes
- explaining the consequences of social, ethical and sustainability decisions for products, services and environments, for example a managed public environment such as a theme park
- predicting the impact of emerging technologies for preferred futures
- constructing scenarios of how the future may unfold (forecasting) and what impacts there may be for society and particular groups, and back casting from preferred futures

Investigate and make judgements on how the principles of food safety, preservation, preparation, presentation and sensory perceptions influence the creation of food solutions for healthy eating (ACTDEK045)
- experimenting with food preservation methods such as freezing and dehydrating to determine changes to food structure and how these impact on designing healthy food solutions, for example dehydrating fruit for the lunch box
- conducting sensory assessment testing of a range of foods to determine how these characteristics might be used to enhance food solutions, for example taste testing a variety of milks, comparing freshly squeezed juice to commercial juices
- determining how the causes of food spoilage can be addressed when preparing, cooking, presenting and storing food items (for example, developing a comprehensive checklist of considerations for safe and hygienic food storage and preparation including danger zone temperatures for a food service)
- preparing and presenting foods using a range of techniques to ensure optimum nutrient content, flavour, texture and visual appeal (for example, designing and producing a healthy snack for the canteen and using food photography and digital technologies to promote the item in a healthy eating campaign)

Investigate and make judgements on how the characteristics and properties of materials, systems, components, tools and equipment can be combined to create designed solutions (ACTDEK046)
- critiquing the design of an existing product to identify environmental consequences of material selection
- justifying decisions when selecting from a broad range of technologies - materials, systems, components, tools and equipment, for example selecting low-emission paints and locally sourced materials
- investigating emerging materials and their impact on design decisions

Investigate and make judgements, within a range of technologies specialisations, on how technologies can be combined to create designed solutions (ACTDEK047)
- critiquing product manufacturing processes in relation to society, ethics, and sustainability factors, for example a mechanised entertainment system; an interactive multimedia product to teach a concept to a student in a country in Asia
- critiquing the social nature of services, for example a signage system to manage students and community members during a school function (signs may include words, pictures and/or braille);

       organisational system for an aged-care facility

- critiquing environments in relation to preferred futures in relation to society, ethics and sustainability practices, for example the refurbishment of a local playground; the re-design of a local wetland

Design and technologies processes and production skills

Critique needs or opportunities to develop design briefs and investigate and select an increasingly sophisticated range of materials, systems, components, tools and equipment to develop design ideas (ACTDEP048)

- critiquing the design of new products to identify how well design ideas respond to sustainability issues
- critiquing a range of design and technologies ideas (for example, assessing those that draw on the intellectual property of others, exploring how well the ideas respond to international and Australian standards)
- examining relationships of properties for complementary materials for products, for example examining compressive and tensile strengths of materials
- identifying appropriate tools, equipment, techniques and safety procedures for each process and evaluating production processes for accuracy, quality, safety and efficiency

Develop, modify and communicate design ideas by applying design thinking, creativity, innovation and enterprise skills of increasing sophistication (ACTDEP049)

- using techniques including combining and modifying ideas and exploring functionality to generate solution concepts
- undertaking functional, structural and aesthetic analyses of benefits and constraints of design ideas, for example to different communities and environments including those from the countries of Asia
- re-imagining designs to feature emerging technologies
- considering competing variables that may hinder or enhance project development, for example weight, strength and price; laws; social protocols and community consultation processes
- producing drawings, models and prototypes to explore design ideas, for example using technical drawing techniques, digital imaging programs, 3D printers or augmented reality modelling software; producing multiple prototypes that show an understanding of key aesthetic considerations in competing designs
- communicating using appropriate technical terms and recording the generation and development of design ideas for an intended audience including justification of decisions, for example developing a digital portfolio with images and text which clearly communicates each step of a design process

Work flexibly to effectively and safely test, select, justify and use appropriate technologies and processes to make designed solutions (ACTDEP050)

- refining technical skills and using production skills with independence to produce quality designed solutions and to reduce risks in production
- using materials, components, tools, equipment and techniques safely and considering alternatives to maximise sustainability, for example using timber because it stores carbon and offsets the demand for alternative products
- experimenting with innovative combinations and ways of manipulating traditional and contemporary materials, components, tools, equipment and techniques, and recording findings in a collaborative space to debate the merits of each with peers
- explaining safe working practices required for a specific classroom design project for individual or community use
- modifying production processes to respond to unforeseen challenges or opportunities, for example when producing bulk quantities of recipes, lower than average rainfall and impacts on

growth, materials with unexpected faults

Evaluate design ideas, processes and solutions against comprehensive criteria for success recognising the need for sustainability (ACTDEP051)

- establishing specific criteria for success for evaluating designed solutions
- evaluating and justifying the use and best combination of traditional, contemporary and emerging technologies during project development, including consideration of sustainability, for example farming methods in South-East Asia
- evaluating choices made at various stages of a design process and modifying plans when needed with consideration of criteria for success
- evaluating projects for their long-term application, functionality and impact
- reflecting on learning, evaluating processes and transferring new knowledge and skills to future design projects

Develop project plans using digital technologies to plan and manage projects individually and collaboratively, taking into consideration time, cost, risk and production processes (ACTDEP052)

- producing, explaining and interpreting drawings; and planning production timelines using digital technologies
- creating production flow charts using digital technologies to ensure efficient, safe and sustainable sequences
- establishing materials and equipment needs using digital technologies such as spreadsheets
- collaborating to develop production plans for equitable distribution of work
- investigating manufacturing processes to identify strategies to enhance production