

Technologies – Design and Technologies

Reception to year 10

Version 1.0



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Terminology

The South Australian Department for Education uses the term ‘Aboriginal’ to refer to people who identify as Aboriginal, Torres Strait Islander, or both Aboriginal and Torres Strait Islander. This term is preferred by Aboriginal South Australians and the department.

SA Curriculum Framework: Essential Learning summary – Design and Technologies

Why Technologies

Technologies learning cultivates curiosity, creativity and resilience by equipping us to think, make and innovate. Through applying design, systems and computational thinking, we learn how people, technologies and environments shape one another. In Technologies we solve problems with empathy and imagination, acting ethically and collaboratively to create sustainable, preferred futures.

Dispositions

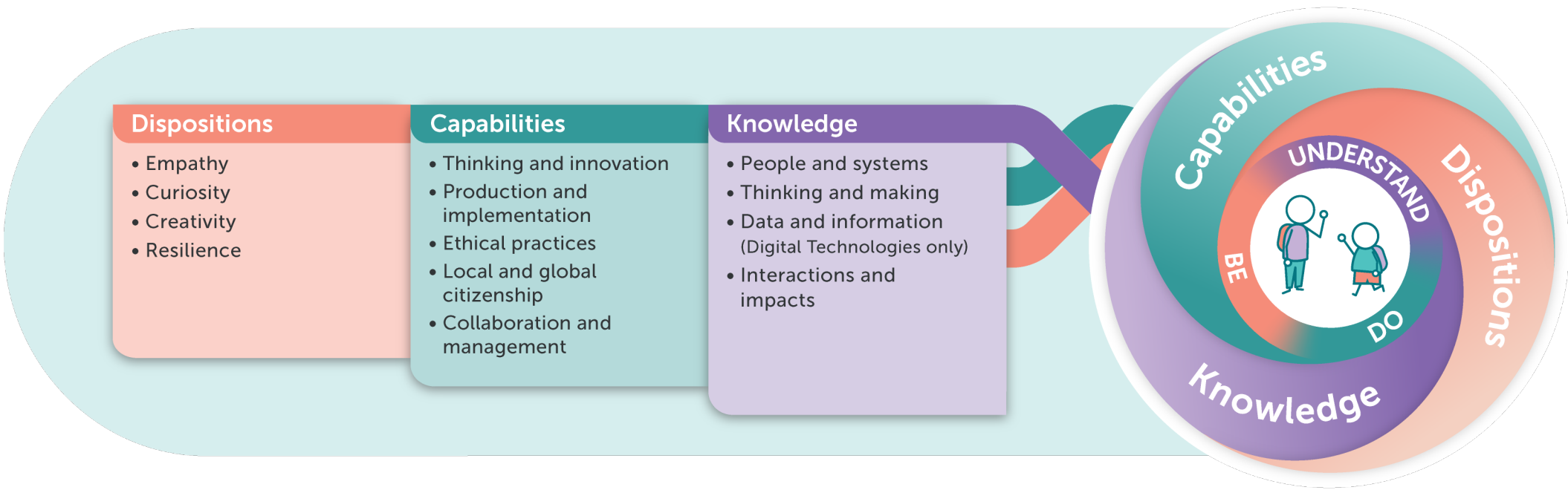
Empathy	Curiosity	Creativity	Resilience
What it is: Relating to and seeking to understand the feelings, experiences and perspectives of others. Why it matters: Being empathetic supports inclusive design and genuine collaboration. Understanding others’ needs and perspectives helps us create solutions that are responsive, sustainable and ethical.	What it is: Being eager to explore, ask questions and understand the things you wonder about. Why it matters: Being curious fosters a fearless desire to find answers and to break things apart to see what makes them work. Experimenting with ideas and technologies is an essential part of seeking to understand the worlds in which we interact and connect.	What it is: Imagining and exploring ideas, experimenting with new possibilities, playing with alternatives and developing original expressions or solutions. Why it matters: Being creative is essential to becoming innovators, dreaming up possibilities and identifying workable solutions.	What it is: Persevering and adapting in the face of challenges. Why it matters: Being resilient matters because productive failure is part of the problem-solving process and enables prototyping, reiteration and evaluation so that all attempts, even mistakes, lead to an improved outcome.

Capabilities

Thinking and innovation	Production and implementation	Ethical practices	Local and global citizenship	Collaboration and management
What it is: Thinking flexibly and creatively through design, systems and computational thinking to explore possibilities, frame problems and test solution ideas. Why it matters: Being innovative helps learners turn curiosity into purposeful ideas that improve how people live and work. It builds confidence to question, experiment, and refine thinking through iteration.	What it is: Transforming ideas into tangible solutions by planning, creating and refining with precision, using tools, resources and digital systems. Why it matters: Being capable of producing and implementing solutions empowers learners to move from imagination to impact. It develops technical skills, safe work practices, resourcefulness and the confidence to bring ideas to life.	What it is: Examining our biases and recognising how decisions affect others; acting with care, fairness and responsibility. Why it matters: Ethical practices foster trust and ensure technologies contribute positively to people and environments. They build awareness of how design decisions influence wellbeing, safety and sustainability.	What it is: Embracing our role in interconnected local and global communities. Engaging with diverse communities to understand how technologies shape – and are shaped by – cultures, values and environments. Why it matters: Intercultural responsiveness helps learners design solutions that are inclusive, respectful and sustainable. Understanding different perspectives strengthens collaboration and shared responsibility.	What it is: Working with others to plan, organise and deliver projects by managing time, roles and resources effectively. Why it matters: Collaboration builds communication, empathy and accountability. Managing projects together enables learners to lead, adapt and achieve shared goals with confidence.

Knowledge

People and systems	Thinking and making	Interactions and impacts
What it is: Interconnected people, components and processes that work together within designed and natural systems to achieve a shared purpose or function. Why it matters: People can create, use, maintain and influence how systems operate and evolve. When we understand how people and systems interconnect, we can anticipate change and design more sustainable solutions.	What it is: Computational, design and systems thinking strategies support the generation of dynamic and inclusive solutions in response to needs or opportunities. Why it matters: When we see ourselves as skilled and organised problem solvers, we can approach any problem with optimism and confidence to enact solutions.	What it is: The intended and unintended consequences of designed solutions. Why it matters: Understanding the impacts of technologies supports us to see ourselves as having agency to influence preferred futures by persistently improving the ways people interact with each other and the planet.



The dispositions, capabilities and knowledge embedded in the SA Curriculum: Technologies

Design and Technologies – Reception

Essential Learning

Dispositions

Empathy	Curiosity	Creativity	Resilience
This disposition may be evident when learners, for example: • listen for and notice people's needs when developing design ideas • seek to understand different user perspectives to inform responsive design solutions • ask clarifying questions to deepen their understanding of user needs before developing design criteria.	This disposition may be evident when learners, for example: • notice and question who made things, why they were made and how they help us when engaging in a design challenge • inquire why specific features of a design were chosen and wonder how the design might be improved • wonder why a feature of their design did not work as expected and explore what might happen if it were changed.	This disposition may be evident when learners, for example: • draw inspiration from a variety of sources to generate possibilities for a workable design solution • play with possibilities in their design • explore different workarounds to generate possible ways forward when designing within constraints or encountering problems.	This disposition may be evident when learners, for example: • troubleshoot a design idea when it does not work as expected, using what they learn to modify the design • respond to difficulty in a design challenge by trying a different way forward • use mistakes made while turning an idea into a solution to work out what to change next.

Capabilities

Thinking and innovation	Production and implementation	Ethical practices	Local and global citizenship	Collaboration and management
Learners develop this capability by, for example: • identifying the problems solved by existing designed solutions (products, services or environments) • identifying a real purpose for designing a solution within their current contexts • investigating systems of production for growing food or fibres • planning and describing their thinking using labelled drawings.	Learners develop this capability by, for example: • experimenting with push or pull forces and using observations in their designs • brainstorming and communicating design ideas and selecting the most suitable for their designed solution • practising skills and procedural steps needed to safely build designed solutions • evaluating and improving on their designed solutions based on criteria.	Learners develop this capability by, for example: • talking about the consequences of design decisions • identifying how to reduce and reuse waste to make sustainable design decisions • investigating how to care for plants and animals and provide them with what they need.	Learners develop this capability by, for example: • exploring solutions from diverse contexts including how Aboriginal people have long designed and produced domestic items related to clothing, tools and shelter • identifying common products, services or environments and comparing similarities and differences over time • discovering diverse food practices for nutrition, celebration or wellbeing.	Learners develop this capability by, for example: • co-creating or responding to simple design briefs • cooperating in groups by taking turns and sharing resources • identifying and using safe and correct ways to use tools and equipment.

Knowledge

People and systems	Thinking and making
Conceptual understandings and supporting content descriptions	
Products, services and environments are designed by people to solve problems. Learners: • explore how familiar products, services and environments are designed by people. AC9TDEFK01	Using a design thinking process helps us imagine and create solutions. Learners: • generate, communicate and evaluate design ideas, and use materials, equipment and steps to safely make a solution for a purpose. AC9TDEFP01

Design and Technologies – Years 1 to 2

Essential Learning

Dispositions

Empathy	Curiosity	Creativity	Resilience
This disposition may be evident when learners, for example: • listen for and notice people's needs when developing design ideas • seek to understand different user perspectives to inform responsive design solutions • ask clarifying questions to deepen their understanding of end user needs before developing design criteria.	This disposition may be evident when learners, for example: • notice and question who made things, why they were made and how they help us when engaging in a design challenge • inquire why specific features of a design were chosen and wonder how the design might be improved • wonder why a feature of their design did not work as expected and explore what might happen if it were changed.	This disposition may be evident when learners, for example: • draw inspiration from a variety of sources to generate possibilities for a workable design solution • play with possibilities in their design • explore different workarounds to generate possible ways forward when designing within constraints or encountering problems.	This disposition may be evident when learners, for example: • troubleshoot a design idea when it does not work as expected, using what they learn to modify the design • respond to difficulty in a design challenge by trying a different way forward • use mistakes made while turning an idea into a solution to work out what to change next.

Capabilities

Thinking and innovation	Production and implementation	Ethical practices	Local and global citizenship	Collaboration and management
Learners develop this capability by, for example: • investigating and identifying the problems that are addressed by common products, services and environments • exploring natural and managed environments to investigate how plants and animals are grown and cared for • describing how to support a natural environment	Learners develop this capability by, for example: • experimenting with different materials to design a product, service or environment that uses push and pull forces • exploring the systems required to get food from paddock to plate or to produce materials required for designed solutions • using different joining systems and making informed choices about which ones to use	Learners develop this capability by, for example: • exploring how Aboriginal people have long understood their dependence on living systems to meet their local and community needs while exploring the material culture of the Ngarrindjeri Peoples, who sustainably make woven items from a grass-like sedge • exploring the impact of designs including the waste created or minimised	Learners develop this capability by, for example: • appreciating Aboriginal people's sustainable use of materials for instructive toys – including propellor toys made from pandanus – and how they are designed and made to produce movement • exploring how Aboriginal people have long histories of sustainably harvesting plants and animals for food and building materials	Learners develop this capability by, for example: • framing feedback in ways that support the designer to appreciate what they have done well and providing clear steps for improvement • co-planning and following a sequence of agreed steps to safely create a designed solution • using safe techniques for handling tools, equipment or food • evaluating solutions based on success criteria

Thinking and innovation	Production and implementation	Ethical practices	Local and global citizenship	Collaboration and management
communicating design ideas using labelled drawings, diagrams or models.	- improving based on feedback and comparing to a simple design brief or set of criteria - following agreed production steps and protocols for the safe use of tools and equipment.	- selecting recyclable materials or digital tools to prototype design ideas - considering food choices and how these impact people or environments.	- identifying food practices that are connected to nutrition, identity and wellbeing - identifying the contribution to designed solutions by members of their immediate community - comparing products, services and environments in local and global communities.	- participating in teams to manage resources, time and roles fairly - co-developing a simple design brief that lists the criteria for success based on personal or collective preferences.

Knowledge

People and systems	Thinking and making	Interactions and impacts
Conceptual understandings and supporting content descriptions		
Materials or technologies can affect movement in designed solutions and can be selected for their suitability for solving a problem. Learners: - explore how technologies including materials affect movement in products. AC9TDE2K02 People can develop sustainable systems for growing plants and animals that supply the resources needed to develop designed solutions. Learners: - explore how plants and animals are grown for food, clothing and shelter. AC9TDE2K03 The ways in which food is selected, prepared and stored is connected to people's health and nutrition. Learners: - explore how food can be selected and prepared for healthy eating. AC9TDE2K04	Designers use a process of design thinking to generate and evaluate ideas, plan processes, and communicate using technical terms, drawings or models. Learners: - generate and communicate design ideas through describing, drawing or modelling, including using digital tools AC9TDE2P01 - sequence steps for making designed solutions cooperatively. AC9TDE2P04 Designers safely and skilfully use appropriate processes, tools and materials to create and collaborate on their designed solutions. Learners: - use materials, components, tools, equipment and techniques to safely make designed solutions. AC9TDE2P02	Designers create and evaluate products, services and environments (designed solutions) to meet the changing needs of people and environments. Learners: - identify how familiar products, services and environments are designed and produced by people to meet personal or local community needs and sustainability AC9TDE2K01 - evaluate the success of design ideas and solutions based on personal preferences and including sustainability. AC9TDE2P03

Design and Technologies – Years 3 to 4

Essential Learning

Dispositions

Empathy	Curiosity	Creativity	Resilience
This disposition may be evident when learners, for example: - explore what a preferred future might mean for a user and use this understanding to inform design ideas - adapt their thinking after considering diverse user needs and community perspectives - consider how diverse groups may experience the impacts of design choices and use this understanding when advocating for ethical and respectful design practices.	This disposition may be evident when learners, for example: - notice differences between old and new production techniques to discover why methods of production have changed - ask questions about why someone created a solution to understand the problem they were trying to address - experiment with unfamiliar tools and techniques to discover what they can do when creating designed solutions.	This disposition may be evident when learners, for example: - explore and build on others' ideas and techniques to generate possibilities when designing and producing - experiment with different ways of representing a design idea to generate new possibilities for how it might develop - generate a range of imaginative solutions within the agreed design criteria.	This disposition may be evident when learners, for example: - adapt their approach or seek new knowledge when their response to a design challenge is not working - continue prototyping and testing when feedback identifies problems or limitations, adjusting the design across further cycles - adapt a plan, material choice or system in response to a setback to improve performance and outcomes.

Capabilities

Thinking and innovation	Production and implementation	Ethical practices	Local and global citizenship	Collaboration and management
Learners develop this capability by, for example: - exploring how different services like websites, cafes or charitable organisations can support communities - exploring how physical or virtual environments, including playgrounds, gardens or farms, impact people and sustainability	Learners develop this capability by, for example: - exploring the various environments in which food grows best to select and grow food items - exploring how to safely prepare food for healthy eating - creating movement in a designed solution by using forces, simple machines or components - using joining processes and strength testing	Learners develop this capability by, for example: - exploring sustainable practices used by Aboriginal people and how these can ensure access to meet community needs - investigating how to care for plants and animals - safely using tools and processes to prevent harm - using resources, materials and technologies responsibly to minimise waste and share them equitably	Learners develop this capability by, for example: - researching food and fibre production techniques and technologies developed by Aboriginal people - exploring how diverse cultures consider the nutrient content of seasonal foods - investigating design practices from diverse cultures, and the opportunities for this to inform the design	Learners develop this capability by, for example: - co-developing design briefs by identifying and recording success criteria while working with others to manage time and resources - co-planning and following production steps and establishing group behaviours - co-creating and following safety guidelines for food preparation, tools or materials

Thinking and innovation	Production and implementation	Ethical practices	Local and global citizenship	Collaboration and management
- exploring and experimenting with common components or materials including magnets, springs or rubber bands and to examine how they create push and pull forces in a product or environment - communicating design ideas to an audience using technical terms and graphics - defining problems or opportunities by listening to or creating user stories.	explaining their use of the design thinking approach by using technical terms and annotated models or diagrams.	providing attribution when using other peoples' creative works as inspiration.	exploring the connection between food production, nutrition, identity and wellbeing.	- providing timely and appropriate feedback to designers to assist with improving and iteration of design solutions - considering time, resources and communication with others to support the achievement of shared tasks.

Knowledge

People and systems	Thinking and making	Interactions and impacts
Conceptual understandings and supporting content descriptions		
Engineered solutions are purposefully designed by recognising how forces interact with the properties of materials to determine function. Learners: - describe how forces and the properties of materials affect function in a product or system. AC9TDE4K02 Land, plants, animals and people are interdependent and can be managed sustainably to produce the resources needed for living. Learners: - describe the ways of producing food and fibre. AC9TDE4K03 People have diverse experiences with preparing, storing and consuming food which can influence their health and nutrition. Learners: - describe the ways food can be selected and prepared for healthy eating. AC9TDE4K04	Designers use an iterative design thinking process to explore needs and opportunities, investigate materials and systems, and make informed decisions that shape possible solutions. Learners: - explore needs or opportunities for designing, and test materials, components, tools, equipment and processes needed to create designed solutions. AC9TDE4P01 Designers bring ideas to life by safely and skilfully selecting and using materials, tools and techniques while communicating their decisions with appropriate attributions and technical language. Learners: - generate and communicate design ideas and decisions using appropriate attributions, technical terms and graphical representation techniques, including using digital tools AC9TDE4P02 - select and use materials, components, tools, equipment and techniques to safely make designed solutions. AC9TDE4P03	Designers use systems and technologies to create or improve products, services or environments (designed solutions) to meet the changing needs of people and environments. Learners: - examine design and technologies occupations and factors including sustainability that impact on the design of products, services and environments to meet community needs. AC9TDE4K01 Design ideas and solutions can be continuously evaluated to improve both the production steps and the sustainability of the solution. Learners: - use given or co-developed design criteria including sustainability to evaluate design ideas and solutions. AC9TDE4P04 Effective collaboration and management involve skilful communication, and organisation of people, tools and resources. Learners: - sequence steps to individually and collaboratively make designed solutions. AC9TDE4P05

Design and Technologies – Years 5 to 6

Essential Learning

Dispositions

Empathy	Curiosity	Creativity	Resilience
This disposition may be evident when learners, for example: • explore user perspectives through questioning and use this understanding to adjust a design brief • consider how people may experience a design and use this understanding to develop more inclusive solutions • consider diverse cultural perspectives when designing solutions that use or have impact on the environment.	This disposition may be evident when learners, for example: • question how the features, components and materials of designs contribute to making them last • explore the limits of a prototype to discover how design choices affect function and user experience • explore what influences design ideas to change during the design process to understand why designs evolve.	This disposition may be evident when learners, for example: • imagine different possibilities for how products, services or environments might be used in the future • reimagine aspects of a design in response to changing resources, tools or timelines to generate new possibilities • explore alternative materials to generate possibilities for an innovative design solution.	This disposition may be evident when learners, for example: • continue working through a complex design task when testing or refinement reveals unexpected problems • experiment with different strategies, ideas or materials when a design attempt fails to achieve its intended purpose • rework a design approach when user feedback, resource limitations or environmental constraints create barriers to achieving the intended outcome.

Capabilities

Thinking and innovation	Production and implementation	Ethical practices	Local and global citizenship	Collaboration and management
Learners develop this capability by, for example: • using an iterative design cycle that involves defining user needs, ideating the problem, prototyping, and testing to validate ideas • investigating and critiquing the ways in which food and fibre products are grown and harvested evaluating the ways in which product, service and environmental solutions source and use electricity	Learners develop this capability by, for example: • growing and harvesting food or fibres in available environments and using them in a designed solution • exploring safe food storage and preservation for long -term use • creating circuits to create movement, sound or light in a designed solution	Learners develop this capability by, for example: • exploring how, prior to colonisation, Aboriginal people live in discrete communities that cared for, protected and sustainably harvested food and fibre resources, including bunya nuts, macadamia and finger lime, which are now cultivated to meet domestic and international demand	Learners develop this capability by, for example: • investigating how Aboriginal people have long used material science knowledge to identify materials and preparation techniques to meet performance needs, including twining techniques of string and rope fibres to ensure suitability for use in wet, dry, freshwater and saltwater applications	Learners develop this capability by, for example: • co-creating user stories to develop design briefs and success criteria • contributing to collaborative projects through joint and individual responsibilities to safely complete a designed solution within constraints • facilitating a respectful feedback process to evaluate solutions against agreed criteria

Thinking and innovation	Production and implementation	Ethical practices	Local and global citizenship	Collaboration and management
- identifying the origins and properties of food, materials and technologies and the processes needed to use them safely and sustainably - explaining their thinking using detailed plans, sketches or models and annotating them using technical terms.	- using tools safely to ensure precision cutting, shaping and implementing effective joining techniques - testing the limitations of materials and technologies under variable conditions.	- investigating how to avoid food waste and ways to contribute to food security and sustainable growing practices - including sustainability considerations and constraints in success criteria or design briefs - using sustainable resources or sustainable sources of energy to create solutions - analysing data collection inclusively to identify needs or opportunities.	- investigating how Aboriginal people have long selected and prepared foods for healthy eating based on their nutritional value, availability, spoilage, preparation and processing requirements - researching the ways people with diverse cultural perspectives find solutions to meet the changing needs of local and global communities - exploring how Australian innovations are used all over the world - identifying the ways in which growing and consuming food are connected to nutrition, identity and wellbeing.	managing time, resources and communication effectively to support the achievement of shared goals.

Knowledge

People and systems	Thinking and making	Interactions and impacts
Conceptual understandings and supporting content descriptions		
Electrical energy can be transformed into movement, sound or light to create a product, service or environment that solves a problem or meets a specific need. Learners: - explain how electrical energy can be transformed into movement, sound or light in a product or system. AC9TDE6K02 The ways materials and technologies behave under certain conditions influence design decisions when creating solutions. Learners: - explain how characteristics and properties of materials, systems, components, tools and equipment affect their use when producing designed solutions. AC9TDE6K05 The ways in which food and fibre are produced in natural and managed environments is important for food security, resource management and sustainability. Learners: - explain how and why food and fibre are produced in managed environments. AC9TDE6K03 People have diverse experiences with food and these practices are connected to culture, identities, health and nutrition. Learners: - explain how the characteristics of foods influence selection and preparation for healthy eating. AC9TDE6K04	Designers use a process of design thinking to investigate and define needs or opportunities and consider production requirements to achieve responsive solutions. Learners: - investigate needs or opportunities for designing, and the materials, components, tools, equipment and processes needed to create designed solutions. AC9TDE6P01 Design ideas and solutions are effectively communicated using technical terms and graphical representation. Learners: - generate, iterate and communicate design ideas, decisions and processes using technical terms and graphical representation techniques, including using digital tools. AC9TDE6P02 Choosing and using suitable tools, technologies and processes safely enable the creation of enduring and functional designed solutions. Learners: - select and use suitable materials, components, tools, equipment and techniques to safely make designed solutions. AC9TDE6P03	People in design and technologies occupations (paid and unpaid) consider competing factors including sustainability when creating or improving designed solutions. Learners: - explain how people in design and technologies occupations consider competing factors including sustainability in the design of products, services and environments. AC9TDE6K01 Using design briefs helps designers to communicate and evaluate ideas, production steps and solutions against agreed criteria and sustainability. Learners: - negotiate design criteria including sustainability to evaluate design ideas, processes and solutions. AC9TDE6P04 Project management requires designers to take individual and joint responsibility for completing a design process within the constraints of available resources, people and time. Learners: - develop project plans that include consideration of resources to individually and collaboratively make designed solutions. AC9TDE6P05

Design and Technologies – Years 7 to 8

Essential Learning

Dispositions

Empathy	Curiosity	Creativity	Resilience
This disposition may be evident when learners, for example: - listen for unresolved needs when collaborating in a design team and respond with ideas that support preferred futures - seek to understand the strengths and preferences of team members and use this understanding when negotiating roles in a collaborative design project - represent the perspective of the user alongside their own design reasoning when evaluating design ideas or products.	This disposition may be evident when learners, for example: - pursue questions about assumptions within a design brief to uncover possibilities or constraints that were not immediately apparent - speculate on the potential of emerging materials and technologies to understand the possible consequences and opportunities for application - explore how a system functions to discover how its operation affects the safety or functionality of a design.	This disposition may be evident when learners, for example: - experiment with materials, components or modelling tools to explore alternative design possibilities - play with different ways of integrating systems or materials to generate possibilities that promote sustainability - iterate a prototype by exploring alternative approaches to solving design problems.	This disposition may be evident when learners, for example: - adjust their plans for testing and refining a design in response to unexpected results or difficulties - continue refining a design across repeated cycles of prototyping and testing when user feedback reveals ongoing problems or limitations - continue working towards a design solution after an unsuccessful attempt by trying alternative approaches.

Capabilities

Thinking and innovation	Production and implementation	Ethical practices	Local and global citizenship	Collaboration and management
Learners develop this capability by, for example: - applying design and systems thinking to analyse needs, define problems and generate creative, purposeful solutions - investigating how materials, components and systems interact, and evaluating their suitability for design goals, safety, function and sustainability	Learners develop this capability by, for example: - selecting and using tools, materials and equipment safely and responsibly, applying appropriate techniques for cutting, shaping, joining or preparing components - testing the properties and limitations of materials, components and ingredients under different conditions to determine suitability for purpose, safety and sustainability	Learners develop this capability by, for example: - incorporating Aboriginal sustainable knowledge respectfully in design contexts, acknowledging practices that care for Country and living systems - applying inclusive design practices that consider diverse users, accessibility, cultural respect and equitable participation	Learners develop this capability by, for example: - exploring how Aboriginal knowledge informs innovative and sustainable design solutions that respond to place and community - researching and valuing cultural perspectives to inform design ideas, material choices and production processes while recognising how different communities resolve similar problems	Learners develop this capability by, for example: - co-creating user stories and design briefs that define clear roles, timelines and shared success criteria for collaborative projects - using digital and non-digital tools to plan, monitor and communicate shared responsibilities safely and inclusively

Thinking and innovation	Production and implementation	Ethical practices	Local and global citizenship	Collaboration and management
- balancing imaginative and logical thinking when planning, prototyping and refining design solutions - testing and iterating designs to improve their effectiveness, efficiency and user experience, using feedback from users and peers - evaluating the broader social, ethical and environmental impacts of design decisions, including how innovations can support preferred futures.	- applying iterative production processes – measuring, marking, cutting, assembling and refining – to improve function, durability and user experience - seeking and interpreting feedback from users or peers, refining products, services or environments to better meet criteria, constraints and user needs - interpreting and creating drawings or digital models to scale using accurate measurement, unit consistency and checking methods to ensure reliable outcomes.	- recognising how design decisions influence social, environmental and economic outcomes, and embedding these considerations into criteria and design briefs - evaluating materials, processes and technologies for their impacts - reducing waste and designing for longevity, repair and responsible innovation.	- creating inclusive and accessible design solutions that respond to cultural backgrounds, user diversity and community needs - collaborating respectfully in design teams, exchanging ideas and perspectives to deepen cross-cultural understanding and shared learning - reflecting on how intercultural awareness enhances creativity, empathy and the quality of designed solutions.	- facilitating constructive feedback cycles that focus on the design process, criteria and evidence of improvement - adapting plans, redistributing tasks or adjusting processes when encountering design or production challenges - reflecting on group dynamics and their personal contribution to strengthen future collaboration and shared problem solving.

Knowledge

People and systems	Thinking and making	Interactions and impacts
Conceptual understandings and supporting content descriptions		
Engineered systems use force, motion and energy through arranged materials and components to perform controlled functions, enabling people to design, analyse and refine solutions for reliability and effectiveness. Learners: - analyse how force, motion and energy are used to manipulate and control engineered systems. AC9TDE8K03 Materials, components and technologies have characteristics that influence how they can be shaped, joined and combined, guiding people to create solutions that balance function, aesthetics and sustainability. Learners: - analyse how characteristics and properties of materials, systems, components, tools and equipment can be combined to create designed solutions. AC9TDE8K06	Design thinking uses investigation, creativity and collaboration to define needs or opportunities and develop design criteria that guide purposeful and user-centred solutions. Learners: - analyse needs or opportunities for designing, and investigate and select materials, components, tools, equipment and processes to create designed solutions. AC9TDE8P01 Iterative modelling, testing and feedback refine design ideas, with choices justified through technical terms, graphical techniques and digital tools. Learners: - generate, test, iterate and communicate design ideas, processes and solutions using technical terms and graphical representation techniques, including using digital tools. AC9TDE8P02	Considering ethical, social and environmental impacts supports designed solutions that enable people to contribute positively to communities and environments. Learners: - analyse how people in design and technologies occupations consider ethical and sustainability factors to design and produce products, services and environments. AC9TDE8K01 Innovation and emerging technologies influence how products, services and environments evolve, shaping opportunities and challenges for preferred futures. Learners: - analyse the impact of innovation and the development of technologies on designed solutions for global preferred futures. AC9TDE8K02

People and systems	Thinking and making	Interactions and impacts
Food and fibre production systems rely on people managing natural and constructed environments so sustainability, resource use and production needs can be balanced for long-term community, environmental and economic viability. Learners: - analyse how food and fibre are produced in managed environments and how these can become sustainable. AC9TDE8K04 Food specialisation practices draw on the sensory, functional and nutritional properties of ingredients to guide how foods are selected, prepared and combined for healthy, sustainable and culturally responsive solutions. Learners: - analyse how properties of foods determine preparation and presentation techniques when designing solutions for healthy eating. AC9TDE8K05	Making processes involve selecting, justifying and safely using appropriate materials, components, tools and techniques in ways that meet identified design criteria, so solutions are functional and fit for purpose. Learners: - select, justify and use suitable materials, components, tools, equipment, skills and processes to safely make designed solutions. AC9TDE8P03 Planning supports efficient time, cost and resource management throughout design and production processes, improving the effectiveness of solutions. Learners: - develop project plans to individually and collaboratively manage time, cost and production of designed solutions. AC9TDE8P05	Evaluating design ideas and solutions effectively relies on collaboratively developed criteria to judge social, environmental and economic implications and identify opportunities for improvement. Learners: develop design criteria collaboratively including sustainability to evaluate design ideas, processes and solutions. AC9TDE8P04

Design and Technologies – Years 9 to 10

Essential Learning

Dispositions

Empathy	Curiosity	Creativity	Resilience
This disposition may be evident when learners, for example: • use an understanding of the wider community's needs to improve design ideas through inclusive design • consider the intent behind others' design ideas when providing specific and constructive feedback • seek to understand how the values and perspectives of peers, clients or stakeholders differ from their own and use this understanding to adjust ideas in the design process.	This disposition may be evident when learners, for example: • interrogate their design assumptions to uncover hidden opportunities, exploring unconventional pathways to solve a problem • experiment with the properties of materials, components and systems to discover hidden possibilities for design solutions • explore what happens when familiar products, services or environments are taken apart or changed to discover how they work or might work differently.	This disposition may be evident when learners, for example: • play with different production techniques, materials or simulations to explore possibilities for optimising a product • explore the way alternative modelling tools might be used to communicate new design possibilities • explore original or alternative design ideas to generate different possibilities for improving environments and creating sustainable futures.	This disposition may be evident when learners, for example: • manage their response to setbacks, adjusting project plans, materials or systems to improve performance and outcomes • develop a strategy for improving a product, system or environment in response to what did not work in their initial design • experiment with a different material, technology or technique after an initial design attempt does not meet its intended purpose.

Capabilities

Thinking and innovation	Production and implementation	Ethical practices	Local and global citizenship	Collaboration and management
Learners develop this capability by, for example: • analysing design problems strategically through context, user needs, goals and constraints through integrating systems, design and computational thinking • researching, evaluating and selecting design options by balancing feasibility, sustainability and user value while justifying trade-offs with evidence	Learners develop this capability by, for example: • selecting, operating and maintaining tools, materials and digital fabrication technologies safely, efficiently and with precision while following procedures appropriate to specialised contexts	Learners develop this capability by, for example: • respecting cultural and intellectual property by seeking permission, attributing knowledge appropriately, and honouring Aboriginal perspectives in design contexts • analysing complex design challenges using ethical frameworks to identify potential harms, benefits, trade-offs and unintended consequences for people and environments	Learners develop this capability by, for example: • valuing and learning from Aboriginal innovations to guide sustainable and ethical design practices through respectful consultation and collaboration • evaluating designed solutions ideas to identify and address cultural bias, representation issues and accessibility limitations	Learners develop this capability by, for example: • leading aspects of collaborative design projects, balancing creativity, resources, constraints and timelines • negotiating roles, responsibilities and ethical decisions to ensure inclusivity, accountability and effective teamwork

Thinking and innovation	Production and implementation	Ethical practices	Local and global citizenship	Collaboration and management
- generating, prototyping and refining creative ideas supported by data, testing and technical reasoning, moving between conceptual and physical models - investigating entrepreneurial, financial and technological strategies to assess feasibility and scale innovation sustainably - evaluating designed solutions for their long-term contribution to people, communities and environments, recognising intended and unintended impacts.	- analysing how materials, components and subsystems interact within a solution when selecting and justifying choices based on performance, sustainability, constraints and user requirements - implementing advanced and iterative production processes, coordinating multiple steps such as layout, prototyping, assembly, finishing or preparation to meet design intent and functional standards - testing prototypes through measurement verification, quality-control checks and user feedback, and refining solutions to improve performance, safety, usability and sustainability - interpreting and producing scaled technical documentation – including orthographic drawings, CAD models or cutting lists – using precise dimensions and conventions to ensure accuracy and fit during production.	- applying responsible design principles to develop solutions that are inclusive, sustainable and socially just while balancing competing needs and constraints - evaluating the long-term impacts of products, services and systems on wellbeing, equity, cultural continuity and ecological health - demonstrating leadership in ethical design practice by advocating for repair, reuse, regenerative innovation and reduced harm across the product lifecycle.	- advocating for cross-cultural collaboration and respectful knowledge exchange to inform globally relevant, ethical and sustainable design practices - analysing how cultural values, traditions and worldviews shape design choices, materials and technologies across diverse global contexts - designing solutions that prioritise inclusivity, equity and sustainability for global communities while accounting for diverse needs environments and constraints.	- using advanced digital tools for project management, communication, documentation and version control to coordinate complex design processes - responding to design or production challenges by analysing risks, troubleshooting and refining plans using systems thinking - evaluating the social, ethical and economic impacts of team outcomes, including sustainability and market viability, to guide future improvement.

Knowledge

People and systems	Thinking and making	Interactions and impacts
Conceptual understandings and supporting content descriptions		
Engineered systems rely on people analysing how materials, components, force, motion and energy interact so system functions can be controlled, optimised and adapted for efficiency, reliability and performance. Learners: analyse and make judgements on how the characteristics and properties of materials are combined with force, motion and energy to control engineered systems. AC9TDE10K03	Design and systems thinking integrate investigation, stakeholder input, problem definition and brief development to guide decisions about materials, components, systems, tools and equipment for complex design opportunities. Learners: analyse needs or opportunities for designing; develop design briefs; and investigate, analyse and select materials, systems, components, tools and equipment to create designed solutions. AC9TDE10P01	Design decisions draw on ethical, cultural, environmental and technological considerations, evaluated for their long-term impacts on people, communities, ecosystems and global futures. Learners: analyse the impact of innovation, enterprise and emerging technologies on designed solutions for global preferred futures. AC9TDE10K02

People and systems	Thinking and making	Interactions and impacts
People analyse and manipulate the properties of materials, components, tools, equipment and systems to create designed solutions that balance function, aesthetics, safety and sustainability. Learners: - analyse and make judgements on how characteristics and properties of materials, systems, components, tools and equipment can be combined to create designed solutions. AC9TDE10K06 Food and fibre enterprises depend on informed, ethical, secure and sustainable decisions when managing production and marketing systems to ensure quality, equity and long-term environmental viability. Learners: - analyse and make judgements on the ethical, secure and sustainable production and marketing of food and fibre enterprises. AC9TDE10K04 Food specialisation practices require people to judge the sensory, functional and nutritional properties of ingredients to design sustainable food solutions that support health, safety, cultural relevance and community needs. Learners: - analyse and make judgements on how the sensory and functional properties of food influence the design and preparation of sustainable food solutions for healthy eating. AC9TDE10K05	Innovation and enterprise skills enable creative risk-taking, experimentation and iterative refinement of ideas and processes, supported by digital tools that enhance modelling, communication and evaluation. Learners: - apply innovation and enterprise skills to generate, test, iterate and communicate design ideas, processes and solutions, including using digital tools. AC9TDE10P02 Making processes use technical expertise, justified selection of technologies, systematic testing and safe practices to realise and refine solutions that respond to the design brief and meet functional, aesthetic and performance requirements. Learners: - select, justify, test and use suitable technologies, skills and processes, and apply safety procedures to safely make designed solutions. AC9TDE10P03 Design criteria – including sustainability, ethics and performance – guide the generation, testing, iteration and refinement of design ideas, processes and solutions. Learners: - develop design criteria independently including sustainability to evaluate design ideas, processes and solutions. AC9TDE10P04 Project planning and management balance time, cost, risk and resources to coordinate ethical, sustainable and collaborative design and production processes, recognising how decisions influence people, environments and long-term impacts. Learners: - develop project plans for intended purposes and audiences to individually and collaboratively manage projects, taking into consideration time, cost, risk, processes and production of designed solutions. AC9TDE10P05	Evaluation of designed solutions considers user experience, enterprise potential, and social, ethical, environmental and economic implications to guide improvements that support responsible innovation and preferred futures. Learners: analyse how people in design and technologies occupations consider ethical, security and sustainability factors to innovate and improve products, services and environments. AC9TDE10K01