The Australian
Curriculum

Learning areas	Technologies
Subjects	Design and Technologies,Digital Technologies
Year levels	Year 5

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ASSESSMENT AND
REPORTING AUTHORITY

Years 5 and 6 Content Descriptions

Design and Technologies Knowledge and Understanding

Examine how people in design and technologies occupations address competing considerations, including sustainability in the design of products, services, and environments for current and future use (ACTDEK019 - Scootle ⧉)

Elaborations

reflecting on the features of designed solutions that ensure safety and wellbeing of users, for example smoke alarms
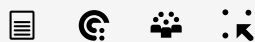
evaluating the sustainability implications of materials, systems, components, tools and equipment, for example materials can be recycled or re-used to reduce waste; systems may benefit some, but disadvantage others

considering the impact designed products, services or environments have in relation to sustainability and also on local, regional and global communities, including Aboriginal and Torres Strait Islander communities and countries in the Asia region

reflecting on the importance of aesthetics, function and sustainability in product design, for example a textile product that gives protection and is appealing; a motor that moves a vehicle and uses a sustainable power source
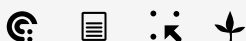
identifying the components of a service or system that contribute to its success and assessing potential risk or failure, for example, communication in the school or communication of a message to a wide audience; a system that manages an aspect of the environment; a campaign such as Clean Up Australia Day in different communities

identifying the impact of the designed features of an environment, for example a modification to a home to reduce environmental impact; restoring a natural environment and retaining access for the public
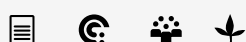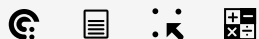
Investigate how electrical energy can control movement, sound or light in a designed product or system (ACTDEK020 - Scootle ↗)

Elaborations

deconstructing a product or system to discover how movement, sound or light can be controlled, for example deconstructing a torch or buzzer and exploring circuit design

investigating the properties of materials to solve problems requiring the control of movement, sound or light, for example the amount of light reflected from different surfaces to control a sensor

investigating the features of electrical devices such as switches, light globes and sensors
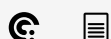
recognising the need to carefully plan and select components for a system to perform a specific task

producing models using materials, tools and equipment to show how to control movement, sound or light

investigating the technologies in a control system for an identified need or opportunity and user, for example a system that allows safe passage at pedestrian crossings

Investigate how and why food and fibre are produced in managed environments and prepared to enable people to grow and be healthy (ACTDEK021 - Scootle ↗)

Elaborations

investigating and experimenting with different tools, equipment and methods of preparing soil and the effect on soil quality and sustainability including conserving and recycling nutrients, for example when designing a sustainable school vegetable garden or cropping area

describing the relationship between plant types and animal breeds and their environmental suitability when selecting suitable plants or animals for an environment
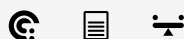
sequencing the process of converting 'on-farm' food or fibre products into a product suitable for retail sale, that is, the 'paddock to plate' supply chain, or when making yarn or fabric from fibre

using current food guides and government-endorsed food policies to plan food choices
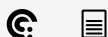
experimenting with tools, equipment, combining ingredients and techniques to design and make food products or meals for selected groups for healthy eating taking into consideration environmental impacts and nutritional benefits

considering traditional and contemporary methods of food preparation used in a variety of cultures, including Aboriginal and Torres Strait Islander methods
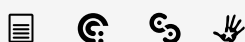
identifying work practices that show an understanding of nutrition, environmental considerations, hygiene and food safety when designing and making a food product, for example washing fruit and vegetables carefully to remove residues, safe disposal of cooking oils to avoid environmental damage, refrigerated storage of highly perishable foods
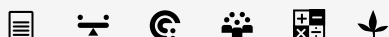
Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use (ACTDEK023 - Scootle ↗)

Elaborations

identifying the properties of materials for the design and construction of a sustainable household item, for example a product for storing harvested water

evaluating the functional properties of a specific-purpose household system, for example a security system

examining the materials and systems used in a public use system that affect the way people live, for example a community exercise environment or arts facility, water treatment, garbage collection

comparing tools, equipment and techniques to select those most appropriate for a given purpose
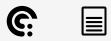
evaluating the use of computer-aided manufacturing in terms of cost and impacts on local and regional designers, producers and enterprises

comparing the design and production of products, services and environments in Australia and a country in the Asia region

Design and Technologies Processes and Production Skills

Critique needs or opportunities for designing, and investigate materials, components, tools, equipment and processes to achieve intended designed solutions (ACTDEP024 - Scootle ⬈)

Elaborations

exploring the steps involved in the process to satisfy a design brief, need or opportunity

investigating designed solutions from around the world to make suitable, quality decisions that meet the design brief, challenge or scenario

identifying the importance of complementary parts of working, everyday systems by deconstructing the components, structure and purpose of products, services or environments

testing a range of materials, components, tools and equipment to determine the appropriate technologies needed to make products, services or environments, for example a moving vehicle
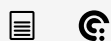
investigating how to minimise material use and manage waste by critiquing the environmental and social impacts of materials, components, tools and equipment

Generate, develop and communicate design ideas and processes for audiences using appropriate

technical terms and graphical representation techniques (ACTDEP025 - Scootle ↗)

Elaborations

generating a range of design ideas for products, services or environments using prior knowledge, skills and research

developing alternative design ideas and considering implications for the future to broaden the appeal and acceptance of design ideas

analysing and modifying design ideas to enhance and improve the sustainability of the product, service, environment or system

representing and communicating design ideas using modelling and drawing standards including the use of digital technologies, for example scale; symbols and codes in diagrams; pictorial maps and aerial views using web mapping service applications
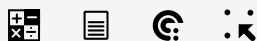
experimenting with materials, tools and equipment to refine design ideas, for example considering the selection of materials and joining techniques to suit the purpose of a product
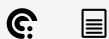
Select appropriate materials, components, tools, equipment and techniques and apply safe procedures to make designed solutions (ACTDEP026 - Scootle ↗)

Elaborations

matching material and joining techniques to the design intention, for example accurately cutting and sewing the fabric pieces to make a community banner or joining components to produce an electric circuit

working safely, responsibly and cooperatively to ensure safe work areas, for example the safe use of equipment when making a water-resistant, floating craft or a model of an environmentally sensitive outdoor shelter

using appropriate personal protective equipment required for the use of some tools and equipment,

for example protective eyewear

manipulating materials with appropriate tools, equipment and techniques, for example when preparing food, cultivating garden beds, constructing products

Negotiate criteria for success that include sustainability to evaluate design ideas, processes and solutions (ACTDEP027 - Scootle ↗)
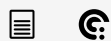
Elaborations

independently and collaboratively identifying criteria for success, processes and planning, for example using visual representations such as a flowchart

evaluating the suitability of materials, tools and equipment for specific purposes

reflecting on how well their designed solutions ensure safety and wellbeing of users and consumers and meet the needs of communities and different cultures

considering the criteria for success in relation to the benefits and costs of production processes, the environmental impact, future use and application, and social values and ethics of clients

evaluating products, services and environments from a range of technologies contexts with consideration of ethics and sustainability

Develop project plans that include consideration of resources when making designed solutions individually and collaboratively (ACTDEP028 - Scootle ↗)
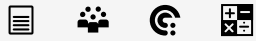
Elaborations

examining the essential features of existing processes to inform project planning including safe work practices that minimise risk
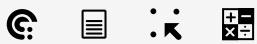
setting milestones for production processes and allocating roles to team members
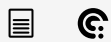
identifying when materials, tools and equipment are required for making the solution

outlining the planning and production steps needed to produce a product, service or environment using digital technologies

reflecting on planned steps to see if improvements can be made

Years 5 and 6 Content Descriptions

Digital Technologies Knowledge and Understanding

Examine the main components of common digital systems and how they may connect together to form networks to transmit data (ACTDIK014 - Scootle ↗)

Elaborations

describing digital systems as having internal and external components that perform different functions, for example external components for inputting data including keyboard, microphone, stylus; internal processing components including the central processing unit; external output components including speakers, projector, screen; and data and information storage components including cloud and external devices

explaining how data may be transmitted between two digital systems in different ways, for example that wires or cables are used in wired networks to transfer data from one digital system to another, and radio waves are used to transmit data in wireless or mobile networks
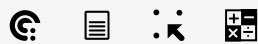
investigating how the internal and external components of digital systems are coordinated to handle data, for example how a keyboard, central processing unit and screen work together to accept, manipulate and present data and information

investigating how emerging digital systems work, for example using an augmented reality app (or blended reality) and considering how images of real-world objects can be blended with computer-generated information to produce a virtual reality

Examine how whole numbers are used to represent all data in digital systems (ACTDIK015 - Scootle ↗)

Elaborations

recognising that digital systems represent all types of data using number codes that ultimately are patterns of 1s and 0s (called binary digits, which is why they are called digital systems)

explaining that binary represents numbers using 1s and 0s and these represent the on and off electrical states respectively in hardware and robotics

recognising that the numbers 0, 1, 2 and 3 could be represented by the patterns of two binary digits of 00, 01, 10 and 11

representing whole numbers in binary, for example counting in binary from zero to 15, or writing a friend's age in binary

exploring how division by two can be used as a technique to determine the binary representation of any whole number by collecting remainder terms
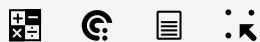
representing the state of an object in a game as active or inactive using the respective binary values of 1 or 0

Digital Technologies Processes and Production Skills

Acquire, store and validate different types of data, and use a range of software to interpret and visualise data to create information (ACTDIP016 - Scootle ↗)
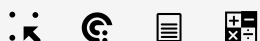
Elaborations

using digital systems to validate data, for example setting data types in a spreadsheet to make sure a date is input correctly

selecting and using peripheral devices suitable to the data, for example using a data probe to collect data about changing soil temperatures for plants, interpreting the data and sharing the results as a digital graph

recognising the difference between numerical, text and date formats in spreadsheets
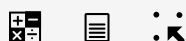
using software to automate calculations to help with interpreting data, for example using functions to make arithmetic calculations using multiple cells and summing cell ranges

acquiring data from online sources by narrowing the focus, for example filtering data using provided options or performing queries using advanced search functions

using data visualisation software to help in interpreting trends, for example uploading data to a web application and building a visualisation of the dataset
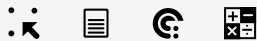
Define problems in terms of data and functional requirements drawing on previously solved problems (ACTDIP017 - Scootle ↗)

Elaborations

checking existing solutions to identify features that are transferable to new but similar digital solutions, for example identifying if there are any similarities (such as user age and special requirements) between an existing game and a new game to be created – in terms of the types of data and the needs of the users

investigating characteristics of user interfaces that are common for particular types of problems, for example, touch screens – many people respond more intuitively than when using a keyboard or stylus; and the consistent placement of symbols helps with performing actions that require speed, for example in games

using and interpreting data, establishing the root cause of a problem, for example using an annotated diagram to identify omissions, duplications or mismatches of data

describing in simple terms the nature of a problem and what a solution needs to achieve, for example what need the problem is associated with, who the solution is needed for, what data are needed and what features the solution would need to include

Design a user interface for a digital system (ACTDIP018 - Scootle ↗)

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Elaborations

exploring different features of user interfaces that allow people from different cultures to access information irrespective of language background, for example using icons and consistently placing icons or symbols in games interfaces to reduce the frustrations of game players

applying the principles and elements of design to a set of requirements in order to produce a user interface for a system that addresses an identified need, for example to emphasise or highlight an area of the screen to draw the viewer's attention to an event or action
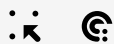
designing the user interface of a solution using different design tools, for example using a storyboard to outline the stages of a game or a mock-up to show the placement of icons

generating and considering alternative designs for a user interface, for example sketching different concepts for a splash screen of a game or interactive multimedia experience

Design, modify and follow simple algorithms involving sequences of steps, branching, and iteration (repetition) (ACTDIP019 - Scootle ↗)

Elaborations

following a diagram of a simple method of sorting numbers or words

following, modifying and describing the design of a game involving simple algorithms represented diagrammatically or in English, for example creating a flowchart with software that uses symbols to show decisions, processes and inputs and outputs
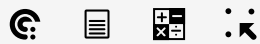
experimenting with different ways of representing an instruction to make a choice, for example branches in a tree diagram or using an 'IF' statement (a common statement used to branch) to indicate making a choice between two different circumstances using a spreadsheet or a visual program
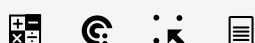
experimenting with different ways of representing an instruction to make a repetition, for example loops in a flowchart diagram or using a 'REPEAT' statement

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designing the instructions for a robot, for example a robot vacuum cleaner to clean a room

using different design tools to record ways in which digital solutions will be developed, for example creating storyboards or flowcharts to record relationships or instructions about content or processes

Implement digital solutions as simple visual programs involving branching, iteration (repetition), and user input (ACTDIP020 - Scootle ↗)

Elaborations

experimenting with different options that involve repeat instructions, for example a continually repeating slideshow, a repeated movement in an animation, a repeated calculation in a spreadsheet

planning and implementing a solution using a visual programming language, for example designing and creating a simple computer game involving decisions and repetitions, suitable for younger children, that requires user input to make selections, taking into account user responses

designing and creating a solution that is interactive, using a visual programming language, for example designing a user interface for people with disability, taking into account visibility and size of icons; or creating a quiz that provides feedback on response and allows the user to try again

creating a quiz where questions are repeated until the correct response is given, for example questions and feedback on responses in a few slides in a slideshow
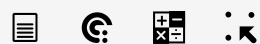
programming a robot to operate independently, for example to find its way out of a maze

experimenting with different ways of instructing to make choices and repeat instructions, for example using 'IF' statements to allow for making choices and iterations (repeat instructions) until a goal is achieved

Explain how student solutions and existing information systems are sustainable and meet current and future local community needs (ACTDIP021 - Scootle ↗)

Elaborations

using sustainability criteria to explain how well students' solutions meet requirements, for example personal data are secured (social) and the solution can only be viewed on screen to avoid printing (environmental)
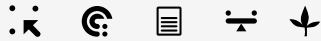
explaining why people interact so readily with touch systems, for example touch input requires less dexterity to issue instructions and is designed to be accessible to users through the use of icons
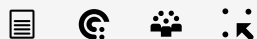
imagining how the functioning of one type of information system could be applied in a new way to meet a community or national need, for example considering how an electronic tracking system such as a global positioning system (GPS) could be used to find people who are lost
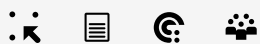
comparing past and present information systems in terms of economic, environmental and social sustainability, including those of Aboriginal and Torres Strait Islander Peoples

exploring the ethics and impact of management practices on the use of communication networks, for example internet censorship from a local, national and global perspective and the impact on freedom of access and expression
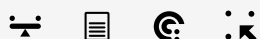
considering opportunities and consequences of decisions for future applications, for example practices to save energy and other resources when using information systems, such as switching off when not in use, ensuring electronic devices are in energy-saving mode

Plan, create and communicate ideas and information, including collaboratively online, applying agreed ethical, social and technical protocols (ACTDIP022 - Scootle ↗)

Elaborations

applying practices that support the organisation of collaborative problem-solving, for example finding online meeting times that suit all members, and agreeing on ways of protecting files and sharing information digitally with members
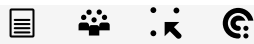
applying safe practices while participating in online environments, for example checking the default privacy settings to ensure maximum protection of personal details, being aware of online filtering techniques and policies used at school and at home
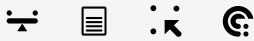
considering ways of managing the use of social media to maintain privacy needs, for example activating privacy settings to avoid divulging personal data such as photographs, addresses and names
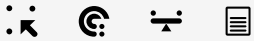
developing a set of 'rules' about appropriate conduct, language and content when communicating online, and using these rules as a basis for resolving ethical dilemmas
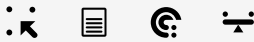
using digital systems to create web-based information taking into consideration referencing conventions, for example creating a blog, website or online learning space for sharing ideas

using a range of communication tools to share ideas and information, for example participating in collaborative online environments