GLOSSARY

For the purpose of the Technologies syllabus, the following definitions will apply:

Abstraction
The process of reducing complexity to formulate generalised fundamental ideas or concepts removed from the specific details or situation. For example, the idea that a cricket ball is a sphere in the same way that a soccer ball is, or the concept that data can be organised in records made up of fields irrespective of whether the *data* are numbers, text, images or something else.

Accessibility
The extent to which a *system*, *environment* or object may be used irrespective of the user's capabilities or disabilities. For example, the use of assistive technologies to allow people with physical disabilities to use computer systems or the use of icons in place of words to allow young children to use a system.

Aesthetics
A branch of philosophy dealing with the nature of art, beauty and taste. It is more scientifically defined as the study of sensory-emotional values, sometimes called judgements of sentiment and taste. Aesthetic judgement is concerned with the visual impact or appeal of a *product* or *environment* and is influenced by social, emotional and demographic factors.

Algorithm/s
A description of the steps and decisions required to solve a problem.
OR
A description of the steps required to solve a problem which may also include decisions.

Algorithmic logic
The logic of breaking down computing problems and information systems to a step-by-step process to solve a problem or achieve some end. It involves sequencing and abstraction and leads to algorithmic statements.

Analyse
Identify components and the relationship between them; draw out and relate implications.

Assess
Make a judgement of value, quality, outcomes, results or size.

Binary
The use of two states or permissible values to represent data, such as the on and off position of a light switch or the transistors in a computer silicon chip that can be in either the electrical state of ON or OFF.
Binary data are typically represented as a series of single digits referred to as binary digits (or bits) due to each taking on the value of either 0 or 1. The image below shows how a dashed line might be represented in binary.

1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1

ON and OFF states for binary code

Branching

Branching involves making a decision between one of two or more actions depending on sets of conditions and the data provided. For example, in testing whether a light works, the following algorithm uses branching:
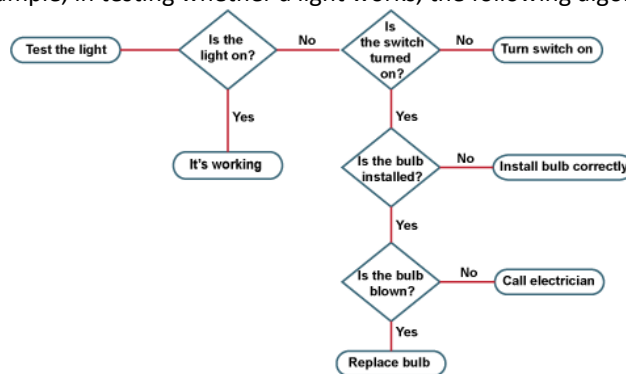

Diagram illustrating branching

Brief

A written document for a design project developed for a need. The document is focused on the desired results of design.

Client

A customer (sometimes known as a client, buyer, or purchaser) is the recipient of a good, service, product, or idea, obtained from a seller, vendor, or supplier for a monetary or other valuable consideration.

Codes of conduct

A code of conduct is a set of rules outlining the social norms and rules and responsibilities of, or proper practices for, an individual, party or organisation.

Components

The parts or elements that make up a system or whole object and perform specific functions. For example, the major components of a car include: the chassis (holds everything on it); the engine (to convert energy to make the car move); the transmission (including controlling the speed and output from the engine and to rotate the wheels); the steering system (to control the direction of movement); brake system (to slow down or stop); fuel delivery system (to supply fuel to the cylinders); exhaust system (to get rid of gases) and the electrical system (for operating wipers, air conditioning, etc.).
Similarly, the components of a computer system may be a central processing unit (chips that follow instructions to control other components and move data); memory chips and a hard disk (for storing data and instructions); keyboard, mouse, camera and microphone (to input instructions and data for the central processing unit); screen, printer, and speakers (to output data); USB and ethernet cards (to communicate with other systems or components).

Compression

Encoding information using fewer bits than the original representation to reduce file size.

Computational thinking

A problem-solving method that involves various techniques and strategies in order to solve problems that can be implemented by digital technologies, such as organising data logically, breaking down problems into components, and the design and use of algorithms, patterns and models.

Constraints

A constraint is something that plays the part of a physical, social or financial restriction.

Constructed environments

Environments developed, built and/or made by people for human and animal activity, including buildings, streets, gardens, bridges and parks. It includes the natural environment after it has been changed by people for a purpose.

Context
The circumstances, or facts, that surround a particular situation or event.

Contextual criteria
A descriptive list of essential features against which success can be measured, within a given context.

Create
Make and/or invent something.

Creativity
Techniques and methods that encourage creative actions, including techniques for idea generation and divergent thinking, methods of re-framing problems and changes in the affective environment, used as part of problem solving.

Criteria
A descriptive list of essential features against which success can be measured.

Data
In Digital Technologies, data refers to the discrete representation of information using number codes. Data may include characters (e.g. alphabetic letters, numbers and symbols), images, sounds and/or instructions that when represented by number codes can be manipulated, stored and communicated by digital systems. For example, characters may be represented using ASCII code or images may be represented by a bitmap of numbers representing each 'dot' or pixel.

Database
A collection of data organised by records and fields that can be easily stored, accessed, managed and updated. Each discrete piece of data to be stored is represented by a field (e.g. song title, song artist or bank account number, date of transaction), and the values in the fields that are associated with an entity (e.g. a song, a bank transaction) are a record. Interaction with the database usually takes place through a user interface designed specifically for the structure and use of the data stored in it.

Decompose
To separate a complex problem into parts to allow a problem to be more easily understood. Decomposition involves breaking down a problem into simpler, less complex parts that allow it to be better understood. For example, to create an interactive story the problem could be decomposed to a list of characters and their characteristics (e.g. clothing), the actions of the characters, the backdrops and the sequence of scenes with reference to which characters, actions and backdrops are involved in each scene. Decomposition may be represented in diagrams.

Define
State meaning and identify essential qualities.

Design brief
A concise statement clarifying the project task and defining the need or opportunity to be resolved after some analysis, investigation and research. It usually identifies the users, criteria for success, constraints, available resources, timeframe for the project and may include possible consequences and impacts.

Design processes
Processes that typically involve investigating; generating; producing; evaluating and collaborating and managing to create a designed solution that considers social, cultural and environmental factors. In Design and Technologies, technologies processes include design processes and production processes.

Design thinking
Use of strategies for understanding design problems and opportunities, visualising and generating creative and innovative ideas, and analysing and evaluating those ideas that best meet the criteria for success and planning.

Designed solutions
In Design and Technologies, the products, services or environments that have been created for a specific purpose or intention as a result of design thinking, design processes and production processes.

Desk checking
A method used by a human to check the logic of a computer program's algorithm to reduce the likelihood of errors occurring. This may be done on paper, using a diagram, or mentally trying a sample of typical inputs to see what the outputs would be. For example, to desk check the branching statement {IF age >65 THEN 'retire' ELSE 'keep working'} the values for age of 64, 65 and 66 could be tried to show that 64 and 65 would result in 'keep working' and 66 in 'retire' so that it could be decided if the statement worked as intended.

Digital citizenship
The acceptance and upholding of the norms of appropriate, responsible behaviour with regard to the use of digital technologies. This involves using digital technologies effectively and not misusing them to disadvantage others. Digital citizenship includes appropriate online etiquette, literacy in how digital technologies work and how to use them, an understanding of ethics and related law, knowing how to stay safe online, and advice on related health and safety issues such as predators and the permanence of data.

Digital information
The nature and forms of information stored digitally, and the processes that transform digital data into information for various purposes and meanings; the structures, properties, features and conventions of particular forms of digital information and the appropriate methods of storage, transmission and presentation of each form.

Digital solutions
The result (or output) of transforming data into information using digital systems, skills, techniques and processes to meet a need or opportunity.

Digital system/s
Digital hardware and software components (internal and external) used to transform data into digital solutions. When digital systems are connected they form a network.

Digital technologies
Any technologies controlled using digital logic, including computer hardware and software, digital media and media devices, digital toys and accessories and contemporary and emerging communication technologies.

Digital tools
A variety of hardware used to create a solution e.g. desktop computers, laptop computers, ipads, smart phones, cameras.

Economic sustainability
Practices that sustain economies while recognising the finite nature of resources and use resources optimally over the longer term without resulting in economic loss.

Electromechanical
A mechanical device that is moved or controlled by electricity.

Emerging technologies/emerging
A field of technology that broaches new territory, in some significant way, with new technological developments.

Engineering
The practical application of scientific and mathematical understanding and principles as part of the process of developing and maintaining solutions for an identified need or opportunity.

Engineering principles and systems
A technologies context focused on how forces can be used to create, light, sound, heat, movement, control or support in systems.

Enterprise
A project or activity that may be challenging, requires effort and initiative, and may have risks.

Enterprising
Showing initiative and willingness to take action and commitment to follow through on initiatives.

Entity
An entity is something that exists in itself, actually or hypothetically.

Environment/s
One of the outputs of technologies processes and/or a place or space in which technologies processes operate. Environments may be natural, managed, constructed or digital.

Environmental sustainability/environmental
Practices that have minimal impact on ecosystem health, allow renewal of natural systems and value environment qualities that support life.

Equipment
Items needed for carrying out specific jobs, activities, functions or processes. For example, a bench hook is used to hold a piece of wood when making a straight cut across it; tailor's chalk is used to make marks on fabric to show details of the location and type of construction; a soldering iron is used to solder components to a printed circuit board; scales are used to accurately weigh ingredients for a cake or feed for domestic animals.

Ethics
Principles that govern a person's behaviour or the conducting of an activity.

Evaluate
Make a judgement based on criteria; determine the value of.

Explore/d
Investigate, search for or evaluate.

Food and fibre production
A technologies context focused on the process of producing food or fibre as natural materials for the design and development of a range of products. Fibre includes materials from forestry.

Food specialisations
A technologies context focused on the application of nutrition principles and knowledge about the characteristics and properties of food to food selection and preparation; and contemporary technology-related food issues.

Functionality
Design of products, services or environments to ensure they are fit for purpose and meet the intended need or market opportunity and identified criteria for success.

Futures thinking
Strategic thinking that envisages what can be, given existing knowledge and strategies, to propose scenarios for probable, possible and preferred futures.

Graphic organisers
A communication tool that uses visual symbols to represent structured thinking. Graphic organisers make thinking processes visible by showing connections between ideas/data. Examples include concept maps, flowcharts and cause-and-effect patterns. Their use has become more popular with the availability of software to create, edit and display them.

Hardware
The collection of physical elements that comprise a computer system.

Health
A state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity (World Health Organization 1948).

Healthy eating
Dietary patterns that aim to promote health and wellbeing including the types and amounts of foods and food groups which reduce the risk of diet-related conditions and chronic disease (National Health and Medical Research Council 2013).

Identify
Recognise and name.

Information
That which informs, i.e. an answer to a question, as well as that from which knowledge and data can be derived (as data represents values attributed to parameters, and knowledge signifies understanding of real things or abstract concepts).

Information systems
The combination of digital hardware and software components (digital systems), data, processes and people that interact to create, control and communicate information.

Innovation
A new idea, more effective device or process.

Investigate
Plan, inquire into and draw conclusions about.

Justify
Support an argument or conclusion; give reasons for your statements or comments.

Iteration
Repetition of a process or set of instructions in computer programming.

Managed environments
In Design and Technologies, those environments coordinated by humans, for example, farms, forests, marine parks, water, wetlands and storage facilities.

Materials
Natural (such as animals, food, fibre, timber) and fabricated materials (such as metals alloys plastics, textiles). Materials are used to create products or environments and their structure can be manipulated by applying knowledge of the origins, structure, characteristics, properties and uses.

Materials and technologies specialisations
A technologies context focused on a broad range of traditional, contemporary and emerging materials and specialist areas that typically involve extensive use of technologies.

Mechanical
A system that manages power to accomplish a task that involves forces and movement.

Mobile networks
A system of connecting movable computer systems or peripheral devices, each one remote from the others.

Model
A representation that describes, simplifies, clarifies or provides an explanation of the workings, structure or relationships within an object, system or idea.

Modify
To change somewhat the form or qualities of; alter somewhat.

Multimedia
The use of digital technologies to present text, graphics, video, animation and sound in an integrated way.

Netiquette
A set of social conventions that facilitate interaction over networks.

Network/s
A system of connecting computer systems or peripheral devices, each one remote from the others.

Nutrients
The nutritional components in foods that an organism utilises to survive and grow.

Online environment
Allows the connection of computers/mobile devices to one or more computers/mobile devices or networks, such as the internet.

Orthogonal drawings
A scaled multiview drawing of a three-dimensional object to show each view separately, in a series of two-dimensional drawings, for example, top or bottom, front, back and sides. In Australia, orthogonal drawings use third-angle projection for layout of the views. Orthogonal drawings may also include the measurements on each view and are used to develop lists of material requirements. In these drawings each edge is represented by a connected line, each segment of which is parallel to a coordinate axis.

Peripheral devices
Digital components that can be connected to a digital system but are not essential to the system, for example printer, scanner, digital camera.

Perspective drawing
A drawing that represents the way objects appear to be smaller and closer together, the further away they are. Perspective drawings may be one-point, or two or three-point perspective and have the corresponding number of vanishing points. A one-point perspective drawing has a single vanishing point (VP). Perspective drawings are often used in building, interior and architectural design.

Play
Includes both an imaginary situation and the exploration of objects and actions for a specific purpose, where meaning and sense of objects, actions and social situation can change for individual and collective needs to create something new.

Preferred futures
Preferences for the future identified by a student to inform the creation and evaluation of solutions.

Producing
Actively realising (making) designed solutions using appropriate resources and means of production.

Product/s
One of the outputs of technologies processes, the end result of processes and production. Products are the tangible end results of natural, human, mechanical, manufacturing, electronic or digital processes to meet a need or want.

Production drawing
A working drawing that details the requirements for the manufacture and assembly of products and environments.

Production processes
In Design and Technologies, the technologies context-specific processes used to transform technologies into products, services or environments, for example the steps used for producing a product.

Programming environment/s
Hardware and software the user interacts with while programming.

Project
The set of activities undertaken by students to address specified content, involving understanding the nature of a problem, situation or need; creating, designing and producing a solution to the project task and documenting the process. Project work has a benefit, purpose and use; a user or audience who can provide feedback on the success of the solution; limitations to work within; and a real-world technologies context influenced by social, ethical and environmental issues. Project management criteria are used to judge a project's success.

Project management
The responsibility for planning, organising, controlling resources, monitoring timelines and activities and completing a project to achieve a goal that meets identified criteria for judging success.

Properties
The distinctive qualities of a material that can be tested and used to help people select the most suitable one for a particular use. Mechanical properties are determined when a force is applied to a material, for example, to test its strength, hardness, wear resistance, machinability/workability, stretch and elasticity. Thermal properties are determined when varying temperatures (for example, cold or heat) are applied to test whether it expands, melts, conducts or absorbs heat (warms up), find its boiling point, and whether its colour changes. Chemical properties relate to the chemicals a material is made up of (its composition) and how it may change because of its surrounding environment, for example, how it ages or taints; develops an odour; deteriorates; resists stains, corrosion or cracks due to heat; or is flammable. Electrical properties relate to the way a material responds if a current is passed through it or if it is placed in an electrical field, for example, whether the material conducts or resists electricity or acts as an insulator. Optical properties relate to how light reacts with a material, for example, opaqueness, transparency and reflectiveness.

Protocols
Generally accepted standards or 'rules' that govern relationships and interactions between and within information systems

Prototype
A trial or model built to test an idea or process to inform further design development.

Qualitative data/qualitative
Qualitative data can be arranged into categories that are not numerical. These categories can be physical traits, gender, colours or anything that does not have a number associated to it.

Quantitative data/quantitative
Quantitative data that can be quantified and verified, and is amenable to statistical manipulation.

Rendered
A drawing that shows the relative relationship of elements or the form of objects using texture, colour, light, shade and tone (lightness or darkness of a colour). Rendered drawings are used, for example, in architecture to show what a building will look like or to show the form and shape of the body of a proposed car design. Rendering can be done by hand, or using computer software such as computer-aided drawing.

Resources
In Design and Technologies, this includes technologies, energy, time and human input.

Service/s
One of the outputs of technologies processes, the end result of processes and production. Services are the less tangible outcome (compared to products) of technologies processes to meet a need or want. They may involve development or maintenance of a system and include, for example catering, cloud computing (software as a service), communication, transportation and water management. Services can be communicated by charts, diagrams, models, posters and procedures.

Service design
The design of the service and the service concept. The service concept aims to meet the needs of the end user, client or customer. The service design includes the physical, organisational, aesthetic and psychological benefits of the service and required systems thinking.

Social protocols
Generally accepted 'rules' or behaviours when people interact in online environments, for example, using language that is not rude or offensive to particular cultures, and not divulging personal details about people without their permission.

Social sustainability
Practices that maintain quality of life for people, societies and cultures in a changing world for a long period of time, ensuring health and wellbeing without disproportionate costs or side-effects.

Software
Any set of machine-readable instructions that directs a computer's processor to perform specific operations.

Stakeholders
A person or organisation with an interest or concern in something.

Storyboards
A graphic organiser in the form of illustrations or images displayed in sequence for the purpose of pre-visualising an idea or concept.

Structured data
A data model that organises data elements and standardises how the data elements relate to one another.

Student developed criteria
Established rules or principles for testing anything developed individually or collaboratively by students.

Sustainability
The capacity for development that can be sustained into the future without destroying the environment in the process.

Sustainable
Supports the needs of the present without compromising the ability of future generations to support their needs.

Systems
The structure, properties, behaviour and interactivity of people and components (inputs, processes and outputs) within and between natural, managed, constructed and digital environments.

Systems thinking
A holistic approach to the identification and solving of problems where parts and components of a system, their interactions and interrelationships are analysed individually to see how they influence the functioning of the whole system. This approach enables students to understand systems and work with complexity, uncertainty and risk.

Technical protocols
A set of rules governing the format in which messages are sent from one computer to another, as in a network, using agreed terminology.

Techniques
Method of performance; way of accomplishing.

Technologies
The materials, data, systems, components, tools and equipment used to create solutions for identified needs and opportunities, and the knowledge, understanding and skills used by people involved in the selection and use of these.

Technologies contexts
The focus and opportunities for students in Design and Technologies to use processes and production skills to design and produce products, services and environments. The technologies contexts for Pre-primary to Year 10 are: engineering principles and systems; food and fibre production; food specialisations; and materials and technologies specialisations.

Technologies processes
The processes that allow the creation of a solution for an audience (end user, client or consumer). The processes involve the purposeful use of technologies and other resources and appropriate consideration of impact when creating and using solutions. The processes typically require one or more of the following types of thinking: computational, critical, design or systems.

Technologies specialisations
Areas of specialisation that typically involve extensive use of technologies (for example, architecture, electronics, graphics technologies, fashion).

Tools
Implements and machines to carry out specific processes when working with materials. For example, a saw is an example of a tool used to cut timber; scissors are used to cut fabric, paper and cardboard; a tape measure is used to measure lengths and widths of wood and fabric; a blender is used to mix and blend food ingredients; secateurs are used to prune plants.

Transmission control protocol/internet protocol (TCP/IP)
A set of rules or standards for organising how messages are transmitted over the internet.

Usability
The ease of use and learnability of a human-made object. The object of use can be a software application, website, book, tool, machine, process, or anything a human interacts with.

User interface
The characteristics of the boundary between users and a computer system, or the manner in which users interact with computer hardware or software. In software, this usually comprises of fields for text and number entry, mouse pointers, buttons and other graphical elements. In hardware, switches, dials and light-emitting diodes (LEDs) provide information about the interactions between the user and machine.

Visual programming

A programming language or environment where the program is represented and created visually rather than as text. A common visual metaphor represents statements and control structures as blocks that can be composed to form programs, allowing programming without having to deal with syntax errors. Examples of visual programming languages include: Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch (Build Your Own Blocks and Snap).

Note: A visual programming language should not be confused with programming languages for creating visualisations or programs with user interfaces, for example, Processing or Visual Basic.

Visualisation tools

Software to help in the recording of ideas as visual representations. Examples in Design and Technologies are computer-aided drawing (or computer-assisted design) (CAD) and computer simulation. Graphic organiser software are visualisation tools, as are software that display graphs of data.

Wired networks/wired

Connected to a wire or system of wires, as an electronic device connecting computer systems or peripheral devices.

Wireless networks/wireless

Any type of computer network that uses wireless data connections for connecting networks.