

Technology (2003)

Years 1 to 10 Sourcebook Guidelines (Part 4 of 7)

Note: The PDF version of this document has been split into sections for easier download. This file is Part 4 of 7.

Elaborations for Levels 1 to 6

Purpose of the elaborations

The core learning outcomes for Levels 1 to 6 have been elaborated to assist teachers in understanding what students are expected to know and do with what they know in relation to the key learning area. The elaborations contextualise the learning outcomes and provide examples of ways to incorporate content into learning activities.

Elaborations are provided as examples only and are interchangeable with other elaborations developed by teachers. They also provide ideas for teachers when planning for learning or assessment. When considering the application of elaborations for their own planning and assessment, teachers should consider a range of factors including:

- students' prior knowledge
- students' interests
- the context in which learning will take place
- the various socioeconomic and cultural backgrounds of students
- available equipment and resources
- school programs
- school authority policies.

Organisation of the elaborations

The tables that follow present elaborations of each core learning outcome. The organisation of these elaborations is by strand and key concept, progressing from Foundation Level to Beyond Level 6.

The purpose of the elaborations is to:

- make clear what students need to know and do with what they know to demonstrate the core learning outcomes
- contextualise the core learning outcomes by providing examples of how they may be demonstrated
- explain specific terms in a core learning outcome
- show how contexts can be used to make learning real-life or lifelike
- provide examples of how content can be incorporated into activities.

Each core learning outcome has been given a unique code. This code is made up of letters (which identify the strand) and numbers (which identify the level and key concept to which the core learning outcome relates). For example, **SYS 1.1** refers to the System strand, Level 1 outcome, which is related to the first key concept in that strand.

The diagram below identifies the layout of the elaborations by levels in key concepts.

Strand from Technology syllabus

Core learning outcome

Example learning activities identify possible contexts and content for learning from the learning outcome

Systems	
Nature Level 1	Techniques Level 1
<p>SYS 1.1 Students identify familiar systems and describe how these are used in everyday life.</p> <p>Students know:</p> <ul style="list-style-type: none"> • what a system is • there are systems and they are used in everyday life. <p>Students identify and describe familiar systems as they:</p> <ul style="list-style-type: none"> • identify and describe systems in everyday life <ul style="list-style-type: none"> – explore systems used in familiar environments – storage system in the classroom – waste disposal system in their home, school, neighbourhood – communication system — postal system, telephone system – irrigation system on a farm or in a garden – systems for self-care — meal times, getting dressed, going to school, crossing the road, daily routine • consider familiar systems and the effects systems have on everyday life <ul style="list-style-type: none"> – discuss positive and negative effects on themselves and others <ul style="list-style-type: none"> • transport systems — ease of moving people and pollution of the environment – discuss what would happen if familiar routines were not followed or if familiar systems were not in place <ul style="list-style-type: none"> • What would happen if there were no garbage collection system? – describe effects of systems that they use <ul style="list-style-type: none"> • electricity system. 	<p>SYS 1.2 Students sequence steps to develop simple systems to carry out familiar tasks.</p> <p>Students know how:</p> <ul style="list-style-type: none"> • to develop simple systems to carry out familiar tasks. <p>Students sequence steps to carry out familiar tasks as they:</p> <ul style="list-style-type: none"> • examine and sequence steps in existing systems or routines <ul style="list-style-type: none"> – identify or sequence steps <ul style="list-style-type: none"> • identify steps in the recipe when making playdough • identify steps to borrow a book from the library • follow steps to access a computer program, or cut or paste in a computer program • follow a series of steps or instructions to achieve a predetermined result such as operating a tape recorder or CD-player – consider how an existing system works <ul style="list-style-type: none"> • consider the way in which pieces of a construction kit or commercial toy work together • disassemble an existing system to investigate various components • consider ways in which books are borrowed from a library – discuss household systems <ul style="list-style-type: none"> • a washing machine or pop-up toaster and how they carry out familiar tasks – consider the routines used within the school <ul style="list-style-type: none"> • the teacher may use pictures or draw a flow chart of the system for evacuating a classroom during a school fire-drill • draw a sequence of pictures to illustrate lunch time eating routines • develop systems to carry out familiar tasks that include a limited number of sequenced components <ul style="list-style-type: none"> – design a simple assembly line to prepare food <ul style="list-style-type: none"> • make sandwiches • cut vegetables for soup – suggest changes to familiar routines <ul style="list-style-type: none"> • design a system for distributing a newsletter to the class – use familiar construction materials to develop systems <ul style="list-style-type: none"> • make moving toys using construction blocks – identify simple tasks that can be organised by a system <ul style="list-style-type: none"> • organise a roster for feeding a pet • design a system to remind children to return books to the school library.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p> <p>Examples</p> <ul style="list-style-type: none"> • Students identify steps in systems they have developed to care for a class pet and describe how this system affects their school day. • Students describe how the ordering system for the school tuck-shop impacts on them and design a system for distributing tuckshop food when it gets back to the classroom. • Students describe how postal systems may work, and design and put in place a class postal system. 	

Identifies the level

Elaboration of the level statement identifying possible contexts and content for learning from the level statement

Advice about contexts, appropriateness and management

Technology Practice	
<p>Level statement — Foundation Level: Students are developing an awareness of the products of technology they use in familiar situations to meet their own needs and wants. They are beginning to generate and communicate ideas for products that can be used for real-life and lifelike purposes. They are developing an understanding of some safety procedures and practices related to the development of products and the use of technological devices. They express their views about various aspects of familiar products and their purposes.</p>	
Investigation Foundation Level	Ideation Foundation Level
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Students develop an awareness of the products of technology when they:</p> <ul style="list-style-type: none"> • observe and identify some features of products <ul style="list-style-type: none"> – express feelings about features of products – match or sort products based on similarities and differences • ask questions about products of technology and some of their purposes • feel, handle and use products of technology to become familiar with how they work • investigate ways products can be used • determine when there is a need to seek help for a technological problem or challenge. <p>Students explore the products of technology used in familiar situations:</p> <ul style="list-style-type: none"> • tools and equipment that manipulate materials — saw, stapler, scissors, beaters, fork, shovel, playdough tools • technological devices that assist communication and mobility — communication board or devices, wheelchairs, prosthetics, spectacles, computers, hearing aids, battery-operated toys, switches • objects used for self-care — combs, toothbrushes, shavers, manicure set • domestic products for convenience and comfort — chairs, shoes, clothing, buttons, zippers, hats, utensils • multimedia equipment — computers, cameras, CDs, televisions, video recorders, sensory equipment • built environments or systems — playgrounds, traffic lights, swimming pools, shopping centres. 	<p>Students begin to generate and communicate ideas for products that can be used for real-life and lifelike purposes when they:</p> <ul style="list-style-type: none"> • show a preference for, or communicate, an idea that meets a need or want <ul style="list-style-type: none"> – point to a design, from a range of pictures, of a building they can make from blocks – use visual cues to indicate the product they would like to make or use – prepare lunch by selecting food, from a range of options – choose from a range of presented options • communicate their ideas about products that may meet needs or wants <ul style="list-style-type: none"> – select types of vegetables to grow in a garden – use photographs or pictures from magazines or books to identify products that they would like to make or use • recall ideas and experiences with products to help them develop ideas for their own products <ul style="list-style-type: none"> – explain how a product helped them to meet a need or want – recall ideas about products with which they have had experience through discussions • link products to purposes <ul style="list-style-type: none"> – identify different ways of meeting the same need or want – match more than one product to a particular purpose • identify potential sources of help for a particular problem or challenge <ul style="list-style-type: none"> – parent/carer to open a container – adults to help with operating a device.
<p>The following are examples of learning outcomes developed from the level statement for Foundation Level. Use these outcomes, or create others, to meet the individual needs and group needs of the class.</p> <p>Students' demonstrations of outcomes are apparent when they have provided evidence across a range of contexts as exemplified below.</p>	
<p>Example learning outcome: Students observe and identify the purpose of a specific product or device.</p>	<p>Example learning outcome: Students indicate a preference from a range of options to meet a need or want.</p>
<p>Students:</p> <ul style="list-style-type: none"> • operate utensils in order to observe how they work, e.g. use electric beaters to make a cake, use sand play toys, use a spade for gardening, eat with a spoon • examine a familiar product by handling, matching or demonstrating the use of it in daily situations, e.g. wheelchair, communication device, a hose to wash a car • observe and identify the purpose of a specific technological device such as traffic signals, ATMs, vending machines, bicycles, playground equipment • investigate the workings of a specific technological device by asking questions, gesturing or interacting with the object, such as how to operate a moving toy. 	<p>Students:</p> <ul style="list-style-type: none"> • select a picture or recipe card of the type of cake they want to make • select where they would like to put plants in a garden by placing markers on the soil before planting • choose shapes to attach to some string in order to make a mobile • identify pictures of clothes to wear for specific purposes such as swimming or school • indicate a preference by, for example, gesturing, smiling, or making eye contact • use communication devices to indicate choices.

Technology Practice	
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Production Foundation Level	Evaluation Foundation Level
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Students develop an awareness of safety procedures and practices for the development of products and the use of technological devices when they:</p> <ul style="list-style-type: none"> • follow directions, with guidance if necessary, to allow safe practices to occur when developing products <ul style="list-style-type: none"> – join materials with guidance using glue – hammer nails or pegs – use a knife when preparing food – use scissors to cut paper – use garden tools to make a garden and store gardening equipment in a safe place – press a switch to operate equipment when instructed to mix batter for pancakes • use technological devices safely with or without guidance, as necessary <ul style="list-style-type: none"> – operate controls such as brakes or a toggle on a wheelchair – operate switches on communication devices, stoves, microwaves or washing machines – wear seat belts in the car or bus – wear a bicycle helmet when riding – place the camera strap around the neck when using the camera • indicate that they think their work is complete <ul style="list-style-type: none"> – say/sign/symbol when finished – put their work down – put their work on display • seek help to use technological devices safely <ul style="list-style-type: none"> – indicate need for assistance to turn on hot taps – ask for protective clothing such as goggles or gloves. 	<p>Students express their views about various aspects of familiar products and their purposes when they:</p> <ul style="list-style-type: none"> • express ownership of products they make <ul style="list-style-type: none"> – indicate ownership — mine, me, my – seek out their own work – recognise their own work • express pride in products they make <ul style="list-style-type: none"> – display their own work – seek approval from others • express opinions about products <ul style="list-style-type: none"> – convey positive views about products <ul style="list-style-type: none"> · aesthetics · functionality · social – identify particular features of a product that they may like or dislike – indicate preferences for their own or others' work.
<p>The following are examples of learning outcomes developed from the level statement for Foundation Level. Use these outcomes, or create others, to meet the individual needs and group needs of the class.</p> <p>Students' demonstrations of outcomes are apparent when they have provided evidence across a range of contexts as exemplified below.</p>	
<p>Example learning outcome: Students follow directions safely for specific purposes.</p>	<p>Example learning outcome: Students express their likes or dislikes about products they have helped to make.</p>
<p>Students:</p> <ul style="list-style-type: none"> • follow a recipe card to participate safely in the making of a cake for a special occasion • follow directions to cut and glue safely to create a card for a special occasion • follow directions to use traffic signals in order to safely cross the road • follow safety procedures such as wearing protective clothing when using a lawn mower. 	<p>Students:</p> <ul style="list-style-type: none"> • express views about the taste and appearance of a cake that they have helped to make • display a card they have made and identify it from other cards on display • describe likes and dislikes about a garden they have looked after • repeat requests for a product or activity • show, give or tell others about the product.

Technology Practice	
Investigation Level 1	Ideation Level 1
<p>TP 1.1 Students gather knowledge, ideas and data from familiar environments and consider how they will use this information to meet design challenges.</p>	<p>TP 1.2 Students generate design ideas and communicate these through experimentation, play and pictures.</p>
<p>Students know that knowledge, ideas and data are:</p> <ul style="list-style-type: none"> • gathered from familiar environments • used in meeting design challenges. <p>Students gather knowledge, ideas and data as they:</p> <ul style="list-style-type: none"> • discuss and question <ul style="list-style-type: none"> – how and why family and friends use products – the function or design of products <ul style="list-style-type: none"> • toys with which to play • clothes to wear — consider why we have clothes of various designs such as rain coats, jumpers, sun hats • play equipment including the use of safety features – how various products are produced • explore <ul style="list-style-type: none"> – features and functions of products and clarify how they are used – characteristics of various materials and products by using senses <ul style="list-style-type: none"> • taste — food; touch — textiles • interact with products in meaningful ways <ul style="list-style-type: none"> – participate in structured socio-dramatic and/or exploratory play – examine handling collections – manipulate materials used to create products. <p>Students consider how knowledge, ideas and data are used to meet design challenges as they:</p> <ul style="list-style-type: none"> • describe, discuss and record how products meet needs and wants <ul style="list-style-type: none"> – categorise products and the needs and wants they meet by listing products from magazines and books – record needs and wants that may exist in some contexts and discuss ideas they gather about different products that could be used in these contexts • draw or illustrate, and label, information gathered <ul style="list-style-type: none"> – pictures of the designs of products they have observed • make charts that record existing ways of meeting a design challenge. 	<p>Students know that:</p> <ul style="list-style-type: none"> • design ideas can be generated in different ways • design ideas can be communicated in different ways. <p>Students generate and communicate design ideas as they:</p> <ul style="list-style-type: none"> • use strategies that may meet needs and wants <ul style="list-style-type: none"> – work in small groups to brainstorm various design ideas for a product – come up with new or novel products – draw what the product may look like • experiment with ways of recording and communicating their own design ideas <ul style="list-style-type: none"> – make models using blocks, clay or playdough – create pictures or pictorial representations of a finished product – present oral descriptions of what a product may do or how it works – roleplay how a product may work or may be used – make approximations of design ideas by arranging objects, materials or props • look at ways other people communicate design ideas <ul style="list-style-type: none"> – 2D representations including pictures, drawings, illustrations, photographs or plans <ul style="list-style-type: none"> • plans of buildings • pictures or photographs of products • diagrams of how to assemble a toy – 3D representations including dioramas or models <ul style="list-style-type: none"> • museum exhibits • prototypes — working models of products – written or verbal descriptions including reports, recounts or labels <ul style="list-style-type: none"> • recipes for preparing food • story books • Technology project folios – combinations of these <ul style="list-style-type: none"> • pictorial and written directions to make a toy • annotations/labels on drawings.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students examine and compare the features of different lunch boxes to inform their design ideas when designing a lunch box for an excursion. • Students explore different environments when gathering ideas for a class garden. • Students disassemble old toys to determine how they move and operate. • Students observe different ways to keep food fresh when storing sweets made for the school fete. 	<p>Examples</p> <ul style="list-style-type: none"> • Students set up socio-dramatic play areas such as a restaurant, train station, home area to stimulate discussion about design ideas and design challenges and record their ideas. • Students visualise, draw or make models of design ideas, e.g. block building, bridge and spacecraft. • Students visualise and draw the layout for a garden. • Students make models or use pictures and photographs to share ideas for an invention to help around the house.

Technology Practice	
Production Level 1	Evaluation Level 1
<p>TP 1.3 Students make products that are meaningful to them, and describe their production procedures.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • products can be made • production procedures can be described. <p>Students make products meaningful to them as they:</p> <ul style="list-style-type: none"> • create <ul style="list-style-type: none"> – products that meet a need or want <ul style="list-style-type: none"> • invent something and explain how it can be used – products to be used in a real or imaginary sense <ul style="list-style-type: none"> • make a platform in the block area so they can view the tigers in the jungle – products to serve a particular purpose <ul style="list-style-type: none"> • prepare food designed for a class morning tea • develop their ideas into products <ul style="list-style-type: none"> – process materials – manipulate information – develop systems – make artefacts – construct an environment – provide a service. <p>Students describe their production procedure as they:</p> <ul style="list-style-type: none"> • examine, consider and identify <ul style="list-style-type: none"> – the use of different production procedures for different effects <ul style="list-style-type: none"> • cut paper, join paper, strengthen paper – the selection of production procedures <ul style="list-style-type: none"> • appropriate production procedures for joining different materials such as using glue to join paper and wood instead of nails – management issues related to <ul style="list-style-type: none"> • materials • people • environments • record in Technology project folios <ul style="list-style-type: none"> – design ideas for different products – processes or actions used to develop a product – issues of safety they considered. 	<p>TP 1.4 Students express thoughts and opinions to evaluate their own and others' design ideas and products.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • design ideas and products can be evaluated • evaluation about design ideas and products can be expressed as thoughts and opinions. <p>Students evaluate design ideas and products by expressing thoughts and opinions as they:</p> <ul style="list-style-type: none"> • answer questions about design ideas and products <ul style="list-style-type: none"> – What is it and what does it do? – Why was it made and who might use it? – Does it do what it is meant to do? – How does it sound/taste/smell/feel/look? – What is it made from? – Does it meet a need or want? – What do I think about it? • consider some issues related to appropriateness <ul style="list-style-type: none"> – aesthetic — Do I like the way it looks? – cultural — Would other groups of people like this? – economic — How much does it cost to make? – environmental — How does it affect the environment? – ethical — What questions can we ask about the effects of this product? Why do people need this? – functional — Does this product do what I want it to do? – social — Would people other than me use this? • make judgments about their own or others' ideas or products <ul style="list-style-type: none"> – record thoughts and opinions about design ideas and products in their Technology project folios – share views about different products <ul style="list-style-type: none"> • artefacts — how well a hat keeps the sun off • systems — the routine for keeping the classroom tidy • processes — borrowing books from the class library • services — transport services in the community • environments — how well the plants grow in a fish tank.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students prepare products for a class art show. Activities may include: <ul style="list-style-type: none"> – making displays and recording safety issues about their placement – preparing food for visitors and describing the process involved in its preparation – producing advertising posters and identifying the types of techniques they would need to use to develop the posters. • Students describe the steps involved in producing a booklet to inform visitors about their classroom. 	<p>Examples</p> <ul style="list-style-type: none"> • Students share views about features of playground equipment that they encountered on an excursion. • Students discuss appropriateness of design ideas and products they developed during a unit of work about space. • Students reflect on project folio entries and express their thoughts and feelings about 'working technologically'. • Students record their reactions to different products by using charts.

Technology Practice	
Investigation Level 2	Ideation Level 2
<p>TP 2.1 Students organise knowledge, ideas and data about how needs and wants might be met and use this information when meeting design challenges.</p>	<p>TP 2.2 Students generate design ideas, acknowledge the design ideas of others and communicate their design ideas using annotated drawings that identify basic design features.</p>
<p>Students know that knowledge, ideas and data can be:</p> <ul style="list-style-type: none"> • organised • used to meet design challenges. <p>Students organise knowledge, ideas and use data to meet design challenges as they:</p> <ul style="list-style-type: none"> • record investigations using <ul style="list-style-type: none"> – written or pictorial records <ul style="list-style-type: none"> • in a Technology project folio • storing it to disk • making a chart, table • photographs, pictures, drawings, video – samples of products or processes investigated – samples of different materials • categorise products, processes, techniques and ideas <ul style="list-style-type: none"> – make charts that classify different processes for joining – sequence pictures or diagrams of how techniques could be carried out – sort materials in a handling collection according to selected characteristics – list features of products that make them useful for a specific purpose – list needs or wants and how they may be met – compare different products that meet the same need or want and give reasons for similarities and differences • use information <ul style="list-style-type: none"> – drawing on ideas to develop concept maps or flowcharts – referring to procedures or processes – discussing alternatives and ideas. 	<p>Students know that:</p> <ul style="list-style-type: none"> • basic features of design ideas need to be identified and described • other people may have similar or different design ideas from their own. <p>Students communicate and acknowledge design ideas as they:</p> <ul style="list-style-type: none"> • draw 2D representations of their design ideas, usually using one view <ul style="list-style-type: none"> – a top view of their ideas for cake decorations – front or back view of clothing – a side view of what their boat would look like • annotate the drawings to identify basic features and their purposes <ul style="list-style-type: none"> – label a view of a cake to indicate colour of icing, decorations, candles – label a front or back view of a T-shirt to identify the collar, colour, logo – label a view of a boat to identify the mast, rudder, engine • acknowledge the design ideas of others <ul style="list-style-type: none"> – view demonstrations of design ideas by peers – listen to peers explaining their design ideas about a model boat for the class boat race – examine drawings or series of plans prepared by professionals – share and compare their own design ideas with others in a group • generate and record design ideas <ul style="list-style-type: none"> – use concept maps or bubble charts to record ideas – make lists/tables – use creative thinking skills such as de Bono's Six Thinking Hats and CoRT thinking skills – predict how some products may change in the future.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students visit a local restaurant to observe and record some of the systems and products used in food preparation to inform their designs in setting up a class restaurant. • Students compare the features of different buildings to determine how they meet peoples' needs and wants and use this data to inform the design of a tree house. • Students compare samples of different materials in a handling collection to determine the most appropriate materials when designing a backpack for an excursion. 	<p>Examples</p> <ul style="list-style-type: none"> • Teachers model the drawing of a plan of a room using design ideas generated by students. • Students use blocks to generate the layout of a bus for the play area, and draw the layout with chalk in the playground. • Students draw or sketch the main features of an insect trap. • Students present an illustration of the main features of a cubby house they have designed and seek others' ideas to add to it. • Students use 3D embossed drawings to communicate ideas for blind students.

Technology Practice	
Production Level 2	Evaluation Level 2
<p>TP 2.3 Students identify, sequence and follow production procedures to make products of their own design.</p> <p>Students know that:</p> <ul style="list-style-type: none"> production procedures can be identified and sequenced production procedures can be followed. <p>Students identify and sequence production procedures as they:</p> <ul style="list-style-type: none"> ask questions of an adult, or more experienced peer, about what production methods to use watch someone modelling a production process and try to incorporate it into their own production procedures select a sequence of steps to develop a product of their own design explain why a production process has been selected <ul style="list-style-type: none"> suitability to the task prior experience with a material or process trial and error limitations of available equipment and materials document production procedures in their Technology project folios. <p>Students follow production procedures to make products of their own design as they:</p> <ul style="list-style-type: none"> follow a simple step-by-step production process <ul style="list-style-type: none"> join materials <ul style="list-style-type: none"> when making a mask for a play using collage materials when making a pot-plant holder using wood cut and past images in a drawing program <ul style="list-style-type: none"> when making a card in a computer program when making an advertisement for the class play follow written, oral and diagrammatical instructions <ul style="list-style-type: none"> to prepare a growing area for the class garden to prepare food for morning tea. 	<p>TP 2.4 Students consider initial design ideas with final products and give reasons for similarities and differences.</p> <p>Students know that:</p> <ul style="list-style-type: none"> initial ideas and final products can be compared reasons can be given to explain similarities and differences. <p>Students consider design ideas and products as they:</p> <ul style="list-style-type: none"> compare design ideas and products <ul style="list-style-type: none"> identify similarities and differences between features of a design idea and the resulting product try out or test a product to assess how well it meets the intended purpose <ul style="list-style-type: none"> Does the fruit drink taste sweet enough? Does the storage system keep the room tidier? Does the poster communicate the message clearly? describe the process of developing a design idea into a product match the features of a design idea with features of a product. <p>Students give reasons for similarities and differences as they:</p> <ul style="list-style-type: none"> explain why changes to initial design concepts may have taken place <ul style="list-style-type: none"> analyse the function or appropriateness of a product and describe how or why it may have been changed <ul style="list-style-type: none"> identify some of the strengths and weaknesses of a design idea, product or process identify constraints in resources, processes, techniques or skills identify the benefits of making changes to ideas or maintaining original proposals exchange views with peers about products they have generated or design ideas they have had <ul style="list-style-type: none"> write a short report or make a photo story.
At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.	
<p>Examples</p> <ul style="list-style-type: none"> Students identify and follow a production process for making a mask that could be used in a cultural story or tale. Students follow their design plan to make a card for a friend using a publishing program on a computer. Students identify, describe and carry out cutting and joining procedures to make costumes for a fancy dress ball. 	<p>Examples</p> <ul style="list-style-type: none"> Students report on tests of materials selected for an unsinkable boat and describe how these tests led to changes in their initial design ideas. Students keep Technology project folios about the development of a frog pond and use it to compare similarities and differences between initial design ideas and products, including changes they make along the way.

Technology Practice	
Investigation Level 3	Ideation Level 3
<p>TP 3.1 Students examine knowledge, ideas and data from a range of sources and establish the relevance of this information when meeting design challenges.</p>	<p>TP 3.2 Students collaboratively generate design ideas and communicate these using presentations, models and technical terms.</p>
<p>Students know that knowledge, ideas and data:</p> <ul style="list-style-type: none"> • can be drawn from a range of sources • should be relevant to design challenges. <p>Students examine knowledge, ideas and data from a range of sources as they:</p> <ul style="list-style-type: none"> • research and draw information from various sources <ul style="list-style-type: none"> – library, the Internet – people — parents/carers, teachers, community – brochures, magazines – environments — excursions to specific places – products. <p>Students establish the relevance of information to the design challenge:</p> <ul style="list-style-type: none"> • identify what they need to know in order to undertake or meet the design challenge • identify user requirements and list existing products that meet similar needs • explain how the information gathered is related to the design challenge • annotate the design ideas they have collected with suggestions for using them to meet the design challenge. 	<p>Students know that:</p> <ul style="list-style-type: none"> • design ideas can be collaboratively generated • design ideas can be communicated using presentations, models and technical terms. <p>Students generate design ideas in response to a design challenge as they:</p> <ul style="list-style-type: none"> • work in groups <ul style="list-style-type: none"> – brainstorm designs for a classroom of the future – sketch possible designs for a birdfeeder – use CoRT Thinking Skills to evaluate ideas for revegetating a riverbank. <p>Students communicate design ideas as they:</p> <ul style="list-style-type: none"> • select from top view, front view and side view in 2D presentations to represent their design ideas and describe major features <ul style="list-style-type: none"> – in a top-view of a classroom of the future, include symbols for doors, walls and windows – in a side view of a birdfeeder, include measurements in millimetres – draw enlarged sections of key features • make 3D models or prototypes of their design ideas to approximate proportions <ul style="list-style-type: none"> – use various materials to make a 3D model of their bedroom of the future – use clay and other materials to make a 3D model of how a revegetated riverbank will look, and label or describe special features • use technical terms to describe their intentions and the major features of their designs <ul style="list-style-type: none"> – describe how their multimedia presentations will work using terms such as animation, transition, effects, font style – use correct terms and symbols to identify measurements, features, processes, tools or equipment <ul style="list-style-type: none"> · use a symbol for a door in a top-view of a room · identify measurements in millimetres, or appropriate scale.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students visit a pet shop or research online sources of information to determine appropriate environments for fish when developing an aquarium. • Students answer focus questions to investigate a handling collection of hats to identify and discuss appropriate features for a sun-smart hat. • Students use a survey to gather information about the school grounds to assist them to design a system for keeping the school litter free. • Students collaborate with Elders from the local Aboriginal community to prepare a bush tucker menu for a multicultural day. 	<p>Examples</p> <ul style="list-style-type: none"> • Students work in groups to generate and record designs for an enclosure for the class pet and use the designs to communicate size and major features. • Students collaborate with the local landcare group to develop a model for communicating their perceptions of how to revegetate a riverbank. • Students sketch more than one view of a compost system and identify measurements, material and features.

Technology Practice	
Production Level 3	Evaluation Level 3
<p>TP 3.3 Students cooperatively develop and follow production procedures to make products that reflect their design ideas.</p>	<p>TP 3.4 Students test and judge how effectively their own and others' processes and products meet the design challenge.</p>
<p>Students know that:</p> <ul style="list-style-type: none"> • production procedures can be developed cooperatively • production procedures can be followed to make products. <p>Students cooperatively develop production procedures as they:</p> <ul style="list-style-type: none"> • work together to describe and sequence steps they can follow to carry out production <ul style="list-style-type: none"> – discuss and select ways to work with materials <ul style="list-style-type: none"> • cut, past, join, save, melt, heat, screw, dig, chop – consider appropriate use of resources <ul style="list-style-type: none"> • availability, cost, suitability, environmental impacts – consider advice they receive from others about <ul style="list-style-type: none"> • tools and equipment (how to use a saw or sew with a needle and thread) • the nature of materials, information or systems they are working with – manage safety <ul style="list-style-type: none"> • use insulated gloves to remove hot things from a stove • finish a product so as to make it safe to use – work efficiently <ul style="list-style-type: none"> • set timelines and work to them • assign tasks • share resources • recycle waste. <p>Students follow production procedures in order to develop products as they:</p> <ul style="list-style-type: none"> • ensure that the quality of products are of a standard to meet their needs or the needs of others <ul style="list-style-type: none"> – follow identified production procedures – modify procedures to suit changing circumstances – monitor the quality of their work or the work of their team • adhere to safety procedures <ul style="list-style-type: none"> – seek assistance where needed – carry out safety checks. 	<p>Students know that:</p> <ul style="list-style-type: none"> • products and processes can be tested • judgments can be made about the effectiveness of processes and products. <p>Students test processes and products and make judgments as they:</p> <ul style="list-style-type: none"> • conduct tests and trials on products and processes in real-life and lifelike situations to determine <ul style="list-style-type: none"> – effectiveness – efficiency – durability – suitability • compare different products that meet the same need or want to determine the most appropriate product • identify requirements or constraints of design challenges and gauge opinions of others to judge how well products meet design challenges <ul style="list-style-type: none"> – judgments can be made <ul style="list-style-type: none"> • aesthetic appeal of colour, texture, sound, taste • cost • efficiency • cultural suitability • environmental and social impacts.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students work together to identify the steps, resources and assistance they will need to make a torch for a camping trip. • Students prepare a meal that can be taken to the beach and follow procedures they have developed to make it. • Students design and develop a system to help them keep track of their belongings on a school camp. 	<p>Examples</p> <ul style="list-style-type: none"> • Students record results from taste tests conducted on pizzas to inform judgments about the appropriateness of toppings used. • Students gather opinions about different designs they have developed to advertise a local event and use this information to evaluate the most appropriate design. • Students trial different processes for decorating fabric to select the most appropriate process for applying a T-shirt design. • Students test various pizza boxes to determine which is most effective in keeping a pizza warm.

Technology Practice	
Investigation Level 4	Ideation Level 4
<p>TP 4.1 Students use consultative methods to gather knowledge, ideas and data when researching alternatives within design challenges.</p> <p>Students know that knowledge, ideas and data are:</p> <ul style="list-style-type: none"> • gathered through various methods of consultation • used to research alternative solutions within a design challenge. <p>Students use consultation to gather knowledge, ideas and data as they:</p> <ul style="list-style-type: none"> • use a variety of methods to gather information from potential users <ul style="list-style-type: none"> – interview people with specialised knowledge <ul style="list-style-type: none"> • architect to seek advice on drawing • chef to seek advice on cooking techniques • Aboriginal Elder regarding cultural issues • nursery worker to seek advice on gardening • more experienced peers about hobbies • school staff with specialised knowledge • community representatives about local issues • potential users to identify constraints – use, for example, interviews, surveys, questionnaires and environmental scans to identify needs and verify information • use resources that specialists have developed to gather opinions or ideas from other communities <ul style="list-style-type: none"> – use email or online communities to seek information – gather information from brochures, pamphlets or advertisements – examine existing products to determine how others have met a similar challenge • discuss options and design ideas with interested people <ul style="list-style-type: none"> – gather opinions about the best designs to meet a design challenge. <p>Students research alternatives within design challenges as they:</p> <ul style="list-style-type: none"> • compare ideas gathered through consultation <ul style="list-style-type: none"> – identify options provided by different people – investigate specialised knowledge or techniques – use library facilities to gather ideas from books – search the Internet • identify advantages and/or disadvantages of particular ideas or options. 	<p>TP 4.2 Students generate design ideas through consultation and communicate these in detailed design proposals.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • consultation may be used to generate design ideas • communication of design ideas can be done using detailed design proposals. <p>Students generate ideas through consultation and communicate them as they:</p> <ul style="list-style-type: none"> • consult with others to generate design ideas <ul style="list-style-type: none"> – discuss the requirements of a design – discuss sketches of different designs with others – gather opinions about a design proposal – question others about features of design ideas – discuss problems that arise during the design process with a person with specialised knowledge • develop detailed design proposals that may include <ul style="list-style-type: none"> – background information about the design challenge, the purpose of their product and its intended users or audience – considerations of appropriateness, contexts and management – a record of consultation processes — sketches and annotated drawings from different views • communicate design ideas using a range of strategies <ul style="list-style-type: none"> – envisage and sketch possible solutions and alternatives to communicate them – use simple scales in plans and drawings – draw designs from a number of views – represent ideas using techniques or advice that has been gathered through consultation – construct prototypes or large-scale models using, for example, blocks, clay or other construction materials.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students interview a wildlife ranger to research different designs for a feeder for birds living in the local area. • Students visit websites and discussion lists about hydroponics to research information that will inform the development of a hydroponic garden. • Students analyse advice provided from peers about preferred features for a class web page and identify skills needed to develop these features. • Students collect home improvement pamphlets to identify ways of representing house plans and house design features that are appropriate to particular climates. 	<p>Examples</p> <ul style="list-style-type: none"> • Students generate ideas for festive decorations by showing sketches of different designs and discussing opinions about proposals. • Students consult with a landscape gardener to assist in developing plans that show appropriate detail when communicating ideas for a rainforest garden. • Students generate ideas about the organisation and activities for the class camp by consulting on a draft program. • Students generate a detailed design proposal for advertising ideas for a school disco.

Technology Practice	
Production Level 4	Evaluation Level 4
<p>TP 4.3 Students identify and make use of the practical expertise of others when following production procedures to make products for specific users.</p>	<p>TP 4.4 Students gather feedback to gauge how well their design ideas and processes meet design challenges and how effectively products meet the needs of specific users.</p>
<p>Students know that:</p> <ul style="list-style-type: none"> • practical expertise of others can be identified and used when following production procedures • products can be made for specific users. <p>Students identify and make use of the practical expertise of others when following production procedures as they:</p> <ul style="list-style-type: none"> • consult people with practical expertise to personally develop skills and techniques <ul style="list-style-type: none"> – ask for guidance in the operation of specialised equipment <ul style="list-style-type: none"> • seek assistance to use a digital camera – learn a particular skill or technique <ul style="list-style-type: none"> • learn how to sew a seam when joining fabric • seek assistance from others to extend their ability to complete a task <ul style="list-style-type: none"> – engage people who work with specialised equipment to safely carry out a particular task <ul style="list-style-type: none"> • organise a printer to colour print tickets for a school event – engage people with specialised skills to carry out techniques which are beyond their own capability <ul style="list-style-type: none"> • identify a person in the community who is qualified to safely weld metal for them. <p>Students make products for specific users as they:</p> <ul style="list-style-type: none"> • negotiate with specific users to enable their requirements to be met <ul style="list-style-type: none"> – work to clearly defined specifications <ul style="list-style-type: none"> • refer to production proposals • identify any special features of the product • document and record decisions – provide advice on progress to users <ul style="list-style-type: none"> • use samples, prototypes or models – seek feedback on progress of production from users <ul style="list-style-type: none"> • negotiate timelines • check quality – safely manage materials and production processes. 	<p>Students know that:</p> <ul style="list-style-type: none"> • feedback can be gathered • feedback can be used to gauge how well design ideas and processes meet design challenges. <p>Students gather feedback from specific users as they:</p> <ul style="list-style-type: none"> • conduct surveys • examine questionnaires • use suggestion boxes • conduct interviews • compare products. <p>Students gauge how well processes and products meet design challenges as they:</p> <ul style="list-style-type: none"> • compare feedback to judge the effectiveness of designs prior to production • consider the opinions of others to assess the effectiveness of designs and products • consider criteria provided by specific users to enable the selection of one design from a range of alternatives based on feedback • survey target groups on the appropriateness of the product • reflect on products and processes by comparing finished products with their original ideas • demonstrate how their ideas evolved into products by pointing out special features and explaining why these features were included • gather feedback by using a product in a real-life situation.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students seek advice to learn how to authentically decorate kites when making Asian kites for a school fete. • Students organise for a person with a kiln to safely fire clay pots they have designed as a gift for a family member. • Students seek assistance to join components of a stand for a birdfeeder to be placed in the school gardens. • Students organise for colour printing of brochures and posters to inform visitors about fauna in a local area. 	<p>Examples</p> <ul style="list-style-type: none"> • Students analyse feedback gathered about the effectiveness of a recipe card they have made to evaluate the appropriateness of its content and layout. • Students evaluate the quality of the finish on a wooden toy designed for a young child by comparing their own products with other products produced for similar purposes. • Students distribute a questionnaire about the school camp to see how well the event met the needs of the children who attended.

Technology Practice	
Investigation Level 5	Ideation Level 5
<p>TP 5.1 Students analyse links between the knowledge, ideas and data gathered to meet design challenges and the design and development of new and improved products.</p>	<p>TP 5.2 Students generate design ideas and communicate these in design proposals that indicate an understanding of factors influencing the development of option(s) they have selected.</p>
<p>Students know:</p> <ul style="list-style-type: none"> that the development of new or improved products is linked to knowledge, ideas and data how to analyse knowledge, ideas and data and link it to the development of new or improved products. <p>Students link knowledge, ideas and data to the development of new and improved products within a design challenge as they:</p> <ul style="list-style-type: none"> capitalise on new materials, products or techniques to enhance products by, for example, using Velcro instead of buttons or zips or invent new products envision ways of developing products to meet new or emerging needs, wants or opportunities determine how and why products evolve to meet changing needs and wants by, for example, developing a handling collection that shows the evolution of the telephone explain why existing products no longer meet needs or wants. <p>Students analyse links as they:</p> <ul style="list-style-type: none"> consider criteria developed for the design challenge and match materials/techniques to the design requirements examine changes in products over time and evaluate alternative ways to meet needs and wants compare existing products by evaluating how well they meet needs and wants interpret information from different sources to identify ways to use alternative materials question reasons for product development and consider how needs and wants have changed and continue to change. 	<p>Students know that:</p> <ul style="list-style-type: none"> a number of design ideas can be generated and a viable idea can be selected from these design proposals should indicate a range of factors influencing the selection and realisation of designs. <p>Students generate and select design ideas as they:</p> <ul style="list-style-type: none"> devise a range of options and select viable design ideas <ul style="list-style-type: none"> work in groups to identify various design ideas to meet needs, wants or opportunities and from these select their preferred option work individually to generate designs and select the most appropriate for their purposes. <p>Students communicate design proposals that indicate influences on selection and realisation of ideas as they:</p> <ul style="list-style-type: none"> outline factors that influence design choices <ul style="list-style-type: none"> include records of consultation with specialists/users/clients/design team members in their Technology project folios describe how issues related to context, appropriateness and management affect the design and realisation of a product <ul style="list-style-type: none"> identify the impacts and consequences arising from its design or development identify design constraints and opportunities related, for example, to materials and costs by including detailed specifications or annotating plans and drawings include, for example, a comparison table that illustrates reasons for selecting or rejecting ideas use software to generate 2D and 3D images to enhance their design proposals.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> Students ascertain a shop's advertising requirements and use this information to create a new window display. Students review advertising materials developed for letterbox drops, and analyse ways to improve them including use of materials, special techniques and layout of information. Students identify safety issues in a workshop, analyse existing practices and design safety signs that help to improve the safety procedures. Students investigate the design of new and improved hamburgers that meet prescribed standards. 	<p>Examples</p> <ul style="list-style-type: none"> Students generate options for an orchard irrigation system, and describe factors influencing the selection of their preferred idea in their design proposals. Students show in their design proposals how they used specifications to guide the selection of an idea, and the identification of relevant processes and equipment needed to realise the idea. Students consider different design options when creating a coordinated suite of business stationery — for example, business cards and letterhead for a local company.

Technology Practice	
Production Level 5	Evaluation Level 5
<p>TP 5.3 Students meet predetermined standards as they follow production procedures to make quality products.</p>	<p>TP 5.4 Students use predetermined criteria to judge how well processes and products meet the needs of specific users, and recommend modifications or improvements.</p>
<p>Students know that:</p> <ul style="list-style-type: none"> • production procedures are affected by predetermined standards • quality of products is dependent on how well production procedures are followed to meet predetermined standards <p>Students follow production procedures to meet predetermined standards as they:</p> <ul style="list-style-type: none"> • meet standards of quality that reflect clients' needs <ul style="list-style-type: none"> – use quality materials to achieve desired effects • manage resources within constraints <ul style="list-style-type: none"> – share limited equipment and/or resources – substitute alternative resources if necessary – work within budget constraints – allocate tasks to make effective use of time • modify their proposed production procedures to, for example <ul style="list-style-type: none"> – ensure safety – minimise waste <ul style="list-style-type: none"> • use recycled material and recycle waste – respond to changes that occur during production <ul style="list-style-type: none"> • adjust components to fine-tune systems. <p>Students make quality products to meet predetermined standards as they:</p> <ul style="list-style-type: none"> • identify the predetermined standards related to <ul style="list-style-type: none"> – workplace health and safety requirements – clients' needs and/or product specifications – design constraints • follow correct procedures for using tools and equipment safely • use techniques that will provide the necessary level of accuracy or flexibility <ul style="list-style-type: none"> – select procedures that match resources <ul style="list-style-type: none"> • optimise images for the Internet • measure ingredients accurately using electronic scales • consider how procedures and decisions about production may impact on appropriateness of the final product <ul style="list-style-type: none"> – identify economical methods of production – minimise negative impacts of production processes <ul style="list-style-type: none"> • minimise noise levels generated by equipment. 	<p>Students know that:</p> <ul style="list-style-type: none"> • predetermined criteria can be used to make judgments about products and processes • judgments can be used to inform recommendations about modifications or improvements to products or processes. <p>Students use predetermined criteria to judge how well products and processes meet the needs of specific users as they:</p> <ul style="list-style-type: none"> • identify issues of appropriateness, context and management <ul style="list-style-type: none"> – consider needs of specific users – recognise that a range of appropriateness can be used to evaluate a process or product • describe how particular criteria were met or were intended to be met • make judgments about the effectiveness of particular processes <ul style="list-style-type: none"> – compare different processes – identify efficient or economical processes • make judgments about how a product meets predetermined criteria <ul style="list-style-type: none"> – carry out a range of product tests – identify how special features meet predetermined criteria. <p>Students use judgments to inform recommendations about improvements to products or processes as they:</p> <ul style="list-style-type: none"> • provide reflections about the effectiveness of their own or others' work • report to users about modifications that could be considered about processes and the ways they were carried out • make recommendations about changes to products that may enhance the ways they meet specific needs or wants.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students identify safety issues related to the operation of equipment needed to make a barbeque. • Students working in groups have regular, documented team meetings to manage aspects of a project including financial planning and budgeting, and consider modifications they will need to make in order to deal with resource constraints when planning a school play. • Students follow appropriate procedures and work with selected resources to produce a container for carrying an item of sports equipment on a pushbike. 	<p>Examples</p> <ul style="list-style-type: none"> • Students use criteria provided by others to evaluate products, such as barbeques, and make recommendations about ways to improve their functionality for specific users. • Students consider a range of ways to compare hamburger production for a school fete against predetermined criteria and use these comparisons to recommend changes in features or processes.

Technology Practice	
Investigation Level 6	Ideation Level 6
<p>TP 6.1 Students formulate detailed plans for gathering knowledge, ideas and data and validate choices of information, sources and methods.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • a detailed plan can be developed to gather knowledge, ideas and data • information comes from a range of sources and choices of information and methods of data collection can be validated. <p>Students formulate detailed plans for gathering knowledge, ideas and data as they:</p> <ul style="list-style-type: none"> • develop an action plan describing: <ul style="list-style-type: none"> – range of sources <ul style="list-style-type: none"> • target groups, clients, stakeholders, libraries, Internet, books, products – range of collection methods <ul style="list-style-type: none"> • surveying — field survey, target groups to collate data and inform decision making • researching — existing ways of solving problems with the view to developing new and innovative ideas to solve these problems • questioning — peers, stakeholders, specialists, users • scanning — environmental scan of identified communities and groups such as a soccer club, school, community group • interviewing — focusing on clients' needs • handling collections • testing — beta testing, bench testing, taste testing, field testing • disassembling/reassembling • sampling – record their detailed plan including timelines in their Technology project folios. <p>Students validate choices of information, sources and methods used to gather it as they:</p> <ul style="list-style-type: none"> • consider questions about the validity of the information <ul style="list-style-type: none"> – What are the sources and what relevance do they have to the design challenge? – How relevant is the data gathered in reflecting the clients' needs? – Is the information source reliable and without bias? • consider the practicality of the plan within the constraints • provide evidence (e.g. author, organisation) that the information is accurate and factual. 	<p>TP 6.2 Students generate design ideas and communicate these in design proposals that indicate various options and incorporate management strategies.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • design ideas can be generated and then communicated in design proposals that indicate various options • design proposals record and communicate management strategies. <p>Students generate design ideas and indicate various options as they:</p> <ul style="list-style-type: none"> • identify a range of resources that could be used to make a product • describe appropriate techniques that they could employ • indicate what makes an option appropriate • record, communicate and generate various options <ul style="list-style-type: none"> – written notes and specifications resulting from consultation with potential clients – detailed sketches, diagrams or plans developed using CAD or 3D software that help to communicate options – prototypes or models that indicate features – presentations to clients/potential users. <p>Students record and communicate management strategies as they:</p> <ul style="list-style-type: none"> • identify strategies for managing people <ul style="list-style-type: none"> – consult with team members to establish workable timelines and to allocate tasks – collaborate with other teams to share ideas or resources – coordinate compatibility between projects • develop plans for managing resources <ul style="list-style-type: none"> – share resources – minimise waste – recycle materials – purchase materials • manage opportunities <ul style="list-style-type: none"> – identify opportunities that exist for innovation – consider enterprise aspects of options • plan for managing constraints <ul style="list-style-type: none"> – lists of materials and sources – consider budgets – production schedules/timelines.
At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.	
<p>Examples</p> <ul style="list-style-type: none"> • Students develop a detailed plan to undertake pre-market and post-market research within the school, or a specific community, leading to the development and evaluation of a product. • Students formulate a detailed plan to gather information from a visiting dietician or food technologist when designing food packs for athletes. • Students validate information they have gathered about the development of web pages for a club or society by cross-referencing their data with other sources. 	<p>Examples</p> <ul style="list-style-type: none"> • Students prepare Technology project folios identifying a range of designs for clothing, including concept sketches or patterns, and strategies for managing the production of a particular option. • Students communicate options for products that support the school musical including posters, programs, lighting and stage settings, and work in groups to develop production plans for developing various aspects. • Students use a 3D model to communicate options for a skate park and detail management issues related to its location and system of operating.

Technology Practice	
Production Level 6	Evaluation Level 6
<p>TP 6.3 Students negotiate and refine production procedures in making quality products that meet detailed specifications.</p>	<p>TP 6.4 Students identify methods for evaluating commercial or industrial products and processes and use these to judge the appropriateness of their own processes and products.</p>
<p>Students know that:</p> <ul style="list-style-type: none"> production procedures can be negotiated and refined quality products meet detailed specifications. <p>Students negotiate and refine production procedures as they:</p> <ul style="list-style-type: none"> share ideas about production procedures and reflect on ways to modify or refine them consider the management of production processes <ul style="list-style-type: none"> systemise production by breaking it into stages set time lines for production identify how to make efficient use of resources within constraints demonstrate understandings of commercial and industrial standards <ul style="list-style-type: none"> consider industrial processes used to streamline production processes examine issues associated with quality production methods of different organisations. <p>Students make quality products that meet detailed specifications as they:</p> <ul style="list-style-type: none"> apply, where appropriate, commercial and industrial standards in meeting specifications <ul style="list-style-type: none"> labelling standards when making a food product follow identified procedures and specifications to achieve accuracy and quality <ul style="list-style-type: none"> use quality control and quality assurance processes in their production use resources that are appropriate to the product and its intended use <ul style="list-style-type: none"> optimise images and save them in suitable format for use on a web page. 	<p>Students know that:</p> <ul style="list-style-type: none"> there are methods for evaluating industrial or commercial products and processes methods used to judge industrial or commercial products and processes can be applied to judge appropriateness of their own products and processes. <p>Students identify methods used to evaluate industrial and commercial products and processes as they:</p> <ul style="list-style-type: none"> describe different methods used to evaluate industrial and commercial products <ul style="list-style-type: none"> explain methods of evaluation based on information gathered from, for example, government or commercial websites compare purposes and key features of methods and gather feedback to evaluate their efficiency investigate how industrial or commercial methods may be transferred or adapted to the requirements of their design challenge. <p>Students evaluate the appropriateness of their own products and processes by applying methods similar to those used in commercial or industrial contexts as they:</p> <ul style="list-style-type: none"> devise their own methods based on those used in industrial or commercial contexts to: <ul style="list-style-type: none"> gather and use feedback design a quality assurance process assess the quality of a product of process <ul style="list-style-type: none"> seek advice from external evaluators about social or cultural appropriateness field test a product to establish environmental appropriateness use destructive or non-destructive testing methods to establish functionality assess the economic viability of their product or process.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> Students work in teams as they test and select appropriate production procedures to work with the fabric they have selected for a beachwear range and complete stages of production while monitoring quality. Students identify production procedures for developing commercially produced fishing lures and refine their production processes to approximate these in order to develop a quality product. Students use specialised software to produce a website that incorporates animation and digital images, and meets specifications related to download time and accessibility. 	<p>Examples</p> <ul style="list-style-type: none"> Students identify methods used to evaluate educational resources and use the information to devise ways to evaluate talking books they produce for young children. Students gather information about food preparation processes and use this information to monitor the safety and freshness of food prepared for a school function. Students evaluate the success of a hydroponic vegetable venture by using criteria based on similar commercial ventures to judge the cost effectiveness of their project. Students use destructive and non-destructive tests to evaluate the strength of their bridge models.

Information	
<p>Level statement — Foundation Level: Students are developing an understanding of information by exploring familiar sources and forms of information and different ways of accessing it. They frequently make meaning of the information they receive. They experiment with a variety of ways of communicating information.</p>	
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Students explore familiar sources and forms of information as they:</p> <ul style="list-style-type: none"> • identify some sources of information <ul style="list-style-type: none"> – people who help them with tasks – books that they use – programs on television – signs in their communities – logos, symbols or pictures • respond to or use different forms of information <ul style="list-style-type: none"> – visual information such as signs or signals – oral information such as speech or vocal sounds – using smell, touch or taste – aural information such as hearing, clapping, ringing a bell. <p>Students access information in different ways as they:</p> <ul style="list-style-type: none"> • watch a person model an action • identify directions given orally, visually or aurally • ask questions by signing, gesturing or speaking • use their senses • use communication devices • look at pictures in books or magazines • use, with structured assistance, the Internet, information touch screens, talking CDs. <p>Students make meaning of information they receive as they:</p> <ul style="list-style-type: none"> • understand some technical terms <ul style="list-style-type: none"> – name/use tools, equipment • follow directions or instructions • react to the stimulations of their senses • interpret information in meaningful ways <ul style="list-style-type: none"> – telephone ringing, walk only when signal is green. <p>Students experiment with a variety of ways of communicating as they:</p> <ul style="list-style-type: none"> • use information for their own purposes <ul style="list-style-type: none"> – express an idea using signs, gestures or symbols – communicate feelings visually by pointing to pictures – show ownership using a sign. 	
<p>The following are examples of learning outcomes developed from the level statement for Foundation Level. Use these outcomes, or create others, to meet the individual needs and group needs of the class.</p> <p>Students' demonstrations of outcomes are apparent when they have provided evidence across a range of contexts as exemplified below.</p>	
<p>Example learning outcome: Students react to stimuli in their environment in various ways.</p>	<p>Example learning outcome: Students use sound, visual or concrete representations to present information.</p>
<p>Students:</p> <ul style="list-style-type: none"> • indicate awareness of environmental changes through posture, eye gaze, startle reflex <ul style="list-style-type: none"> – sound of an approaching train – school bell – smell of food • indicate signs in their community <ul style="list-style-type: none"> – 'walk' signs at pedestrian crossings – logos or symbols for cafes, restaurants or shops – for community services such as police or ambulance – within the school such as toilet or office – for bus stops. 	<p>Students:</p> <ul style="list-style-type: none"> • display photographs of specific family members • create drawings or models of family members in domestic situations • manipulate digital images of family members for a communication board • label their possessions using an icon.

Information	
Nature Level 1	Techniques Level 1
<p>INF 1.1 Students identify and describe different forms of information.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • information exists • forms of information can be identified and described. <p>Students understand how information exists as they:</p> <ul style="list-style-type: none"> • realise there are different sources of information <ul style="list-style-type: none"> – people – television/radio/print – libraries – Internet • realise there are different forms of information <ul style="list-style-type: none"> – aural — spoken, sound <ul style="list-style-type: none"> • telephone conversation, school bell – visual — text, graphical <ul style="list-style-type: none"> • recipe, email letter, drawings of ideas, advertising brochure – multimedia — combinations of different media <ul style="list-style-type: none"> • program on the television, interactive story book on CD-ROM, website. <p>Students identify and describe different forms of information as they:</p> <ul style="list-style-type: none"> • consider and discuss forms in which information is conveyed <ul style="list-style-type: none"> – signs, symbols and logos used in public places – explanatory photographs and videos – information posters – labels in classrooms – television advertisements – non-fiction books – sound recordings such as music CDs or story tapes – telephone book • locate forms of information in the community <ul style="list-style-type: none"> – identify some forms of information in the local area <ul style="list-style-type: none"> • street name, road signs, billboards – use libraries or the Internet <ul style="list-style-type: none"> • electronic • text • graphical • pictorial. 	<p>INF 1.2 Students use simple techniques for presenting information for their own purposes.</p> <p>Students know how:</p> <ul style="list-style-type: none"> • simple techniques are used to present information. <p>Students prepare and present information for their own purposes as they:</p> <ul style="list-style-type: none"> • use simple techniques to prepare information <ul style="list-style-type: none"> – draw <ul style="list-style-type: none"> • pictures for posters • pictures to illustrate a product – lay out information <ul style="list-style-type: none"> • cut/paste items to create charts • layout of information using a computer • write lists to use for different purposes • write simple sentences (with assistance) to explain their ideas – use certain design techniques they have observed <ul style="list-style-type: none"> • colour • change text • change font size. • use simple techniques to present information <ul style="list-style-type: none"> – oral presentations – display posters – print information using a computer – electronic slide shows – pictures, using a digital camera or video – audio recordings.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students describe how road signs are used in their surroundings and use simple techniques to make their own signs for the classroom. • Students examine the layouts of storybooks and apply them to make new storybooks. • Students look at recipes and present a drawing of a sequence of steps to explain how they wish to make sandwiches. • Students observe posters in the library and select ways to organise a display board of photos from an excursion. • Students use computers, with assistance, to access sources of information and print the information they find. • Students watch information programs on television and video their own roleplays of these programs. 	

Information	
Nature Level 2`	Techniques Level 2
<p>INF 2.1 Students explain the purposes of different forms of information and describe how these are used in everyday life.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • different forms of information have different purposes • different forms of information are used in everyday life. <p>Students explain the purposes of information as they:</p> <ul style="list-style-type: none"> • consider the role of different forms of information <ul style="list-style-type: none"> – to instruct <ul style="list-style-type: none"> · a recipe for making playdough · symbols such as road symbols – to persuade <ul style="list-style-type: none"> · advertising on TV and billboards – to inform <ul style="list-style-type: none"> · news on TV, newspapers, magazines – to report <ul style="list-style-type: none"> · non-fiction books, weather reports – to help different people understand the same message <ul style="list-style-type: none"> · sign language, symbols – to entertain <ul style="list-style-type: none"> · a joke or a film. <p>Students consider how forms of information are used in everyday life as they:</p> <ul style="list-style-type: none"> • record which forms of information students, their families and friends access <ul style="list-style-type: none"> – newspapers for information – television programs for entertainment – instructions for assembling an item – recipes when cooking – signs when locating a shop or street – diagrams or maps to find a location – instructions to enter competitions – advertisements to persuade themselves or others to buy things or do things. 	<p>INF 2.2 Students use simple techniques for accessing and presenting information for themselves and others.</p> <p>Students know how:</p> <ul style="list-style-type: none"> • simple techniques are used to access and present information. <p>Students access and present information for themselves and others as they:</p> <ul style="list-style-type: none"> • access information <ul style="list-style-type: none"> – use the library to gather data – question classmates about opinions, feelings or ideas – use the computer to access information from a CD-ROM – use books to find information – watch television or video to gather information about a selected topic • present information <ul style="list-style-type: none"> – identify purposes for presentation <ul style="list-style-type: none"> · to instruct · to persuade · to inform · to report · to help different people understand the same message · to entertain – identify the intended audience – select forms that are appropriate for the purpose <ul style="list-style-type: none"> · present this information in a simple graph · present it using a computer program · make a simple chart of instructions for others to follow.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students identify the role of colour in packaging and use bright colours to make advertisements. • Students examine features used in a newspaper layout, such as print size and font style, and adopt these ideas as they design their own newspapers. • Students examine how television interviews report on people's ideas and use a video camera to record a report on the environmental views of their classmates. • Students explain why they use a simple graph to present information from a class survey about how children get to school. • Students explain how their poster, created with the computer, informs people about the school fete and encourages them to attend. 	

Information	
Nature Level 3	Techniques Level 3
<p>INF 3.1 Students describe advantages and disadvantages of different sources and forms of information.</p>	<p>INF 3.2 Students select and use techniques for generating, modifying and presenting information for different purposes.</p>
<p>Students know that:</p> <ul style="list-style-type: none"> • information comes from different sources and can be presented in different forms • different sources and forms have advantages and disadvantages. <p>Students describe the different sources and forms of information as they:</p> <ul style="list-style-type: none"> • identify different sources of information appropriate to their needs <ul style="list-style-type: none"> – list and choose sources of information — for example, Internet, books, television, signs, environment, people – classify information according to its source • gather and compare information in various forms <ul style="list-style-type: none"> – collect and compare a newspaper feature article, editorial and letters to the editor on a particular topic. <p>Students describe advantages and disadvantages of different forms and sources of information as they:</p> <ul style="list-style-type: none"> • compare information to determine its appropriateness in meeting a design challenge • establish reliability and relevance of forms and sources of information <ul style="list-style-type: none"> – compare newspaper articles with television coverage about the same news story – compare forms and sources of information accessed electronically with library resources – compare information from people and consider its reliability • consider the effects of different forms of information <ul style="list-style-type: none"> – compare the visual appeal of black-and-white and colour photographs – compare the use of sound in radio and television advertisements – evaluate different combinations of media in multimedia products such as websites or multimedia presentations. 	<p>Students know how:</p> <ul style="list-style-type: none"> • techniques can be selected and used to generate, modify and present information. <p>Students generate, present and modify information for different purposes as they:</p> <ul style="list-style-type: none"> • generate information <ul style="list-style-type: none"> – organise information so it can be used for different purposes <ul style="list-style-type: none"> · use a computer to organise information in different ways · record data using tables they have designed • present information <ul style="list-style-type: none"> – display information in forms that are meaningful to the purpose <ul style="list-style-type: none"> · adopt ideas about presentation from an existing form · present data in a simple table or spreadsheet – consider appropriateness when laying out information <ul style="list-style-type: none"> · aesthetic appeal, social relevance – use equipment such as digital cameras, video and audio devices to present information <ul style="list-style-type: none"> · record and develop a video about a class camp • modify information <ul style="list-style-type: none"> – consider feedback about presentations and use this to change them <ul style="list-style-type: none"> · trial a multimedia presentation to gather reactions to the use of different background colours · show samples of pictures to be used on a poster – use computers to cut, paste and print information from one source and modify it in order to create a new information product <ul style="list-style-type: none"> · a brochure, school project or assignment.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students describe the advantages and disadvantages of different ways of circulating information about their school camp and select ways to present the information. • Students select techniques to create and modify a web page about the school and describe some of the advantages and disadvantages of presenting the information in this form. • Students describe advantages and disadvantages of different forms of advertising and generate advertisements for the same product using different forms and appropriate techniques. • Students input data that they have gathered about Australian animals into a database, and discuss advantages and disadvantages of generating, presenting and modifying information in this form. 	

Information	
Nature Level 4	Techniques Level 4
<p>INF 4.1 Students analyse sources and forms of information and match these to the requirements of design challenges.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • sources and forms of information can be analysed • sources and forms of information can be matched to the requirements of design challenges. <p>Students analyse sources of information as they:</p> <ul style="list-style-type: none"> • verify whether the source of information is reliable, comprehensive, current, accurate, unbiased <ul style="list-style-type: none"> – currency of text in magazines, Internet, books – credibility of information from the Internet – bias of television programs. <p>Students analyse forms of information as they:</p> <ul style="list-style-type: none"> • compare similar information stored, presented and/or transmitted in different ways • evaluate the effectiveness of methods of presenting and transmitting information such as print and electronic forms • identify the purposes of the features — for example, text type, layout, use of graphics and sound — in different forms of information. <p>Students match sources of information to requirements of design challenges as they:</p> <ul style="list-style-type: none"> • identify specifications and constraints in a design brief <ul style="list-style-type: none"> – timelines, management or other requirements • seek specialised information from reliable sources to inform the development of their design ideas • seek clarification of user requirements or feedback on design ideas or products from potential users <ul style="list-style-type: none"> – interview potential users – involve potential users in test runs or trials. <p>Students match forms of information to requirements of design challenges as they:</p> <ul style="list-style-type: none"> • identify effective forms of information for particular purposes • identify suitable forms of information for specific audiences <ul style="list-style-type: none"> – cultural significance of using specific colours – inclusivity of a selection of pictures – acceptable use of terminology. 	<p>INF 4.2 Students apply techniques for transforming and transmitting information for different audiences.</p> <p>Students know how:</p> <ul style="list-style-type: none"> • techniques are applied to transform and transmit information. <p>Students transform and transmit information for different audiences as they:</p> <ul style="list-style-type: none"> • transform information using a variety of techniques <ul style="list-style-type: none"> – use special effects in a computer program <ul style="list-style-type: none"> · slide transitions and sound effects · insert animated graphics – use specialised equipment to manipulate information in different ways <ul style="list-style-type: none"> · scan or take digital images to include in a brochure · convert data to a pictorial or graphical presentation – use freehand techniques to layout a product, manipulate and present information <ul style="list-style-type: none"> · a brochure for tourists about local wildlife – edit wording to make it appropriate for a specific audience – redesign the information products of others to make them more effective for specific users • transmit information in appropriate forms <ul style="list-style-type: none"> – send information to communities in a remote location via the Internet or email – select appropriate forms to communicate information to a large audience <ul style="list-style-type: none"> · design a poster to advertise an event · present an advertisement in audio form as well as visual form • report on changes to the media <ul style="list-style-type: none"> – the Internet — the ease of access to a wide range of current information • research contemporary sources of information and compare them with those of the past • describe the effects that changes to sources of information have on occupations and leisure • access different sources • present the same information in a range of ways targeting the needs of particular audiences.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students verify the currency of information by including references to publication dates and explain how the information can be used to meet the design challenge. • Students access reliable sources of information to inform their development of local area maps for the school website. • Students analyse information from a parents/carers' survey about their preferences for school lunches and compare the effectiveness of emailing the survey findings to parent/carers or reporting them in the school newsletter. • Students examine bias in television interviews and make a video recording to present an unbiased view of an event or issue. 	

Information	
Nature Level 5	Techniques Level 5
<p>INF 5.1 Students explain how changes to sources, forms and management of information affect design and production decisions.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • changes in sources, forms and management of information are ongoing • changes in sources, forms and management of information affect production decisions. <p>Students consider reasons for changes to sources, forms and management of information as they:</p> <ul style="list-style-type: none"> • identify reasons for ongoing change <ul style="list-style-type: none"> – technical advances <ul style="list-style-type: none"> · invention of computers and the Internet · invention of analogue and digital mobile phones – changes in society <ul style="list-style-type: none"> · changes in government and public perceptions · uptake of procedures related to new technology – changes to public policy <ul style="list-style-type: none"> · privacy legislation · regulations for food labelling – financial changes resulting in accessibility to equipment • describe some impacts of changes to sources, forms and management of information on, for example, health, study, occupations and leisure <ul style="list-style-type: none"> – accessibility of information – volume of information <ul style="list-style-type: none"> · sources vary in reliability · multiple forms of information exist – data management <ul style="list-style-type: none"> · privacy issues · data integrity · data security. <p>Students explain how ongoing changes to sources, forms and management of information affect design and production decisions as they:</p> <ul style="list-style-type: none"> • examine impacts of technological advances to sources and forms of information <ul style="list-style-type: none"> – CAD programs — rendering – programmable devices — robots – encryption of information — online banking • compare past and present information management systems and identify impacts of changes to these • predict implications of emerging technologies. 	<p>INF 5.2 Students compare and select techniques for processing, managing and presenting information for specific users.</p> <p>Students know how:</p> <ul style="list-style-type: none"> • techniques are compared and selected to process, manage and present information. <p>Students process, manage and present information for specific users as they:</p> <ul style="list-style-type: none"> • compare and select techniques <ul style="list-style-type: none"> – select tools such as computers and use computer programs to manipulate and present information in specialised ways <ul style="list-style-type: none"> · use charts and graphs to present financial information – use equipment such as scanners, computers, VCRs, cameras and tape recorders <ul style="list-style-type: none"> · select appropriate equipment for the type of information product that is most suitable for the task and audience — a photograph may require transfer to a digital image for electronic transmission – organise and store information <ul style="list-style-type: none"> · create suitable filing systems · back up file and store to disk – retrieve information <ul style="list-style-type: none"> · compare the retrieving of information from traditional paper storage and electronic storage – transform and transmit information • make decisions about design and production <ul style="list-style-type: none"> – consider the requirements of the audience <ul style="list-style-type: none"> · children compared with adults – decide on the format for a presentation <ul style="list-style-type: none"> · a brochure format compared with an electronic format – consider the implications of choosing a particular medium for their product <ul style="list-style-type: none"> · printed format compared with non-printed format • present information for specific users <ul style="list-style-type: none"> – consider the needs of individual users when designing information <ul style="list-style-type: none"> · special needs, remoteness or access to and availability of equipment – consider the cultural background of potential audiences and how this affects interpretation and use of information.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students consider the design and production features of multimedia software when creating a presentation to inform other students about vacation activities. • Students consider the implications of privacy related to recording people's personal details when developing a database. • Students consider impacts of changes in the ways information is presented on specific groups of people, and select techniques to present information in forms that are meaningful to them. • Students explain how perceptions of health have led to changes in labelling and use this information to create packaging for genetically modified products or 'low fat' products. 	

Information	
Nature Level 6	Techniques Level 6
<p>INF 6.1 Students analyse issues related to the ownership and control of information in societies.</p>	<p>INF 6.2 Students use specialised techniques for managing and organising the presentation of information to meet detailed specifications.</p>
<p>Students know that:</p> <ul style="list-style-type: none"> • there are issues related to ownership of information • the control of the presentation and transmission of information by individuals and groups impacts on societies. <p>Students analyse issues related to ownership of information as they:</p> <ul style="list-style-type: none"> • observe intellectual property rights <ul style="list-style-type: none"> – seek permission for use – acknowledge sources of information – recognise the need for patents • discuss issues related to ownership of information <ul style="list-style-type: none"> – plagiarism – controlling access to information – censorship – privacy. <p>Students analyse issues related to the control of the presentation and transmission of information as they:</p> <ul style="list-style-type: none"> • identify influences of different groups on how information is presented and transmitted <ul style="list-style-type: none"> – compare presentation and transmission of information in different media – identify legislated requirements for presentation and transmission of information – identify impacts of restricting bandwidth for data communication • identify issues that may impact on the accessibility of information <ul style="list-style-type: none"> – ownership of media companies <ul style="list-style-type: none"> • software development by a limited number of companies • ownership of television and print media • availability of technology for accessing information <ul style="list-style-type: none"> – accessibility to computers and the Internet • consider issues that may impact on the way information is presented <ul style="list-style-type: none"> – provision of information in different forms to increase access – availability of technology for presenting information in accessible forms. 	<p>Students know how:</p> <ul style="list-style-type: none"> • specialised techniques are used to manage, organise and present information. <p>Students manage, organise and present information to meet detailed specifications as they:</p> <ul style="list-style-type: none"> • use specialised techniques to manage information <ul style="list-style-type: none"> – make use of the Internet and email to access and transmit information – manage the distribution of interrelated pieces of information <ul style="list-style-type: none"> • coordinate the advertising for a product they have developed • consider management of a school magazine • use specialised techniques to organise information <ul style="list-style-type: none"> – develop a database for the storage and retrieval of information – use spreadsheets • use specialised techniques to present information <ul style="list-style-type: none"> – specialised software programs to achieve desired effects <ul style="list-style-type: none"> • CAD programs, multimedia programs, animation programs, publishing programs, webpage designs • video software to create an online video clip • software to create a virtual fly-through of a public space they have designed – create information products using a range of media sources and equipment <ul style="list-style-type: none"> • record/edit/produce a short video clip • develop a suite of business stationery including letterhead, web page, email, business card.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students critically investigate and debate ownership and control issues related to a website they are developing that provides music samples of popular bands. • Students use storyboard techniques to manage the shooting of an advertisement and consider issues of control that relate to the presentation of advertisements on television. • Students produce a multimedia information package for a tourist destination on CD-ROM and investigate ethical issues related to selected images, text and music. • Students investigate the control of media in Australia and create a website that provides access to a range of publications controlled by different interests. 	

Materials	
<p>Level statement — Foundation Level: Students are developing understandings of the basic characteristics of familiar materials through exploration. They choose materials from a range of options. They select materials for simple tasks, and suitable tools and equipment for manipulating and processing the materials.</p>	
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Students are developing understandings of basic characteristics of materials as they:</p> <ul style="list-style-type: none"> • investigate materials by handling them <ul style="list-style-type: none"> – sort materials by texture <ul style="list-style-type: none"> • rough or smooth – describe cooking ingredients by their characteristics <ul style="list-style-type: none"> • wet or dry • categorise the characteristics of materials <ul style="list-style-type: none"> – light or heavy – shiny or dull • explore materials in their play <ul style="list-style-type: none"> – float or sink – dry or damp. <p>Students choose materials for simple tasks as they:</p> <ul style="list-style-type: none"> • select different materials to decorate an object • select a suitable material to make a card for a special occasion. <p>Students choose tools, equipment and props for manipulating and for processing the materials as they:</p> <ul style="list-style-type: none"> • select a knife to spread butter to make a sandwich • select a suitable container to carry water • use a prop, in socio-dramatic play, to manipulate an imaginary material • select tools required to carry out tasks such as cutting or pasting • use scissors to cut paper when making a card • use a spade to dig the earth when preparing a garden • choose a freezer to make an iceblock • identify an appliance needed to make toast. 	
<p>The following are examples of learning outcomes developed from the level statement for Foundation Level. Use these outcomes, or create others, to meet the individual needs and group needs of the class.</p> <p>Students' demonstrations of outcomes are apparent when they have provided evidence across a range of contexts as exemplified below.</p>	
<p>Example learning outcome: Students sort materials according to differences in characteristics.</p>	<p>Example learning outcome: Students choose suitable materials and equipment for a familiar task.</p>
<p>Students:</p> <ul style="list-style-type: none"> • sort materials into groups, e.g. same or different; or by colour, shape, size, texture, smell, sound • select paper according to colour • sort landscape materials by texture • match fabrics according to pattern • choose between two objects • sort fabrics by feel. 	<p>Students show that they understand the need to:</p> <ul style="list-style-type: none"> • use a jug to add water to a mixture when making gravy • use a spoon to stir ingredients when making a cake • pour detergent into a bucket to make bubble-blowing liquid • use scissors to cut cardboard to make a card • select a tool to dig a hole to plant a tree • select a tool to hammer a nail into a piece of wood • use a brush to brush a dog's coat • use soap to wash hands • select a spoon rather than a fork to eat yoghurt.

Materials	
Nature Level 1	Techniques Level 1
<p>MAT 1.1 Students identify characteristics of materials and explain how materials are used in everyday products.</p>	<p>MAT 1.2 Students explore equipment and techniques when joining and combining materials for meaningful purposes.</p>
<p>Students know that:</p> <ul style="list-style-type: none"> • materials have characteristics that can be identified • materials are used in everyday products. <p>Students identify characteristics of materials as they:</p> <ul style="list-style-type: none"> • examine materials <ul style="list-style-type: none"> – look at characteristics of different materials in a handling collection – sort materials by characteristics <ul style="list-style-type: none"> • weight, flexibility, strength, texture – compare the characteristics of different materials • describe several characteristics of different materials <ul style="list-style-type: none"> – wood – plastic – ingredients for cooking. <p>Students explain how materials are used in everyday products as they:</p> <ul style="list-style-type: none"> • identify materials used in everyday products <ul style="list-style-type: none"> – name materials used in everyday products <ul style="list-style-type: none"> • plastic used in a toothbrush, paper used in tissues, wood used in rulers – describe some ways materials could be used • discuss why different materials are used in different products <ul style="list-style-type: none"> – discuss the selection of a material to make a product <ul style="list-style-type: none"> • use of a plastic drink bottle in the design of their boat • discuss why a material may have been used to make a particular toy • explain why toppings were selected for a pizza. 	<p>Students know how:</p> <ul style="list-style-type: none"> • to explore and experiment with a range of equipment and techniques for meaningful purposes. <p>Students explore equipment and techniques for working with materials as they:</p> <ul style="list-style-type: none"> • experiment with a variety of equipment and range of techniques to make products <ul style="list-style-type: none"> – blend materials <ul style="list-style-type: none"> • use beaters to combine ingredients – join materials <ul style="list-style-type: none"> • use glue to join collage materials to create a model house • use a hammer and nails to join pieces of wood • use a screwdriver to assemble and disassemble parts – cut materials <ul style="list-style-type: none"> • use scissors to cut fabric – process data <ul style="list-style-type: none"> • use computers to paste pictures in a paint program • explore a range of equipment <ul style="list-style-type: none"> – make use of equipment <ul style="list-style-type: none"> • use screwdriver in a play or lifelike scenario to fix a toy car • use home tools or appliances (with adult supervision) to prepare a meal — a microwave to heat soup – make use of materials <ul style="list-style-type: none"> • use different fabrics as a costume to act out part of a story • make a product from collage materials as a gift.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students investigate materials used to make products brought in for 'repair' to play workshop in the classroom and use equipment and techniques to repair them. • Students explore the use of equipment such as hammers, nails and glue and use them with materials they select to make a toy that they have designed. • Students identify characteristics of materials they will use to make placemats and explore appropriate techniques and equipment needed to make them. • Students taste ingredients as they select pizza toppings and experiment with different ways of cooking pizza. 	

Materials	
Nature Level 2	Techniques Level 2
<p>MAT 2.1 Students match the characteristics of materials to design requirements.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • characteristics of materials can be matched to design requirements. <p>Students match the characteristics of materials to design requirements as they:</p> <ul style="list-style-type: none"> • identify how materials can be used depending on their characteristics <ul style="list-style-type: none"> – identify design requirements and select materials <ul style="list-style-type: none"> · talk to preschoolers about their needs when making a toy and select appropriate materials – categorise materials as to how well they meet design requirements <ul style="list-style-type: none"> · identify materials that meet the design requirements of being waterproof and light weight – describe characteristics needed in materials to support the features and functions of a product <ul style="list-style-type: none"> · select materials appropriate for making portable chairs · identify ingredients for making a birthday cake – match materials to purposes based on the materials' characteristics <ul style="list-style-type: none"> · plant a specific tree that attracts birds and butterflies when designing an environmental area. 	<p>MAT 2.2 Students select and use suitable equipment and techniques for manipulating and processing materials.</p> <p>Students know how:</p> <ul style="list-style-type: none"> • to select and use suitable equipment and techniques • to manipulate and process materials. <p>Students select and use suitable equipment and techniques as they:</p> <ul style="list-style-type: none"> • choose appropriate equipment and techniques <ul style="list-style-type: none"> – identify and use <ul style="list-style-type: none"> · a suitable size hammer and nail when joining wood · a digital camera to take pictures · a glue gun to join materials · gardening tools to plant vegetables. <p>Students manipulate and process materials as they:</p> <ul style="list-style-type: none"> • explore appropriate equipment and techniques <ul style="list-style-type: none"> – identify different methods of processing the same material <ul style="list-style-type: none"> · fabrics can be joined by sewing or gluing · food can be cooked by steaming, frying or baking · paper can be used by folding, taping, stapling or gluing – consider the characteristics of a material and select and use appropriate ways of processing it <ul style="list-style-type: none"> · cut wire with pliers · trim fabric with pinking shears to prevent fraying · melt butter in a microwave oven using a non-metal tray.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students select materials that float and process these materials in appropriate ways to make an unsinkable boat. • Students select herbs that will grow in their local area and make a garden using appropriate tools and equipment. • Students select materials with appropriate characteristics in order to make a bag for carrying their belongings on an excursion. 	

Materials	
Nature Level 3	Techniques Level 3
<p>MAT 3.1 Students choose materials according to various characteristics that best suit the product and user.</p>	<p>MAT 3.2 Students select and use suitable equipment and techniques to combine materials accurately in order to meet design requirements.</p>
<p>Students know that:</p> <ul style="list-style-type: none"> • materials have various characteristics that make them more suitable for a specific purpose • materials can be selected based on the needs of the user. <p>Students choose materials according to various characteristics as they:</p> <ul style="list-style-type: none"> • describe what makes certain materials appropriate for products <ul style="list-style-type: none"> – identify a number of characteristics that make a material suitable <ul style="list-style-type: none"> • the purpose of a toy boat is to float, so a lightweight, waterproof material is selected • a kite has to fly and be seen, so it is made out of light, colourful materials. <p>Students consider the characteristics of materials for users as they:</p> <ul style="list-style-type: none"> • identify purposes of products and describe how some materials support these purposes <ul style="list-style-type: none"> – identify materials used in products and how these meet the needs of a user <ul style="list-style-type: none"> • non-toxic, soft materials used in toddlers toys • waterproof materials used in swimming bags for themselves • soft, easily digestible food for an elderly person • analyse the characteristics of different or similar materials <ul style="list-style-type: none"> – compare the characteristics of materials to determine their suitability for a purpose <ul style="list-style-type: none"> • compare different cheeses for a pizza • compare the flexibility of different pieces of wood when making a fishing rod. 	<p>Students know how:</p> <ul style="list-style-type: none"> • to combine materials accurately in order to meet design requirements. <p>Students select and use suitable equipment and techniques as they:</p> <ul style="list-style-type: none"> • consider the need for accuracy when processing materials to meet design requirements <ul style="list-style-type: none"> – accurately combine ingredients when cooking <ul style="list-style-type: none"> • accurately measure and combine ingredients using appropriate equipment – accurately combine different materials using suitable techniques and equipment <ul style="list-style-type: none"> • use screws and wood glue to make a mouse house – use needle and thread to join the seams on a bag <ul style="list-style-type: none"> • stitch evenly to sew a neat seam – cut accurately around a pattern piece <ul style="list-style-type: none"> • pin pattern pieces and cut closely around a pattern to make a stuffed toy – combine different types of materials to fit together accurately <ul style="list-style-type: none"> • measure and cut wood, plastic and fabric when making parts of a kite.
<p>At each level, activities should occur in a range of contexts. Student should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students identify appropriate materials for a compost system and select techniques and equipment that allow them to accurately follow design instructions. • Students explore, compare and specify characteristics needed to join materials with different characteristics and accurately work with the materials to make a pet shelter. • Students identify materials that have characteristics that provide insulation when making a take-away food container and accurately use equipment and techniques to meet design requirements. • Students choose appropriate materials that are flexible, easy to print on and durable, and use appropriate techniques to make a book. • Students choose materials with different characteristics to affect the noise a marble makes as it moves through a marble maze. 	

Materials	
Nature Level 4	Techniques Level 4
MAT 4.1 Students explain how characteristics of materials affect ways they can be manipulated.	MAT 4.2 Students employ their own and others' practical knowledge about equipment and techniques for manipulating and processing materials in order to enhance their products.
<p>Students know that:</p> <ul style="list-style-type: none"> • materials have characteristics that affect the ways they can be manipulated. <p>Students explain how the characteristics of materials affect their manipulation as they:</p> <ul style="list-style-type: none"> • investigate and describe ways in which materials may be manipulated <ul style="list-style-type: none"> – describe the properties of a material <ul style="list-style-type: none"> • strength, flexibility, appearance – list advantages and disadvantages of using materials <ul style="list-style-type: none"> • glass to make a fish tank – identify materials that keep their shape <ul style="list-style-type: none"> • clay, playdough – describe how the characteristics of a material will allow it to be manipulated <ul style="list-style-type: none"> • thickness and strength of a material will affect how it can be cut • characteristics of a fabric will determine ways it can be joined • absorbency of different types of materials will affect the type of glue used • combining ingredients is affected by the characteristics of the different ingredients. 	<p>Students know how:</p> <ul style="list-style-type: none"> • to enhance products by manipulating and processing materials. <p>Students use their own and others' knowledge to enhance products as they:</p> <ul style="list-style-type: none"> • develop practical knowledge about specific equipment and techniques <ul style="list-style-type: none"> – build on previous personal experiences <ul style="list-style-type: none"> • develop familiarity and adeptness with a word-processing program • explore how different equipment and techniques could be used to create a finish on a wooden product – gather information by working with others to process materials <ul style="list-style-type: none"> • work with specialists to design a watering system for the school garden • prepare a meal with an invited guest who has specialist knowledge about Asian food • incorporate advice about equipment and techniques as they process materials and enhance products <ul style="list-style-type: none"> – manipulate and process materials to achieve specific effects <ul style="list-style-type: none"> • use a mitre box and hand saw to cut material for a picture frame • fold paper to achieve special effects on a card for a special occasion • decorate a picture frame using different techniques • use particular cooking techniques to achieve desired effects.
At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.	
<p>Examples</p> <ul style="list-style-type: none"> • Students select materials with suitable characteristics in order to make take-away food warmers for a class restaurant, and seek advice about the most appropriate techniques and equipment needed to develop their product. • Students select materials needed to make scenery for a class play, and seek advice about the most appropriate techniques and equipment needed to make the scenery look realistic. • Students select materials with suitable characteristics for the construction of an indoor or outdoor hydroponic garden, and explore different techniques and equipment that can be used to minimise water loss. 	

Materials	
Nature Level 5	Techniques Level 5
<p>MAT 5.1 Students compare and contrast materials according to their characteristics to determine how effectively the materials meet predetermined standards.</p>	<p>MAT 5.2 Students operate equipment and apply techniques for manipulating and processing materials to meet predetermined standards.</p>
<p>Students know that:</p> <ul style="list-style-type: none"> • materials can be compared and contrasted according to their characteristics • materials can be selected to meet predetermined standards. <p>Students compare and contrast materials according to their characteristics as they:</p> <ul style="list-style-type: none"> • consult with clients and potential users about the characteristics of a selection of materials <ul style="list-style-type: none"> – colour schemes and textures • conduct tests on a range of materials to compare their characteristics <ul style="list-style-type: none"> – the flammability of a range of fabrics – the effects of the sun on a range of materials over a period of time • consider the economic, environmental and functional impacts and consequences of using materials with particular characteristics. <p>Students select materials that meet predetermined standards as they:</p> <ul style="list-style-type: none"> • identify predetermined standards <ul style="list-style-type: none"> – standards determined by the context of the design challenge – quality standards set by clients – safety standards predetermined through legislation, regulation and convention • identify the characteristics of materials that make them suitable for meeting a standard <ul style="list-style-type: none"> – consider size, weight, durability, flexibility, transparency – availability and cost • conduct tests to determine whether particular materials meet particular standards <ul style="list-style-type: none"> – select fabrics for children's clothing that meet safety standards based on the results of flammability tests • base their selection of materials to meet standards on comparisons of the materials' characteristics <ul style="list-style-type: none"> – compare the effect of using lightweight cement or timber for construction – select ingredients based on comparisons of fat or sugar content – compare the aesthetic appeal and cultural appropriateness of particular colour combinations. 	<p>Students know how:</p> <ul style="list-style-type: none"> • to meet predetermined standards by manipulating and processing materials. <p>Students safely operate equipment and apply techniques to meet predetermined standards as they:</p> <ul style="list-style-type: none"> • develop skills to manipulate and process materials <ul style="list-style-type: none"> – use precision when operating equipment and applying techniques <ul style="list-style-type: none"> · accurately cut materials to measured lengths · accurately weigh ingredients and combine them in a cooking process · mark out fabric and use a sewing machine to make clothing · optimise digital images to a defined standard • refer to predetermined standards to identify the precision with which materials need to be manipulated <ul style="list-style-type: none"> – identify the standard required <ul style="list-style-type: none"> · standards determined in the context of the design challenge · quality standards set by clients · safety standards predetermined through legislation · operating instructions of the manufacturer of equipment in order to meet safety standards.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students identify materials suitable for the construction of a device that can be produced for use by people with disabilities. • Students identify materials with characteristics that are sun safe, and select and use techniques so that the garments are, for example, suitable for the occasion, culturally appropriate, durable, functional and aesthetically pleasing. • Students identify standards for food packaging, and select materials and techniques to make food packaging that meets these predetermined standards. 	

Materials	
Nature Level 6	Techniques Level 6
<p>MAT 6.1 Students incorporate in their design proposals ideas about the impacts of particular materials used in products.</p>	<p>MAT 6.2 Students use specialised equipment and refined techniques to make quality products to detailed specifications.</p>
<p>Students know that:</p> <ul style="list-style-type: none"> • impacts result from the use of particular materials in products. <p>Students incorporate ideas about impacts of materials in their design proposals as they:</p> <ul style="list-style-type: none"> • record information about the use of materials and the impacts these may have in their design proposals <ul style="list-style-type: none"> – describe consequences of using materials in particular situations <ul style="list-style-type: none"> · justify the selection of materials to make a product based on how materials have been used in the past and impacts this may have had on the environment · use various methods to research the use of chemical fertilisers and the impacts these have on crop growth and the environment • make an informed decision about the impacts materials may have <ul style="list-style-type: none"> – use their understandings of the characteristics of materials to make appropriate decisions about the selection of materials <ul style="list-style-type: none"> · select materials that will have beneficial impacts on the functionality of products · select materials that allow a product to be produced inexpensively · select materials that meet environmental conditions. 	<p>Students know how:</p> <ul style="list-style-type: none"> • to use detailed specifications to make quality products • to make quality products using specialised equipment and refined techniques. <p>Students determine detailed specifications as they:</p> <ul style="list-style-type: none"> • identify the specifications required to make quality products <ul style="list-style-type: none"> – determine standards in the context of the design challenge – consider the quality standards set by clients – examine safety standards determined through legislation, regulation or convention – make checks on quality to ensure detailed specifications are met <ul style="list-style-type: none"> · use calipers to confirm size of material on a lathe · test soil to determine pH levels for plant growth – consider quality of digital images needed in different situations — web, paper, multimedia presentations. <p>Students use specialised equipment and refined techniques to make quality products as they:</p> <ul style="list-style-type: none"> • select and use specialised equipment and techniques <ul style="list-style-type: none"> – match equipment and technique to desired specifications <ul style="list-style-type: none"> · turn wood on a lathe to make matching table legs · grow plants indoors using hydroponics · use a computer-controlled tool to mill, embroider or engrave a product · cook using specialised equipment and food preparation techniques.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students record considerations about the impacts of materials they have selected to make a solar-powered product and employ the necessary equipment and techniques required to develop a quality product. • Students select fabrics for sports uniforms based on performance tests against specific criteria and use specialised techniques to make a prototype of their design. • Students consider impacts of different fertilisers, trace elements and methods of delivery on local flora and fauna and select the most appropriate method of delivery to promote efficient plant growth. 	

Systems	
Level statement — Foundation Level: Students are developing an understanding of simple routines and familiar tasks and are participating in activities that involve familiar, simple systems. They identify cause–effect relationships within these systems.	
At each level, activities should occur in a range of contexts. Student should consider aspects of appropriateness and management within these activities.	
<p>Students, with scaffolding, are developing an understanding of simple routines and familiar tasks as they:</p> <ul style="list-style-type: none"> • undertake simple routines and familiar tasks <ul style="list-style-type: none"> – recall steps in a daily routine <ul style="list-style-type: none"> • make a poster that describes a routine • choose from visual cues and match them to the steps of a routine – sequence images to describe events – carry out a safe practice <ul style="list-style-type: none"> • prepare a meal — make toast • follow or give one- or two-step instructions <ul style="list-style-type: none"> – on, off, start, stop, in, out – instruct someone to carry out the steps of a task for them • develop their own routines and familiar tasks <ul style="list-style-type: none"> – prepare a meal — make sandwiches – organise belongings – tidy the workplace – play activities — make a train line or road system, serve customers • adapt to or accept changes to a routine. <p>Students are participating in activities that involve familiar, simple systems as they:</p> <ul style="list-style-type: none"> • operate traffic lights to cross the road • use equipment to carry out a task <ul style="list-style-type: none"> – turn on a computer – use a mixer to process food. <p>Students identify cause–effect relationships in familiar, simple systems as they:</p> <ul style="list-style-type: none"> • identify components of systems that they use <ul style="list-style-type: none"> – identify a switch to operate a light – identify switches or handles for opening or closing doors • observe the effect of operating components of systems <ul style="list-style-type: none"> – turn a CD-player, television, tape player or computer on or off – make an electric wheelchair go backwards or forwards. 	
<p>The following are examples of learning outcomes developed from the level statement for Foundation Level. Use these outcomes, or create others, to meet the individual needs and group needs of the class.</p> <p>Students' demonstrations of outcomes are apparent when they have provided evidence across a range of contexts as exemplified below.</p>	
<p>Example learning outcome: Students use simple routines for familiar purposes.</p>	<p>Example learning outcome: Students indicate their understandings of cause–effect relationships through the use of simple routines.</p>
<p>Students:</p> <ul style="list-style-type: none"> • sequence representations (pictures or concrete objects) of the steps involved in a routine <ul style="list-style-type: none"> – getting dressed – mowing the lawn – washing dishes – eating a meal • respond appropriately to routines <ul style="list-style-type: none"> – put on a hat and gloves before gardening – wash hands before eating – put on an apron before cooking – place dirty clothes in a bag – use a spoon to add sugar to a drink. 	<p>Students:</p> <ul style="list-style-type: none"> • plug in an appliance before turning it on • turn off the power before removing the power plug • carry out a task as part of a group process or sequence <ul style="list-style-type: none"> – add topping to a pizza – make a cake – participate in the care of a pet • press a switch to produce a sound or picture.

Systems	
Nature Level 1	Techniques Level 1
<p>SYS 1.1 Students identify familiar systems and describe how these are used in everyday life.</p> <p>Students know:</p> <ul style="list-style-type: none"> • what a system is • there are systems and they are used in everyday life. <p>Students identify and describe familiar systems as they:</p> <ul style="list-style-type: none"> • identify and describe systems in everyday life <ul style="list-style-type: none"> – explore systems used in familiar environments – storage system in the classroom – waste disposal system in their home, school, neighbourhood – communication system — postal system, telephone system – irrigation system on a farm or in a garden – systems for self-care — meal times, getting dressed, going to school, crossing the road, daily routine • consider familiar systems and the effects systems have on everyday life <ul style="list-style-type: none"> – discuss positive and negative effects on themselves and others <ul style="list-style-type: none"> • transport systems — ease of moving people and pollution of the environment – discuss what would happen if familiar routines were not followed or if familiar systems were not in place <ul style="list-style-type: none"> • What would happen if there were no garbage collection system? – describe effects of systems that they use <ul style="list-style-type: none"> • electricity system. 	<p>SYS 1.2 Students sequence steps to develop simple systems to carry out familiar tasks.</p> <p>Students know how:</p> <ul style="list-style-type: none"> • to develop simple systems to carry out familiar tasks. <p>Students sequence steps to carry out familiar tasks as they:</p> <ul style="list-style-type: none"> • examine and sequence steps in existing systems or routines <ul style="list-style-type: none"> – identify or sequence steps <ul style="list-style-type: none"> • identify steps in the recipe when making playdough • identify steps to borrow a book from the library • follow steps to access a computer program, or cut or paste in a computer program • follow a series of steps or instructions to achieve a predetermined result such as operating a tape recorder or CD-player – consider how an existing system works <ul style="list-style-type: none"> • consider the way in which pieces of a construction kit or commercial toy work together • disassemble an existing system to investigate various components • consider ways in which books are borrowed from a library – discuss household systems <ul style="list-style-type: none"> • a washing machine or pop-up toaster and how they carry out familiar tasks – consider the routines used within the school <ul style="list-style-type: none"> • the teacher may use pictures or draw a flowchart of the system for evacuating a classroom during a school fire-drill • draw a sequence of pictures to illustrate lunch time eating routines • develop systems to carry out familiar tasks that include a limited number of sequenced components <ul style="list-style-type: none"> – design a simple assembly line to prepare food <ul style="list-style-type: none"> • make sandwiches • cut vegetables for soup – suggest changes to familiar routines <ul style="list-style-type: none"> • design a system for distributing a newsletter to the class – use familiar construction materials to develop systems <ul style="list-style-type: none"> • make moving toys using construction blocks – identify simple tasks that can be organised by a system <ul style="list-style-type: none"> • organise a roster for feeding a pet • design a system to remind children to return books to the school library.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students identify steps in systems they have developed to care for a class pet and describe how this system affects their school day. • Students describe how the ordering system for the school tuckshop impacts on them and design a system for distributing tuckshop food when it gets back to the classroom. • Students describe how postal systems may work, and design and put in place a class postal system. 	

Systems	
Nature Level 2	Techniques Level 2
<p>SYS 2.1 Students identify and describe the order of components in familiar systems.</p>	<p>SYS 2.2 Students combine components to assemble systems in order to meet their needs and the needs of others.</p>
<p>Students know that:</p> <ul style="list-style-type: none"> • systems are made up of ordered components. <p>Students identify and describe the order of components as they:</p> <ul style="list-style-type: none"> • investigate different components that make up a system <ul style="list-style-type: none"> – recognise that components of a system can include people – identify basic components of a system and describe how they function <ul style="list-style-type: none"> • the ordering system and people involved in making the tuckshop function • the function of a wheel, bucket and handle of a wheelbarrow • the processes of sending and receiving mail • identify the order of different components in a system and describe their purposes <ul style="list-style-type: none"> – describe how components are linked in a sequence to perform a task <ul style="list-style-type: none"> • waste disposal system — collect, sort and dispose of rubbish • tuckshop ordering system — accept order and payment, make and pack orders, deliver orders • identify and describe the purpose of various components within a system <ul style="list-style-type: none"> – identify the purpose of a timer in moving students through a fitness program. 	<p>Students know how:</p> <ul style="list-style-type: none"> • to combine components to assemble systems. <p>Students assemble systems to meet their needs and the needs of others as they:</p> <ul style="list-style-type: none"> • combine components to make a system <ul style="list-style-type: none"> – use existing components to make a simple product <ul style="list-style-type: none"> • make a simple light fitting using a battery, light bulb and aluminium foil – use equipment to assemble and disassemble various systems <ul style="list-style-type: none"> • use tools to disassemble a clock – create a system to meet their needs <ul style="list-style-type: none"> • a system for alerting the class that someone is at the classroom door – create an organisational system for an identified class need <ul style="list-style-type: none"> • design a roster for watering the class garden.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students identify and describe some components needed to make a transport system and combine components to assemble a transport system for a model town. • Students identify and describe components needed to recycle aluminium cans and assemble a recycling system for their home or class. • Students identify components that could be included in a class fitness program and organise and operate a fitness circuit. • Students describe some effects of a pulley system by experimenting with it, and devise and use a system that combines similar components to lift weights in a sandpit. 	

Systems	
Nature Level 3	Techniques Level 3
<p>SYS 3.1 Students identify and describe relationships between inputs, processes and outputs in systems.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • systems have inputs, processes and outputs. <p>Students identify and describe relationships between inputs, processes and outputs as they:</p> <ul style="list-style-type: none"> • identify inputs, processes and outputs of systems <ul style="list-style-type: none"> – use simple flowcharts, drawings and diagrams to record how systems operate <ul style="list-style-type: none"> • draw a flowchart of a water-treatment system that identifies unfiltered water, filtering processes and clean water as inputs, processes and outputs • list inputs, processes and outputs of different systems • label diagrams or models to show names of inputs processes or outputs • identify relationships between components <ul style="list-style-type: none"> – discuss and record what happens to an input as a result of a process <ul style="list-style-type: none"> • water becomes cleaner during a treatment process • ingredients change chemically during cooking processes • bread changes to toast during the heating process – describe effects that may arise from changing an input or process <ul style="list-style-type: none"> • describe the effects if the number of batteries in a lighting circuit is doubled • describe the result of increasing oven temperature when baking a cake • describe the impact of electric vehicles on the transport systems of the future • describe how navigation aids assist blind students to navigate their way around the school. 	<p>SYS 3.2 Students assemble and trial systems they design by considering inputs, processes and outputs.</p> <p>Students know how:</p> <ul style="list-style-type: none"> • to assemble and trial systems. <p>Students consider inputs, processes and outputs as they:</p> <ul style="list-style-type: none"> • design and assemble systems • develop different systems that carry out similar tasks <ul style="list-style-type: none"> – systems for serving food at a school camp — self-service or table service – systems for storing school books — storing books in desks or storing books in bags • develop a system to achieve specific outputs <ul style="list-style-type: none"> – design and make a system to help keep school lunches cool – combine components in a simple electronic circuit to make an alarm to identify if a person is at the door • describe the function of components in a system <ul style="list-style-type: none"> – identify the effect a heating process is meant to have on an input – draw diagrams and explain to others how their systems operate • trial systems they design <ul style="list-style-type: none"> – test and evaluate their own and others' designs for consistency of outputs <ul style="list-style-type: none"> • describe how an alarm rings when the switch is activated • consider the appropriateness of inputs, process and outputs <ul style="list-style-type: none"> – time taken for system to operate – cost of inputs – effectiveness of processes.
<p>At each level, activities should occur in a range on contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students identify the inputs, processes and desired outputs for a system for cooking and distributing food on a school camp and design a system that they can trial at the camp. • Students identify relationships between inputs, processes and outputs in a mail system and assemble and trial a mail system for distributing mail around the classroom and school. • Students describe some relationships that exist between components in electronic circuits and design and trial a simple alarm system for a window or door. • Students disassemble old toys that contain systems and determine how they could use the components in these to create new systems to meet their needs or the needs of others. 	

Systems	
Nature Level 4	Techniques Level 4
<p>SYS 4.1 Students identify and explain the logic of systems and subsystems.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • systems and subsystems have logic. <p>Students identify and explain the logic of systems and subsystems as they:</p> <ul style="list-style-type: none"> • identify logic of systems and subsystems in terms of their organisation <ul style="list-style-type: none"> – describe the logic of components in systems and subsystems and the links between them <ul style="list-style-type: none"> · draw a diagram that shows the placement of components in a circuit and links between each component · draw a flowchart that illustrates the operation of subsystems in a hydroponic system · describe the logic involved in a ticketing and seating system at a school cultural evening • explain/examine the cause–effect relationships that exist between systems and subsystems <ul style="list-style-type: none"> – control relationships <ul style="list-style-type: none"> · identify and describe subsystems that help to control a system such as an on/off switch or warning mechanism – operational relationships <ul style="list-style-type: none"> · identify and describe how subsystems for sorting affect the operation of a recycling plant · describe the cause–effect relationship between pedals, chain and wheel on a bicycle. 	<p>SYS 4.2 Students incorporate feedback to refine and modify systems and/or subsystems.</p> <p>Students know how:</p> <ul style="list-style-type: none"> • to gather relevant feedback to refine and modify systems and/or subsystems. <p>Students refine and modify systems and/or subsystems by incorporating feedback as they:</p> <ul style="list-style-type: none"> • adjust systems/subsystems based on feedback gathered from others <ul style="list-style-type: none"> – refine and modify the system based on feedback from users <ul style="list-style-type: none"> · add a dimming device to a torch for night spotting of wildlife on a school camp after gathering information about the specific needs of the user – refine and modify systems/subsystems based on test results <ul style="list-style-type: none"> · carry out a field test or operational test of a solar cooker to observe the effectiveness of achieving desired outputs · test the effectiveness and accuracy of a device and make adjustments to improve its operation – consider how a system can be changed to lessen its impact on the environment or society – make comparisons between systems that carry out similar tasks to identify features that could be incorporated into a hybrid system <ul style="list-style-type: none"> · examine two alarm systems and select the best features of each to create new system/subsystem.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students describe the logic of a hydroponic system they have designed and conduct field tests over an extended period in order to modify it. • Students design and refine an organisational system with subcommittees for ticketing, catering and seating to help coordinate a school event. • Students design and refine a system for the election of school leaders with clearly identified steps involved in the casting and counting of votes. • Students describe and refine the logic for a simple electric system for a torch. 	

Systems	
Nature Level 5	Techniques Level 5
<p>SYS 5.1 Students explain the structures, controls and management of systems and subsystems.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • systems and subsystems have structures and can be controlled and managed. <p>Students explain how systems and subsystems can be structured, controlled and managed as they:</p> <ul style="list-style-type: none"> • explain the structure in terms of components, logic and relationships between systems and subsystems • analyse the structure of systems and subsystems <ul style="list-style-type: none"> – compare and explain different types of structures <ul style="list-style-type: none"> • automated and manual structures — garage door • the structure of management within an office • different configurations for lighting systems where bulbs are in parallel or series circuits – assemble or disassemble systems to investigate their structures <ul style="list-style-type: none"> • disassemble a simple electrical system and identify its components and structure by drawing a circuit diagram • assemble different systems for feeding animals and describe their alternative structures – use systems with different structures and describe some of the advantages or disadvantages they may have <ul style="list-style-type: none"> • describe how a computer-controlled system may work differently from a non-computer-controlled system • justify choosing a computerised database for a filing system instead of a manual filing system • analyse controls and management of systems and subsystems <ul style="list-style-type: none"> – observe and describe the control or management of systems and subsystems <ul style="list-style-type: none"> • observe the operation of an irrigation system and identify how it is controlled and managed – describe advantages and disadvantages of different ways of controlling and managing systems and subsystems <ul style="list-style-type: none"> • observe the management and control of food quality in a fast-food outlet – suggest structures for control and management of systems <ul style="list-style-type: none"> • review and recommend structures to control and manage a school-based enterprise for sponsoring an overseas child. 	<p>SYS 5.2 Students incorporate control and management mechanisms in systems that include subsystems.</p> <p>Students know how:</p> <ul style="list-style-type: none"> • to control and manage systems. <p>Students incorporate 'control and management mechanisms' as they:</p> <ul style="list-style-type: none"> • use various control and management mechanisms to meet the needs of different users <ul style="list-style-type: none"> – design systems that incorporate control and management mechanisms <ul style="list-style-type: none"> • locks • sensors • alarms • backup systems • ledger balances – modify control or management mechanisms in existing systems <ul style="list-style-type: none"> • replace an existing handle on a tap so it can be controlled by a person with arthritis • add series numbers to tickets to manage seating at a school concert – add control or management mechanisms to an existing system <ul style="list-style-type: none"> • handbrake on a go-kart to control speed • timer on a watering system to manage water loss.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • Students develop a structure for a watering system that incorporates timers and allows for the watering of different areas at different times. • Students analyse local waste-management systems to identify structures, management and control mechanisms, and incorporate similar ideas as they develop systems for managing waste at school. • Students analyse the management of food hygiene or workplace health and safety and use this to improve their own food-preparation and hygiene systems. • Students develop a system to control and manage the finances and resources associated with a school-based enterprise. 	

Systems	
Nature Level 6	Techniques Level 6
<p>SYS 6.1 Students explain principles underlying complex systems in terms of structures, control and management.</p> <p>Students know that:</p> <ul style="list-style-type: none"> • systems have principles that can be explained in terms of structures, control and management. <p>Students explain principles underlying complex systems as they:</p> <ul style="list-style-type: none"> • analyse and synthesise how the structure of a system affects its operation <ul style="list-style-type: none"> – explain relationships existing within structures <ul style="list-style-type: none"> • between systems and subsystems such as a sorting system within a mail exchange • between inputs, processes and outputs such as gears and brakes on a bike • between components such as the components in an electrical circuit • draw schematic diagrams, flowcharts, concept maps to illustrate the structure of systems • analyse and synthesise how the control and management of a system affects its operation <ul style="list-style-type: none"> – explain processes used to control and manage a system <ul style="list-style-type: none"> • monitor and maintain systems such as a computer-network system • modify or refine systems based on tests and feedback such as adding a gear to a motor to increase power • use control and management mechanisms such as creating folders to sort and manage mail • compare the advantages and disadvantages of different control mechanisms — manual, automatic, and computer-controlled systems. 	<p>SYS 6.2 Students devise ways to manage and monitor the operation of complex systems.</p> <p>Students know how:</p> <ul style="list-style-type: none"> • to manage and monitor complex systems. <p>Students devise ways to manage and monitor complex system as they:</p> <ul style="list-style-type: none"> • design ways to provide for efficient and effective operation of systems <ul style="list-style-type: none"> – plan quality-control procedures <ul style="list-style-type: none"> • consider how industry uses systems to monitor the quality of their products and devise similar quality-control procedures – monitor systems <ul style="list-style-type: none"> • design a fault-finding methodology for faults in an irrigation system • field test or bench test to measure current flow to determine a fault in an electrical system • troubleshoot software to debug a computer program – develop back-up or fail-safe measures <ul style="list-style-type: none"> • devise and implement systems for backing up computer data – develop ways of gathering feedback to ensure outputs are appropriate <ul style="list-style-type: none"> • consult users to identify difficulties and preferred modifications.
<p>At each level, activities should occur in a range of contexts. Students should consider aspects of appropriateness and management within these activities.</p>	
<p>Examples</p> <ul style="list-style-type: none"> • To assist them in developing their own tests of a system they have designed, students observe alternative ways of testing a system's structure, control and management. • Students devise ways to monitor the structure, control or management of an existing system and, based on feedback, recommend how the system could be modified to minimise its impacts on individuals, communities and environments. • Students use understandings about the structures of macros and use these to develop a macro that will make a spreadsheet more efficient by automatically calculating data. • Students use their understandings of the structures of systems to develop programs that control and manage a robot, and monitor its operation in performing desired tasks. 	