FOREWORD

The *R–10 Design and technology teaching resource* is part of the *SACSA Companion Documents* series. Underlying the development of this series is the need to promote consistency of curriculum within and across schools in South Australia.

These resources are designed to support teachers to engage further with the SACSA Framework and work towards maximising students’ achievement. They arise from the need expressed by many teachers for the requirements of the SACSA Framework to be made more explicit for each year level.

The documents are written by practising teachers in close collaboration with curriculum officers, members of professional associations and other committed educators.

This resource is a valuable support for teachers working to meet the diverse needs of learners in the range of settings across South Australia.

Steve Marshall  
CHIEF EXECUTIVE
ACKNOWLEDGMENTS

The following people and groups are acknowledged for their valuable contribution to the development of this resource.

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## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>6</td>
</tr>
<tr>
<td>Design and technology learning and the SACSA Framework (concept map)</td>
<td>9</td>
</tr>
<tr>
<td>Design brief guidance</td>
<td>10</td>
</tr>
<tr>
<td>Overview of Key Ideas and Developmental Learning Outcomes</td>
<td>11</td>
</tr>
<tr>
<td>Early Years (R–2)</td>
<td></td>
</tr>
<tr>
<td>Assessment criteria</td>
<td>12</td>
</tr>
<tr>
<td>Critiquing</td>
<td>14</td>
</tr>
<tr>
<td>Designing</td>
<td>17</td>
</tr>
<tr>
<td>Making</td>
<td>20</td>
</tr>
<tr>
<td>Acronyms— Terrific technology teaching tips</td>
<td>25</td>
</tr>
<tr>
<td>Primary Years (3–5)</td>
<td></td>
</tr>
<tr>
<td>Assessment criteria</td>
<td>26</td>
</tr>
<tr>
<td>Critiquing</td>
<td>28</td>
</tr>
<tr>
<td>Designing</td>
<td>34</td>
</tr>
<tr>
<td>Making</td>
<td>38</td>
</tr>
<tr>
<td>Middle Years (6–8)</td>
<td></td>
</tr>
<tr>
<td>Assessment criteria</td>
<td>46</td>
</tr>
<tr>
<td>Critiquing</td>
<td>48</td>
</tr>
<tr>
<td>Designing</td>
<td>54</td>
</tr>
<tr>
<td>Making</td>
<td>60</td>
</tr>
<tr>
<td>Acronyms— Terrific technology teaching tips</td>
<td>71</td>
</tr>
<tr>
<td>Middle–Senior Years (8–10)</td>
<td></td>
</tr>
<tr>
<td>Assessment criteria</td>
<td>72</td>
</tr>
<tr>
<td>Critiquing</td>
<td>74</td>
</tr>
<tr>
<td>Designing</td>
<td>79</td>
</tr>
<tr>
<td>Making</td>
<td>85</td>
</tr>
<tr>
<td>Skills continuum: Materials</td>
<td>94</td>
</tr>
<tr>
<td>Glossary</td>
<td>96</td>
</tr>
<tr>
<td>Resources</td>
<td></td>
</tr>
<tr>
<td>References</td>
<td>98</td>
</tr>
<tr>
<td>Early–Primary Years suggested resources</td>
<td>98</td>
</tr>
<tr>
<td>Middle–Senior Years suggested resources</td>
<td>99</td>
</tr>
<tr>
<td>R–10 Suggested websites</td>
<td>100</td>
</tr>
<tr>
<td>R–10 Outreach and other services</td>
<td>101</td>
</tr>
</tbody>
</table>
INTRODUCTION

This R–10 Design and technology teaching resource is one in a series of companion documents to the South Australian Curriculum, Standards and Accountability (SACSA) Framework and provides specific support for planning, teaching and learning.

It has been written by junior primary, primary and secondary teachers with the support of and in collaboration with curriculum officers, professional associations and other committed educators.

The document has been drafted in workshops, initially circulated in draft form to all South Australian schools, reviewed and refined by teachers as the result of feedback from colleagues.

Support for using the SACSA Framework

The purpose of this document is to provide support for teachers in planning, programming and assessing using the SACSA Framework.

This teaching resource details a sample range of learning descriptors relating to the Key Ideas and Outcomes in design and technology R–10. These descriptors, in dot point format:

- make explicit the knowledge, skills and understandings reflected in the Key Ideas and Outcomes
- make consistent the expectations for learning at specific year levels within and across sites
- are written from the learner’s perspective
- help to make explicit the development of Essential Learnings identified within each Key Idea
- help to make explicit the teaching and learning processes of this Learning Area
- make visible the literacy and numeracy practices of the Learning Area
- provide examples for the use of a range of ICTs sequenced developmentally across the Bands.

Assessment to support learning is maintained as a focus throughout the resource.

The learning descriptors are not prescriptive. They describe the possible growth points of learners as they progress towards demonstrating Outcomes to reach a Standard. Learning does not develop in a linear fashion. Teachers will continue to use their professional knowledge, skills and judgment to provide the rich array of learning experiences that cater for all learners in their classrooms. This teaching resource is a tool to support this process.

Planning for teaching and learning

When using this resource for planning, teaching and learning, teachers will also need to engage with the following core principles:

- Learning involves building on prior knowledge, with learners active in constructing their own learning as they progress through cycles of growth.
- Linked and integrated learning with other Learning Areas are vital components of program planning and learning development.
- Equity Cross-curriculum Perspectives and Enterprise and Vocational Education are critical considerations.
- In the Early Years, when planning for teaching, learning and assessing children’s progress, it is important that teachers refer to the Developmental Learning Outcomes. The Overview of Key Ideas and Developmental Learning Outcomes chart has been included at the beginning of the Early Years section, particularly for use by those teachers of Reception and Year 1 children.
• Safe and secure teaching and learning environments should be established in which managers and teachers use appropriate risk management processes to minimise risks to health and safety. This should be done in accordance with the department’s Risk Management Framework, the principles of hazard management and occupational health, safety and welfare legislation.

The design and technology Learning Area

In the context of the SACSA Framework, the design and technology Learning Area is structured around three main strands of learning:

• critiquing
• designing
• making.

These strands are designed to capture ways of ‘knowing, understanding and doing’ in design and technology. They are interrelated and of equal importance, informing one another and providing different starting points for learning. Together, they constitute the essence of a quality design and technology education.

Through active engagement in practical design and technology experiences, learners develop creative and powerful ways of designing and making to meet identified needs. They also learn to examine critically existing and planned technologies through investigating and questioning the four phases of a technology lifespan: intention, design, making and use/misuse/abuse.

Technologies do not exist in isolation; they are created for specific purposes and to meet an identified need. Students learn to consider the cultural, economic and environmental issues that influence and are influenced by technologies. The interdependence of people and technologies is examined through investigating relationships, questioning the thinking behind technologies and developing understandings of the criteria that drive technological developments. Technologies, past, present and proposed, are considered in order to develop understandings of the interplay of technologies with people, society, the economy and the environment.

Achieving a balance of design and technology learning experiences

Design and technology education provides an opportunity to develop critical thinking skills, knowledge and understanding of materials, tools and techniques in creating products, processes and systems. Quality programs draw on knowledge from all Learning Areas in practical and applied ways. Design and technology learning is inherently interdisciplinary. This document provides examples involving materials and information and systems technologies while also demonstrating the interrelationship of the Key Ideas and Outcomes. The examples provided are not prescriptive or necessarily year level specific.

It is recommended that design briefs allowing students to learn and explore within set contexts and agreed parameters are used. A balanced mix of open-ended and closed design briefs is suggested depending upon the learning program and individual student needs. Design briefs clearly outline the task within a context, state design and task criteria (eg specifying restrictions or requirements and often outlining a process or specialised practical task) and make assessment explicit, providing scaffolds for success.

The key to a balanced design and technology program is recognising connections between all of the components and ensuring depth of learning in what is manageable.

Format of this resource

The format of this document has been developed:

• for practical use by teachers
• to provide a broad range of learning possibilities in design and technology
• to ensure consistency across Curriculum Bands
• with consideration to the organisation of the SACSA Framework, including the following pattern:

**Year levels, Key Ideas and Outcomes, and Standards**

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<tr>
<th>Year Level</th>
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<tbody>
<tr>
<td>Key Ideas and Outcomes</td>
<td>Early Years</td>
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<td>Towards</td>
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<td>Standards</td>
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</table>

To meet these objectives, the document:
• is organised in Curriculum Bands for the following year levels: Early Years (R–2), Primary Years (3–5), Middle Years (6–8) and a combined Middle–Senior Years Band (8–10)
• includes Band specific assessment criteria at the commencement of each section
• interprets the Key Ideas and Outcomes at each year level from Reception to Year 10 for each design and technology strand
• contains a concept map that illustrates how the three strands—critiquing, designing and making—are structured to capture ways of knowing, understanding and doing in design and technology. The elaboration of each strand on the concept map is, in turn, reflected in the headings within each Band in this document
• provides examples with descriptors to further expand learning possibilities
• includes Year 8 descriptors in both the Middle and Middle–Senior Years to assist continuity from primary to secondary schooling

• includes cross-referencing to allow navigation between year levels and strands
• provides a glossary of design and technology terms
• provides examples of resources, including references, suggested resources, suggested websites, DECS Outreach and other services.

**Assessment to support learning**

A range of negotiated and inclusive assessment practices are needed to continuously gather evidence of learner achievement in relation to the Outcomes. The determination of a Standard in design and technology should be made ‘on balance’ between achievement across the three strands and their Outcomes for each Band of schooling. Such determination is best supported by the collection of a variety of evidence, including completed products, processes and systems, work diaries, journals and folios; research documentation and essays; and student commentary such as oral or written presentations and/or computer-generated or video presentations.

**Further assistance**

To further assist in planning, programming and assessing:
• a copy of this document in *Word* format is available on the SACSA website. This format allows teachers to cut, paste and modify the document to suit individual needs. Go to <http://www.sacsa.sa.edu.au/companion>
• a professional learning package, *Planning for teaching and learning*, which includes a *PowerPoint* presentation, has been developed to support use of this and the other SACSA Companion Documents and is also available on the SACSA website. Go to <http://www.sacsa.sa.edu.au/companion>. 
DESIGN AND TECHNOLOGY LEARNING AND THE SACSA FRAMEWORK

DESIGNING IS ABOUT:
- Exploring, generating and representing ideas
- Employing imaginative and logical thinking to create mental models
- Solving problems and creating solutions for identified needs
- Making choices, interpreting criteria and matching needs
- Inventing, refining and experimenting with materials, techniques and prototypes
- Documenting and communicating the thinking behind the design/ideas using a variety of methods
- Applying, executing, implementing and exploring ideas with others
- Illustrating, displaying, presenting and communicating ideas
- Reflecting and questioning

CRITIQUING IS ABOUT:
- Questioning, identifying, classifying, examining and exploring technologies
- Analysing, choosing, discerning, checking, monitoring and surveying
- Researching past, present and proposed technologies
- Learning/knowing/finding out about technologies, locally and globally
- Understanding that technologies are made
- Understanding social and cultural differences
- Determining points of view, bias and intent, and considering values inherent in any technology
- Comparing, contrasting and experiencing
- Understanding the impact of technologies on people, economies and the environment
- Identifying inconsistencies
- Appraising, reviewing, evaluating and judging

MAKING IS ABOUT:
- Developing skills and knowledge about equipment, tools and techniques
- Realising design ideas through processing/manipulating materials
- Using tools and equipment safely and competently
- Developing understanding of quality, accuracy and the role of specialist tools and equipment
- Combining components to create a system
- Choosing and using software/hardware to create information

Developing procedures that enable safe work and responsible resource management
- Developing understandings of the sustainability and the economic, environmental and social impacts of technological practice
- Understanding the role of risk management by maximising safety and managing people, materials and equipment
- Developing understandings of procedures, sequences and systems in carrying out tasks
- Using devices ethically and in socially acceptable ways
An example design brief: Deconstruction

CONTEXT
Deconstruction is the systematic dismantling of a piece of technology for the purpose of locating, understanding and recording the components that make up the object. It may also include investigating the reasons for its existence.

TASK
You are required to carefully deconstruct an everyday object (e.g., a multi-colour ballpoint pen) and present information about the process and the object to other students. When that phase is completed, create something new out of the components.

REQUIREMENTS
You are required to record the deconstruction process. The record should reflect:
- each action you undertake
- a name for each component
- a description of the function of each component.

Choose a graphic organiser to display the process and your findings; for example:
- Flow-chart
- Component wheel
- Consequence wheel
- Fishbone
- Slide show or PowerPoint presentation.

CRITIQUING
Investigate how parts of tools or equipment are named using a resource like the internet, the Resource Centre and technical manuals. Consider any actions in deconstructing the object.

DESIGNING
Consider the different ways the object could be dismantled. Ask questions like:
- Will it break if I do this?, Is it able to be dismantled easily?, Which are the major (larger) parts and should they be first?, Are there safety features incorporated?, Are there aesthetic or environmental features?

Consider the best graphic organiser to explain your findings to the identified audience and design a number of layouts.

MAKING
Dismantle the object and record the deconstruction.

CRITIQUING/EVALUATING
Check your work against the requirements outlined above. Ask yourself questions like: Did I record all the steps undertaken?, Have I named all of the parts and described their purpose? Reflect on the process you used. Consider whether your presentation does what you intended. Explain your understanding of the deconstruction process, describing components and their function and clearly presenting information.

DESIGN BRIEF GUIDANCE

DESIGN BRIEF FORMAT—an example

CONTEXT
Explains the content and purpose of the activity

TASK
Provides clear instruction about the task or problem

REQUIREMENTS
Focuses learning activities, specifies directions or places limitations

CRITIQUING
Provides direction for examining the four phases of any technology: the intention, the design, the manifestation, the use/misuse/abuse/disposal

DESIGNING
Describes requirements for investigating, devising, evaluating, the trialling of materials, techniques and communication of ideas and information

MAKING
Establishes conditions for creating the product, process or system; includes skills, techniques, materials and responsible resource management

CRITIQUING/EVALUATING
Provides direction for evaluating the product, process or system against agreed criteria; includes communication of findings and reflecting on processes used and the outcome

The following example design brief outlines a task designed to assist in understanding how technologies may be deconstructed or decoded.

Design briefs are written for learners, in negotiation with learners, and by learners as their expertise, knowledge and understanding increases. The text in the example is descriptive and may need to be modified to ensure age group appropriateness.
## Overview of Key Ideas and Developmental Learning Outcomes: BIRTH to AGE 5

**South Australian Curriculum, Standards and Accountability Framework**

The Developmental Learning Outcomes are deliberately broad long-term accomplishments. They reflect the integration of learning and development through the Essential Learnings and all Learning Areas and allow for different developmental pathways.

### BIRTH to AGE 3

<table>
<thead>
<tr>
<th>LEARNING AREAS</th>
<th>KEY IDEAS</th>
<th>DEVELOPMENTAL LEARNING OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The psycho-social self</td>
<td>In partnership with educators in respectful and caring environments:</td>
<td>The Developmental Learning Outcomes are deliberately broad long-term accomplishments. They reflect the integration of learning and development through the Essential Learnings and all Learning Areas and allow for different developmental pathways.</td>
</tr>
<tr>
<td></td>
<td>Children form secure attachments developing close bonds with one and then more educators. Id • In • KC4</td>
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<td></td>
<td>Children begin to develop trust in themselves and others and their environments. F • Id • In • KC4</td>
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<td></td>
<td>Children construct a secure sense of self and a confident personal and group identity within their family, their communities and their out-of-home care. Id • In</td>
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<td></td>
<td>Children develop self-awareness and a sense of being connected with others within the context of their environments. These connections foster increasing appreciation of caring relationships as the basis for shared understandings. F • In • KC4</td>
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<td></td>
<td>Children develop autonomy and a sense of agency as well as dispositions and skills for self-regulation, decision-making and an understanding of their interdependence with others. F • Id • In • T • KC4 • KC6</td>
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<td>Children explore and develop emotional wellbeing. F • In • KC1</td>
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<td></td>
<td>Children begin to explore and develop understandings and strategies to effectively manage change. F • KC1 • KC6</td>
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### AGE 3 to AGE 5

<table>
<thead>
<tr>
<th>LEARNING AREAS</th>
<th>KEY IDEAS</th>
<th>DEVELOPMENTAL LEARNING OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self and social development</td>
<td>Children extend their sense of personal and group identity. Id • In</td>
<td>Children develop autonomy and a sense of agency. Id • In • KC4 • KC8</td>
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<td></td>
<td>Children contribute in a variety of ways as members of groups. Id • In</td>
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<tr>
<td>Arts and creativity</td>
<td>Children explore arts forms including visual arts, drama, music, dance and media through symbolic and creative expression. Id • T • C • KC5 • KC8</td>
<td>Children develop processes, understandings and skills to support their artistic expression. T • C • KC1</td>
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<td>Children interact with and respond to arts works. In • C • KC2</td>
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<tr>
<td>Communication and language</td>
<td>Children continue to acquire and are supported in the language of their homes, families and communities. Id • In • C • KC2</td>
<td>Children are purposeful and effective users of communication and language. Id • C • KC2</td>
</tr>
<tr>
<td></td>
<td>Children are effective communicators. T • C</td>
<td>Children increase their understanding of the power and complexity of language and communication. T • C • KC8</td>
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<tr>
<td>Design and technology</td>
<td>Children examine, identify and critique processes, products and systems. In • T • C • KC3 • KC7</td>
<td>Children use their imagination to generate ideas and participate in processes of design. F • T • C • KC3 • KC5</td>
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<td></td>
<td>Children use materials, equipment and processes to design and develop products and systems. In • T • C • KC3</td>
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<td>Diversity</td>
<td>Children develop a respect for, and appreciation of, the diverse nature of their communities. In • KC</td>
<td>Children begin to develop an understanding of Aboriginal and Torres Strait Islander peoples as the indigenous inhabitants of Australia. In • KC</td>
</tr>
<tr>
<td></td>
<td>Children begin to develop an understanding of Aboriginal and Torres Strait Islander peoples as the indigenous inhabitants of Australia. In • KC</td>
<td>Children learn to take action to bring about change for a just society. F • In • T • KC4</td>
</tr>
<tr>
<td>Health and physical development</td>
<td>Children extend their range of physical skills and strengthen their physical vitality. F • In</td>
<td>Children develop understandings about their physical capabilities through individual and shared activities. Id • In • KC1 • KC4</td>
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<td>Children begin to develop responsibility for their personal health and safety. Id • In</td>
<td>Children develop a sense of responsibility for natural and social environments and an understanding that their world is shared. F • In • KC1</td>
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<tr>
<td>Understanding our world</td>
<td>Children develop a sense of responsibility for natural and social environments and an understanding that their world is shared. F • In • KC1</td>
<td>Children develop confidence through making sense of their world by thinking, acting and working scientifically. Id • In • T • KC5</td>
</tr>
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<td></td>
<td>Children develop and use mathematical skills and understandings to investigate their physical and social worlds, both natural and constructed. In • T • KC1 • KC5</td>
<td>Children develop understanding of natural and social environments and an understanding that their world is shared. F • In • KC1</td>
</tr>
</tbody>
</table>

The Birth to Age 5 Key Ideas and the Developmental Learning Outcomes complement and connect with the Reception to Year 2 Key Ideas and Curriculum Standards. Together they comprise the requirements for the Early Years Band.

Reference to the Reception to Year 2 phase will support continuity in teaching and learning (see Learning Area overviews).
# BAND: EARLY YEARS
Assessment criteria

<table>
<thead>
<tr>
<th>Key Ideas</th>
<th>Strands</th>
<th>The learner is able to:</th>
<th>Working technologically</th>
<th>Outcomes</th>
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</thead>
<tbody>
<tr>
<td><strong>Critiquing</strong>&lt;br&gt;- questioning, identifying, clarifying, examining and exploring technologies</td>
<td>• Ask questions&lt;br&gt;• Describe and articulate own opinions&lt;br&gt;• Communicate clearly and explain processes with ‘technology terms’&lt;br&gt;• Use ICTs as recording, presentation and communicating tools</td>
<td>• Achieving quality and accuracy&lt;br&gt;• Asking questions&lt;br&gt;• Being creative&lt;br&gt;• Being optimistic about what is achievable&lt;br&gt;• Building on others’ thinking&lt;br&gt;• Considering possible solutions&lt;br&gt;• Demonstrating respect for others’ ideas&lt;br&gt;• Developing coordination&lt;br&gt;• Developing independence&lt;br&gt;• Developing ownership&lt;br&gt;• Expanding confidence&lt;br&gt;• Experimenting with tools and processes&lt;br&gt;• Exploring options&lt;br&gt;• Increasing responsibility&lt;br&gt;• Innovating&lt;br&gt;• Investigating ideas of self and others&lt;br&gt;• Increasing trial and error&lt;br&gt;• Listening&lt;br&gt;• Making decisions</td>
<td>1.1 &lt;br&gt;Children develop understandings about people, diversity and the technological world, and learn to question by assessing their own and others’ products, processes and systems.&lt;br&gt;T KC1&lt;br&gt;relating to Outcome 1.1</td>
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<td><strong>Designing</strong>&lt;br&gt;- exploring, generating and representing ideas</td>
<td>• Play and experiment to help generate own ideas&lt;br&gt;• Identify design problems and restrictions in own designs&lt;br&gt;• Play and experiment with ICTs as design tools&lt;br&gt;• Think imaginatively&lt;br&gt;• Explore materials and ideas&lt;br&gt;• Help and teach others</td>
<td>• Makes judgments about the significance of different characteristics of products, processes and systems made by themselves and others.&lt;br&gt;T KC1&lt;br&gt;1.2 &lt;br&gt;Children recognise and use different ways of thinking, planning and preparing that are helpful in achieving and presenting their designs. They learn that by designing it is possible to effect change.&lt;br&gt;F T C KC1 KC2 KC3&lt;br&gt;relating to Outcome 1.2</td>
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<td><strong>Designing</strong>&lt;br&gt;- documenting and communicating the thinking behind the design/idea using a variety of methods</td>
<td>• Share design ideas confidently with other class members&lt;br&gt;• Reflect on design proposals&lt;br&gt;• Incorporate labels into own designs&lt;br&gt;• Discuss and justify the choices made in designs and proposals</td>
<td>1.3 &lt;br&gt;Children use different strategies, including using a range of technologies, for successfully reflecting on, communicating and expressing to others their design ideas and thinking.&lt;br&gt;Id T C KC1 KC2 KC6 KC7&lt;br&gt;relating to Outcome 1.3</td>
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<td>Children develop confidence in their capacity to use materials and equipment to make products, processes and systems and, in so doing, reflect on how they work.</td>
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<td><strong>Making</strong> - developing skills and knowledge about equipment, tools and techniques</td>
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<tr>
<td>- Identify stages of production and appropriate techniques and materials</td>
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<td>- Select and use a range of resources, techniques and equipment for a variety of purposes</td>
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<td>- Measure and manipulate with confidence</td>
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<tr>
<td>- Use tools and equipment safely, efficiently and accurately</td>
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<td><strong>Outcome 1.4</strong></td>
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<tr>
<td>- Making judgments</td>
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<tr>
<td>- Negotiating roles</td>
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<tr>
<td>- Observing</td>
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<tr>
<td>- Planning and managing production</td>
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<tr>
<td>- Recording ideas and processes</td>
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<tr>
<td>- Reflecting on and accepting constructive feedback</td>
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<tr>
<td>- Reflecting on ideas</td>
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<tr>
<td>- Researching ideas</td>
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<tr>
<td>- Sharing ideas</td>
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<tr>
<td>- Showing concern about the effects of technology</td>
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<td>- Solving problems</td>
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<tr>
<td>- Taking responsibility</td>
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<td>- Taking risks</td>
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<tr>
<td>- Thinking flexibly</td>
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<td>- Thinking imaginatively</td>
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<tr>
<td>- Using different genres</td>
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<tr>
<td>- Working collaboratively</td>
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<tr>
<td>- Working cooperatively in a team</td>
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<tr>
<td>- Working effectively on their own</td>
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<tr>
<td>- Working flexibly in teams</td>
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<tr>
<td><strong>KC1 KC6 KC7</strong></td>
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<table>
<thead>
<tr>
<th>Children analyse and explain the uses and potential of equipment and materials. They recognise that a range of resources can be used to accomplish their ideas and to (re)shape their world.</th>
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</thead>
<tbody>
<tr>
<td><strong>Making</strong> - understanding material characteristics and how they determine the material use</td>
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<tr>
<td>- Recognise that materials have different properties and characteristics</td>
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<tr>
<td>- Match materials used with design outcomes</td>
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<tr>
<td>- Name tools, materials and processes correctly and accurately</td>
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<tr>
<td><strong>Outcome 1.5</strong></td>
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<tr>
<td>- Exploring current and alternative uses of materials and equipment in creating products, processes and systems.</td>
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<td><strong>KC1</strong></td>
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<table>
<thead>
<tr>
<th>Children analyse the importance of organisation and safety rules in order to use resources well and consider the personal and social responsibilities involved when working with others.</th>
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<tbody>
<tr>
<td><strong>Making</strong> - developing procedures that enable safe and responsible resource management</td>
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<tr>
<td>- Follow instructions carefully</td>
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<tr>
<td>- Recognise the safety and organisation requirements for tasks</td>
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<td>- Recognise issues of safety, individually and when working in groups</td>
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<tr>
<td>- Share tasks and materials</td>
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<tr>
<td><strong>Outcome 1.6</strong></td>
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<tr>
<td>- Understands the importance of simple organisation and safety issues in terms of their consciousness of people and fairness.</td>
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<td><strong>KC1</strong></td>
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</tbody>
</table>
### Learning Area: Design and technology
#### Strand: Critiquing

**Possible starting points for planning, programming and assessing**

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th>Reception Towards Standard 1</th>
<th>Year 1 Towards Standard 1</th>
<th>Year 2 Standard 1</th>
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</thead>
<tbody>
<tr>
<td><strong>OUTCOMES</strong></td>
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</table>

**Analysing, choosing, discerning, checking, monitoring and surveying**

- Explores and investigates a range of everyday products to discover similarities and differences.
- Analyses and compares past and present equipment used by children (eg questions parents/caregivers about their school days’ play equipment and compares with today’s).
- Explores and critiques a range of cooking tools (eg from home and those used by other cultures).
- Reviews and considers how an intended product would work.
- Explores and documents what play equipment in the future could look like.
- Chooses and uses tools for a specific purpose (eg utensils needed to make a cup cake).
- Analyses various designing tools to choose the most appropriate for the intended task.
- Experiments, analyses and chooses appropriate tools for designing, including software.
- Reviews a made product to investigate possible modifications for different purposes.

**Researching past, present and proposed technologies**

- Researches and collects examples of items that have a similar purpose (eg lids) to compare size, shape and names of common components.
- Justifies decisions for design ideas for a future product.
- Identifies and compares ICTs and how they have changed over time (eg telephone, television, radio).
- Compares past and present designs and makes predictions for future designs.
- Looks at the variety of technologies, past and present, to see how and why changes have occurred (eg clocks, writing tools).

**Learning/knowing/finding out about technologies, locally and globally**

- Researches technologies within the local community and documents their purposes (eg traffic lights, security alarms).
- Investigates and compares rural and city technologies (eg transportation).
- Researches technologies in the community that have common elements (eg pumps).
- Researches and compares global technologies (eg water supply).
- Identifies products and processes that have common global significance (eg measuring).

---

**Children develop understandings about people, diversity and the technological world, and learn to question by assessing their own and others’ products, processes and systems.**

**KC1 relating to Outcome 1.1**

**Key Competencies:**
- KC1 collecting, analysing and organising information
- KC2 communicating ideas and information
- KC3 planning and organising activities
- KC4 working with others and in teams
- KC5 using mathematical ideas and techniques
- KC6 solving problems
- KC7 using technology

**Possible starting points for planning, programming and assessing**

1.1 Makes judgments about the significance of different characteristics of products, processes and systems made by themselves and others. **T KC1**

---

**Key to Symbols**
- **F** Futures
- **Id** Identity
- **In** Interdependence
- **T** Thinking
- **C** Communication

**Essential Learnings:**

- F Futures
- Id Identity
- In Interdependence
- T Thinking
- C Communication

---

**Learning Area:** Design and technology

**Band:** Early Years

**Strand:** Critiquing

**Standard:** 1
Children develop understandings about people, diversity and the technological world, and learn to question by assessing their own and others’ products, processes and systems.

**Answers questions about design ideas and products:**
- 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 a want?
- What do I think about it?

**Explores community services (eg hospital, police station, supermarket, petrol station) and their technological attributes.**

**Understanding that technologies are made**
- Investigates and explores manufactured and natural materials/resources, documenting different attributes.
- Researches the type of materials used in everyday products and systems (eg building materials).
- Experiments, uses and analyses sports equipment (eg explores shape, style, materials used) and records similarities and differences.
- Experiments with cause and effect using different equipment and materials.
- Reviews technologies for the purpose of modifying an existing product (eg classroom storage).
- Reviews playground equipment for aesthetics, physical challenge, and disability access.
- Creates a game to demonstrate cause and effect.

**Understanding social and cultural differences**
- Researches and compares different clothing styles from different cultures (eg Australia, Japan).
- Researches and compares aspects of different cultures (eg food, housing, transport).
- Researches the technology of clothing in different cultures, exploring the past and present (eg buttons, cloth, leather, synthetic).
- Researches building construction within a variety of cultures, thinking about purpose (eg design, size, aesthetics, materials).
- Explores different cultural traditions within the local community.
- Explores celebrations and musical instruments within different cultures.
- Researches the weaving and patterns of different cultures.

**Determining points of view, bias and intent, and considering values inherent in any technology**
- Looks at the impact of a chosen piece of common technology on the natural and built environments (eg plastic bags).
- Reflects on a product they have made and responds to questions (eg ‘Does it fulfil its purpose?’ , ‘Does it meet the design brief?’ , ‘How could it be improved?’).
- Presents design ideas to an audience for discussion and critiquing.
Children develop understandings about people, diversity and the technological world, and learn to question by assessing their own and others’ products, processes and systems.

**Comparing, contrasting and experiencing**
- Participates in an excursion to a local community facility and explores links between people and technology (e.g., a fire station, police station, aquatics centre).
- Writes to the manager of a local business (e.g., a supermarket) suggesting more effective technology designs (e.g., trolleys).
- Promotes environmentally friendly packaging (e.g., designs and makes a poster).
- Designs futuristic packaging (e.g., using software such as Kid Pix).
- Constructs a model of a new community facility incorporating latest technologies (e.g., a Fun Park).

**Understanding the impact of technologies on people, economies and the environment**
- Researches the various written communications that are used and documents the range of tools used for writing purposes.
- Researches the importance of technologies and reliance that people have on them as part of everyday life (e.g., mobile phones, computers).
- Interviews people in the community about the impact of different technologies on their life.
- Discusses the advantages and disadvantages of different ways to present information (e.g., print, e-mail, intranet, internet).
- Explores and researches the impact on the environment of the tools for written technology (e.g., pencils, ballpoint pens, keyboards).
- Considers some issues related to appropriateness:
  - Aesthetics—Do I like the way it looks?
  - Cultural—Could 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—Will other people use this?
### Learning Area: Design and technology

**Strand: Designing**

**Possible starting points for planning, programming and assessing**

**Band: Early Years**

**Standard: 1**

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th>(refer p11 for DLO overview)</th>
<th>OUTCOMES</th>
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<tbody>
<tr>
<td><strong>Reception</strong> Towards Standard 1</td>
<td><strong>Year 1</strong> Towards Standard 1</td>
<td><strong>Year 2</strong> Standard 1</td>
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</table>

#### Empowering imaginative and logical thinking to create mental models

- Develops knowledge and skills about designing, through creative and imaginative play with unstructured objects.
- Creates a range of scenarios (e.g., uses construction blocks/sets).
- Uses computer software (e.g., Kid Pix) to experiment and investigate designs.
- Explores and develops own drawings (e.g., labelling/scribing).
- Observes and then creates own construction (e.g., observes an adult activity such as plumbing or carpentry, or another child’s model making).
- Develops knowledge and skills about designing by manipulating a range of materials (e.g., play dough, clay, wood).
- Explores and discusses the uses of a variety of materials.
- Practises sketching and labelling design ideas.
- Considers a variety of design ideas using different modes of presentation (e.g., drawing, modelling with clay).
- Uses construction materials to create a range of different models/designs with the same materials (e.g., construction sets/blocks, popsicles).
- Designs a solution for a particular problem (e.g., a recycling machine), using computer software (e.g., Kid Pix).
- Practises sketching and labelling own designs and writing instructions.
- Displays an understanding of designing (e.g., talks about or documents process).
- Gathers design ideas from familiar environments and considers how to use this information.
- Uses ICT ideas to help develop a project (e.g., with an environmental focus).
- Explores creatively methods for displaying designs (e.g., uses audiovisual equipment).
- Presents ideas and designs to the peer group (e.g., uses a well-known story to present).
- Articulates ‘think, draw, steps, make’ process to others.

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**Design questions:**
- Will it do what it is supposed to do?
- Will it work?
- Is it a practical proposition?
- Will what I am proposing, do what it is supposed to do?
- Have I got what I need to make the design?
- Is it appropriate?
- If I were a grandparent, would I buy this for my grandchildren?
- Who will gain and who will lose if this is produced?

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**Possible starting points for planning, programming and assessing**

1.2 Demonstrates an initial variety of design practices and recognises design as a tool for change.

FT FK1 FK2 FK3

— relating to Outcome 1.2
Children recognise and use different ways of thinking, planning and preparing that are helpful in achieving and presenting their designs. They learn that by designing it is possible to effect change.

<table>
<thead>
<tr>
<th>F T C KC1 KC2 KC3 relating to Outcome 1.2</th>
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<tbody>
<tr>
<td>• Experiments with designs and materials (eg designs furniture for a doll’s house, designs a shoebox house).</td>
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<td>• Constructs a habitat for a creature found in the outdoor area (eg explores the elements of an outdoor habitat).</td>
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**Solving problems and creating solutions for identified needs**

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<th>Reception Towards Standard 1</th>
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<th>Year 2 Standard 1</th>
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<tbody>
<tr>
<td>• Follows set directions and procedures (eg models, recipes).</td>
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<tr>
<td>• Researches and develops an idea further (eg creates an ant farm).</td>
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<tr>
<td>• Makes products and prepares instructions (eg for another child).</td>
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<tr>
<td>• Works in a group to solve a problem (eg compares different animal habitats).</td>
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**Making choices, interpreting criteria and matching needs**

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<tr>
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<tbody>
<tr>
<td>• Chooses tools (eg pencils, paint, photos) to present a design idea.</td>
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<tr>
<td>• Imagines, explores and presents designs (eg future transport, a shopping centre, a playground).</td>
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<tr>
<td>• Researches materials to meet the needs of an imagined design.</td>
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<tr>
<td>• Selects software to show designs (eg Kid Pix, PowerPoint).</td>
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**Inventing, refining and experimenting with materials, techniques and prototypes**

**Applying, executing, implementing and exploring ideas with others**

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<tbody>
<tr>
<td>• Discusses design possibilities (eg with a peer audience).</td>
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<td>• Presents design sketches (eg to a small group of peers) for a new gadget.</td>
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<td>• Works collaboratively to develop a project (eg with a buddy class).</td>
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<td>• Seeks and records feedback about constructions (eg documents comments from peers).</td>
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<tr>
<td>• Explores and plays with a range of materials, discovering and investigating their attributes and effectiveness for constructing and making (eg discusses the use of cardboard in the construction).</td>
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<td>• Explains how materials/components can be used in different ways for new designs (eg recycled cartons, seashells, pebbles).</td>
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<tr>
<td>• Investigates how some materials can be affected by changes in conditions (eg compares and decides suitability for a product).</td>
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<tr>
<td>• Explores the effectiveness of different materials to construct a covered space (eg inside/outside cubby house).</td>
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<tr>
<td>• Plays with commercial construction kits and describes their attributes (eg to a peer audience).</td>
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<tr>
<td>• Compares properties and conditions for use of materials and experiments with environmental effects (eg water, heat, light, pressure).</td>
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<thead>
<tr>
<th>Reception Towards Standard 1</th>
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<tbody>
<tr>
<td>• Seeks and records feedback about constructions (eg documents comments from peers).</td>
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**1.2 Demonstrates an initial variety of design practices and recognises design as a tool for change.**
### Learning Area: Design and technology  
**Strand: Designing**

### Possible starting points for planning, programming and assessing

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<tr>
<td><strong>Illustrating, displaying, presenting and communicating ideas</strong></td>
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<tr>
<td>* Reflects on a design and product and expresses thoughts with visual clues (eg I feel ☺/☺ about my robot design).</td>
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<tr>
<td>* Illustrates design ideas (eg creates a poster, uses <em>Kid Pix</em> or <em>Max’s sandbox</em>).</td>
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<tr>
<td>* Explores design ideas in a whole group process (eg shares ideas and establishes a shared design layout for a group project).</td>
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<tr>
<td>* Presents designs for a preferred future product (eg a method of transport).</td>
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<tr>
<td>* Describes inventive ways of transporting different zoo animals.</td>
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<tr>
<td>* Explores ways to improve projects (eg with a group).</td>
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<tr>
<td>* Reflects, questions, discusses and records plans for improvement.</td>
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<tr>
<td>* Records designs, and shares ideas with others (eg different writing tools, gardening equipment).</td>
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<tr>
<td>* Sketches and develops labels to show how parts of a design come together.</td>
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<tr>
<td>* Sketches a pop-up picture in 3-D form, drawing the section that will pop up separately and indicating where it will fit into the design (eg sketches a pop-up card).</td>
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<tr>
<td>* Sketches design ideas using ICT software package.</td>
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</table>

### Design questions to review and check design ideas:
- How do I describe my ideas?
- What are the key features?
- Can I describe the purpose of each feature?
- Can I talk about similar designs?
- Can I explain why someone would prefer my designs?
- Are my design proposals sustainable?
- What are the consequences of my designs?
- Do my designs match my intended purpose?
- Is it well made?
- What is the best way of presenting my designs?
- Who is the audience I am targeting with my designs?

### Records designs, and shares ideas with others (eg different writing tools, gardening equipment).

**OUTCOMES**

**1.3 Shares a variety of ways of communicating their design ideas and thinking.**

**T C KC2**
## Learning Area: Design and technology  
**Strand: Making**

### Key Ideas

<table>
<thead>
<tr>
<th>Reception</th>
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<th>Year 2</th>
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<tbody>
<tr>
<td>Towards Standard 1</td>
<td>Towards Standard 1</td>
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</table>

### Outcomes

#### Reception
- Towards Standard 1

- Children develop confidence in their capacity to use materials and equipment to make products, processes and systems and, in so doing, reflect on how they work.

**KC1** **KC6** **KC7** relating to Outcome 1.4

#### Year 1: Towards Standard 1

- Safe situations are those in which the risks have been controlled, reducing the possibility of harm and damage.

**DANGER**

- Explicit teaching needed of:
  - Correct tool use, safe procedures and the set-up of designated work areas for specific tasks (eg sawing table, drilling table, glue gun area, cutting table, painting table).
  - The non-interference of others when using tools.
  - The importance of keeping hands and fingers away from sharp tools.
  - The necessity of keeping work areas clear of waste.

#### Year 2: Standard 1

- Records experiences when cooking and shares with a wider audience (eg morning tea for parents/caregivers, group cook book).

**KC7**

- Makes predictions about tool use and material suitability (eg choosing materials to make a product that floats).

- Shows another child how to use a particular tool.

- Creates a visual display of tools used, with labels, to highlight their use and application.

### Realising design ideas through processing/manipulating materials

- Plays with and manipulates a range of materials to explore their properties (eg collects a variety of materials to compare their feel and pliability).

- Experiments and plays with a variety of materials and tests them for their properties (eg in water) and records outcomes.

- Uses trial and error with materials to develop an understanding of design constraints (eg is cellophane waterproof?).

- Investigates using a sensory approach (eg tastes a range of food and documents findings).

- Explores a range of joining techniques and materials (eg different glues, pipe cleaners and straws for joining corners, plasticine, slotting with cardboard).

- Experiments with a range of tools to observe how they work and how they can be used in making things.

- Creates a visual display of the tools used, with labels, to highlight their use and application.

- Experiments with a range of joining techniques and materials (eg explores suitability for a tall, stable structure).

- Experiments with and hypothesises about a range of materials (eg that filter light).

- Explores different ways materials are contained (eg baskets, vessels, clay pots).

- Investigates changes to food using different preparation processes (eg cooking, freezing, drying).

- Creates (eg as a group) a display board of joining ideas that could be used in the construction of a model.

- Selects suitable tools for a particular purpose.

- Uses a variety of tools, observes how they work, and knows their correct names (eg Phillips head screwdriver, G clamp, low melt glue gun, stapler).

- Records experiences when cooking and shares with a wider audience (eg morning tea for parents/caregivers, group cook book).

- Makes predictions about tool use and material suitability (eg choosing materials to make a product that floats).

- Shows another child how to use a particular tool.

- Creates a visual display of tools used, with labels, to highlight their use and application.
Children develop confidence in their capacity to use materials and equipment to make products, processes and systems and, in so doing, reflect on how they work.

** KC1 KC6 KC7 relating to Outcome 1.4

### Open ended suggestions

- "Specific purpose" in many suggestions are designed to allow children and teachers to define their own purpose for individual, small group and/or class projects.

### Using tools and equipment safely and competently

- Demonstrates awareness of safety issues (eg helps set up areas using awareness of safety issues—cooking, painting, gluing).
- Promotes appropriate hygiene and safety rules (eg creates a visual display concerning safety in the classroom).
- Considers the safety of others and adopts safe working practices.
- Stores tools correctly.

### Developing understanding of quality, accuracy and the role of specialised tools and equipment

- Indicates a preference for a specific product or piece of equipment (eg knows that one tool is better than another for a certain task).
- Describes how a product is made up of different parts (eg handles, shapes, wheels).
- Recalls steps in a simple routine (eg a familiar daily task).
- Recognises cause and effect relationships in systems used (eg identifies a switch to turn on a light, handles to open doors, traffic lights to cross a road).

### Combining components to create a system

- Understands and articulates the importance of safe practices.
- Cooperates with others and shares tools and materials in a safe way.
- Demonstrates appropriate handling techniques (eg low melt glue guns).
- Shares safety issues with a wider audience.
- Describes and displays safety rules to others.
- Presents and explains safety rules to an audience, targeting a variety of safety issues (eg makes a set of safety posters).

### Year 1

- Maintains and uses tools and equipment safely and appropriately (eg wears gloves when using low melt glue guns).
- Tests a variety of materials and tools for a specific purpose (eg adhesive tape compared to glue).

### Year 2

- Develops own routine to complete tasks (eg describes how to make a sandwich).
- Makes a movable toy with interconnecting parts (eg uses a construction kit with gears and levers).
- Describes the systems used to get to school and why they are important (eg getting dressed appropriately, the transport system, personal safety).
- Creates a system to meet a class need (eg to take care of a class pet).
### Learning Area: Design and technology
#### Strand: Making

**Possible starting points for planning, programming and assessing**

**Band: Early Years**

**Standard: 1**

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th>OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children analyse and explain the uses and potential of equipment and materials. They recognise that a range of resources can be used to accomplish their ideas and to (re)shape their world. F C KC1 KC2 KC7 relating to Outcome 1.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5 Explores current and alternative uses of materials and equipment in creating products, processes and systems. F C KC1</td>
</tr>
</tbody>
</table>

#### Reception
Towards Standard 1

- Experiments with and trials a wide variety of materials before using them in a design task (eg suitable materials for threading beads, shells).
- Sorts materials for a purpose (eg recycling, materials for making a collage).
- Identifies by name a variety of materials (eg glass, plastic, polystyrene, wood).

#### Year 1
Towards Standard 1

- Chooses, with support, materials and equipment to be used in a task.
- Matches tools to materials (eg creates a poster by gluing pictures of tools onto pieces of different material).

#### Year 2
Standard 1

- Chooses materials and equipment to be used in a specific task.
- Identifies tools used with occupations (eg teacher, plumber, chef).

### Sorting and selecting materials

- Explores and discusses how choosing appropriate materials helps the design process.
- Explains choices of materials for the design of a tool (eg for picking up litter).
- Compares samples to determine the most appropriate materials when designing (eg looks at factors such as durability and size).
- Explains using ‘technology words’ how a range of materials and equipment can be used for joining other materials (eg paper, plastic, cardboard, foam, wood).
- Makes a model using junk/recycled materials and shares the finished product with the class.
- Chooses appropriate materials and equipment to be used to make a product.
- Explains why tools match specific materials (eg after testing a variety of tools and materials).

### Matching tools with materials

#### Creating quality products

- Explores and discusses how choosing appropriate materials helps the design process.
- Explains choices of materials for the design of a tool (eg for picking up litter).
- Compares samples to determine the most appropriate materials when designing (eg looks at factors such as durability and size).
- Explains using ‘technology words’ how a range of materials and equipment can be used for joining other materials (eg paper, plastic, cardboard, foam, wood).
- Makes a model using junk/recycled materials and shares the finished product with the class.
- Chooses appropriate materials and equipment to be used to make a product.
- Explains why tools match specific materials (eg after testing a variety of tools and materials).
Children analyse and explain the uses and potential of equipment and materials. They recognise that a range of resources can be used to accomplish their ideas and to (re)shape their world.

Relating to Outcome 1.5

**Developing appropriate skills and techniques for the materials used**

- Develops knowledge of materials through playing with them (e.g., wood, clay, sand).
- Chooses an assortment of materials and sorts by texture, weight, colour, shape or appearance.
- Makes a range of products, using a variety of materials, including recycled articles.
- Experiments with different materials to find the most suitable for making designated items (e.g., creates a model using a range of materials such as straws, plasticine and balsa wood).
- Creates products, with consideration of using recycled materials.
- Selects and uses appropriate materials and techniques to create a product.
- Understands and follows a design brief (e.g., to use only recycled materials).
- Develops a presentation to share results (e.g., makes a slide show).

**Analysing and responding to information about materials, processes and systems**

- Asks questions to gain information about materials (e.g., ‘What is it?’, ‘What can it do?’ or ‘Where did it come from?’).
- Asks questions such as ‘What does it do?’ and ‘What’s good about it?’ and investigates properties of materials (e.g., paper: exploring ways to strengthen through folding, rolling and layering).
- Asks questions and provides answers (e.g., next time I might try new tools/different materials).
- Selects materials and processes appropriate to the task, considering which joining techniques might be suitable and whether joins need to be permanent or temporary.
### Learning Area: Design and technology
**Strand: Making**

**Possible starting points for planning, programming and assessing**

**Band: Early Years**

**Standard: 1**

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th>OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Children analyse the importance of organisation and safety rules, in order to use resources well and consider the personal and social responsibilities involved when working with others. In C KC1 KC4 relating to Outcome 1.6</td>
<td>- 1.6 Understands the importance of simple organisation and safety issues in terms of their consciousness of people and fairness. Id In KC1</td>
</tr>
<tr>
<td>- Develops understandings of the impact of using technology inappropriately (eg damaging equipment, wasting materials).</td>
<td>- All accidents, no matter how minor, should be reported.</td>
</tr>
<tr>
<td>- Considers the impact of their work and needs on others (eg not cooperating in a group task, wasting materials).</td>
<td>- Hands should be washed thoroughly after working with materials and tools.</td>
</tr>
<tr>
<td>- Discusses the impact of their designs on the intended user (eg safety, cost).</td>
<td>- Long hair should be tied back at all times.</td>
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<tr>
<td>- Explores how technology can meet the needs of others (eg providing information, fresh food).</td>
<td>- The use of dust masks is essential when sawing, sanding and drilling.</td>
</tr>
<tr>
<td>- Observes how familiar products work and consults with others about their use.</td>
<td>- Report all damaged tools.</td>
</tr>
<tr>
<td>- Discusses how tools or equipment might be used to harm other people (eg running with sharp tools, throwing tools).</td>
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</tbody>
</table>
## Acronyms — Terrific Technology Teaching Tips

<table>
<thead>
<tr>
<th>Use PRISMER:</th>
<th>Use PRIDMER:</th>
<th>Use TRIDMES:</th>
<th>Use COSMIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P</strong> Problem</td>
<td><strong>P</strong> Problem</td>
<td><strong>T</strong> Task and context</td>
<td><strong>C</strong> Collect information</td>
</tr>
<tr>
<td><strong>R</strong> Restrictions</td>
<td><strong>R</strong> Restrictions</td>
<td><strong>R</strong> Requirements</td>
<td><strong>O</strong> Organise</td>
</tr>
<tr>
<td><strong>I</strong> Investigating</td>
<td><strong>I</strong> Investigating</td>
<td><strong>I</strong> Investigating</td>
<td><strong>S</strong> Select and design</td>
</tr>
<tr>
<td><strong>S</strong> Solutions</td>
<td><strong>D</strong> Designing</td>
<td><strong>D</strong> Designing</td>
<td><strong>M</strong> Make</td>
</tr>
<tr>
<td><strong>M</strong> Making</td>
<td><strong>M</strong> Making</td>
<td><strong>M</strong> Making</td>
<td><strong>I</strong> Implement</td>
</tr>
<tr>
<td><strong>E</strong> Evaluation</td>
<td><strong>E</strong> Evaluating</td>
<td><strong>E</strong> Evaluating</td>
<td><strong>C</strong> Critically reflect</td>
</tr>
<tr>
<td><strong>R</strong> Reflecting</td>
<td><strong>R</strong> Reflecting</td>
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</tbody>
</table>
# BAND: PRIMARY YEARS

## Assessment criteria

<table>
<thead>
<tr>
<th>Key Ideas</th>
<th>Strands</th>
<th>The learner is able to:</th>
<th>Working technologically</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Critiquing</strong></td>
<td>- questioning, identifying, clarifying, examining and exploring technologies</td>
<td>• Question, analyse and discuss issues and intentions behind products and processes</td>
<td>• Achieving quality and accuracy</td>
<td>2.1 Identifies a range of ways in which the design of everyday products, processes and systems is related to those who use them. In T KC1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use and apply higher order thinking skills to compare, analyse, create and make connections</td>
<td>• Asking questions</td>
<td>3.1 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems. In T KC2</td>
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<tr>
<td></td>
<td></td>
<td>• Consider impact of products, including their own, on others and the world</td>
<td>• Being creative</td>
<td>3.2 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems. F In KC6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Communicate clearly and explain processes with ‘technology terms’</td>
<td>• Being optimistic about what is achievable</td>
<td>3.3 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems. F In KC6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use ICTs as recording, presentation and communicating tools</td>
<td>• Building on others’ thinking</td>
<td>3.4 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems. F In KC6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reflect on and articulate own opinions using evidence</td>
<td>• Considering possible solutions</td>
<td>3.5 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems. F In KC6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Relate original designs to the finished product</td>
<td>• Demonstrating respect for others’ ideas</td>
<td>3.6 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems. F In KC6</td>
</tr>
<tr>
<td><strong>Designing</strong></td>
<td>- exploring, generating and representing ideas</td>
<td>• Create designs that meet a need</td>
<td>• Developing coordination</td>
<td>2.2 Develops a range of design skills and uses them to effect change. F T KC3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Investigate ideas that contribute to designs</td>
<td>• Developing independence</td>
<td>3.2 Users and understands the relationship between different design skills to become better designers. F In KC3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Describe, record and display a range of design ideas</td>
<td>• Developing ownership</td>
<td>3.3 Suggests appropriate communication forms and technologies to document and convey clearly design ideas, thinking and organisation. T C KC2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Develop detailed designs using drawings, sketches or prototypes</td>
<td>• Expanding confidence</td>
<td>3.4 Users and understands the relationship between different design skills to become better designers. F In KC3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Develop planned approaches for own designs</td>
<td>• Experimenting with tools and processes</td>
<td>3.5 Users and understands the relationship between different design skills to become better designers. F In KC3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use ICTs as designing tools</td>
<td>• Exploring options</td>
<td>3.6 Users and understands the relationship between different design skills to become better designers. F In KC3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Generate design plans and sketches that explain what is wanted to be achieved</td>
<td>• Increasing responsibility</td>
<td>3.7 Users and understands the relationship between different design skills to become better designers. F In KC3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Create drawings of own design ideas and proposals</td>
<td>• Innovating</td>
<td>3.8 Users and understands the relationship between different design skills to become better designers. F In KC3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use ICT applications to aid in the communication of own ideas</td>
<td>• Investigating ideas of self and others</td>
<td>3.9 Selects appropriate communication forms and technologies to document and convey clearly design ideas, thinking and organisation. T C KC2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Discuss, question and reflect on the design process</td>
<td>• Involving trial and error</td>
<td>3.10 Selects appropriate communication forms and technologies to document and convey clearly design ideas, thinking and organisation. T C KC2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Listening</td>
<td>3.11</td>
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<td></td>
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<td></td>
<td>• Making decisions</td>
<td>3.12</td>
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<td></td>
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<td></td>
<td>• Making judgments</td>
<td>3.13</td>
</tr>
</tbody>
</table>

**Students** identify relationships between people, diversity and everyday products, processes and systems. They investigate design characteristics which shape, and are shaped by, these relationships and suggest why the particular design criteria may have been used.

In T KC1 KC2 relating to Outcome 2.1

Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

In T KC1 KC2 relating to Outcome 3.1

**Students** learn a range of specific design skills, which help them to design more effectively and develop their thinking and capacity to effect change.

F T KC3 relating to Outcome 2.2

Students understand and value the combining of different design skills in order to create personal strategies to become better designers of culturally, environmentally and socially defensible products, processes and systems.

F In KC6 relating to Outcome 3.2

Students reflect on their own work by clarifying and communicating their design ideas and their thinking and planning for products, processes and systems. They use effective design communication methods, including appropriate digital and electronic technologies.

T C KC2 KC7 relating to Outcome 2.3

Students use a full range of communication skills and techniques in the design field, including information and communication technologies, to document and communicate effectively their design thinking, ideas and proposals.

T C KC2 KC7 relating to Outcome 3.3

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26
<table>
<thead>
<tr>
<th><strong>Making</strong> - developing skills and knowledge about equipment, tools and techniques</th>
<th><strong>Making</strong> - understanding material characteristics and how they determine the material use</th>
<th><strong>Making</strong> - developing procedures that enable safe and responsible resource management</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Select and use tools and materials appropriate for a task</td>
<td>- Describe the characteristics of materials used in making things</td>
<td>- Use the literacy of technological terms to describe procedures, materials and tools</td>
</tr>
<tr>
<td>- Use ICTs with skill and confidence</td>
<td>- Predict how materials can be used, manipulated and modified</td>
<td>- Establish safe work practices and maintain a safe work environment</td>
</tr>
<tr>
<td>- Apply appropriate safety procedures when using tools and equipment</td>
<td>- Develop a knowledge base of materials and equipment</td>
<td>- Keep to a timeline to complete tasks set</td>
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<tr>
<td>- Manipulate materials accurately in the making of designed products</td>
<td>- Evaluate designs, materials and equipment to be used</td>
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<tr>
<td>- Create quality end products using the materials and resources available</td>
<td>- Use technological terms appropriately</td>
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<td></td>
<td>- Negotiating roles</td>
<td>- Using different genres</td>
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<tr>
<td></td>
<td>- Observing</td>
<td>- Working collaboratively</td>
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<tr>
<td></td>
<td>- Planning and managing production</td>
<td>- Working cooperatively in a team</td>
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<td></td>
<td>- Recording ideas and processes</td>
<td>- Working effectively on their own</td>
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<td></td>
<td>- Reflecting on and accepting constructive feedback</td>
<td>- Working flexibly in teams</td>
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<td>- Reflecting on ideas</td>
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<td>- Researching ideas</td>
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<td></td>
<td>- Sharing ideas</td>
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<td></td>
<td>- Showing concern about the effects of technology</td>
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<td></td>
<td>- Solving problems</td>
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<td></td>
<td>- Taking responsibility</td>
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<td></td>
<td>- Taking risks</td>
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<td></td>
<td>- Thinking flexibly</td>
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<td></td>
<td>- Thinking imaginatively</td>
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<td></td>
<td>- Investigating the characteristics of materials and equipment used in design and production in order to achieve sustainability.</td>
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<td></td>
<td>- Identifying and articulating a range of responsible strategies for managing resources and working safely.</td>
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</tbody>
</table>

**Students learn techniques and demonstrate competence in using a broad range of materials and equipment for making products, processes and systems. They reflect on how they work with the equipment and materials they use and, in so doing, improve their practice.**

**Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations.**

**Students identify, explain and value the characteristics and uses of a range of materials and equipment. They use this knowledge when critiquing their own and others’ designs for products, processes and systems.**

**Students understand, give reasons for, and manage equipment and resources responsibly and effectively, and work in ways which respect diverse personal and social identities.**

**Students describe and communicate principles of good resource management and duty of care, and integrate them into socially and environmentally sustainable designing and making practice.**
### Learning Area: Design and technology

**Band: Primary Years**

**Strand: Critiquing**

**Standards: 2 & 3**

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th>(refer p14 for Early Years)</th>
<th>OUTCOMES</th>
<th>(refer p48 for Middle Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 3</strong></td>
<td><strong>Towards Standard 2</strong></td>
<td><strong>Year 4</strong></td>
<td><strong>Year 5</strong></td>
</tr>
<tr>
<td><strong>Analysing, choosing, discerning, checking, monitoring and surveying</strong></td>
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</tr>
<tr>
<td>Students identify relationships between people, diversity and everyday products, processes and systems. They investigate design characteristics, which shape, and are shaped by, these relationships and suggest why the particular design criteria may have been used.</td>
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<tr>
<td>In <strong>T KC1 KC2</strong> relating to Outcome 2.1</td>
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<tr>
<td>Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.</td>
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<tr>
<td>In <strong>T KC1 KC2</strong> relating to Outcome 3.1</td>
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<tr>
<td><strong>Researching past, present and proposed technologies</strong></td>
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<tr>
<td>• Explores and researches examples of the same product to understand similarities and differences (eg shoes, cereals, magazines, chairs, boats).</td>
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<tr>
<td>• Considers size and purpose of a product (eg appropriate to type of activity, age; cost; materials; strengths and weaknesses) and investigates any changes that have occurred.</td>
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<tr>
<td>• Makes refinements during the making process so that safety requirements are an integral component.</td>
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<tr>
<td>• Considers safety (eg when using candles or hairdryers to make a hot air balloon fly).</td>
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<tr>
<td>• Chooses different materials for strength (eg cardboard instead of paper).</td>
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<tr>
<td>• Uses knowledge of the relationship between materials, tools and techniques to make refinements to the making process.</td>
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<tr>
<td>• Solves problems and generates new solutions/ideas, and constructs and tests prototypes to achieve the final product.</td>
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<tr>
<td>• Acquires new skills and techniques (eg from a teacher, peer, books, videos) to achieve desired outcomes.</td>
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</tr>
<tr>
<td>• Explores and tests different products that meet the same need or want to determine the most appropriate product (eg compares dishwashing liquids in terms of quality and quantity), and asks probing questions (eg ‘Does expensive mean that it is best?’, ‘Which is the best for the environment?’).</td>
<td></td>
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<tr>
<td>• Tests packaging strength and questions functionality (eg by asking questions such as: ‘Does it do what it is intended to?’).</td>
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<tr>
<td>• Makes refinements, with a focus on safety, to techniques used during the making process.</td>
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<tr>
<td>• Identifies the different materials used and the reasons for their selection.</td>
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</tbody>
</table>
Students identify relationships between people, diversity and everyday products, processes and systems. They investigate design characteristics, which shape, and are shaped by, these relationships and suggest why the particular design criteria may have been used.

In T KC1 KC2 relating to Outcome 2.1

Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

In T KC1 KC2 relating to Outcome 3.1

Answers questions about design ideas and products:
- 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 a want?
- What do I think about it?

Learning/knowing/finding out about technologies locally and globally

- Questions people of different ages about significant changes in technology throughout their lives.
- Asks questions about new technologies (eg 'How important is it?’, ‘How will it affect people’s lifestyles?’).
- Investigates the differences between shape, form and structure to highlight characteristics.
- Identifies the relationship between structural design, climate and the local environment.
- Identifies and analyses house construction techniques and styles (eg Queensland house styles, mud brick walls, timber walls) and relationships to the availability of materials.
- Tests shape strengths (eg square, triangular shapes), and compares interlocking to non-interlocking shapes (eg uses Lego).
- Discusses whether an intended product fulfils requirements.
- Examines and deconstructs everyday products.
- Examines and records the deconstruction of a mechanism (eg a wind-up clock).

Understanding that technologies are made

- Discusses and questions whether a particular product meets a need or a want.
- Looks at everyday items and new technologies (eg mobile phones, internet, skate parks) and decides whether they are 'needed' or 'wanted'.
- Examines and deconstructs everyday products.
- Examines and records the deconstruction of a mechanism (eg a wind-up clock).
- Investigates future energy systems and compares them to current practices.
- Analyzes the impact of technology on our society, in the past, present and future.
- Investigates a tradeperson’s tools and procedures.
- Investigates the development of a piece of equipment (eg the telescope).
- Surveys family members and friends about changes in technology throughout their lives.

2.1 Identifies a range of ways in which the design of everyday products, processes and systems is related to those who use them.

In T KC1

3.1 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems.

In T KC2

DANGER

Safety issues cannot be left to come up incidentally within an activity—they have to be dealt with before the activity begins. Whether it is the use of scissors, cutters or low melt glue guns, learners need to be given explicit instructions on how they are to be used, where they can be used and any other specific safety issues related to their use.
Students identify relationships between people, diversity and everyday products, processes and systems. They investigate design characteristics, which shape, and are shaped by, these relationships and suggest why the particular design criteria may have been used.

**In T KC1 KC2 relating to Outcome 2.1**

Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

**In T KC1 KC2 relating to Outcome 3.1**

### Understanding social and cultural differences

- Discusses how structures from around the world (eg houses, aeroplanes, places of worship, materials, tools) are different and finds out the reasons (eg different cultures’ needs).
- Examines the effectiveness of structural design through the ages, to compare different cultures’ needs (eg houses, aeroplanes, places of worship, materials, tools).
- Determines the most appropriate product by comparing different products that meet the same need or want.
- Compares different materials used for the same product (eg shopping bags—plastic, biodegradable, brown paper, calico, string).
- Investigates types of packaging (eg bubble wrap, shredded paper, biodegradable products, foam).

### Determining points of view, bias and intent, and considering values inherent in any technology

- Predicts benefits and drawbacks of technologies (eg researches past, present and proposed technologies).
- Appreciates impacts of technologies on the environment and society (eg investigates past, present and proposed technologies).
- Appreciates impacts of technologies on the environment and society by focusing on future technologies.
Students identify relationships between people, diversity and everyday products, processes and systems. They investigate design characteristics, which shape, and are shaped by, these relationships and suggest why the particular design criteria may have been used.

In T KC1 KC2

relating to Outcome

2.1

Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

In T KC1 KC2

relating to Outcome

3.1

Comparing, contrasting and experiencing

- Researches telecommunications (eg the introduction of mobile phones and their development over time).
- Documents the development of processed materials over time (eg plastics).
- Investigates the development of transport (eg aeroplanes, space travel).
- Researches the changes in computer hardware and software since their introduction.
- Considers the impact of human activity on the environment (eg dams, nuclear waste, wood chipping, mining—role-plays, mining chocolate chips from a biscuit).
- Creates a role-play to explain a concept (eg mining chocolate chips from a biscuit to observe the implications of mining).
- Considers the impact of new technologies on everyday lives.
- Discusses (eg in groups) why products are recalled (eg faulty components, safety).

Considers some issues related to appropriateness:
- Aesthetics—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—Will other people use this?
- Matches design requirements by exploring available resources and materials.
- Researches to identify resources (eg materials to make a travel container that matches the needs of a class pet).
- Considers ways that will allow a vehicle to move over different surfaces (eg experiments with a range of wheels).
- Examines and compares computer programs that have been designed for the same purpose (eg word processing, creating graphics).
- Shares the benefits of drawing software that has been reviewed (eg uses a graphic organiser to review Kid Pix).
- Reviews software to select a preferred display/presentation program for design ideas and proposals.
- Determines how acceptable and user friendly a product is (eg tests a computer program/game with peers).
- Analyses a designing tool (eg analyses Kid Pix using a graphic organiser—develops a consequence wheel).
- Tests software programs that can be used to display design ideas (eg Inspiration).
- Compares and contrasts available resources to match materials to use/purpose (eg considers materials for the roof of a cardboard house model, compares a range of materials when making a hull for a model solar boat, considers plastic instead of paper for a boat hull because it is waterproof).
- Tests own designs (eg own torch designs for intensity of light and battery usage).
- Clarifies what was intended in designs by comparing, analysing and refining ideas.
- Adapts ideas developed by others (eg from plans).
- Generates and refines ideas, incorporating both environmental and social considerations (eg collaboratively examines with the local landcare group how to develop a model for communicating ideas about revegetating a river bank).
- Compares, tests and judges products and processes in real-life and lifelike situations, to determine effectiveness, efficiency, durability and suitability.
- Compares materials to be used for a specific design purpose (eg gathers ideas for a craft to stay afloat for 24 hours).

2.1

Identifies a range of ways in which the design of everyday products, processes and systems is related to those who use them.

In T KC1

3.1

Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems.

In T KC2
Students identify relationships between people, diversity and everyday products, processes and systems. They investigate design characteristics, which shape, and are shaped by, these relationships and suggest why the particular design criteria may have been used.

In T KC1 KC2 relating to Outcome 2.1

Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

In T KC1 KC2 relating to Outcome 3.1

Understanding the impact of technologies on people, economies and the environment

- Considers ways of joining materials (eg. uses pop sticks instead of straws for a model raft, because they are easier to join).
- Considers availability of materials for use in construction (eg. uses cardboard instead of balsa wood for a model space station, because it comes in larger sheet sizes).
- Analyses strengths and weaknesses of materials used in construction.
- Uses a range of materials to construct different versions of the same product and tests them for strength and weakness, using a fair test (eg builds model bridges made of paper, card, pop sticks etc to span a distance between two desks and support a predetermined weight—makes alternative suggestions regarding choice of materials and explains criteria for selection).

Identifying inconsistencies

- Explores the appropriateness of materials and their effect on the environment.
- Discusses sustainability and appropriateness of materials.
- Compares natural and manufactured/processed materials.
- Promotes sustainability and appropriateness of materials used in the making of future products.
- Considers natural and manufactured/processed materials.
- Compares natural and manufactured/processed materials.
- Plans appropriate technologies for the ‘throw away society’.
- Promotes modifications of an everyday finished product to make it more environmentally friendly.
- Develops a proposal to make an everyday product more environmentally friendly.
- Reports and discusses how closely a finished product meets its design brief.
- Questions techniques and processes.
- Presents a product report (eg to the class or a small group).
Students identify relationships between people, diversity and everyday products, processes and systems. They investigate design characteristics, which shape, and are shaped by, these relationships and suggest why the particular design criteria may have been used.

In T KC1 KC2 relating to Outcome 2.1

Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

In T KC1 KC2 relating to Outcome 3.1

Appraising, reviewing, evaluating and judging

- Evaluates and reflects on processes, techniques, materials and tools.
- Asks questions about and reflects on the way materials can be joined together.
- Discusses problems encountered when producing a product.
- Compares similar products and describes key features, similarities and differences.
- Evaluates and reflects on processes, techniques, materials and tools.
- Asks questions such as: ‘Was it easy or difficult?’, ‘Did I learn new skills?’.
- Asesses how effectively their own and others’ models meet the design brief.
- Questions critically and asks for feedback (eg from peers/teachers).
- Discusses and reflects on problems encountered (eg describes what worked and what didn’t work).
- Identifies some of the strengths and weaknesses of a design idea.
- Devises a criteria sheet for purchasing technology (eg new computer programs/games to achieve accurate designs).
- Considers product criteria (eg whether it is user friendly, practical, cost effective, provides value for money).
- Evaluates and reflects on processes, techniques, materials and tools.
- Makes prototypes of specific components in order to evaluate their suitability.
- Demonstrates modifications throughout the design process.
- Maintains a record which reflects thoughts about processes, techniques, materials and use of tools (eg in a journal or portfolio).

• Evaluates and reflects on processes, techniques, materials and tools.
• Asks questions such as: ‘Was it easy or difficult?’,”Did I learn new skills?”.
• Asesses how effectively their own and others’ models meet the design brief.
• Questions critically and asks for feedback (eg from peers/teachers).
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In T KC1

3.1 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems.

In T KC2
### Learning Area: Design and technology
### Strand: Designing

### Possible starting points for planning, programming and assessing

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th>(refer p17 for Early Years)</th>
<th>OUTCOMES</th>
<th>(refer p54 for Middle Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td>Students learn a range of specific design skills, which help them to design more effectively and develop their thinking and capacity to effect change.</td>
<td><a href="#">KC3</a> relating to Outcome 2.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students understand and value the combining of different design skills in order to create personal strategies to become better designers of culturally, environmentally and socially defensible products, processes and systems.</td>
<td><a href="#">KC6</a> relating to Outcome 3.2</td>
<td></td>
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</tbody>
</table>

#### Year 3
**Towards Standard 2**

- Generates design ideas for an intended product (eg brainstorms).
- Creates mental pictures of possible design ideas (eg for an aquatic animal habitat).
- Reflects on prior knowledge and skills learnt to generate design ideas for an alternative method of communicating (eg in the classroom).

#### Year 4
**Standard 2**

- Explores (eg brainstorms), imagines and creates design solutions to a perceived problem.
- Discusses ideas and solutions for a particular problem (eg a parking problem in the school grounds).
- Examines safety issues (eg regarding playground equipment).

#### Year 5
**Towards Standard 3**

- Considers different perspectives using a range of thinking strategies.
- Defends reasons for using some ideas and rejecting others.
- Generates design ideas that reflect group identity (eg creates a new school uniform).
- Identifies that possible solutions may take too long to learn new skills and/or construct.

### Empowering imaginative and logical thinking to create mental models

- Generates design ideas for an intended product (eg brainstorms).
- Creates mental pictures of possible design ideas (eg for an aquatic animal habitat).
- Reflects on prior knowledge and skills learnt to generate design ideas for an alternative method of communicating (eg in the classroom).

### Solving problems and creating solutions for identified needs

- Estimates the amount of material required in a task so as to minimise waste (eg calculates the material required for making a protective cover).
- Sketches ideas for a template (eg to use in cutting the fuselage of a balsa wood flying machine).
- Illustrates and appropriately labels the designs of intended products.
- Creates an advertising poster of an everyday product (eg a Game Boy).
- Organises knowledge and ideas to meet the specific task set.
- Describes how to make something (eg a pizza, a sandwich—designs a poster).
- Describes why some solutions and strategies are better than others.
- Designs and builds a model (eg a model bridge that will hold a 500g weight), labels it, explains the role of different key components, and describes why it is a good design.
- Plans and documents ideas to meet a design brief.
- Produces promotional material (eg generates a pamphlet to promote the local area).
- Develops a procedure to follow when making a product.
- Creates a flow-chart of how to make a product (eg using Kid Pix).
- Programs a robot using software (eg Lego’s ROBOLAB and Mindstorms for schools).
Students learn a range of specific design skills, which help them to design more effectively and develop their thinking and capacity to effect change.

**Making choices, interpreting criteria and matching needs**

- Discusses and examines a design brief to design possible solutions or products (eg discusses possible solutions for opening a jar).
- Designs and discusses an alternative form of transport (eg a 'people transporter' to get from one classroom to another).
- Generates ideas and recognises constraints in designs.
- Examines equipment and ingredients that could be used for preparing a meal (eg a class lunch).
- Selects appropriate tools for a task.
- Designs a shelter to meet the needs of the occupants (eg for an animal being studied, considering life cycle, needs and wants—a bird, possum or bat nesting box for trees in the local area).
- Designs a decorative feature for a room giving consideration to its purpose (eg designs wallpaper patterns, recording how different patterns affect the ambience).
- Analyses a design brief to design possible solutions or products (eg considers the constraints and requirements).
- Swaps design ideas (eg with peers, ‘buddy’ class, ‘buddy’ school).
- Recommends a preferred way to open a container (eg a jar).
- Explains the relationship of tools to materials.
- Analyses and interprets a design brief to design possible solutions or products.
- Uses a range of technologies to exchange and evaluate design ideas and interpretations (eg uses e-mail, digital cameras, web cams, faxes, letters).
- Presents an idea to a junior primary class (eg creates a puppet show).
- Recommends a recycling program for a particular organisation (eg the school).
- Articulates the reasons for their choices of material/process in designing a solution.
- Selects the most appropriate methods for joining to meet the requirements of a task.
- Creates a product utilising appropriate materials and joining methods (eg a kite).
- Makes a hinge (eg that allows a door to open).
- Experiments with different structures, allowing for flexibility or rigidity.

**Inventing, refining and experimenting with materials, techniques and prototypes**

- Experiments with a variety of joining techniques to increase skill and knowledge.
- Makes a hinge (eg joining two boards of brainstormed ideas).
- Explores ways of connecting axles and wheels to a vehicle (eg deciding which is the best for speed and stability).
- Explores a variety of joining techniques in order to meet the requirements of a task.
- Explores ancient mechanical propulsion devices in order to make one using similar materials (eg a device that could project a small soft object over a set distance).
- Designs a shelter to meet the needs of the occupants (eg for an animal being studied, considering life cycle, needs and wants—a bird, possum or bat nesting box for trees in the local area).
- Designs a decorative feature for a room giving consideration to its purpose (eg designs wallpaper patterns, recording how different patterns affect the ambience).

**Students understand and value the combining of different design skills in order to create personal strategies to become better designers of culturally, environmentally and socially defensible products, processes and systems.**

**Design Questions:**
- Will it do what it is supposed to do?
- Will it work?
- Is it a practical proposition?
- Will what I am proposing, do what it is supposed to do?
- Have I got what I need to make the design?
- Is it appropriate?
- If I were a grandparent, would I buy this for my grandchildren?
- Who will gain and who will lose if this is produced?
### Learning Area: Design and technology

**Strand: Designing**

### Possible starting points for planning, programming and assessing

**Band: Primary Years**

**Standards: 2 & 3**

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th>OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students reflect on their own work by clarifying and communicating their design ideas and their thinking and planning for products, processes and systems. They use effective design communication methods, including appropriate digital and electronic technologies.</td>
<td><strong>OUTCOMES</strong></td>
</tr>
<tr>
<td><strong>T C KC2 KC7 relating to Outcome 2.3</strong></td>
<td></td>
</tr>
<tr>
<td>Students use a full range of communication skills and techniques in the design field, including information and communication technologies, to document and communicate effectively their design thinking, ideas and proposals.</td>
<td></td>
</tr>
<tr>
<td><strong>T C KC2 KC7 relating to Outcome 3.3</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Applying, executing, implementing and exploring ideas with others**

<table>
<thead>
<tr>
<th>Year 3 Towards Standard 2</th>
<th>Year 4 Standard 2</th>
<th>Year 5 Towards Standard 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 3</strong></td>
<td><strong>Year 4</strong></td>
<td><strong>Year 5</strong></td>
</tr>
<tr>
<td>2.3 Uses a range of communication forms and technologies, as a means of self-reflection and to describe their design ideas, thinking and planning.</td>
<td>3.3 Selects appropriate communication forms and technologies to document and convey clearly design ideas, thinking and organisation.</td>
<td></td>
</tr>
<tr>
<td>Records alternative design ideas that meet a design brief.</td>
<td>Records existing ideas for a design brief and proposes ideas for future development.</td>
<td>Records existing skills to be used in meeting the needs of a design brief and identifies new skills to be learnt.</td>
</tr>
<tr>
<td>Documents designs for a room layout (eg a new classroom layout).</td>
<td>Gathers information from a variety of sources (eg electronic and books) to enhance the designs of the intended product.</td>
<td>Categorises materials, processes and skills.</td>
</tr>
<tr>
<td>Uses ICTs to record design ideas (eg for the production of a torch).</td>
<td>Uses correct terminology for tools, materials and processes.</td>
<td>Records work in a journal or portfolio.</td>
</tr>
<tr>
<td>Uses correct terminology for tools, materials and processes.</td>
<td>Uses correct terminology for tools, materials and processes (eg uses terminology associated with construction such as fabricating, manufacturing, producing).</td>
<td>Uses correct terminology for tools, materials and processes.</td>
</tr>
<tr>
<td>Uses correct names for tools (eg safety rulers, rotary cutters, glue gun, G clamp, pliers, hand drills, dove-tail saw, plastic film, PVA glue).</td>
<td>Identifies and uses proper names when using materials (eg balsa wood, yarn, thread, sandpaper).</td>
<td>Uses technical terms for joining materials when making a frame (eg butt joint, T-halving joint, mitre joint).</td>
</tr>
<tr>
<td>Describes processes clearly when investigating, deconstructing, critiquing, designing, devising and making.</td>
<td>Prepares a simple storyboard showing visuals and simple directions for planning (eg an animation sequence).</td>
<td>Generates and demonstrates intentions behind proposed design ideas.</td>
</tr>
<tr>
<td>Describes orally the key features of designs (eg to friends/peers/teachers).</td>
<td>Shares and discusses design ideas, thinking and planning with a specific audience.</td>
<td>Exchanges views about products generated, or proposed design ideas.</td>
</tr>
<tr>
<td>Gives feedback to others (eg ‘I like the way …’).</td>
<td>Uses a chart or a slide show (eg <em>PowerPoint</em>) to explain the stages of making a product (eg building a house).</td>
<td>Writes a short report or makes a photo story.</td>
</tr>
<tr>
<td>Creates a graphic of the way the idea was generated (eg a storyboard or flow-chart).</td>
<td></td>
<td>Analyses and discusses design ideas.</td>
</tr>
<tr>
<td>Records existing ideas for a design brief and proposes ideas for future development.</td>
<td>Gathers information from a variety of sources (eg electronic and books) to enhance the designs of the intended product.</td>
<td></td>
</tr>
</tbody>
</table>
Students reflect on their own work by clarifying and communicating their design ideas and their thinking and planning for products, processes and systems. They use effective design communication methods, including appropriate digital and electronic technologies.

**Illustrating, displaying, presenting and communicating ideas**

- Generates sketches, 2-D plans and simple labels to explain design ideas.
- Uses computer software to draw designs (e.g., an invitation for a school concert or fundraising activity, menu for a party).
- Uses a spreadsheet (e.g., Excel) to show the results of a survey (e.g., about the use of machines by people in their spare time).

**Reflecting and questioning**

- Questions and reflects on design solutions.
- Questions and discusses design ideas and solutions (e.g., the designs of watercraft).
- Sketches with a degree of accuracy in 2-D or 3-D views and annotates in detail to clarify ideas.
- Questions and reflects on design solutions.
- Deconstructs designs, reflects on changes that could have been made and proposes and communicates design improvements, explaining criteria.
- Selects appropriate communication forms and technologies to document and convey clearly design ideas, thinking and organisation.

Students use a full range of communication skills and techniques in the design field, including information and communication technologies, to document and communicate effectively their design thinking, ideas and proposals.

**Design questions to review and check design ideas:**

- How do I describe my ideas?
- What are the key features?
- Can I describe the purpose of each feature?
- Can I talk about similar designs?
- Can I explain why someone would prefer my designs?
- Are my design proposals sustainable?
- What are the consequences of my designs?
- Do my designs match my intended purpose?
- Is it well made?
- What is the best way of presenting my designs?
- Who is the audience I am targeting with my designs?
# Learning Area: Design and technology

## Strand: Making

### Possible starting points for planning, programming and assessing

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th>(refer p20 for Early Years)</th>
<th>OUTCOMES</th>
<th>(refer p60 for Middle Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students learn techniques and demonstrate competence in using a broad range of materials and equipment for making products, processes and systems. They reflect on how they work with the equipment and materials they use and, in so doing, improve their practice.</td>
<td><strong>Year 3</strong> Towards Standard 2</td>
<td><strong>Year 4</strong> Standard 2</td>
<td><strong>Year 5</strong> Towards Standard 3</td>
</tr>
<tr>
<td><strong>Id T KC7</strong> relating to Outcome 2.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>In T KC4 KC6</strong> relating to Outcome 3.4</td>
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</tbody>
</table>

### Realising design ideas through processing/manipulating materials

- Understands the relationship between raw materials and a finished product (e.g., mixing ingredients when making a cake, assembling components to build a model).
- Discusses the differences in materials used in particular products (e.g., in clothes—for warmth, coolness).
- Exposes materials to different environmental conditions and observes and records effects (e.g., fabrics—leaves in water, sun).
- Describes the changes in materials under different conditions (e.g., heating, cooling, rusting).
- Exposes materials to different environmental conditions to observe and record effects (e.g., places unsealed and sealed paper or cardboard in water).
- Tests different types of glues and joining techniques on a variety of materials and in different environmental conditions (e.g., using cello/vinyl tape for a long-term joint in an outside application).
- Explains the changes in materials under different conditions (e.g., heating, cooling, rusting).
- Discusses the changes that take place when materials are used in different structural situations (e.g., bending material in one spot as a hinge).
- Manipulates materials, taking advantage of their characteristics to meet specific needs.

### Using tools and equipment safely and competently

- Chooses appropriate tools and adopts safe working practices to make a quality end product (e.g., uses power scissors instead of normal scissors to cut card).
- Selects and uses appropriate tools (e.g., hole punches and paper drills for making holes in paper and card).
- Manages their own safety (e.g., wears safety glasses and dust masks while sanding materials, washes hands).
- Adopts safe working practices while making a product.
- Selects and uses appropriate tools and processes (e.g., makes and uses templates to aid accuracy and consistency).
- Manages their own and others’ safety by using tools and equipment in appropriate spaces (e.g., reviews the classroom layout for making activities).
- Applies appropriate safety procedures when operating specific tools and equipment (e.g., uses a safety ruler, and cuts away from themselves while using a rotary cutter).
- Negotiates procedures that utilises the expertise of others and takes the opportunity to learn new skills and techniques.

### 2.4
Demonstrates effective use of a broad range of materials and equipment, and reflects on their personal interaction with resources they use.

### 3.4
Demonstrates skills and confidence in creating products, processes and systems, which respect personal and collective identities.
Students learn techniques and demonstrate competence in using a broad range of materials and equipment for making products, processes and systems. They reflect on how they work with the equipment and materials they use and, in so doing, improve their practice.

**Developing understanding of quality, accuracy and the role of specialised tools and equipment**

- Chooses wisely when making decisions about appropriate tools to match a specific task (eg knows to select a saw to cut timber dowel).
- Explains why accuracy is necessary when making (eg when measuring ingredients to follow recipes, when marking the centre of a wheel).
- Describes the differences between something handmade and machine made (eg hand and machine sewing).
- Makes informed choices of appropriate tools to match a specific task (eg the best way to make an accurate hole in timber, card, plastic).
- Uses junior hacksaws, razor saws and a mitre box to cut small-sized timber (eg to accurately cut 10mm x 10mm, 8mm x 8mm).
- Recognises opportunities to use the expertise of others with specific tools to achieve a better product.
- Understands the limitations of specific tools/equipment and follows the design specifications.
- Selects the appropriate tools to match a specific task (eg chooses an appropriate scale when weighing).
- Understands and demonstrates the need for accurate marking out when making.
- Meets a predetermined standard by choosing specific materials because of their characteristics.
- Considers the impact on the final product of using alternative tools and materials.

| 2.4 Demonstrates effective use of a broad range of materials and equipment, and reflects on their personal interaction with resources they use. |
| Id T KC7 |
| 3.4 Demonstrates skills and confidence in creating products, processes and systems, which respect personal and collective identities. | Id T KC6 |

**Combining components to create a system**

- Matches materials and joining methods to build a successful model.
- Devises an axle and wheel system (eg for a moving vehicle).
- Considers the impact of removing components from a model (eg asks questions such as ‘What happens if I take this part away?’).
- Explores different ways to assemble the same item or achieve the same result.
- Describes the basic parts of systems and interaction of the parts (eg pulleys, gears, cams, levers).
- Explains how to reduce friction between moving parts.
- Selects appropriate materials and joining methods to build a structure or a moving system.
- Devises a system that regulates or changes moving water (eg a lock or weir).
- Uses the internet to research characteristics of structures.
- Understands there are a number of systems for movement (eg pneumatics, hydraulics, motors, robotics, wheels and axles, gears, cams).
- Researches and makes a water filtration device (eg that separates dirt and leaves from rainwater).
- Uses appropriate materials and joining methods to match an intended design of a product.
- Devises a system that suits an immediate need (eg a system for a group to assemble a number of items quickly).
- Creates a mechanism to perform a task remotely (eg that automatically opens and closes a door, rings a door bell, sets off an alarm system).
- Identifies parts of a production system and uses this information to build a moving model.

| 3.4 Demonstrates skills and confidence in creating products, processes and systems, which respect personal and collective identities. |
| Id T KC6 |

Before food preparation, handles hot pans and oven trays with oven gloves/mitts).
Students learn techniques and demonstrate competence in using a broad range of materials and equipment for making products, processes and systems. They reflect on how they work with the equipment and materials they use and, in so doing, improve their practice.

### 2.4
Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations.

<table>
<thead>
<tr>
<th>Year 3</th>
<th>Towards Standard 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Makes a pulley with a loop of string (eg to hoist a flag).</td>
<td></td>
</tr>
<tr>
<td>• Recognises the need for gears to mesh accurately and how different size gears change the speed.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 4</th>
<th>Standard 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Develops knowledge of how systems work and their specific characteristics (eg cams, levers, electrical circuits).</td>
<td></td>
</tr>
<tr>
<td>• Utilises a cam to make an up-down movement in a mechanism.</td>
<td></td>
</tr>
<tr>
<td>• Makes crank handles.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 5</th>
<th>Towards Standard 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Identifies the components of a machine (eg a fruit-packing machine—conveyor belts, cogs, wheels, gears, axles, levers, linkages).</td>
<td></td>
</tr>
<tr>
<td>• Joins levers to make linkages to move different parts (eg shadow puppets).</td>
<td></td>
</tr>
<tr>
<td>• Uses batteries and bulbs in a circuit (eg to light a model or activate a motor or buzzer).</td>
<td></td>
</tr>
</tbody>
</table>

### Choosing and using software/hardware to create information

<table>
<thead>
<tr>
<th>Year 4</th>
<th>Standard 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Creates and labels side and top views of their design.</td>
<td></td>
</tr>
<tr>
<td>• Uses ICTs in the production of a visual display.</td>
<td></td>
</tr>
<tr>
<td>• Designs a card (eg for a friend).</td>
<td></td>
</tr>
<tr>
<td>• Imports pictures into a software program (eg into PowerPoint) to display the design of a house.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 5</th>
<th>Towards Standard 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Selects appropriate ICTs to generate desired outputs.</td>
<td></td>
</tr>
<tr>
<td>• Designs an interactive card.</td>
<td></td>
</tr>
<tr>
<td>• Generates a storyboard (eg for a short animation).</td>
<td></td>
</tr>
<tr>
<td>• Imports a sequence of pictures/photos (eg into Movie Maker) and adds a sound track to produce a short animation.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 5</th>
<th>Towards Standard 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Decides which ICTs are appropriate to adopt to generate desired outcomes.</td>
<td></td>
</tr>
<tr>
<td>• Designs a card with moving parts (eg pop-outs).</td>
<td></td>
</tr>
<tr>
<td>• Generates a storyboard for an animation (eg considers the number of frames, time, sequence and storyline).</td>
<td></td>
</tr>
<tr>
<td>• Uses video software programs and capture programs (eg to produce a clay animation).</td>
<td></td>
</tr>
</tbody>
</table>

Id T KC7 relating to Outcome 2.4

Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations.

Id T KC6 relating to Outcome 3.4

Id T KC7

2.4 Demonstrates effective use of a broad range of materials and equipment, and reflects on their personal interaction with resources they use.

3.4 Demonstrates skills and confidence in creating products, processes and systems, which respect personal and collective identities.

Id T KC6

<table>
<thead>
<tr>
<th>Year 4</th>
<th>Standard 2</th>
</tr>
</thead>
</table>
| Choose

<table>
<thead>
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<th>Towards Standard 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>choosing and using software/hardware to create information</td>
<td></td>
</tr>
</tbody>
</table>
### Key Ideas

Students identify, explain and value the characteristics and uses of a range of materials and equipment. They use this knowledge when critiquing their own and others’ designs for products, processes and systems.

#### In KC1 KC2 relating to Outcome 2.5

Students apply their knowledge of the characteristics of materials and equipment when creating solutions and designing to meet criteria related to function, aesthetics, sustainability and production.

#### F In KC3 KC6 relating to Outcome 3.5

Students identify, explain and value the characteristics and uses of a range of materials and equipment. They use this knowledge when critiquing their own and others’ designs for products, processes and systems. **(refer p22 for Early Years)**

### Outcomes

<table>
<thead>
<tr>
<th>Year 3</th>
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<th>Year 5</th>
</tr>
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<tbody>
<tr>
<td>Towards Standard 2</td>
<td>Standard 2</td>
<td>Towards Standard 3</td>
</tr>
</tbody>
</table>

#### Sorting and Selecting Materials

- Selects and demonstrates the use of appropriate materials for a specific task.
- Selects appropriate materials and tools to use for mask making and considers the effect materials might have on the wearer (e.g., weight, itchiness, sharpness).
- Uses a range of materials to best suit design ideas and final products.
- Uses junk material to make a structure for a fantasy story (e.g., dowel, fabrics).

#### Matching Tools with Materials

- Describes materials and equipment characteristics to be used in a specific task.
- Evaluates material and equipment characteristics to predict their intended use.

#### Possible Starting Points for Planning, Programming and Assessing

- Matching tools with materials
- Sorting and selecting materials
- Evaluating material and equipment characteristics
- Choosing and using appropriate materials for a specific task

#### Matching Tools with Materials

- Describes materials and equipment characteristics to be used in a specific task.
- Evaluates material and equipment characteristics to predict their intended use.

#### Matching Tools with Materials

- Chooses best materials, equipment and processes to use to make a designed product.
Students identify, explain and value the characteristics and uses of a range of materials and equipment. They use this knowledge when critiquing their own and others’ designs for products, processes and systems.

In C KC1 KC2 relating to Outcome 2.5
Students apply their knowledge of the characteristics of materials and equipment when creating solutions and designing to meet criteria related to function, aesthetics, sustainability and production.

F In KC3 KC6 relating to Outcome 3.5

Safety issues with materials
- Wood has splinters: take care.
- Heavy materials: use safe lifting practices.
- Metal and plastics can have sharp edges and corners: handle carefully.
- Hot materials can cause burns: wear gloves.
- Flames may be produced: check ventilation.
- Sanding wood or plastics: wear goggles, face mask, and use a ventilated area.

Creating quality products
- Revisits and evaluates designs to cater for changing priorities and requirements.
- Questions design solutions/products and compares with the design brief, constraints, and purpose.
- Asks for feedback about their product (eg from peers) and considers how they could make it better.

Developing appropriate skills and techniques for the materials used
- Proposes various materials and joining techniques for the production of a proposed project.
- Researches the properties of materials (eg for waterproofing).
- Identifies and practises key skills in order to create a quality product for use by others.
- Examines their product for faults and design flaws, and suggests ways it can be made better.
- Identifies the market for goods to be made and sold (eg at a school fundraiser).

2.5 Identifies the characteristics of a range of materials and equipment, and explains the relationship of those characteristics to designed and made products, processes and systems.

3.5 Investigates the characteristics of materials and equipment used in design and production in order to achieve sustainability.
Students identify, explain and value the characteristics and uses of a range of materials and equipment. They use this knowledge when critiquing their own and others’ designs for products, processes and systems.

In C KC1 KC2 relating to Outcome 2.5
Students apply their knowledge of the characteristics of materials and equipment when creating solutions and designing to meet criteria related to function, aesthetics, sustainability and production.

F In KC3 KC6 relating to Outcome 3.5

- Recognises that materials match their use according to their characteristics and the requirements (eg uses coloured fabric for puppet clothes, plastic film to make a window pane).
- Considers how materials are categorised (eg natural, processed, synthetic).
- Investigates the school recycling system for paper, cardboard, cans etc and suggests how it can be improved.
- Selects and develops a knowledge base regarding the characteristics of specific materials and equipment.
- Researches the processes about recycling (eg recycling glass and the production of new glass containers—manufacturing wine bottles).
- Investigates the characteristics of materials and equipment used in design and production in order to achieve sustainability.
- Investigates combinations of materials and likely consequences of their application.
- Uses different glues to improve the strength of structures and then tries to dismantle them (eg Lego bricks).
- Investigates the strength of various shapes to determine which are the strongest (eg various box shapes).
- Revisits and evaluates designs and techniques, ensuring they match design criteria.
- Questions design solutions/prototypes/products against the design brief constraints, including the intended audience and purpose.

2.5 Identifies the characteristics of a range of materials and equipment, and explains the relationship of those characteristics to designed and made products, processes and systems.

In C KC2

3.5 Investigates the characteristics of materials and equipment used in design and production in order to achieve sustainability.

F In KC7
# Learning Area: Design and technology

**Strand: Making**

### Possible starting points for planning, programming and assessing

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th>OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students understand, give reasons for, and manage equipment and resources responsibly and effectively, and work in ways which respect diverse personal and social identities.</td>
<td></td>
</tr>
</tbody>
</table>

#### Year 3
Towards Standard 2

- Recognises and promotes that some materials can be recycled to control waste.
- Recycles scrap material (eg uses scrap paper and card for papermaking).
- Reuses scrap material (eg reuses cereal boxes in a process known as Reverse Box Modelling—deconstructs a box and reforms it into the original shape but inside out).

#### Year 4
Standard 2

- Understands the need for sustainability and accountability.
- Considers environmental issues related to material use.
- Compiles and presents the results of a survey about shopping habits and considers waste management issues.

#### Year 5
Towards Standard 3

- Identifies and understands the need for waste management of recyclable and non-recyclable materials.
- Designs and makes a system to encourage people to recycle more waste material.
- Makes a system that demonstrates the life cycle of a container (eg a cereal box, milk carton, a plastic bag).

### Developing understandings of the sustainability and the economic, environmental and social impacts of technological practice

- Identifies the reasons for managing resources effectively and for working in personally and socially safe and responsible ways.  
  **Id In KC1**

#### Year 3
Towards Standard 2

- Identifies and articulates a range of responsible strategies for managing resources and working safely.  
  **F In C KC2 KC3**

#### Understanding the role of risk management by maximising safety and managing people, materials and equipment

- Discusses safety rules to reinforce the necessity for safe work practices.
- Recognises risk issues (eg when using papier-mâché or needles and thread when making puppets).
- Discusses moving around the classroom whilst carrying tools (eg carrying scissors by the closed blades pointing downward by the side).
- Reports damaged tools and equipment so they can be removed and made safe.
- Assesses risks when selecting tools and processes to minimise the danger to themselves and others.
- Holds materials by clamping, while cutting and joining.
- Considers their role in the safety of others (eg maintains a clean workspace, shares tools fairly).
- Maintains and uses equipment properly and safely to achieve design outcomes.

#### Year 5
Towards Standard 3

- Identifies hazards and is aware of risk management of tools and materials within the group and classroom.
- Manages safe work practices for themselves and others when setting up workspaces (eg a cutting table).
- Understands and implements safe practices when moving around during making sessions.
- Maintains tools and replaces worn and damaged blades (eg junior hacksaws, snap blade cutters).

Safe situations are those in which the risks have been controlled, reducing the possibility of harm and damage.  
Explicit teaching needed of:
- Correct tool use, safe procedures and the set-up of designated work areas for specific tasks eg sawing table, drilling table, glue gun area, cutting table, painting table).
- The non-interference of others when using tools.
- The importance of keeping hands and fingers away from sharp tools.
- The necessity of keeping work areas clear of waste.
Students understand, give reasons for, and manage equipment and resources responsibly and effectively, and work in ways, which respect diverse personal and social identities.

Id In KC3 KC7

Students describe and communicate principles of good resource management and duty of care, and integrate them into socially and environmentally sustainable designing and making practice.

F In C KC2 KC3

Developing understandings of procedures, sequences and systems in carrying out tasks

- Uses safe work practices (e.g., wears gloves for specific processes, allows glue guns to cool down before storing away, manages the amount of glue being used).
- Recognises and uses collective knowledge of the design team to carry out a task.
- Selects and presents foods and drinks for a class party (e.g., makes shashlik, fruit punch).
- Writes a step-by-step recipe (e.g., to make a favourite meal).
- Creates a storyboard (e.g., outlining the procedure used to make a short presentation).
- Describes why they need to follow a procedure when making.
- Identifies risks and hazards while cooking (e.g., takes particular care when using graters and knives, makes sure that pans of hot liquids do not get knocked over, turns ovens and heating rings off after use, uses blenders and food mixers safely, cleans up spills).
- Recognises and understands the advantages of being in a design team to reach the desired end product.
- Designs and makes a model of a performance stage (e.g., with a section that revolves and with moving scenery).
- Organises a production line process (e.g., making a model car, decorated storage boxes, stationery sets, sandwiches for a class camp).
- Describes procedures used to construct a product (e.g., uses a flow-chart).
- Describes making furniture from plantation timber to finished product.
- Creates safe working procedures for constructing and testing.
- Recognises and acts upon risk issues (e.g., when constructing and launching soft drink bottle rockets).
- Identifies the purpose of different roles and requirements of design team members to achieve the desired outcome.
- Works with team members to produce different parts of a final product (e.g., concert item).
- Uses recycled materials (e.g., to construct a model car to roll down an incline).
- Uses technical language to describe procedures used to construct a product.
- Identifies and explains the systems on a machine (e.g., a bike—gears, brakes, lights).
- Explains the interrelationships of parts in their designs and models.
- Applies knowledge of health and safety issues while making decisions.
- Identifies and articulates a range of responsible strategies for managing resources and working safely.

Questions for safety:
- What are the risks here?
- What can be done to prevent them?
- Can designers help people to use their products carefully?
- How will risks be controlled?

Using devices ethically and in socially acceptable ways

- Identifies safe procedures necessary for the construction of a designed product.
- Builds a model using sustainable materials (e.g., of a home of the future).
- Uses safe procedures necessary for the construction of a designed product.
- Builds a model using sustainable materials.
- Promotes and displays safe procedures necessary for the construction of a designed product.
- Builds a model using sustainable materials.
- Builds a model using sustainable materials.

All accidents, no matter how minor, should be reported. Hands should be washed thoroughly after working with materials and tools. Long hair should be tied back at all times. The use of dust masks is essential when sawing, sanding and drilling. Report all damaged tools.
## BAND: MIDDLE YEARS
### Assessment criteria

<table>
<thead>
<tr>
<th>Key Ideas</th>
<th>Strands</th>
<th>The learner is able to:</th>
<th>Working technologically</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world. In T KC1 KC2 relating to Outcomes 3.1, 4.1   | Critiquing - questioning, identifying, clarifying, examining and exploring technologies | • Question, investigate and verbalise accurately issues and intentions behind products and processes  
• Identify design problems and take action  
• Lead and work in a team cooperatively  
• Think beyond themselves, into local and global community  
• Communicate through the application and use of ‘technological language’ to a wider audience  
• Apply ICTs as integrated components  
• Describe, articulate and form arguments for own opinions  
• Articulate clearly the impact of technology on our society  
• Justify and defend decisions involved in the design and making of a product or a system  
• Incorporate higher order thinking skills in tests and analyses  
• Acknowledge and take action on issues for future sustainability | • Achieving quality and accuracy  
• Asking questions  
• Being creative  
• Being optimistic about what is achievable  
• Building on others’ thinking  
• Considering possible solutions  
• Demonstrating respect for others’ ideas  
• Developing coordination  
• Developing independence  
• Developing ownership  
• Expanding confidence  
• Experimenting with tools and processes  
• Exploring options  
• Increasing responsibility  
• Innovating  
• Investigating ideas of self and others  
• Involving trial and error  
• Listening  
• Making decisions | 3.1 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems. In T KC2  
4.1 Explains the decisions and choices made in designed and manufactured products, processes and systems and identifies alternative possibilities. In T KC2 KC6 |
| Students understand and value the combining of different design skills in order to create personal strategies to become better designers of culturally, environmentally and socially defensible products, processes and systems. F In KC6 relating to Outcomes 3.2, 4.2   | Designing - exploring, generating and representing ideas | • Generate detailed design proposals  
• Use appropriate tools to develop designs  
• Develop various designs of an idea  
• Generate designs that are specific, futures focused and with a global impact  
• Design products that meet the needs of specific groups  
• Use more complex and technical techniques to generate design ideas | • Achieving quality and accuracy  
• Asking questions  
• Being creative  
• Being optimistic about what is achievable  
• Building on others’ thinking  
• Considering possible solutions  
• Demonstrating respect for others’ ideas  
• Developing coordination  
• Developing independence  
• Developing ownership  
• Expanding confidence  
• Experimenting with tools and processes  
• Exploring options  
• Increasing responsibility  
• Innovating  
• Investigating ideas of self and others  
• Involving trial and error  
• Listening  
• Making decisions | 3.2 Understands and uses the relationship between different design skills to become better designers. F In KC1  
4.2 Integrates design skills to create personal strategies for designing culturally and socially defensible products, processes and systems. F In KC6 |
<table>
<thead>
<tr>
<th>Making</th>
<th>Designing</th>
</tr>
</thead>
<tbody>
<tr>
<td>- developing skills and knowledge about equipment, tools and techniques</td>
<td>- discussing and communicating the thinking behind the design/idea using a variety of methods</td>
</tr>
<tr>
<td>- understanding material characteristics and how they determine the material use</td>
<td>- identify and apply the appropriate skills when necessary</td>
</tr>
<tr>
<td>- analysing and selecting various materials for characteristics and appropriateness</td>
<td>- operate and use a range of equipment</td>
</tr>
<tr>
<td>- selecting and manipulating accurately a wide range of materials and equipment</td>
<td>- selecting and using appropriate skills to construct products of high quality</td>
</tr>
<tr>
<td>- using and applying an increased understanding of materials and equipment</td>
<td>- following and modifying the production sequence to make quality end products</td>
</tr>
<tr>
<td>- evaluating completed design processes, materials and equipment, providing evidence for their choices</td>
<td>- select and use safely and accurately a range of assembly techniques</td>
</tr>
<tr>
<td>- using technical terminology at all times and in context</td>
<td>- select and use a variety of making techniques accurately and appropriately</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Students</th>
<th>3.3 Selects appropriate communication forms and technologies to document and convey clearly design ideas, thinking and organisation. T C KC3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>3.4 Demonstrates skills in using a broad range of recognised communication forms and technologies to convey design thinking. T C KC1</td>
</tr>
<tr>
<td>Students</td>
<td>3.5 Demonstrates skills and confidence in creating products, processes and systems which respect personal and collective identities. Id T KC6</td>
</tr>
<tr>
<td>Students</td>
<td>3.6 Identifies and articulates a range of responsible strategies for managing resources and working safely. F In KC2 KC3</td>
</tr>
<tr>
<td>Students</td>
<td>3.6 Analyses and applies the principles of good resource management, sustainability and duty of care in their design and making practice. F In KC3</td>
</tr>
</tbody>
</table>

Students describe and communicate principles of good resource management and duty of care, and integrate them into socially and environmentally sustainable design and making practice. F In KC2 KC3 relating to Outcomes 3.6, 4.6

Making - developing procedures that enable safe and responsible resource management

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Making - developing skills and knowledge about equipment, tools and techniques

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Designing - documenting and communicating the thinking behind the design/idea using a variety of methods

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### KEY IDEAS

Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

**In T KC1 KC2 relating to Outcomes**

3.1, 4.1

### KEY TO SYMBOLS

**Essential Learnings:**
- F Futures
- Id Identity
- In Interdependence
- T Thinking
- C Communication

**Key Competencies:**
- KC1 collecting, analysing and organising information
- KC2 communicating ideas and information
- KC3 planning and organising activities
- KC4 working with others and in teams
- KC5 using mathematical ideas and techniques
- KC6 solving problems
- KC7 using technology

### OUTCOMES

**Possible starting points for planning, programming and assessing**

<table>
<thead>
<tr>
<th>Year 6</th>
<th>Year 7</th>
<th>Year 8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard 3</strong></td>
<td><strong>Towards Standard 4</strong></td>
<td><strong>Standard 4</strong></td>
</tr>
</tbody>
</table>

#### Analysing, choosing, discerning, checking, monitoring and surveying

- Researches possible ways to present a design idea to a potential market (eg mail-outs, letter box drops, posters, media advertisements, billboards, e-mails and websites).
- Classifies materials by characteristics (eg creates a spreadsheet, completes a rubric).
- Conducts tests to make comparisons between products (eg foods, materials, tools).
- Explores different and new technologies through research and practice.
- Promotes a design idea to a potential market.
- Considers options for a global market for the design idea.
- Investigates different ways materials may be used (eg plastics—styrene, alloys, synthetic textiles).
- Interrogates data downloaded from the internet (eg material data sheets, technical information/manuals).
- Examines and evaluates like products to determine specifications.
- Considers and suggests improvements to technologies based on found information (eg new applications, materials, techniques).
- Investigates packaging ideas for various age groups.
- Surveys the opinion and understandings of a target group (eg a peer group to gain opinion about clothing designs; students, parents/caregivers, community about the school canteen and the need to have a range of healthy foods; students about possible uniform design changes).
- Considers the appropriateness of a variety of safety equipment.
- Investigates various safety equipment resources (eg websites).
- Investigates appropriate hygiene methods when preparing or serving food (eg the use of antiseptic hand wash or latex gloves).
- Compares the advantages of various soft fall materials used in play grounds.

3.1 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems.

**In T KC2**

4.1 Explains the decisions and choices made in designed and manufactured products, processes and systems and identifies alternative possibilities.

**In T KC2 KC6**
**Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.**

<table>
<thead>
<tr>
<th>In T KC1 KC2 relating to Outcomes 3.1, 4.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Describes how an identified everyday technology has changed over time, exploring if and how its intended use and application has changed over time (e.g., the development of the shoe, fabrics and how they have changed, energy systems).</td>
</tr>
<tr>
<td>• Researches the reasons behind a product’s design, development and manufacture to meet a specific requirement over time (e.g., cars as a means of transportation).</td>
</tr>
<tr>
<td>• Analyses the impact of the removal of an everyday technology.</td>
</tr>
<tr>
<td>• Analyses the reasons for having technology.</td>
</tr>
<tr>
<td>• Considers and analyses the reasons behind a product’s design and manufacture.</td>
</tr>
<tr>
<td>• Investigates the range of ways to access information (e.g., the internet and resource centres).</td>
</tr>
</tbody>
</table>

**Researching past, present and proposed technologies**

| 3.1 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems. |
| 4.1 Explains the decisions and choices made in designed and manufactured products, processes and systems and identifies alternative possibilities. |

**Learning/knowing/finding out about technologies locally and globally**

| • Compares the impact on our society of everyday technologies over time. |
| • Surveys people about changes in technology throughout their lives (e.g., family members and friends). |
| • Investigates the impact of a worldwide technology, and predicts its future impact on our society. |
| • Investigates technological development in an industry and predicts future change (e.g., the music industry). |
| • Reviews systems that are in harmony with local cultures. |
| • Investigates materials used in different cultures. |
| • Researches and compares cooking techniques from a variety of cultures. |

**Understanding that technologies are made**

| • Explores how an everyday product is manufactured. |
| • Investigates different joining techniques (e.g., Lego, hinges, studs). |
| • Describes steps required during assembly of a product. |
| • Examines the way that components interrelate within a product. |
| • Describes how products are assembled. |
| • Investigates different joining techniques (e.g., Lego, hinges, studs). |
| • Compares surface textures (e.g., on Lego, Meccano pieces). |
| • Describes steps required during assembly of a product. |
| • Examines the way that components interrelate within a product. |
| • Presents and reviews information that was pivotal to the construction of a project. |
| • Analyses the components that make up a system. |
| • Explores a communication technology service provider (e.g., telecommunication), listing the various sections. |
Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

Relating to Outcomes 3.1, 4.1

Year 6
Towards Standard 3

- Presents an exploded drawing of a product.
- Investigates a range of products and how they relate to a particular group.
- Deconstructs a product for a disabled person.
- Analyses a product that has been developed for a specific age group (e.g., for a three-year-old child).
- Examines a product for a leisure activity.

Understanding social and cultural differences

- Promotes a product that relates to a variety of groups.
- Researches the use of popular products, looking for commonalities (e.g., with a peer group).
- Talks about alternatives, and values other people’s opinions.
- Reviews carrying and lifting systems (e.g., in a developing country).
- Finds out about clothing designs in different cultures/countries.
- Compares the design of product packaging used for different markets.
- Compares carrying devices of different cultures (e.g., makes a 3-D poster).

Determining points of view, bias and intent, and considering values inherent in any technology

- Considers the use of a particular technology and its impact on society.
- Considers the impact of a particular technology on everyday lives.
- Promotes the use of a future proposed technology, highlighting the value added nature of the product on the environment and society.
- Discusses and compares the plans provided/used with the actual product produced.
- Talks about alternatives and values other people’s opinions.

Year 7
Towards Standard 4

- Explores the necessary steps in the manufacture of a project (e.g., a textile project).
- Describes the steps and processes necessary to order materials/ingredients.
- Considers and defends construction strategies in the making of a product.
- Articulates differences between the available materials.
- Comments on the finishing system used on an article.

Year 8
Standard 4

- Also developing skills/attitudes in:
  - Responsibility for managing own learning
  - Optimism about the future
  - Showing concern about effects of technology
  - Making judgments

- Explores the necessary steps in the manufacture of a project (e.g., a textile project).
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Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

In T KC1 KC2 relating to Outcomes 3.1, 4.1

- Investigates and compares software programs designed for students (eg Kid Pix, Paintshop, Kewala, Sim City).
- Investigates how specific software programs work for a student with a disability (eg sight, hearing).
- Researches form and function of a particular material (eg fabric in clothing).
- Constructs a poster that compares changing personal requirements during different seasons and climatic conditions (eg clothing, heating/cooling, leisure activities).
- Surveys manufacturers to compare materials for similar products (eg compares fibres used in different garments, materials used in shoe manufacture).
- Considers the impact of particular technologies on everyday lives.
- Discusses (eg in groups) foodstuffs for healthy diets.
- Explores the pros and cons of fast food (eg efficiency of production, versus nutritional content).

Comparing, contrasting and experiencing

- Compares several products used for the same purpose and explains the reasoning and intent behind the best.
- Uses a presentation software program (eg to show the use of two different types of glue).
- Investigates the use of different types of a product (eg tennis racquets, bicycles, portable sound systems).
- Surveys the use of different types of clothing and defends their personal choice (eg running shoes).
- Investigates a range of materials and procedures.
- Compares items manufactured for different age groups (eg compares a range of toys to discover how the size of parts differs for different age ranges).
- Demonstrates an awareness of potential hazards (eg compares a range of toys for the very young).
- Investigates hygiene procedures (eg compares cooking and storage methods).
- Investigates the properties of a range of materials (eg by trial and error techniques).
- Compares the properties of different timbers available.
- Considers cost of materials to be used, within a budget.
- Considers the environmental impact of different materials to be used.
- Compares the tastes of selected ingredients.
- Compares the strength of packaging (eg fast food, electrical goods/white goods).
- Compares colour, shape and size of packaging from various countries.

In T KC2 KC6

3.1 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems.

4.1 Explains the decisions and choices made in designed and manufactured products, processes and systems and identifies alternative possibilities.

Safety issues cannot be left to come up incidentally within an activity—they have to be dealt with before the activity begins. Whether it is the use of scissors, cutters or low melt glue guns, students need to be given explicit instructions on how they are to be used, where they can be used and any other specific safety issues related to their use.
Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

In T KC1 KC2 relating to Outcomes 3.1, 4.1

Understanding the impact of technologies on people, economies and the environment

- Investigates the function of a product (eg the many possible uses of a syringe—hydraulics and administering medicine).
- Explains the reasons for including particular ingredients in a recipe (eg baking powder).
- Explains the importance of particular practices when marking out a pattern on a fabric (eg using tailor’s chalk).

Identifying inconsistencies

- Investigates the function of a product (eg the many possible uses of a syringe—hydraulics and administering medicine).
- Explains the reasons for including particular ingredients in a recipe (eg baking powder).
- Explains the importance of particular practices when marking out a pattern on a fabric (eg using tailor’s chalk).

- Investigates the impact of technology upon society and the environment.
- Researches the impact technology has made on their life and lifestyle.
- Researches the intent behind a product and whether it meets its intended purpose.
- Researches how a technological advance has impacted on society and the environment.

- Investigates how technologies are used and explains their impact (eg the introduction of robots into assembly lines, refrigeration, overlockers).
- Distinguishes between what people want and what they need and examines changing lifestyles.
- Explores the problems of fumes when working (eg hot wire cutting polystyrene foam).
- Compares final outcome with original task requirements (eg discusses the menu for a special event).
- Discusses the appropriateness of materials in products (eg the use of flammable textiles in pyjamas).

3.1 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems.

In T KC2

4.1 Explains the decisions and choices made in designed and manufactured products, processes and systems and identifies alternative possibilities.

In T KC2 KC6
### Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

<table>
<thead>
<tr>
<th>KC1</th>
<th>KC2</th>
<th>relating to Outcomes 3.1, 4.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Considers the most appropriate graphics and animation to use when presenting work (e.g., Kid Pix, Clip Art, animated gif, jpeg, bmp).</td>
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<tr>
<td>• Reflects on how to use photographs, sketches and cartoons to meet the purpose of a presentation.</td>
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<tr>
<td>• Identifies the key features of a product they have designed (e.g., completes a written or oral report).</td>
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<tr>
<td>• Delivers a presentation about a finished product (e.g., oral presentation).</td>
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<tr>
<td>• Explains the function of a plan or diagram.</td>
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<tr>
<td>• Reviews a household product (e.g., an item of furniture, a kitchen utensil).</td>
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<tr>
<td>• Analyses the finished product of a design brief.</td>
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<tr>
<td>• Comments critically on the degree of success with which a team has solved a design problem.</td>
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<tr>
<td>• Reviews the achievements of a working partnership (e.g., participates in a group discussion).</td>
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<tr>
<td>• Assesses the usefulness of a finished project and suggests improvements.</td>
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</table>

### Appraising, reviewing, evaluating and judging

<table>
<thead>
<tr>
<th>KC2</th>
<th>KC6</th>
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<tbody>
<tr>
<td>• Recommends how a product can be changed to improve its function.</td>
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<tr>
<td>• Designs features of a food container (e.g., a milk carton to improve its pouring capabilities).</td>
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<tr>
<td>• Recommends an appropriate fabric for specific types of garments (e.g., fabric for a safety jacket for a firefighter).</td>
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<tr>
<td>• Writes and presents to the class a report which describes how a product met the design brief.</td>
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<tr>
<td>• Explores whether a product performs as expected.</td>
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<tr>
<td>• Explains how a design may be changed to improve the end use of a product.</td>
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<tr>
<td>• Documents and reports about the correct tools for a task.</td>
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<tr>
<td>• Shows and explains the use of tools with different materials (e.g., designs a poster).</td>
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<tr>
<td>• Demonstrates an understanding of protocols relating to setting a table (e.g., reports about the correct cutlery to be used/set for different courses of a meal).</td>
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<tr>
<td>• Demonstrates the correct procedure for baking a cake (e.g., sketches labels and discusses the correct procedure for preparing a baking tin for a cake mix).</td>
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<tr>
<td>• Reviews and considers how a product meets the design brief during the making process.</td>
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<tr>
<td>• Discusses with others whether the design criteria are defined accurately (e.g., when they negotiate their own design brief).</td>
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<tr>
<td>• Establishes criteria to appraise the outcomes of their work (e.g., taste, texture, presentation, finish functionality).</td>
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<tr>
<td>• Makes judgments about the suitability of materials or processes when designing and making (e.g., when joining different materials).</td>
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<tr>
<td>• Presents their recommendations for product improvement (e.g., an oral presentation to the class about the limitations of materials or equipment).</td>
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<tr>
<td>• Comments on group structure and individual responsibilities when completing a task as a team (e.g., when operating a production line or using a systems approach).</td>
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### 3.1 Describes the significance to diverse groups of people of the various criteria used in the design of particular products, processes and systems.

### 4.1 Explains the decisions and choices made in designed and manufactured products, processes and systems and identifies alternative possibilities.

In T KC2 KC6
**Learning Area: Design and technology**  
**Strand: Designing**  
**Band: Middle Years**  
**Standards: 3 & 4**

### KEY IDEAS

Students understand and value the combining of different design skills in order to create personal strategies to become better designers of culturally, environmentally and socially defensible products, processes and systems.  

**F In KC6 relating to Outcomes 3.2, 4.2**

### OUTCOMES

#### Year 6  
**Standard 3**

- Explains in detail reasons for using specific ideas.
- Designs a piece of apparatus to meet a specific purpose (eg new school playground equipment).

#### Year 7  
**Towards Standard 4**

- Defends the reasons for using specific ideas.
- Designs an item of clothing to meet a specific purpose (eg creates a new school uniform).
- Identifies that possible solutions may take too long to learn new skills and/or construct.

#### Year 8  
**Standard 4**

- Designs a product (eg a futuristic bed) using CAD to create a 3-D view drawing.
- Presents proposals that include feedback from interested clients or groups.
- Researches a product for design ideas (eg uses the internet).

- Considers design ideas from a range of environments (eg home, school, broader community).
- Produces a poster displaying a design for a future building (eg a school classroom in the year 2100).
- Uses a range of recording methods (eg sketches, writes notes, finds pictures) of a range of similar products to develop an information base for a project (eg ideas for an eye protection device).
- Explores a range of possibilities when designing (eg works in groups and provides feedback to each other).

### Possible starting points for planning, programming and assessing

**Employing imaginative and logical thinking to create mental models**

- 3.2 Understands and uses the relationship between different design skills to become better designers.  
  **F In KC1**

- 4.2 Integrates design skills to create personal strategies for designing culturally and socially defensible products, processes and systems.  
  **F In KC6**
Students understand and value the combining of different design skills in order to create personal strategies to become better designers of culturally, environmentally and socially defensible products, processes and systems. F In KC6 relating to Outcomes 3.2, 4.2

Solving problems and creating solutions for identified needs

- Generates various designs for a multi-purpose product.
- Designs a container that can be used in many different ways (eg a shopping bag).
- Designs a piece of clothing that can be adapted to suit conditions.
- Designs a seat that can be multifunctional.
- Generates a design idea in response to a design challenge.
- Designs a tool that can be used for a variety of purposes.
- Generates various designs for new, improved products.
- Designs a new food container (eg a milk carton).
- Presents a range of ideas for designs for sports equipment (eg suited to various disabilities).
- Invents a pouring device for a container (eg could be fitted to a motor oil container).
- Generates a team design for an everyday product.
- Designs a piece of clothing for a specific purpose.
- Designs a system that can help manage an aspect of the environment.
- Prepares and modifies own designs and the designs of others.
- Uses, with support, a design acronym such as CTRIDMC—Context, Task, Restrictions, Investigations, Devising, Making, Critiquing.
- Researches various systems that have a global impact.
- Develops a system that restores rather than exploits the environment.
- Presents (eg using annotated sketches) possible methods for future food storage or cooking.
- Explores how a design may be made more aesthetically pleasing.
- Changes a container so that it suits a different function.
- Utilises less conventional sources to gather design ideas (eg magazines, catalogues, newspapers, junk mail).

Proposes a design of a product for a particular group.

Investigates designs of various products and how they relate to meeting the needs of the end user (eg a disabled person).

Presents information about a specific diet (eg presents and justifies the staple diet of two different cultural groups, vegetarians).

Plans various designs for a futuristic idea and decides on the best design.

Investigates future needs (eg develops designs for futuristic classrooms).

Designs a food packaging system (eg to meet the needs of demanding environmental conditions).

Records the design features of a specific product that meets a specific need (eg a bat for a three-year-old girl, a chair for a toddler, a shopping bag for a disabled person).

Proposes ways in which materials may be changed during manufacture (eg a photo frame to suit different décor).

Making choices, interpreting criteria and matching needs

- Proposes a design of a product for a particular group.
- Plans various designs for a futuristic idea and decides on the best design.
- Records the design features of a specific product that meets a specific need (eg a bat for a three-year-old girl, a chair for a toddler, a shopping bag for a disabled person).
- Explores how a design may be made more aesthetically pleasing.
- Changes a container so that it suits a different function.
- Utilises less conventional sources to gather design ideas (eg magazines, catalogues, newspapers, junk mail).

Also developing skills/attitudes in:
- Taking risks
- Responsibility
- Ownership
- Cooperating
- Collaborating
- Independence
- Decision making.
Students understand and value the combining of different design skills in order to create personal strategies to become better designers of culturally, environmentally and socially defensible products, processes and systems.

F In KC6 relating to Outcomes 3.2, 4.2

- Identifies clothing fabrics that match specific needs (eg constructs a poster/collage showing a variety of different types of fabric available for sports wear).

- Develops steps for the use of appropriate tools, materials and processes to manufacture a product accurately.

- Prepares a template to manufacture a product accurately (eg a model surfboard, a drawstring bag).

- Considers elements of a balanced diet (eg designs a meal that contains items from at least five food groups).

- Selects appropriate tools, materials and processes to manufacture a template accurately.

- Prepares a template to manufacture a product accurately (eg a model skateboard, a piece of jewellery).

- Constructs a template for a specific written genre (eg constructs a template for a business letter using Word).

- Uses a teacher prepared spreadsheet to compare project costs for the class and make adjustments if necessary.

- Discusses, practises, tests and selects appropriate jointing techniques for own project.

- Manipulates and uses an expanding range of tools and techniques to present a more detailed design idea.

- Tests own project to ensure that it fits the design brief (eg tests if a model seat will support a weight, tests an adhesive to ascertain its suitability in a water environment).

- Changes a product that is designed for a particular group to suit the needs of another group.

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Inventing, refining and experimenting with materials, techniques and prototypes

- Uses a teacher prepared spreadsheet to compare project costs for the class and make adjustments if necessary.

- Discusses, practises, tests and selects appropriate jointing techniques for own project.

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<th>Year 6 Standard 3</th>
<th>Year 7 Towards Standard 4</th>
<th>Year 8 Standard 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students use a full range of communication skills and techniques in the design field, including information and communication technologies, to document and communicate effectively their design thinking, ideas and proposals. <strong>T C KC2 KC7</strong></td>
<td></td>
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<tr>
<td><strong>Applying, executing, implementing and exploring ideas with others</strong></td>
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<tr>
<td>Discusses various design ideas for an intended product.</td>
<td>Develops an oral presentation of intended design ideas.</td>
<td>Records the design features of a product that meets a specific need.</td>
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</tr>
<tr>
<td>Discusses ideas (eg in teams) for a future writing instrument.</td>
<td>Discusses and explores design ideas for the decoration of a garment (eg a new Year 7 top).</td>
<td>Communicates design ideas to a wider audience (eg presents design ideas for a recycling system for used printer cartridges within the school).</td>
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</tr>
<tr>
<td>Debates design ideas for a safe product (eg a soft toy).</td>
<td>Discusses design ideas for a new product (eg design ideas for a new toy with a younger ‘buddy’ class).</td>
<td>Presents a digital portfolio (eg of hand tools, parts and applications).</td>
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<tr>
<td>Explains a design for a system to improve the function of a building/room (eg explains a design for a lighting system in a classroom).</td>
<td>Discusses the design of an improved way for the school to communicate with students and parents/caregivers (eg discusses with parents/caregivers the design for an updated reporting format or school newsletter).</td>
<td>Creates an iMovie/video (eg of clothing designs over time).</td>
<td></td>
</tr>
<tr>
<td>Produces a book of designs for futuristic methods of transportation (eg aircraft/spacecraft, leisure craft).</td>
<td>Documents design ideas for an intended product.</td>
<td>Creates an interactive slide show (eg using PowerPoint) about food: past, present and future.</td>
<td></td>
</tr>
<tr>
<td>Presents the opinions of a cross-section of people/peers about an intended product (eg an audiovisual presentation).</td>
<td>Produces a range of photographs depicting current designs (eg clothing styles, housing, jewellery).</td>
<td>Documents design ideas using sketches and clear labels (eg sketches design ideas for alternatives to common shirt styles).</td>
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<tr>
<td></td>
<td></td>
<td>Develops a design portfolio of safety posters for design and technology workshops (eg produces a range of photographs comparing correct and incorrect use of materials).</td>
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<td></td>
<td></td>
<td>Creates a 3-D visual display or model of an intended product design.</td>
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</table>

**Possible starting points for planning, programming and assessing**

3.3 Selects appropriate communication forms and technologies to document and convey clearly design ideas, thinking and organisation. **T C KC2**

4.3 Demonstrates skills in using a broad range of recognised communication forms and technologies to convey design thinking. **T C KC1**
Students use a full range of communication skills and techniques in the design field, including information and communication technologies, to document and communicate effectively their design thinking, ideas and proposals.

relating to Outcomes 3.3, 4.3

- Designs ways to monitor and test a system.
- Tests effectiveness of a system (eg the school’s watering system).
- Justifies safety procedures within the school (eg evacuation procedures).
- Reviews a procedure and suggests improvements (eg a classroom procedure, a school procedure).

Illustrating, displaying, presenting and communicating ideas

- Considers a variety of designs for a product.
- Draws 2-D views showing top view, side view, front view (eg using a computer aided drawing (CAD) program, such as AppleWorks).
- Produces thumbnail sketches in the process of deciding on a final idea.
- Creates a storyboard of a design idea (eg for a new school garden).
- Develops a computer-generated presentation of design ideas for a product.
- Presents design ideas (eg using PowerPoint) for a energy saving device (eg a home device).

- Uses a variety of technical drawing methods to depict the proposed item/product accurately.
- Presents a 3-D view drawing incorporating plan, side and end elevations.
- Creates an orthogonal drawing.
- Shows three dimensions using sketches drawn in perspective.
- Generates a visual presentation of design ideas using ICTs.
- Creates an animation of how a device works (eg a water saving device).
- Produces an interactive presentation of design ideas for an area of choice (eg uses PowerPoint).

- Identifies the limitations of an identified product (eg discusses as a group).
- Explores alternative uses for a product (eg brainstorms as a class group).
- Shares design ideas with others (eg shares sketches).
- Makes a class project using production line techniques and creates a flow-chart describing the different tasks and responsibilities.
- Uses combinations of graphics and modelling to convey design ideas.

- Selects appropriate communication forms and technologies to document and convey clearly design ideas, thinking and organisation.
- Demonstrates skills in using a broad range of recognised communication forms and technologies to convey design thinking.

Year 6
Towards Standard 3

Year 7
Towards Standard 4

Year 8
Standard 4

3.3
- Includes drawings/sketches and production sequences to assist explanation.
- Uses a digital camera to record a manufacturing process and create a presentation, including notes and comments.
- Considers a poster design and whether it meets its desired function (eg a safety poster, an event poster, location symbols).
- Presents a design proposal that includes dimensioned sketches and thumbnail sketches, with notation.
- Demonstrates planning (eg using a range of different sketching techniques, ICT drawing methods).
Students use a full range of communication skills and techniques in the design field, including information and communication technologies, to document and communicate effectively their design thinking, ideas and proposals. 

3.3 Selects appropriate communication forms and technologies to document and convey clearly design ideas, thinking and organisation.

4.3 Demonstrates skills in using a broad range of recognised communication forms and technologies to convey design thinking.

Also developing skills/attitudes in:
- Taking risks
- Responsibility
- Ownership
- Cooperating
- Collaborating
- Independence
- Decision making.

Design questions to review and check design ideas:
- How do I describe my ideas?
- What are the key features?
- Can I describe the purpose of each feature?
- Can I talk about similar designs?
- Can I explain why someone would prefer my designs?
- Are my design proposals sustainable?
- What are the consequences of my designs?
- Do my designs match my intended purpose?
- What is the best way of presenting my designs?
- Who is the audience I am targeting with my designs?

Design questions to review and check design ideas:
- How do I describe my ideas?
- What are the key features?
- Can I describe the purpose of each feature?
- Can I talk about similar designs?
- Can I explain why someone would prefer my designs?
- Are my design proposals sustainable?
- What are the consequences of my designs?
- Do my designs match my intended purpose?
- What is the best way of presenting my designs?
- Who is the audience I am targeting with my designs?

Questions and reflects on design solutions.
- Analyses designs, developing changes that could be made to improve product sustainability.

Reflecting and questioning
- Questions and reflects on design solutions.
- Explores alternative designs, to enhance a future proposed product.

Also developing skills/attitudes in:
- Taking risks
- Responsibility
- Ownership
- Cooperating
- Collaborating
- Independence
- Decision making.

Design questions to review and check design ideas:
- How do I describe my ideas?
- What are the key features?
- Can I describe the purpose of each feature?
- Can I talk about similar designs?
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## Learning Area: Design and technology

**Band: Middle Years**

**Strand: Making**

**Possible starting points for planning, programming and assessing**

**Standards: 3 & 4**

### OUTCOMES

<table>
<thead>
<tr>
<th>Year 6</th>
<th>Year 7</th>
<th>Year 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard 3</td>
<td>Towards Standard 4</td>
<td>Standard 4</td>
</tr>
</tbody>
</table>

### KEY IDEAS

- Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations.

  In T KC4 KC6 relating to Outcomes 3.4, 4.4

#### Realising design ideas through processing/manipulating materials

- Understands how materials change under different conditions (eg heating, cooling, rusting).
- Knows the changes that take place when materials are used in different structural situations.
- Forecasts the changes in materials under different conditions (eg heating, cooling, rusting).
- Discusses the changes that take place when materials are used in different structural situations.
- Manipulates and uses appropriate hand tools and materials in the manufacturing process (eg cuts out a pattern using dressmaking scissors, prepares a cake mixture for baking).
- Uses various grades of files/sanding tools to produce a desired shape and finish on wood or plastic projects.
- Follows a plan accurately to ensure that components will fit together as intended.
- Prepares and machines the components of a storage container (eg a CD tower or box).
- Prepares and constructs the components of a toy (eg a child’s soft toy).
- Learns techniques in the use of an overlocker.

#### Using tools and equipment safely and competently

- Understands that tools are made to perform a task and, in some cases, cannot do other work safely or effectively.
- Uses tools that are made to perform a task and, in some cases, cannot do other work safely or effectively.
- Operates and uses tools appropriately following all Safe Operating Procedures (SOPs).

### Outcomes

- **3.4**: Demonstrates skills and confidence in creating products, processes and systems which respect personal and collective identities. Id T KC6
- **4.4**: Effectively uses, in personally and interpersonally appropriate ways, a range of skills that achieve consistent production outcomes. Id T
Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations. In T KC4 KC6 relating to Outcomes 3.4, 4.4

Developing understanding of quality, accuracy and the role of specialist tools and equipment

- Applies the appropriate skills to make a quality end product.
- Identifies and selects appropriate materials and equipment.
- Demonstrates the skills involved in joinery.
- Understands and employs appropriate measuring techniques.
- Manipulates appropriate materials to create a quality end product (eg constructs a model waterproof boat which can float for 24 hours, creates a re-usable exercise book cover using textiles and folds and glues cardboard to make a stable structure).

- Applies the appropriate skills to make a quality end product.
- Identifies and selects appropriate materials and equipment.
- Researches and understands the use of basic tools, materials and processes (eg accesses a variety of information sources to research and develop notes).
- Develops understanding of a range of materials suitable for constructing a project (eg the limitations of certain materials when making structures or frames).
- Appreciates accuracy of measuring and marking (eg when assembling a frame and testing for squareness, sewing a garment).
- Develops knowledge of tools for specific purposes (eg tinsnips, chisels, dressmaking shears, whisks).

- Correctly uses tools (eg a tenon saw, hacksaw, wood rasp, file, tinsnips, Stanley knife).
- Demonstrates the correct use of cooking equipment (eg whisks, ladles, measuring spoons, biscuit cutters, mixing bowls, cooking tins).
- Uses common dressmaking tools (eg needles, unpicker, tracing wheel, tape measure, tailor’s chalk).
- Checks equipment for faults (eg damaged electrical cords, guards).
- Seeks help when unsure of correct procedures.
- Uses a range of finishing techniques on articles made.

- Also developing skills/attitudes in:
  - Achieving quality
  - Responsibility
  - Planning and managing production
  - Managing time
  - Working effectively on own and in teams
  - Expanding confidence
  - Optimism about what is achievable
  - Innovation
  - Negotiation of roles and timelines
  - Flexibility in working in teams.
### Combining components to create a system

- Plans and selects the components for a system to perform a specific task.
- Constructs a moving device (e.g., levers and pulleys to make a crane, makes a rubber band powered car).
- Produces an interactive presentation that explains a system (e.g., uses multimedia).
- Demonstrates how systems operate (e.g., water conservation and storage systems).

<table>
<thead>
<tr>
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<td>Year 8</td>
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</tr>
</tbody>
</table>

- Prepares and assembles the components for a system to perform a specific task (e.g., an electrical system).
- Constructs communication device (e.g., a Morse Code communicator).
- Assembles components for a battery powered circuit (e.g., a circuit tester).
- Produces an interactive presentation that explains a system (e.g., uses multimedia).
- Explains a joining system (e.g., creates an interactive *PowerPoint* presentation using graphics, correct technical language and easy-to-use instructions).
- Demonstrates an understanding of using multimedia (e.g., uses multimedia to create a project).

### Choosing and using software/hardware to create information

<table>
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- Follows plans accurately (e.g., to create a model touch-sensitive switch as part of an energy saving system, based on a computer-generated circuitry system design using <www.crocodile-clips.com>).
- Selects and uses appropriate software for a task (e.g., creating a spreadsheet for displaying a range of materials) and creates a short animation.
- Considers the needs of the audience when choosing presentation software (e.g., is using *PowerPoint* the most effective way?).

- Operates tools appropriate to designs (e.g., uses a scroll saw to manufacture a jigsaw puzzle, a cutting device to make a mitre joint for a picture frame, dressmaking scissors to cut out a clothing pattern).
- Selects and applies appropriate adhesives and/or fastening systems to suit a particular end use for a project.
- Uses waterproof glue for an item to be used in a wet environment (e.g., a model boat).
- Uses an alternative fastening system for an outdoor structure.
- Uses a selected form/method of panel fastening/closure on a textile project.
- Creates circuits (e.g., using switches, lamps and buzzers).
- Recognises and adopts different roles within group planning activities.
- Uses levers, cams and linkages to control movement (e.g., automata).
- Constructs and publishes an online web page of designs for a particular product (e.g., their team’s designs of a kitchen item).
- Constructs a shared intranet page showing a variety of designs (e.g., for possible future leisure pursuits).
Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations.

**In T KC4 KC6 relating to Outcomes 3.4, 4.4**

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selects and uses a computer program to convey their design thinking</td>
<td>(eg graphic organisers, <em>Inspiration</em>).</td>
</tr>
<tr>
<td>Determines which drawing program is best for producing 3D images</td>
<td>(eg uses and compares results).</td>
</tr>
<tr>
<td>Assembles a multimedia presentation using a range of resources</td>
<td>(eg a <em>PowerPoint</em> presentation).</td>
</tr>
<tr>
<td>Researches different word processing and publication software</td>
<td>(eg <em>Microsoft Word, Microsoft Publisher, Clarisworks</em>).</td>
</tr>
<tr>
<td>Constructs a web page to display a product</td>
<td>(eg tourism packages to other planets for the year 2500, school activities to be linked to the school intranet).</td>
</tr>
<tr>
<td>Displays own digital photographic work</td>
<td>(eg in a looped <em>PowerPoint</em> display).</td>
</tr>
<tr>
<td>Documents the design process used with a project</td>
<td>(eg uses <em>Publisher, Word</em>).</td>
</tr>
<tr>
<td>Uses a CAD package to create working drawings or patterns for a</td>
<td>project.</td>
</tr>
<tr>
<td>Also developing skills/attitudes in:</td>
<td></td>
</tr>
<tr>
<td>Achieving quality</td>
<td></td>
</tr>
<tr>
<td>Responsibility</td>
<td></td>
</tr>
<tr>
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<tr>
<td>Expanding confidence</td>
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<td>Optimism about what is achievable</td>
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</table>

3.4 Demonstrates skills and confidence in creating products, processes and systems which respect personal and collective identities.

4.4 Effectively uses, in personally and interpersonally appropriate ways, a range of skills that achieve consistent production outcomes.

**Id T KC6**
Learning Area: Design and technology  
Strand: Making  
Possible starting points for planning, programming and assessing  
Band: Middle Years  
Standards: 3 & 4

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th>(refer p41 for Primary Years)</th>
<th>OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students apply their knowledge of the characteristics of materials and equipment when creating solutions and designing to meet criteria related to function, aesthetics, sustainability and production. F In C KC3 KC6 relating to Outcomes 3.5, 4.5</td>
<td></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td><strong>OUTCOMES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SORTING AND SELECTING MATERIALS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Selects and uses appropriate materials and equipment to suit the design brief.</td>
<td>• Analyses and selects from a range of natural and artificial materials.</td>
<td>• Defends the use of particular tools and materials.</td>
</tr>
<tr>
<td>• Makes a product (eg a torch) using simple electrical materials.</td>
<td>• Analyses the properties and/or characteristics of materials (eg to make a protective cover for a vegetable garden).</td>
<td>• Prepares and debates a report to a specific audience, defending the use of particular materials and equipment.</td>
</tr>
<tr>
<td>• Makes a product, intended for the outdoors, that will be long lasting in all weather (eg a weather vane).</td>
<td>• Decides and selects the most appropriate materials for a project (eg a food storage container).</td>
<td>• Reports to the class why people continue to use paper.</td>
</tr>
<tr>
<td>• Creates a product from recycled materials (eg a rain gauge).</td>
<td>• Modifies a plan to accommodate new materials and techniques.</td>
<td>• Discusses why a project may be best made from wood/timber.</td>
</tr>
<tr>
<td>• Researched a range of materials to find the most appropriate for making a specific product (eg searches the web for a UV resistant material for a sun shade).</td>
<td></td>
<td>• Presents information (eg a 3 minute presentation) showing why machinery is used in mass production of foodstuffs.</td>
</tr>
<tr>
<td>• Tests the strength of different materials to choose the best for a structure (eg timber for a tall structure).</td>
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<tr>
<td>• Tests foodstuffs for their freezing suitability.</td>
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Students apply their knowledge of the characteristics of materials and equipment when creating solutions and designing to meet criteria related to function, aesthetics, sustainability and production.  

**Matching tools with materials**

- Assesses the suitability of tools for use with specific materials.
- Uses a tenon saw to cut timber accurately (e.g., for butt joining).
- Experiments with hand mixing implements to find which tool suits a given recipe.
- Cuts components of a textile pattern using a variety of tools (e.g., a rotary cutter, scissors, Stanley knife) to ascertain the best method.
- Uses a measuring device to measure a component accurately.
- Considers the factors that determine the best use of materials and equipment when making a product.
- Chooses a suitable tool when using different materials (e.g., sandpaper for smoothing balsa wood).
- Explains why particular materials are suited for outside use (e.g., comparing properties of core flute with corrugated cardboard).
- Selects approved plastic containers for microwave cooking and explains why metal containers cannot be used.
- Selects the appropriate materials and equipment needed to make a specific product.
- Selects solar powered cells to produce a self-generating light source.
- Demonstrates an understanding of multimedia (e.g., by creating an interactive PowerPoint presentation or a video to demonstrate safe tool use to explain a joining system).
- Selects and uses various joining techniques for the production of a proposed product.
- Tests and practises using tools and equipment on a range of materials (e.g., giving consideration to safety and intended use).
- Examines the quality of finish that different tools produce (e.g., compares cutting and joining techniques for accuracy).
- Chooses the appropriate tools and materials to modify a product to make it more environmentally friendly (e.g., selects solar powered cells to produce a self-generating light source).
- Selects and uses from recycled fabrics sufficient components to manufacture a product (e.g., a desk tidier).
- Researches equipment and techniques to determine suitability for specific materials.
- Considers the implications of using incorrect tools/equipment (e.g., a carving knife for peeling fruit, a wood saw for cutting metal).
- Uses and develops understandings of how tools and equipment function.

**3.5 Investigates the characteristics of materials and equipment used in design and production in order to achieve sustainability.**  

**4.5 Evaluates materials and equipment in order to meet principles of function, aesthetics and sustainability.**
Students apply their knowledge of the characteristics of materials and equipment when creating solutions and designing to meet criteria related to function, aesthetics, sustainability and production.

### Creating quality products

- Makes a suitable, quality end product to meet the design brief.
- Constructs a scale model accurately (eg from common materials).
- Experiments with materials to ascertain their suitability for a project.
- Applies the results of experimentation to select appropriate materials for a task.
- Selects and applies the best suited software package for a given design brief.
- Compares quality of own outcomes with those of peers.
- Distinguishes between aesthetic appeal and durability (eg strength of joints, taste) when assessing if something is well made.

### Developing appropriate skills and techniques for the materials used

- Tests the strength gained by the use of gusset joints as reinforcement (eg for a framed article, a picture frame or a simple framed box).
- Selects and uses various materials and joining techniques for the production of a proposed project.
- Selects materials and joining techniques that best fit the making of a particular product (eg a food storage device).
- Researches the reasons that chemical finishes are necessary for weatherproofing materials (eg varnishes).
- Uses a range of tools appropriate to working with a variety of materials in making a useful household article (eg constructing a toilet roll holder from a recycled broom handle and salvaged timber, a potato storage box from recycled floorboards, a child’s toy from recycled materials).
- Selects and uses appropriate joinery methods when making a frame construction (eg chooses to use a lap joint, butt joint, mitre joint).

### Analysing and responding to information about materials, processes and systems

- Modifies the purpose of a crafted product.
- Changes the layout of a building to make it different from the others in a group of similar structures.
- Provides the reasons for choice of material in the production of a specific item.
- Uses ICTs to produce a visual display of the reasons for material choice.
- Presents a photographic display (eg of simple homeware devices).
- Compiles a portfolio of material swatches of natural fibres.

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**Analysing and responding to information about materials, processes and systems**

- Modifies the purpose of a crafted product.
- Changes the colour of a product to appeal to a different audience.
- Provides the reasons for choice of material in the production of a specific item.
- Uses ICTs to produce a visual display of the reasons for material choice.
- Compiles a portfolio of material swatches of natural fibres.
# Learning Area: Design and technology
## Strand: Making
### Possible starting points for planning, programming and assessing

**Band: Middle Years**
**Standards: 3 & 4**

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| Students describe and communicate principles of good resource management and duty of care, and integrate them into socially and environmentally sustainable designing and making practice. | Year 6 Standard 3  <br> **Year 7** Towards Standard 4  <br> **Year 8** Standard 4

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**Developing understandings of the sustainability and the economic, environmental and social impacts of technological practice**

- Uses materials in the most economical manner.
- Plans to use a complete sheet of material to construct a model (e.g., balsa wood).
- Trials a layout or cutting plan.
- Shares a sheet of material with another student.
- Explains the relationship between sustainability and tool/artefact-making strategies.
- Reports about a craftsperson (e.g., an Australian Indigenous craftsperson and reports about the methods and materials used to produce colour in traditional artefacts).
- Reports to the class about the way people pass on the skills of artefact production from one generation to the next (e.g., Australian Indigenous people).
- Identifies a sustainable materials source and promotes its use.
- Makes a usable item from recycled materials, which could replace one currently used (e.g., a new type of book cover).
- Makes a clothing item using natural fibres.
- Makes food from home-grown ingredients (e.g., biscuits).
- Plans to deploy material resources conservatively.
- Plans cutting of materials which will result in the least possible waste of material resources.
- Stores off-cuts of materials.
- Shares materials when making things.
- Understands that materials are limited and promotes the use of recycled materials.
- Negotiates and manages the cost of materials used to complete a product (e.g., makes a materials list and calculates cost of materials).
- Ensures that safety equipment is in good condition.
- Plans a system for applying finish to the product (e.g., a clear finish).
- Applies safety procedures when using equipment.
- Prevents damage to equipment (e.g., researches the use of an alternative safety equipment storage unit).
- Researches the safety properties of tools, such as general machine and appliance guarding.
- Introduces a material safety data sheet for a product that was used.

**Possible starting points for planning, programming and assessing**

- Developing understandings of the sustainability and the economic, environmental and social impacts of technological practice

- year 6 standard 3  
- year 7 towards standard 4  
- year 8 standard 4  

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3.6 Identifies and articulates a range of responsible strategies for managing resources and working safely.  
F In C KC2 KC3

4.6 Analyses and applies the principles of good resource management, sustainability and duty of care in their design and making practice.  
F In KC3
Students describe and communicate principles of good resource management and duty of care, and integrate them into socially and environmentally sustainable designing and making practice.  

**Understanding the role of risk management by maximising safety and managing people, materials and equipment**

- Selects the appropriate safety equipment and procedures for the task.
- Chooses to wear safety glasses during finishing processes (e.g., when using sandpaper) and explains why.
- Chooses to wear gloves when using particular equipment (e.g., a hot glue gun) and discusses the reasons for wearing them.
- Chooses to use a cutting mat when using a cutting device and explains why.
- Selects and uses appropriate safety equipment for the task.
- Uses safety glasses when cleaning chemicals are used.
- Uses clamps or bench hooks when sawing.
- Uses clamps when drilling.
- Observes standard operating and safety procedures in the classroom or workshop.
- Applies the use of designated work areas for specific tasks (e.g., sawing table, drilling table, hot glue area).
- Observes organisational strategies (e.g., a list of learners’ names for order of tool use).
- Embraces and adopts safe work practices and conservation of material and equipment.
- Discusses safe methods of performing tasks.
- Plans and explains the reasons for the safety equipment used during an intended task.
- Justifies the requirement for washing hands during the process of preparing food.
- Explains the reasons for using particular electrical equipment (e.g., a hot glue gun) in a designated area.
- Reviews the condition of safety equipment and follows/considers safety rules and infrastructure.
- Inspects the condition of appropriate safety equipment before undertaking a task.
- Talks about the need for care in the storage of safety equipment.
- Discusses in teams the need for additions/modifications to existing safety rules, when new/different tasks or equipment are introduced.
- Applies safe work habits in the workshop.
- Follows Safe Operation Procedures (SOPs) when using machinery and tools.
- Wears correct clothing in the workshop.
- Ensures long hair is tied back.
- Demonstrates safe working procedures with tools and machines.
- Demonstrates classroom safety rules.
- Wears safety glasses at all times and models safe hand tool use.
- Acts in a manner that demonstrates the care and safety of others (e.g., when in groups).
- Cares for safety of themselves and others.
- Works safely in teams, assisting each other with machine use (e.g., supports others using the bandsaw, tailing out, acting as a safety officer).
- Identifies hazards and warns others (e.g., water on floor, faulty switch).
- Applies knowledge of tools and techniques on practice tasks to develop skills.
- Plans carefully for efficient use of time.

*Also developing skills/attitudes in:*  
- Achieving quality
- Responsibility
- Planning and managing production
- Managing time
- Working effectively on own and in teams
- Expanding confidence
- Optimism about what is achievable
- Innovation
- Negotiation of roles and timelines
- Flexibility in working in teams.
Students describe and communicate principles of good resource management and duty of care, and integrate them into socially and environmentally sustainable designing and making practice.  

F In C  KC2 KC3

relating to Outcomes 3.6, 4.6

- Learns to conserve consumables.
- Describes the safe use of tools and equipment.
- Practises energy conservation such as turning electrical appliances off when not in use.
- Uses time in technology sessions efficiently and productively.

Developing understandings of procedures, sequences and systems in carrying out tasks

- Discusses the storage needs for projects relative to the available space.
- Creates ways in which projects can be stored while in the making process, without being damaged.
- Contributes to the easy access of raw materials.
- Identifies ways to share resources.
- Describes safety procedures when moving around during making sessions.
- Understands and promotes the need for clean, well organised work areas.
- Plans for the storage of unused materials.
- Returns tools to the storage area.
- Maintains a clean work space.
- Shares tools fairly.
- Allows sufficient time for cleaning up.
- Appraises production issues for making an item and prepares a report highlighting safety issues.
- Applies safety issues in the making of a product (e.g., a wooden toy).
- Appraises the social issues involved in a production line process.
- Prepares a report commenting on the use of different tools and/or materials in different cultures.
- Creates strategies that would give a disabled person equality in a production line process.
- Understands and promotes safe work practices in everyday life.
- Conducts a home survey about the storage of chemicals and medicines and suggests possible improvements.
- Observes work practices around the school and conducts a risk management survey.
- Operates and controls systems to produce a product (e.g., uses cutting tools, sewing machines, computer programs).
- Learns that systems are applied to achieve specified outcomes (e.g., stock control—creates an electronic system).
- Investigates how human and physical systems have functional, aesthetic, social and environmental implications (e.g., robotic production lines, watering systems including irrigation and storage, refrigeration logistics).
- Plans carefully for efficient use of time.

3.6  Identifies and articulates a range of responsible strategies for managing resources and working safely.  
F In C  KC2 KC3

4.6  Analyses and applies the principles of good resource management, sustainability and duty of care in their design and making practice.  
F In KC3
Students describe and communicate principles of good resource management and duty of care, and integrate them into socially and environmentally sustainable designing and making practice.

**Using devices ethically and in socially acceptable ways**

- Highlights the differences between synthetic and natural fibres in clothing.
- Considers people’s values and beliefs about technologies and translates needs into goals to guide their work.
- Perseveres with teamwork to resolve differences of opinion.
- Uses a range of strategies (eg graphic organisers) to predict consequences of proposed action.
- Considers the impact of their work on others.
- Develops safety rules for storage of a product (eg supermarket trolleys).
- Defends and promotes the use of natural products.
- Promotes use of natural foods in the canteen (eg organically grown foods).
- Uses safe and hygienic work practices when preparing a meal.
- Examines the benefits and costs in functional, social and environmental terms.
- Assesses how well outcomes meet the needs of communities/different cultures.
- Discusses ownership, intellectual property and copyright.
- Considers and defends construction strategies in the making of a product (eg describes differences between the available materials).
- Defends how time, resources and labour have been used.
- Critiques techniques used by the group to achieve quality products, such as hazard identification.
- Understands the impact the designer can have in bringing about cultural and social change (eg creation of a new monetary system).
- Understands the need to determine authenticity of information sourced from the internet.

**F In C KC2 KC3**

**KC3**

**Year 6**
Standard 3

**Year 7**
Towards Standard 4

**Year 8**
Standard 4

3.6 Identifies and articulates a range of responsible strategies for managing resources and working safely.

4.6 Analyses and applies the principles of good resource management, sustainability and duty of care in their design and making practice.

**F In KC3**
### Acronyms — Terrific Technology Teaching Tips

<table>
<thead>
<tr>
<th>Use PRISMER:</th>
<th>Use PRIDMER:</th>
<th>Use TRIDMES:</th>
<th>Use COSMIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P</strong> Problem</td>
<td><strong>P</strong> Problem</td>
<td><strong>T</strong> Task and context</td>
<td><strong>C</strong> Collect information</td>
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<tr>
<td><strong>R</strong> Restrictions</td>
<td><strong>R</strong> Restrictions</td>
<td><strong>R</strong> Requirements</td>
<td><strong>O</strong> Organise</td>
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<tr>
<td><strong>I</strong> Investigating</td>
<td><strong>I</strong> Investigating</td>
<td><strong>I</strong> Investigating</td>
<td><strong>S</strong> Select and design</td>
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<tr>
<td><strong>S</strong> Solutions</td>
<td><strong>D</strong> Designing</td>
<td><strong>D</strong> Designing</td>
<td><strong>M</strong> Make</td>
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<td><strong>M</strong> Making</td>
<td><strong>M</strong> Making</td>
<td><strong>M</strong> Making</td>
<td><strong>I</strong> Implement</td>
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<td><strong>E</strong> Evaluation</td>
<td><strong>E</strong> Evaluating</td>
<td><strong>E</strong> Evaluating</td>
<td><strong>C</strong> Critically reflect</td>
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<td><strong>R</strong> Reflecting</td>
<td><strong>R</strong> Reflecting</td>
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</table>
### BAND: MIDDLE–SENIOR YEARS
#### Assessment criteria

<table>
<thead>
<tr>
<th>Key Ideas</th>
<th>Strands</th>
<th>The learner is able to:</th>
<th>Working technologically</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.</td>
<td>Critiquing - questioning, identifying, clarifying, examining and exploring technologies</td>
<td>• Question, analyse and formulate arguments on the issues and intentions behind products and processes</td>
<td>• Achieving quality and accuracy</td>
<td>4.1 Examines the decisions and choices made in designed and manufactured products, processes and systems and identifies alternative possibilities. In T KC2 KC6</td>
</tr>
<tr>
<td>Students deconstruct technologies in order to expose the values which lie behind the intentions, design and manufacture of products, processes and systems. They critically examine the consequences of past technologies, and speculate on and explain the consequences of present and future technologies and their capacities to shape human existence. F In T KC1 KC2</td>
<td>• Analyse and document the impacts of technology upon key areas of society</td>
<td>• Asking questions</td>
<td>5.1 Examines critically the competing values embodied in designed products, processes and systems, clarifies relationships amongst people, products and quality of life and presents ethical analyses of various possible technological futures. F In T KC1</td>
<td></td>
</tr>
<tr>
<td>Students understand and value the combining of different design skills in order to create personal strategies to become better designers of culturally, environmentally and socially defensible products, processes and systems. F In KC9</td>
<td>Designing - exploring, generating and representing ideas</td>
<td>• Generate well considered design proposals that reflect extended research and range of ideas</td>
<td>• Developing coordination</td>
<td>4.2 Integrates design skills to create personal strategies for designing culturally and socially defensible products, processes and systems. F In KC6</td>
</tr>
<tr>
<td>Students are self-managing designers who bring together experience, self-knowledge and appropriate design strategies to create ethically defensible products, processes and systems. Id In T KC1 KC8</td>
<td>• Apply an extended range of tools/resources to develop own designs</td>
<td>• Developing independence</td>
<td>5.2 Independently generates and manages design strategies to create ethically defensible products, processes and systems. Id In T KC3 KC6</td>
<td></td>
</tr>
<tr>
<td>Students use a full range of communication skills and techniques in the design field, including information and communication technologies, to document and communicate effectively their design thinking, ideas and proposals. T C KC2 KC7</td>
<td>Designing - documenting and communicating the thinking behind the design/idea using a variety of methods</td>
<td>• Generate designs that successfully reflect consideration of ethical, cultural and futures issues</td>
<td>• Developing ownership</td>
<td>4.3 Demonstrates skills in using a broad range of recognised communication forms and technologies to convey design thinking. T C KC1</td>
</tr>
<tr>
<td>Students communicate their design thinking and proposals effectively, efficiently and at a standard approaching community or industry practice. T C KC2 KC3 KC7</td>
<td>• Design products in consultation with identified groups to meet a need</td>
<td>• Expanding confidence</td>
<td>5.3 Demonstrates high level skills approaching community or industry practice in effectively recording and communicating their design thinking. T C KC2</td>
<td></td>
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<tr>
<td>• Justify and defend own opinions and ideas</td>
<td>• Incorporate ICTs extensively to communicate design ideas</td>
<td>• Experimenting with tools and processes</td>
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<tr>
<td>• Include ICTs as means to clearly present proposals, research findings and intentions</td>
<td>• Design products in consultation with identified groups to meet a need</td>
<td>• Exploring options</td>
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<tr>
<td>• Use ICTs as means to clearly present proposals, research findings and intentions</td>
<td>• Design products in consultation with identified groups to meet a need</td>
<td>• Increasing responsibility</td>
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<tr>
<td>• Develop design ideas confidently and in detail with a range of stakeholders</td>
<td>• Generate visual displays that clearly convey design ideas and proposals reflecting industry standards/expectations</td>
<td>• Innovating</td>
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<tr>
<td>• Discuss design ideas confidently and in detail with a range of stakeholders</td>
<td>• Incorporate ICTs extensively to communicate design ideas</td>
<td>• Investigating ideas of self and others</td>
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<tr>
<td>• Communicate clearly and in detail design proposals to a wider audience</td>
<td>• Communicate clearly and in detail design proposals to a wider audience</td>
<td>• Involving trial and error</td>
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<td>• Communicate clearly and in detail design proposals to a wider audience</td>
<td>• Communicate clearly and in detail design proposals to a wider audience</td>
<td>• Listening</td>
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<td></td>
<td>• Communicate clearly and in detail design proposals to a wider audience</td>
<td>• Making decisions</td>
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<td></td>
<td>• Communicate clearly and in detail design proposals to a wider audience</td>
<td>• Making judgments</td>
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<tr>
<td>Making</td>
<td>Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations.</td>
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<tr>
<td>Making</td>
<td>Students demonstrate skills that empower them creatively and independently to solve problems involved in making sophisticated products, processes and systems which approach community and industry standards.</td>
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<tr>
<td>Making</td>
<td>Students apply their knowledge of the characteristics of materials and equipment when creating solutions and designing to meet criteria related to function, aesthetics, sustainability and production.</td>
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<tr>
<td>Making</td>
<td>Students describe and communicate principles of good resource management and duty of care, and integrate them into socially and environmentally sustainable designing and making practice.</td>
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<tr>
<td>Making</td>
<td>Plan, lead and work cooperatively in teams and on individual projects.</td>
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<tr>
<td>Making</td>
<td>Analyse and select various materials for characteristics, aesthetics and best practice.</td>
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<td>Making</td>
<td>Operate and use a range of equipment.</td>
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<tr>
<td>Making</td>
<td>Select and use appropriate skills to construct products of a high quality.</td>
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<td>Making</td>
<td>Develop a production sequence.</td>
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<tr>
<td>Making</td>
<td>Select and use safely and accurately a range of techniques.</td>
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<td>Making</td>
<td>Negotiating roles.</td>
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<td>Making</td>
<td>Observing.</td>
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<td>Making</td>
<td>Planning and managing production.</td>
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<td>Making</td>
<td>Recording ideas and processes.</td>
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<td>Making</td>
<td>Reflecting on and accepting constructive feedback.</td>
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<td>Making</td>
<td>Reflecting on ideas.</td>
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<td>Making</td>
<td>Researching ideas.</td>
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<td>Making</td>
<td>Sharing ideas.</td>
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<td>Making</td>
<td>Solving problems.</td>
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<td>Making</td>
<td>Taking responsibility.</td>
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<td>Making</td>
<td>Taking risks.</td>
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<td>Making</td>
<td>Thinking flexibly.</td>
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<td>Making</td>
<td>Thinking imaginatively.</td>
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<td>Making</td>
<td>Using different genres.</td>
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<td>Making</td>
<td>Working collaboratively.</td>
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<td>Making</td>
<td>Working cooperatively in a team.</td>
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<td>Making</td>
<td>Working effectively on their own.</td>
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<tr>
<td>Making</td>
<td>Working flexibly in teams.</td>
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</table>

4.4 Effectively uses, in personally and interpersonally appropriate ways, a range of skills that achieve consistent production outcomes. 

5.4 Demonstrates specialised skills to create, independently and in teams, products, processes and systems approaching community and industry standards.
Learning Area: Design and technology  
Strand: Critiquing  
Band: Middle–Senior Years  
Standards: 4 & 5

### KEY IDEAS

( refer p48 for Middle Years)

<table>
<thead>
<tr>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard 4</td>
<td>Towards Standard 5</td>
<td>Standard 5</td>
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</table>

#### OUTCOMES

**Year 8**

- Investigates packaging ideas for various age groups.
- Surveys the opinion and understandings of a target group (eg a peer group to gain opinion about clothing designs; students, parents/caregivers, community about the school canteen and the need to have a range of healthy foods; students about possible uniform design changes).
- Considers the appropriateness of a variety of safety equipment.
- Investigates various safety equipment resources (eg websites).
- Investigates appropriate hygiene methods when preparing or serving food (eg the use of antiseptic hand wash or latex gloves).
- Compares the advantages of various soft fall materials used in play grounds.

**Year 9**

- Researches to compare similar products and refine design ideas (eg on the internet).
- Researches furniture construction (eg the Bentwood chair and Barcelona chair).
- Selects an appropriate joining process (eg for thin-walled tubing suitable for its final use).
- Selects appropriate graphic software to meet needs.
- Compares the final outcome with the original task requirements.
- Suggests alternative methods and materials which could be used to perform the same task.
- Compares own finished product with those of others.

**Year 10**

- Investigates design ideas to help make an informed choice (eg outdoor furniture in local area, public places; to assist in making outdoor furniture for the school yard).
- Collates preliminary responses from client groups and adjusts design brief (eg for a small business inventory database).
- Identifies and articulates the key reasons for the quality of the end product.

### KEY TO SYMBOLS

**Essential Learnings:**
- F Futures
- Id Identity
- In Interdependence
- T Thinking
- C Communication

**In T KC1 KC2 relating to Outcome 4.1**

Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

**F In T KC1 KC2 relating to Outcome 5.1**

Students deconstruct technologies in order to expose the values which lie behind the intentions, design and manufacture of products, processes and systems. They critically examine the consequences of past technologies, and speculate on and explain the consequences of present and future technologies and their capacities to shape human existence.

### Possible starting points for planning, programming and assessing

- Analysing, choosing, discerning, checking, monitoring and surveying.
Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

**In T KC1 KC2 relating to Outcome 4.1**

Students deconstruct technologies in order to expose the values which lie behind the intentions, design and manufacture of products, processes and systems. They critically examine the consequences of past technologies, and speculate on and explain the consequences of present and future technologies and their capacities to shape human existence.

**KC1 collecting, analysing and organising information**

- Analyses the impact of the removal of an everyday technology.
- Analyses the reasons for having technology.
- Considers and analyses the reasons behind a product’s design and manufacture.
- Investigates the range of ways to access information (eg the internet and resource centres).
- Predicts where technology will have an impact on the future.
- Accesses a range of resources to develop an understanding of their properties.
- Investigates the properties of a range of resources (eg using the internet and school resource centre).
- Considers how systems have changed (eg communications, dwellings, household products and appliances).
- Researches how products have changed over time.

**Learning/knowing/finding out about technologies, locally and globally**

- Reviews systems that are in harmony with local cultures.
- Investigates materials used in different cultures.
- Researches and compares cooking techniques from a variety of cultures.
- Reviews the availability of materials and equipment in developing countries.
- Reviews and compares construction techniques in different environments.
- Analyses the reasons behind a product’s design and manufacture to meet a specific requirement.
- Describes the impact of technology on cultural groups/lifestyles (eg investigates the surf culture).
- Researches safety issues over time (eg workers’ safety versus production efficiency).
- Relates the changes in designed products to meet people’s changing needs (eg ethical needs).

**KC2 communicating ideas and information**

- Researching past, present and proposed technologies
- Reviews emerging technologies in the developed world using references to the past and present context.
- Investigates the availability of a particular technology throughout the world (eg electricity, water supply).

**KC3 planning and organising activities**

- Reviews appropriate use of images, typography, layout, colour, composition (eg own magazine cover).
- Analyses the reasons behind a product’s design and manufacture to meet a specific requirement.
- Describes the impact of technology on cultural groups/lifestyles (eg investigates the surf culture).
- Researches safety issues over time (eg workers’ safety versus production efficiency).
- Relates the changes in designed products to meet people’s changing needs (eg ethical needs).

**KC4 working with others and teams**

- Tests to see that all the requirements of form, function and aesthetics are met (eg examines own CD rack to see that it meets all the criteria).
- Reviews appropriate use of images, typography, layout, colour, composition (eg own magazine cover).

**KC5 using mathematical ideas and techniques**

- Analyses the reasons behind a product’s design and manufacture to meet a specific requirement (eg compares various electronic games such as XBox and PlayStation).
- Considers the properties that contribute to the quality of a product that is built for lasting service.

**KC6 solving problems**

- Analyses the reasons behind a product’s design and manufacture to meet a specific requirement.
- Describes the impact of technology on cultural groups/lifestyles (eg investigates the surf culture).
- Researches safety issues over time (eg workers’ safety versus production efficiency).
- Relates the changes in designed products to meet people’s changing needs (eg ethical needs).

**KC7 using technology**

- Tests to see that all the requirements of form, function and aesthetics are met (eg examines own CD rack to see that it meets all the criteria).
- Reviews appropriate use of images, typography, layout, colour, composition (eg own magazine cover).
Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

In T KC1 KC2 relating to Outcome 4.1

Students deconstruct technologies in order to expose the values which lie behind the intentions, design and manufacture of products, processes and systems. They critically examine the consequences of past technologies, and speculate on and explain the consequences of present and future technologies and their capacities to shape human existence.

In T KC1 KC2 relating to Outcome 5.1

Year 8 Standard 4

- Explores the necessary steps in the manufacture of a project (eg a textile project).
- Describes the steps and processes necessary to order materials or ingredients.
- Considers and defends construction strategies in the making of a product.
- Articulates differences between the available materials.
- Comments on the finishing system used on an article.

Year 9 Towards Standard 5

- Defends how time, resources and labour have been used.
- Critiques techniques used by the group to achieve quality products (eg hazard identification).
- Comments on how materials can be transformed (eg natural fibres, sheet materials, foodstuffs) by examining materials and techniques used.

Year 10 Standard 5

- Researches and tests techniques and products for accuracy and durability.
- Investigates the development of a new or improved technology and describes why it is different.
- Searches for ways to improve production and the product, to meet design criteria.

Understanding social and cultural differences

- Talks about alternatives and values other people’s opinions.
- Reviews carrying and lifting systems (eg in a developing country).
- Finds out about clothing designs in different cultures/countries.
- Compares the design of product packaging used for different markets.
- Compares carrying devices of different cultures (eg makes a 3-D poster).

Determining points of view, bias and intent, and considering values inherent in any technology

- Discusses and compares the plans provided/used with the actual product produced.
- Talks about alternatives and values other people’s opinions.

4.1 Explains the decisions and choices made in designed and manufactured products, processes and systems and identifies alternative possibilities.

5.1 Examines critically the competing values embodied in designed products, processes and systems, clarifies relationships amongst people, products and quality of life and presents ethical analyses of various possible technological futures.

In T KC1

4.1 Explains the decisions and choices made in designed and manufactured products, processes and systems and identifies alternative possibilities.

5.1 Examines critically the competing values embodied in designed products, processes and systems, clarifies relationships amongst people, products and quality of life and presents ethical analyses of various possible technological futures.
Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

**In T KC1 KC2 relating to Outcome 4.1**

Students deconstruct technologies in order to expose the values which lie behind the intentions, design and manufacture of products, processes and systems. They critically examine the consequences of past technologies, and speculate on and explain the consequences of present and future technologies and their capacities to shape human existence.

**In T KC1 KC2 relating to Outcome 5.1**

- Discusses (eg in groups), foodstuffs for healthy diets.
- Explores the pros and cons of fast food.
- Surveys to establish design requirements of the end user (eg a group of elderly citizens about required garden seating, primary students on their ideas for an adventure playground, an electronic book for preschool children).
- Debates issues when considering design possibilities in a research assignment.
- Discusses possible implications of genetically modified foods.

**Comparing, contrasting and experiencing**

- Investigates the properties of a range of materials (eg by trial and error techniques).
- Compares the properties of different timbers available.
- Considers cost of materials to be used, within a budget.
- Considers the environmental impact of different materials to be used.
- Compares the tastes of selected ingredients.
- Compares the strength of packaging (eg fast food, electrical goods/white goods).
- Compares colour, shape and size of packaging from various countries.
- Changes ideas after considering new possibilities and reflects this in design proposals.
- Discusses issues with teacher and peers about the design process and refines plans accordingly.
- Considers safety, construction techniques and processes.
- Collates results of a food testing survey.
- Incorporates customer feedback in a design (eg a chair design).
- Discusses the use of materials with support of a software presentation package (eg *PowerPoint*).
- Uses software to create concept maps to show development of ideas (eg *Inspiration*).
- Examines and discusses whether applications are sustainable and desirable.
- Reappraises economic, moral, social, environmental and aesthetic effects of technology.
- Presents the results of the design process to the class (eg when making a table, designing a corporate image, designing a package, making a maquette).
- Examines critically the competing values embodied in designed products, processes and systems, clarifies relationships amongst people, products and quality of life and presents ethical analyses of various possible technological futures.

**4.1**

Explains the decisions and choices made in designed and manufactured products, processes and systems and identifies alternative possibilities.

**5.1**

Examines critically the competing values embodied in designed products, processes and systems, clarifies relationships amongst people, products and quality of life and presents ethical analyses of various possible technological futures.
Students analyse and explain the design decisions and thinking implicit in products, processes and systems made by themselves and others. They develop an initial understanding of the competitive nature of the designed and made world.

In T KC1 KC2 relating to Outcome 4.1

Students deconstruct technologies in order to expose the values which lie behind the intentions, design and manufacture of products, processes and systems. They critically examine the consequences of past technologies, and speculate on and explain the consequences of present and future technologies and their capacities to shape human existence.

In T KC1 KC2 relating to Outcome 5.1

**Understanding the impact of technologies on people, economies and the environment**

- Investigates how technologies are used and explains their impact (eg the introduction of robots into assembly lines, refrigeration, overlockers).
- Distinguishes between what people want and what they need and examines changing lifestyles.
- Explores the problems of fumes when working (eg hot wire cutting polystyrene foam).
- Supports choice of materials, processes and techniques.
- Compares final outcome with original task requirements (eg discusses the menu for a special event).
- Discusses the appropriateness of materials in products (eg the use of flammable textiles in pyjamas).
- Discourages the use of cutting/manipulating materials in manufacture.
- Discusses the impact of technology upon society and the environment (eg work patterns and leisure).
- Analyses the impact of the removal of an everyday technology.
- Analyses the reasons for having technology.
- Investigates the implications of new ways of doing things.
- Follows a four stage process to describe, analyse, interpret and judge.
- Supports choice of materials, processes and techniques.
- Discourages the use of cutting/manipulating materials in manufacture.
- Discusses the problems when using cutting/manipulating materials in manufacture.
- Discusses using materials that cause destruction of habitats.
- Explores use of recycled products versus the throw-away product.
- Considers alternatives to using rainforest timbers (eg Philippine mahogany) for furniture (eg a coffee table).
- Explores use of recycled products versus the throw-away product.
- Considers alternative processes and techniques.
- Considers alternative processes and techniques.
- Supports choice of materials, processes and techniques.
- Discourages the use of cutting/manipulating materials in manufacture.
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- Considers alternatives to using rainforest timbers (eg Philippine mahogany) for furniture (eg a coffee table).
- Explores use of recycled products versus the throw-away product.
- Considers alternative processes and techniques.
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**Identifying inconsistencies**

- Demonstrates understanding of the three areas of design when deconstructing: communication, product, and environmental design.
- Discusses personal choices of materials and associated manufacturing processes (eg presents a defence of material selection and processes in the use of plastics).
- Demonstrates and discusses, as a member of a team, the final outcome of a task.
- Surveys users and critically analyses own work.
- Examines in detail all aspects of the set task (eg tests systems and questions aspects of own design).
- Considers production techniques, occupational health, safety and welfare and the labour force in different cultures.
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- Examines in detail all aspects of the set task (eg tests systems and questions aspects of own design).
- Considers production techniques, occupational health, safety and welfare and the labour force in different cultures.
### Learning Area: Design and technology
**Strand: Designing**

#### Possible starting points for planning, programming and assessing

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<td>Students understand and value the combining of different design skills in order to create personal strategies to become better designers of culturally, environmentally and socially defensible products, processes and systems.</td>
<td><strong>4.2</strong> Integrates design skills to create personal strategies for designing culturally and socially defensible products, processes and systems. F In KC6</td>
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<tr>
<td>Students are self-managing designers who bring together experience, self-knowledge and appropriate design strategies to create ethically defensible products, processes and systems.</td>
<td><strong>5.2</strong> Independently generates and manages design strategies to create ethically defensible products, processes and systems. Id In T KC3 KC6</td>
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#### Year 8
**Standard 4**

- Designs a product (eg a futuristic bed) using CAD to create a 3-D drawing.
- Presents proposals that include feedback from interested clients or groups.
- Researches a product for design ideas (eg uses the internet).
- Considers design ideas from a range of environments (eg home, school, broader community).
- Produces a poster displaying a design for a future building (eg a school classroom in the year 2100).
- Uses a range of recording methods (eg sketches, writes notes, finds pictures) of a range of similar products to develop an information base for a project (eg ideas for an eye protection device).
- Explores a range of possibilities when designing (eg works in groups and provides feedback to each other).

**Employing imaginative and logical thinking to create mental models**

- Develops original and creative ideas using different drawing techniques.
- Plans designs in group activities.
- Researches a wider range of design ideas for consideration (eg uses the internet).
- Creates graphically 3-D lettering that expresses the meaning of a word (eg ‘break’, ‘stop’ or ‘crumble’).
- Develops procedures for preparing and assembling their design.
- Considers ideas, styles and form in relation to the function of an everyday product (eg design approaches in relation to gardening implements, handles and pouring vessels).
- Develops design ideas by discussing, arguing and compromising.
- Researches the development of specific design concepts (eg uses the internet).
- Generates ideas with a class group (eg schoolyard benches).
- Uses imagination, originality and initiative when designing.
- Designs a creative feature for the local community (eg a mural, an adventure playground, a sculpture garden).
- Investigates ideas, tools and materials to determine shape and structures.
- Uses others’ ideas (eg manufacturers’ catalogues) to select a range of knockdown fittings for a cabinet.

#### Year 9
Towards Standard 5

#### Year 10
**Standard 5**

| 4.2 | Integrates design skills to create personal strategies for designing culturally and socially defensible products, processes and systems. F In KC6 |
| 5.2 | Independently generates and manages design strategies to create ethically defensible products, processes and systems. Id In T KC3 KC6 |
Students understand and value the combining of different design skills in order to create personal strategies to become better designers of culturally, environmentally and socially defensible products, processes and systems.

F In KC6 relating to Outcome 4.2

Students are self-managing designers who bring together experience, self-knowledge and appropriate design strategies to create ethically defensible products, processes and systems.

Id In T KC1 KC6 relating to Outcome 5.2

Solving problems and creating solutions for identified needs

- Prepares and modifies own designs and the designs of others.
- Uses, with support, a design acronym such as CTRIDMC—Context, Task, Restrictions, Investigations, Devising, Making, and Critiquing.
- Researches various systems that have a global impact.
- Develops a system that restores rather than exploits the environment.
- Presents (eg using annotated sketches) possible methods for future food storage or cooking.
- Explores how a design may be made more aesthetically pleasing.
- Changes a container so that it suits a different function.
- Utilises less conventional sources to gather design ideas (eg magazines, catalogues, newspapers, junk mail).
- Prepares and modifies own designs and takes into account the results of testing.
- Documents processes by applying a design acronym such as CTRIDMC—Context, Task, Restrictions, Investigations, Devising, Making, Critiquing—or the Systems Development Life Cycle.
- Gathers a range of information (eg from peers and others) to help with the design of a product.
- Discusses and consults with others to develop a design (eg with families and students for the design of a plant nursery or flower bed/stand).
- Explores how a design may be made more aesthetically pleasing.
- Changes a container so that it suits a different function.

Making choices, interpreting criteria and matching needs

- Records the design features of a specific product that meets a specific need (eg a bat for a 3-year-old girl, a chair for a toddler, a shopping bag for a disabled person).
- Proposes ways in which materials may be changed during manufacture (eg a photo frame to suit different décor).
- Chooses a software database program to suit needs.
- Uses a prepared database to research costs of materials.
- Generates project costing using a spreadsheet.
- Discusses and seeks constructive feedback about projects.
- Reviews and modifies designs as a result of experiments and making prototypes.
- Uses independently a design acronym such as CTRIDMC—Context, Task, Restrictions, Investigations, Devising, Making, Critiquing—or the Systems Development Life Cycle, or another system as a guide for setting out thinking and documenting planning.
- Applies design elements to achievable tasks.
- Writes a design proposal using the design brief layout provided by the teacher.
- Also developing skills/attitudes in:
  - Taking risks
  - Responsibility
  - Ownership
  - Cooperating
  - Collaborating
  - Independence
  - Decision making.

4.2 Integrates design skills to create personal strategies for designing culturally and socially defensible products, processes and systems.

5.2 Independently generates and manages design strategies to create ethically defensible products, processes and systems.

Id In T KC3 KC6

Also developing skills/attitudes in:
- Taking risks
- Responsibility
- Ownership
- Cooperating
- Collaborating
- Independence
- Decision making.
Students understand and value the combining of different design skills in order to create personal strategies to become better designers of culturally, environmentally and socially defensible products, processes and systems.

Students are self-managing designers who bring together experience, self-knowledge and appropriate design strategies to create ethically defensible products, processes and systems.

**Inventing, refining and experimenting with materials, techniques and prototypes**

- Uses a teacher prepared spreadsheet to compare project costs for the class and make adjustments if necessary.
- Discusses, practises, tests and selects appropriate jointing techniques for own project.
- Uses more technical drawings to express design ideas with accuracy.
- Discusses the sizes and types of materials that could be used for a project (eg talks with parents/caregivers).
- Records and comments on the results of trials and testing for joint or material suitability.
- Provides input into the development of an action plan (eg to provide shade at the local swimming pool; to promote a local event by producing invitations, advertising posters and flyers).
- Becomes familiar with and uses selected software applications (eg uses the ‘draw’ feature in Microsoft Word to create a flow-chart, scans a drawn image of own design and manipulates it).
- Tests own project to ensure that it fits the design brief (eg tests if a model seat will support a weight, an adhesive to ascertain its suitability in a water environment).
- Makes decisions and changes to a project design as part of the design process.
- Makes three different joint types and performs a stress test to compare strength of each one.
- Uses more technical drawings to express design ideas with accuracy.
- Records and comments on the results of trials and testing for joint or material suitability.
- Becomes familiar with and uses selected software applications (eg uses the ‘draw’ feature in Microsoft Word to create a flow-chart, scans a drawn image of own design and manipulates it).
- Tests own project to ensure that it fits the design brief (eg tests if a model seat will support a weight, an adhesive to ascertain its suitability in a water environment).
- Makes decisions and changes to a project design as part of the design process.
- Questions all interested parties about what design is needed (eg a barbecue being designed for the local kindergarten, security barriers in the canteen).
- Negotiates with the local government authority over the design and development of a community facility (eg shelters at the local skate park and playground).
- Seeks advice from design experts from industry (eg e-mails designers for information about their work).
- Seeks advice from design experts from industry (eg e-mails designers for information about their work).
- Evaluates what has been completed so far, looks for problems and provides documented evidence of solutions.
### Learning Area: Design and technology
**Band: Middle–Senior Years**
**Strand: Designing**
**Standards: 4 & 5**

#### Key Ideas

*(refer p57 for Middle Years)*

**OUTCOMES**

<table>
<thead>
<tr>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
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**Standard 4**

**Standard 5**

**Possible starting points for planning, programming and assessing**

**Applying executing, implementing and exploring ideas with others**

- Records the design features of a product that meets a specific need.
- Communicates design ideas to a wider audience (eg presents design ideas for a recycling system for used printer cartridges within the school).
- Presents a digital portfolio (eg of hand tools, parts and applications).
- Creates an iMovie/video (eg of clothing designs over time).
- Creates an interactive slide show (eg a PowerPoint) about food: past, present and future.
- Documents design ideas using sketches and clear labels (eg sketches design ideas for alternatives to common shirt styles).
- Develops a design portfolio of safety posters for design and technology workshops (eg produces a range of photographs comparing correct and incorrect use of materials).
- Creates a 3-D visual display or model of an intended product design.
- Demonstrates thorough planning (eg uses detailed plans and sketches).
- Investigates using websites (eg www.howstuffworks.com) for different ways to describe techniques or machines.
- Develops a presentation that shows design ideas for a new product launch (eg an audiovisual package).
- Discusses and produces a video or a slide show (eg a PowerPoint presentation) related to the design task.
- Develops skills in the use and application of CAD (eg designs and draws a garment pattern; draws a complete, dimensioned front view, third angle orthographic) when designing products.
- Creates a design portfolio and documents progress, lesson by lesson.
- Explores the requirements of the task with others (eg talks in groups about project planning).
- Designs and documents all intended options.
- Produces high quality documentation and presents design proposals for manufacture (eg a school barbecue).
- Uses graphic software packages (eg ProDESKTOP, Illustrator, Photoshop, Dreamweaver) to generate and evaluate a number of design options, and applies a range of tool options found within these packages.
- Produces an assignment (eg a web page) using a multimedia package.
- Presents a review of trialled software and explains advantages and disadvantages.
- Documents evaluation of a product and uses a range of available examples (eg completes a written critical evaluation of parts of the processes used in construction).
- Constructs/manufactures prototypes or models, demonstrating the processes required.

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Students use a full range of communication skills and techniques in the design field, including information and communication technologies, to document and communicate effectively their design thinking, ideas and proposals.

**T C KC2 KC7**

**relating to Outcome 4.3**

Students communicate their design thinking and proposals effectively, efficiently and at a standard approaching community or industry practice.

**T C KC2 KC3 KC7**

**relating to Outcome 5.3**

**4.3** Demonstrates skills in using a broad range of recognised communication forms and technologies to convey design thinking.

**T C KC1**

**5.3** Demonstrates high level skills approaching community or industry practice in effectively recording and communicating their design thinking.

**T C KC2**

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82
Students use a full range of communication skills and techniques in the design field, including information and communication technologies, to document and communicate effectively their design thinking, ideas and proposals.

- Identifies the limitations of an identified product (eg discusses as a group).
- Explores alternative uses for a product (eg brainstorms as a class group).
- Shares design ideas with others (eg shares sketches).
- Makes a class project using production line techniques and creates a flow-chart describing the different tasks and responsibilities.
- Uses combinations of graphics and modelling to convey design ideas.
- Explores the requirements of the task with others (eg talks in groups about project planning).
- Discusses the planning constraints within the design brief and uses the teacher as a resource.
- Uses a range of sketching techniques to convey information about projects (eg orthogonal, isometric, oblique).
- Creates drawings that readily communicate ideas to an audience.
- Accesses and uses a spreadsheet (eg Excel) to calculate and compare costs.
- Understands group dynamics and includes all team members in presenting an evaluation and demonstration (eg of a model factory, a solar-powered model car for competitive racing purposes, an interactive CD).
- Provides evidence of having used a range of information sources in the planning process.
- Includes ICTs, where appropriate, in the designing of intended products.
- Uses a digital camera to record a manufacturing process and create a presentation, including notes and comments.
- Consults Australian Drawing Standards AS1100 when producing a CAD drawing (eg of a bedside cabinet).
- Creates a planning tool (eg a checklist of steps to be followed).
- Presents design sketches that conform to drawing conventions.
- Develops thumbnail sketches of solutions for a project.
- Provides a range of different views of the project (eg isometric sketches, top view, plan view, end view).
- Uses a variety of media and methods to report and publish (eg makes a video presentation, creates a PowerPoint/slide show or pamphlet).
- Uses a slide show display (eg a PowerPoint presentation) to assist with the presentation of the design solution.
- Uses software (eg Illustrator, Freehand) to create working drawings (eg of logo designs).
- Uses spreadsheets in documenting, planning and assisting with calculating costs and providing material lists.
- Uses internet search engines effectively to review material options for appropriateness.
- Completes a written critical evaluation of parts of the processes used in construction.

Illustrating, displaying, presenting and communicating ideas

- Includes drawings.sketches and production sequences to assist explanation.
- Uses a digital camera to record a manufacturing process and create a presentation, including notes and comments.
- Considers a poster design and whether it meets its desired function (eg a safety poster, an event poster or location symbols).
- Presents a design proposal that includes dimensioned sketches and thumbnail sketches, with notation.

4.3 Demonstrates skills in using a broad range of recognised communication forms and technologies to convey design thinking.

5.3 Demonstrates high level skills approaching community or industry practice in effectively recording and communicating their design thinking.
Students use a full range of communication skills and techniques in the design field, including information and communication technologies, to document and communicate effectively their design thinking, ideas and proposals. T C KC2 KC7 relating to Outcome 4.3

Students communicate their design thinking and proposals effectively, efficiently and at a standard approaching community or industry practice. T C KC2 KC3 KC7 relating to Outcome 5.3

**Year 8 Standard 4**
- Demonstrates planning (eg using a range of different sketching techniques, ICT drawing methods).
- Provides sketches that communicate the overall dimensions and style of a small piece of furniture (eg includes detailed assembly drawings of drawers or plinth).
- Presents design proposals and processes using a range of methods (eg using a PowerPoint/slide show presentation, a concept map).
- Creates flow-charts explaining the method to be used for constructing a project.
- Considers the quality of the final product and suggests ways it could have been improved.
- Compares self-assessment with the teacher’s assessment.

**Year 9 Towards Standard 5**
- Evaluates own solutions with reference to the design brief.
- Conveys through collected examples a range of existing products for consideration (eg photos, clippings).
- Develops detailed design proposals to construct a scale prototype of a product, with evidence of feedback and ideas from other sources (eg a scale drawing of a solar-powered water craft).
- Uses ICTs (eg to develop a pattern for a garment using a CAD package, to cost projects with a spreadsheet template, to design an interactive web page of ideas for a CD cover).
- Considers, reflects and responds to feedback (eg about a proposed event by altering the design/schedule).

**Year 10 Standard 5**
- Presents the design and/or manufacturing processes in detail.
- Completes a research assignment, journal or portfolio, reflecting all design and manufacturing tasks attempted, using correct terminology and sequence.
- Reports, in writing, on a class visit (eg to a local restaurant food preparation area or printing business).
- Uses ICTs (eg to create detailed working drawings with a CAD package, to develop own spreadsheet to cost projects).
- Develops own design brief criteria to evaluate the quality of the design outcome.
- Reflects on own progress and the quality of work.

**Reflecting and questioning**
- Evaluates own solutions with reference to the design brief criteria.
- Considers, reflects and responds to feedback (eg about a proposed event by altering the design/schedule).
- Considers, reflects and responds to feedback (eg about a proposed event by altering the design/schedule).

**4.3** Demonstrates skills in using a broad range of recognised communication forms and technologies to convey design thinking. T C KC1

**5.3** Demonstrates high level skills approaching community or industry practice in effectively recording and communicating their design thinking. T C KC2
**Learning Area: Design and technology**  
**Strand: Making**  
**Band: Middle–Senior Years**  
**Standards: 4 & 5**

### KEY IDEAS
- Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations.

### OUTCOMES

<table>
<thead>
<tr>
<th>Year 8</th>
<th>Year 9</th>
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<tr>
<td>Standard 4</td>
<td>Towards Standard 5</td>
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**Realising design ideas through processing/manipulating materials**

- Manipulates and uses appropriate hand tools and materials in the manufacturing process (e.g., cuts out a pattern using dressmaking scissors, prepares a cake mixture for baking).
- Uses various grades of files/sanding tools to produce a desired shape and finish on wood or plastic projects.
- Follows a plan accurately to ensure that components will fit together as intended.
- Prepares and machines the components of a storage container (e.g., a CD tower or box).
- Prepares and constructs the components of a toy (e.g., a child’s soft toy).
- Learns techniques in the use of an overlocker.

- Creates a product by demonstrating an understanding of the principles and construction skills required for a successful solution.
- Develops understanding about how knowledge of construction techniques influences designing.
- Creates trial models, prototypes and scale models in order to test viability of construction methods.
- Discusses safety issues and how they apply in context.
- Chooses the best tools for particular tasks and applies safe techniques while working.
- Realises design ideas through learnt techniques in the use of materials and equipment.
- Requests support and training from qualified people (e.g., teacher) when using machines.

- Gains information on construction methods from the local and global environment and documents this within the design proposal.
- Understands when new skills are required and recognises practice is necessary to achieve quality products.
- Develops skills requiring a higher level of complexity with both hand and machine tools (e.g., skills in relation to printed circuit boards for electronics projects, digital photographic skills).
- Produces accurate observational drawings and demonstrates skills in using appropriate graphic software to communicate ideas.
- Considers and substitutes alternative systems, caused by continually critiquing own work, and makes changes accordingly.
- Adapts cooking methods to use available resources.
- Replaces hand skills with machine skills when cutting multiple joints (e.g., for a tubular steel table).
Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations. In T KC4 KC6 relating to Outcome 4.4

Students demonstrate skills that empower them creatively and independently to solve problems involved in making sophisticated products, processes and systems which approach community and industry standards. Id In T KC6 relating to Outcome 5.4

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<th>Year 9 Towards Standard 5</th>
<th>Year 10 Standard 5</th>
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### Using tools and equipment safely and competently

- Operates and uses tools appropriately following all Safe Operating Procedures (SOPs).
- Correctly uses tools (eg a tenon saw, hacksaw, wood rasp, file, tinsnips, Stanley knife).
- Demonstrates the correct use of cooking equipment (eg whisks, ladles, measuring spoons, biscuit cutters, mixing bowls, cooking tins).
- Uses common dressmaking tools (eg needles, unpicker, tracing wheel, tape measure, tailors’ chalk).
- Checks equipment for faults (eg damaged electrical cords, guards).
- Seeks help when unsure of correct procedures.
- Uses a range of finishing techniques on articles made.
- Transfers safety knowledge and skills to new situations.
- Develops skills through practice (eg band-sawing skills in trial exercises).
- Progresses to more sophisticated machines or processes in order to achieve higher quality or more complex outcomes.
- Practises accurate marking out techniques in preparation for marking out and cutting joints (eg housing trenches).
- Develops skills with a number of joining systems over a range of tasks (eg develops joining systems skills including welding and glued butt and dowel joints).
- Shows an understanding of structures, bracing and strengthening structures or frames through triangulation.
- Investigates and learns how to use the router to cut a decorative edge (eg on a tabletop).
- Provides, in planning, evidence of having sourced information required to help complete the task (eg a number of machining techniques).
- Researches information on welding techniques (eg to help complete a birdcage).
- Investigates and learns how to use the router to cut a decorative edge (eg on a tabletop).
- Provides, in planning, evidence of having sourced information required to help complete the task (eg a number of machining techniques).
- Researches information on welding techniques (eg to help complete a birdcage).
- Investigates and learns how to use the router to cut a decorative edge (eg on a tabletop).
- Provides, in planning, evidence of having sourced information required to help complete the task (eg a number of machining techniques).
- Researches information on welding techniques (eg to help complete a birdcage).

4.4 Effectively uses, in personally and interpersonally appropriate ways, a range of skills that achieve consistent production outcomes. Id T

5.4 Demonstrates specialised skills to create, independently and in teams, products, processes and systems approaching community and industry standards. In T KC4
Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations.

In T KC4

relating to Outcome 4.4

Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations.

In T KC6

relating to Outcome 5.4

Developing understanding of quality, accuracy and the role of specialist tools and equipment

- Researches and understands the use of basic tools, materials and processes (e.g. accesses a variety of information sources to research and develop notes).
- Develops understanding of a range of materials suitable for constructing a project (e.g. the limitations of certain materials when making structures or frames).
- Appreciates accuracy of measuring and marking (e.g. when assembling a frame and testing for squareness, sewing a garment).
- Develops knowledge of tools for specific purposes (e.g. tinsnips, chisels, dressmaking shears, whisks).
- Operates tools appropriate to designs (e.g. uses a scroll saw to manufacture a jigsaw puzzle, a cutting device to make a mitre joint for a picture frame, dressmaking scissors to cut out a clothing pattern).
- Considers function, aesthetics, sustainability and production methods when creating a final product (e.g. determines own criteria for achieving balance when creating a product).
- Accesses the internet and books to research and develop notes on own project (e.g. tools and materials used).
- Strives for accuracy and precision and recognises the need for an increased skill level.
- Develops a knowledge of how to use tools and demonstrates this while realising own solution.
- Completes a research assignment on cooking tools from different cultures.
- Investigates how tools work (e.g. use of levers, cutting action).
- Investigates how tool use has changed over time (e.g. the availability and lower cost of portable battery tools).
- Relates the use of machines to material characteristics and quality outcomes.
- Demonstrates reflective, sustained, independent or collaborative work practices as used in industry.
- Selects from a range of different shaped router cutters (e.g. a suitable profile for the edge of a table).
- Enhances images for a pamphlet design (e.g. uses a digital camera/scanner/manipulation software).
- Uses a biscuit joiner to secure solid edging strips to the edge of a table top (e.g. a coffee table).
- Develops a skills bank of appropriate construction techniques and judges when to apply individual skills.

Combining components to create a system

- Selects and applies appropriate adhesives and/or fastening systems to suit a particular end use for a project.
- Uses waterproof glue for an item to be used in a wet environment (e.g. a model boat).
- Uses an alternative fastening system for an outdoor structure.
- Uses joining techniques that will enable stability and movement.
- Selects, uses and connects components in different ways to achieve different outcomes (e.g. uses gears and pulleys).
- Considers fail-safe mechanisms as backup.
- Develops skills with frame construction, carcase construction, welding and gluing systems.
- Works with a range of old and new joining techniques, including knockdown fittings.
- Investigates a number of different ways of constructing garments.

4.4

Effectively uses, in personally and interpersonally appropriate ways, a range of skills that achieve consistent production outcomes.

5.4

Demonstrates specialised skills to create, independently and in teams, products, processes and systems approaching community and industry standards.

In T KC4
Students demonstrate skills in creating products, processes and systems that achieve consistent production outcomes. They apply these skills in enterprising and empowering ways to personal and group situations.

**In T KC4 KC6 relating to Outcome 4.4**

Students demonstrate skills that empower them creatively and independently to solve problems involved in making sophisticated products, processes and systems which approach community and industry standards.

**Id In T KC6 relating to Outcome 5.4**

Demonstrates specialised skills to create, independently and in teams, products, processes and systems approaching community and industry standards.

### Choosing and using software/hardware to create information

<table>
<thead>
<tr>
<th>Year 8 Standard 4</th>
<th>Year 9 Towards Standard 5</th>
<th>Year 10 Standard 5</th>
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<tr>
<td>Uses a selected form/method of panel fastening/closure on a textile project.</td>
<td>Observes different control systems in the workshop/home and describes differences and components.</td>
<td>Uses a MIG welder to weld joints quickly and efficiently (eg on an outdoor setting).</td>
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<tr>
<td>Creates circuits (eg using switches, lamps and buzzers).</td>
<td>Modifies and controls systems to enhance performance.</td>
<td>Documents the design task on the school network for assessment, by transferring, sharing and archiving data or graphic files.</td>
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<tr>
<td>Recognises and adopts different roles within group planning activities.</td>
<td>Generates a solution graphically by using appropriate software applications.</td>
<td>Develops final drawings and plans using ICTs (eg CAD, Illustrator, Freehand, Photoshop and scanners).</td>
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<td>Uses levers, cams and linkages to control movement (eg automata).</td>
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**4.4** Effectively uses, in personally and interpersonally appropriate ways, a range of skills that achieve consistent production outcomes.

**5.4** Demonstrates specialised skills to create, independently and in teams, products, processes and systems approaching community and industry standards.

**In T KC4**
**KEY IDEAS**

Students apply their knowledge of the characteristics of materials and equipment when creating solutions and designing to meet criteria related to function, aesthetics, sustainability and production.  
*F In KC3 KC6 relating to Outcome 4.5*

Students make discriminating and responsible use of materials and equipment to create sustainable products. They use the knowledge gained to conceptualise, communicate and act for more ethical resource use in the wider community.  
*F In C KC2 KC7 relating to Outcome 5.5*

<table>
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| **4.5** Evaluates materials and equipment in order to meet principles of function, aesthetics and sustainability.  
*F In KC1*
| **5.5** Defends and applies choices made in using particular materials and equipment to create sustainable products, processes and systems.  
*F In C KC2*

### Year 8

- **Standard 4**

### Year 9

- **Towards Standard 5**

### Year 10

- **Standard 5**

**OUTCOMES**

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| **Year 8**
| **Standard 4** |
| **Year 9**
| **Towards Standard 5** |
| **Year 10**
| **Standard 5** |

**Possible starting points for planning, programming and assessing**

- **Sorting and selecting materials**
  - Defends the use of particular tools and materials.
  - Prepares and debates a report to a specific audience, defending the use of particular materials and equipment.
  - Reports to the class why people continue to use paper.
  - Discusses why a project may be best made from wood/timber.
  - Presents information (eg a 3 minute presentation) showing why machinery is used in mass production of foodstuffs.
  - Tests a range of materials under a range of conditions to aid in the selection process.
  - Soaks a number of types of manufactured board in water to determine which would be most suitable for outside use.
  - Tests fabrics under a range of conditions, for garment construction.
  - Uses knowledge of materials to determine a procedure for making, paying particular attention to the techniques and materials used.

- **Matching tools with materials**
  - Reports on the benefits of using different materials and construction methods.
  - Investigates the development of composite materials (eg reports on the use of carbon fibre, Kevlar and titanium in making tennis racquets, boat hulls and car body parts).
  - Reflects on the methods and materials used in creating own products.
  - Reports orally or in writing to peers about the outcomes of the finished task.
  - Selects and modifies the way tools are used to work accurately.
  - Develops a knowledge of how to use tools and demonstrates this while making.
  - Identifies constraints, due to equipment availability, on the making process and adapts planning.
  - Considers the use of specialist equipment (eg mixers, blenders, CADCAM software, to achieve industry standard products).
Students apply their knowledge of the characteristics of materials and equipment when creating solutions and designing to meet criteria related to function, aesthetics, sustainability and production. 

**Creating quality products**

- Determines criteria for comparing like products (e.g., hand made/machine made, amateur/professional).
- Considers the relationship of tool and material selection and quality end products.
- Details the specifications required to ensure consistent quality outcomes.
- Refines techniques and knowledge of equipment and materials to make quality products.

**Developing appropriate skills and techniques for the materials used**

- Uses a range of tools appropriate to working with a variety of materials in making a useful household article (e.g., constructing a toilet roll holder from a recycled broom handle and salvaged timber, a potato storage box from recycled floorboards, a child’s toy from recycled materials).
- Selects and uses appropriate joinery methods when making a frame construction (e.g., chooses to use a lap joint, butt joint, mitre joint).
- Designs within set parameters, either restrictions or requirements, that may include tools or materials.
- Tests materials and processes for appropriateness.
- Checks materials and techniques against personal and community values (e.g., using or disposing of toxic materials).
- Applies a range of techniques and applications.
- Uses researched options and solutions to create worthwhile products.
- Negotiates criteria for analysis of materials and reflects on how they are used in a chosen product.

**Analysing and responding to information about materials, processes and systems**

- Provides the reasons for choice of material in the production of a specific item.
- Uses ICTs to produce a visual display of the reasons for material choice.
- Presents a photographic display (e.g., of simple homeware devices).
- Compiles a portfolio of material swatches of natural fibres.
- Evaluates and makes decisions about material types and uses the most appropriate tools, materials and processes.
- Considers the relationship between tools, materials and safe use (e.g., choice of timber, metal or plastic for an aquarium structure).
- Proposes the appropriate use of manufactured board compared to solid timber.
- Selects materials based on a review of collected information about material properties.
- Considers issues such as strength, availability, cost and existing furniture when designing new furniture (e.g., an entertainment unit).
- Develops criteria for selecting materials (e.g., hardness, strength, ability to be moulded, animal skins/hides in chair upholstery, the making of clothes).

Students make discriminating and responsible use of materials and equipment to create sustainable products. They use the knowledge gained to conceptualise, communicate and act for more ethical resource use in the wider community.

**Towards Standard 5**

- Year 8
- Standard 4
- Developing appropriate skills and techniques for the materials used
- Analysing and responding to information about materials, processes and systems

- Year 9
- Standard 5
- Creating quality products
- Developing appropriate skills and techniques for the materials used
- Analysing and responding to information about materials, processes and systems

- Year 10
- Standard 5
- Creating quality products
- Developing appropriate skills and techniques for the materials used
- Analysing and responding to information about materials, processes and systems
Learning Area: Design and technology  
Strand: Making

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th>(refer p67 for Middle Years)</th>
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</thead>
<tbody>
<tr>
<td>Students describe and communicate principles of good resource management and duty of care, and integrate them into socially and environmentally sustainable designing and making practice.</td>
<td>F In C KC2 KC3 relating to Outcome 4.6</td>
</tr>
<tr>
<td>Students manage their designing and making activities independently, successfully and with sensitive duty of care in their interactions with others. They are able to transfer this knowledge to new contexts and situations.</td>
<td>F Id In KC4 relating to Outcome 5.6</td>
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</table>

### Developing understandings of the sustainability and the economic, environmental and social impacts of technological practice

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<thead>
<tr>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard 4</td>
<td>Towards Standard 5</td>
<td>Standard 5</td>
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</tbody>
</table>

**Outcomes**

- **Year 8**
  - Understands that materials are limited and promotes the use of recycled materials.
  - Negotiates and manages the cost of materials used to complete a product (eg makes a materials list and calculates cost of materials).
  - Ensures that safety equipment is in good condition.
  - Plans a system for applying finish to the product (eg a clear finish).
  - Applies safety procedures when using equipment.
  - Prevents damage to equipment (eg researches the use of an alternative safety equipment storage unit).
  - Researches the safety properties of tools, such as general machine and appliance guarding.
  - Introduces a material safety data sheet for a product that was used.

- **Year 9**
  - Understands that issues of sustainability, durability and ease of use are directly related to the design and materials used.
  - Recognises a material’s characteristics that make it unsuitable for a particular use (eg flammable material, poisonous chemicals, treated timber).
  - Investigates ways to improve group work and productivity.
  - Monitors physical aspects of the learning environment (eg natural light, air quality and ventilation).
  - Considers the materials used and the environmental cost of disposal.
  - Assesses how well outcomes of technological practice meet the needs of communities.

- **Year 10**
  - Investigates materials and recycling processes and compares the effect on the environment of different methods.
  - Manages own time effectively (eg documents timelines, uses flow-charts, keeps diaries of progress).
  - Examines whether technologies are sustainable or desirable.
  - Documents procedures for making a project, clearly indicating timelines and construction sequences.
  - Tests materials to determine suitability in the production of the intended product and applies knowledge of tools, materials and construction to establish the best option.
  - Investigates implications of new methods of communication (eg how information is stored, privacy, buying online).

**Possible starting points for planning, programming and assessing**

**Band: Middle–Senior Years**

**Standards: 4 & 5**

- **Year 8**
  - Understands that materials are limited and promotes the use of recycled materials.
  - Negotiates and manages the cost of materials used to complete a product (eg makes a materials list and calculates cost of materials).
  - Ensures that safety equipment is in good condition.
  - Plans a system for applying finish to the product (eg a clear finish).
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  - Prevents damage to equipment (eg researches the use of an alternative safety equipment storage unit).
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  - Understands that issues of sustainability, durability and ease of use are directly related to the design and materials used.
  - Recognises a material’s characteristics that make it unsuitable for a particular use (eg flammable material, poisonous chemicals, treated timber).
  - Investigates ways to improve group work and productivity.
  - Monitors physical aspects of the learning environment (eg natural light, air quality and ventilation).
  - Considers the materials used and the environmental cost of disposal.
  - Assesses how well outcomes of technological practice meet the needs of communities.

- **Year 10**
  - Investigates materials and recycling processes and compares the effect on the environment of different methods.
  - Manages own time effectively (eg documents timelines, uses flow-charts, keeps diaries of progress).
  - Examines whether technologies are sustainable or desirable.
  - Documents procedures for making a project, clearly indicating timelines and construction sequences.
  - Tests materials to determine suitability in the production of the intended product and applies knowledge of tools, materials and construction to establish the best option.
  - Investigates implications of new methods of communication (eg how information is stored, privacy, buying online).
Students describe and communicate principles of good resource management and duty of care, and integrate them into socially and environmentally sustainable designing and making practice.

**KC2 KC3**

**relating to Outcome 4.6**

Students manage their designing and making activities independently, successfully and with sensitive duty of care in their interactions with others. They are able to transfer this knowledge to new contexts and situations.

**KC4**

**relating to Outcome 5.6**

- Applies safe work habits in the workshop.
- Follows Safe Operation Procedures (SOPs) when using machinery and tools.
- Wears correct clothing in the workshop.
- Ensures long hair is tied back.
- Demonstrates safe working procedures with tools and machines.
- Demonstrates classroom safety rules.
- Wears safety glasses at all times and models safe handtool use.
- Acts in a manner that demonstrates the care and safety of others (eg when in groups).
- Cares for safety of themselves and others.
- Works safely in teams, assisting each other with machine use (eg supports others using the bandsaw, tailing out or acting as a safety officer).
- Identifies hazards and warns others (eg water on floor, faulty switch).
- Applies knowledge of tools and techniques on practice tasks to develop skills.
- Plans carefully for efficient use of time.
- Demonstrates safe working practices with tools and machines.
- Prepares a procedure for the use of a selected range of equipment (eg workshop or kitchen equipment).
- Considers own safety and that of others.
- Demonstrates to others how to complete a task safely (eg to set up and use the drill press, bandsaw).
- Transfers safety knowledge and skills to situations within the workshop and school environment.
- Discusses safety issues and how they apply in context.
- Develops safe attitudes to tools, materials and processes.
- Provides documented evidence in the design proposal about how to use equipment correctly and safely.
- Selects and uses correct safety equipment.
- Discusses recent personal injuries, thinks about how they were caused and how they could have been avoided.
- Discusses the role of occupational health, safety and welfare in the workplace, with particular reference to activities involved in the current design task.
- Applies knowledge of food preparation protocols.
- Identifies potential hazards and seeks advice about safe working environments.
- Uses dust extraction equipment when machining timber.
- Wears safety glasses at all times in the workshop.
- Wears solid shoes and close fitting clothing.
- Behaves in a responsible manner and considers others.
- Practises and models safe working guidelines for tools, materials and processes.
- Wears the necessary safety clothing/equipment.
- Identifies safety issues associated with the planned manufacture of a product (eg a metal table frame).
- Uses information from standards and manufacturers’ handbooks and seeks advice from experts.
- Audits the technology workshop to assist completion of occupational health, safety and welfare reports.
Students describe and communicate principles of good resource management and duty of care, and integrate them into socially and environmentally sustainable designing and making practice.

F In C KC2 KC3

Students manage their designing and making activities independently, successfully and with sensitive duty of care in their interactions with others. They are able to transfer this knowledge to new contexts and situations.

F Id In KC4

Using devices ethically and in socially acceptable ways

- Considers and defends construction strategies in the making of a product (eg describes differences between the available materials).
- Defends how time, resources and labour have been used.
- Critiques techniques used by the group to achieve quality products, such as hazard identification.
- Understands the impact the designer can have in bringing about cultural and social change (eg creation of a new monetary system).
- Understands the need to determine authenticity of information sourced from the internet.

Developing understandings of procedures, sequences and systems in carrying out tasks

- Operates and controls systems to produce a product (eg uses cutting tools, sewing machines, computer programs).
- Learns that systems are applied to achieve specified outcomes (eg stock control—creates an electronic system).
- Investigates how human and physical systems have functional, aesthetic, social and environmental implications (eg robotic production lines, watering systems—including irrigation and storage, refrigeration logistics).
- Plans carefully for efficient use of time.
- Chooses resources to make systems for identified needs (eg suitable wheels for a beach trolley).
- Creates systems to perform specific functions (eg designs an irrigation system, builds an electronic circuit, programs a robot, organises a cooking schedule for a three-course dinner).
- Investigates and describes how systems have operational processes and limitations (eg explains how a microwave oven works, a gearing system operates).
- Modifies systems based on analysing performance (eg makes alteration to gearing on a Pedal Prix vehicle to improve speed, suggests ways of improving shelf life of selected foods).
- Varies the output of systems to improve a product (eg adjusts time management and work schedules).
- Assesses design issues in the application and control of systems at the local, regional and global levels (eg how energy sources are used).
- Plans carefully for efficient use of time.
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- Varies the output of systems to improve a product (eg adjusts time management and work schedules).
- Assesses design issues in the application and control of systems at the local, regional and global levels (eg how energy sources are used).

F In KC3

5.6 Integrates the principles of good resource management and duty of care when creating sustainable products, processes and systems and assembles effective arguments to defend these principles.

F Id In C KC2 KC3

4.6 Analyses and applies the principles of good resource management, sustainability and duty of care in their design and making practice.
## SKILLS CONTINUUM: MATERIALS

<table>
<thead>
<tr>
<th>BAND</th>
<th>MATERIAL</th>
<th>SHAPE</th>
<th>DRILL</th>
<th>JOIN</th>
<th>FINISH</th>
<th>MEASURE</th>
<th>TRANSFORM</th>
<th>MANAGE</th>
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<tbody>
<tr>
<td><strong>EY</strong></td>
<td>Aluminium foil</td>
<td>Clay modelling</td>
<td>Hammer and nail—making a hole</td>
<td>Glue (eg Clag)</td>
<td>Colouring</td>
<td>Drawing lines on materials with 10mm accuracy</td>
<td>Bending</td>
<td>Acting as a monitor</td>
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<td></td>
<td>Cardboard</td>
<td>Coping saw</td>
<td>Hammer and nail—punching a hole</td>
<td>Glue sticks</td>
<td>Complete project for aesthetic appearance</td>
<td>Estimating</td>
<td>Efficiently using materials</td>
<td>Efficiently using materials</td>
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<td></td>
<td>Clay</td>
<td>Hole punch</td>
<td>Nails</td>
<td>Low-melt glue gun</td>
<td>Paint (eg water colour)</td>
<td>Measuring simple amounts and distances</td>
<td>Managing work-space</td>
<td>Managing work-space</td>
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<td>Core flute</td>
<td>Pliers—bending, folding</td>
<td>Pins</td>
<td>Nails</td>
<td>Paces/steps</td>
<td>Simple ruler work</td>
<td>Setting up</td>
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<td>Duplo</td>
<td>Scissors—cutting</td>
<td>PVA glue</td>
<td>Simple spacing—paces, handwidths</td>
<td>Placing</td>
<td>Simple spacing—paces, handwidths</td>
<td>Tidying up, putting materials away</td>
<td>Tidying up, putting materials away</td>
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<td>Fabric</td>
<td>Tearing</td>
<td>Tape</td>
<td>Weaving</td>
<td>Weighing using arbitrary units</td>
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<td>Recycled materials (eg trays, bottles)</td>
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<td><strong>P</strong></td>
<td>Aluminium foil</td>
<td>Bending with accuracy</td>
<td>Cordless drill</td>
<td>Hand drill</td>
<td>Clay glazes</td>
<td>Lengths, widths, thicknesses in mm</td>
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<td>As above plus: Natural and synthetic fibres</td>
<td>Filing</td>
<td>Hand punch</td>
<td>Needles</td>
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<td>Marking out lengths, widths and thicknesses</td>
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<td>Recycling materials</td>
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<td>Papier mâché</td>
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<td>Needle</td>
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<td>Ironing</td>
<td>Measuring, marking out and testing 90° angles</td>
<td>Working with and storing foodstuffs hygienically</td>
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<td>PET bottles</td>
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<td>Paint</td>
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<td>Marking pens</td>
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<td>Simple glazes</td>
<td>Measuring for recipes</td>
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<td>Plastic film</td>
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<td>Measuring length, width and thickness to nearest 2mm</td>
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<td></td>
<td>A range of timbers</td>
<td>Acrylic and styrene sheet</td>
<td>Aluminium Electronic components Leather Lights, switches Medium density fibreboard (MDF) Melamine boards Mild steel (flat black, rod, tube) Motors Particle board Radiata pine Recycled foam Solar panels Stainless steel Tinplate Veneered boards</td>
<td>Bandsaw Bench folder Dressmaker’s scissors Hatchet stakes Jeweller’s saw Jigsaw Metal lathe Paper patterns Piercing saw Pinking shears Plane Rasp Scroll saw Tenon saw Timman’s rolls Tinsnips Twisting Unpicker Wood lathe Drill press Forstner bit Hole saw Metal lathe—boring Metal punches Solid punch Spade bit Twist drills Bolting Buttons, studs, hooks and eyes Constructing frames Dovetail joint Glued joints Hot melt glue Knockdown fittings Machine sewing Mitre joints Nuts and bolts Overlockers Sewing and stitching Soldering Specialty adhesives Using electric arc welding (stick, MIG welding, TIG welding) Using gas welding (fusion, brazing) Using screws Appliqué Embroidery Food presentation Plastic coating Polishes Spray paints Stains Vegetable oil Water-based sealer Checking squareness using a try square Constructing and marking out angles other than 90° Estimating and weighing Length, width and thickness in mm Marking and measuring angles to suit a design brief Measuring tapes Micrometer to 1/100mm Patterns Vernier micrometer (1/100mm) Checking squareness using a try square Constructing and marking out angles other than 90° Estimating and weighing Length, width and thickness in mm Marking and measuring angles to suit a design brief Measuring tapes Micrometer to 1/100mm Patterns Vernier micrometer (1/100mm) Alternative energy sources (eg utilising solar power to make a solar vehicle move) Casting Dry cutting and finishing Fabricating constructions (eg carcase, framed, laminated) with emphasis on accuracy and strength Freeze drying Injection moulding Mixing lists of ingredients (eg blending, folding, whisking, kneading, steaming, boiling) Modifying recipes Moulding Preserving Using finishes for specific purposes, aesthetic and functional Checking squareness using a try square Constructing and marking out angles other than 90° Estimating and weighing Length, width and thickness in mm Marking and measuring angles to suit a design brief Measuring tapes Micrometer to 1/100mm Patterns Vernier micrometer (1/100mm) Alternative energy sources (eg utilising solar power to make a solar vehicle move) Casting Dry cutting and finishing Fabricating constructions (eg carcase, framed, laminated) with emphasis on accuracy and strength Freeze drying Injection moulding Mixing lists of ingredients (eg blending, folding, whisking, kneading, steaming, boiling) Modifying recipes Moulding Preserving Using finishes for specific purposes, aesthetic and functional</td>
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**Please note:**

This information is provided as a guide only and can be extended. The materials and techniques used within each Band are dependent on facilities and teacher expertise, while ensuring duty of care and adherence to safety guidelines. The Middle–Senior years are to be interpreted as involving increasing complexity and sophistication.
GLOSSARY

Adhesive glue
Sticks two materials together but never becomes a part of either (eg PVA glue).

Aesthetics
The appreciation of and sensitivity towards works of art, beautiful objects/artefacts.

Analyses
Studies something critically to identify the elements or relationships between processes, techniques and materials.

Appropriate
Describes the selection of socially, economically and environmentally sustainable equipment and materials in designing and making things.

Appropriate technique
Correct use of tools, machines and processes; correct match of tools and equipment to the materials and processes used.

Biscuit joint
Two pieces joined together by a ‘biscuit’ which is commercially manufactured and requires a special ‘biscuit’ cutter. This joint increases the glue area and increases the strength of all common joints.

Brief
See ‘Design brief’.

Butt joins
Materials joined by flat surfaces.

Cohesive glue
Soaks into the materials and becomes an invisible part of the structure (eg super glue).

Common materials
Easily available materials such as cardboard, Lego, balsa, plywood, Medium Density Fibreboard (MDF), print/core flute, aluminium foil, fabric, polystyrene foam, trays (do not use heat to cut or operate upon because deadly gasses are a by-product) bottles, caps, recycled materials, plastic tubing, syringes and hydraulic joiners.

Considers
Thinks about carefully, taking all options into account.

Construction
A method or process of making, where parts or components are joined together to make a product, process or system.

Constructs
Applies knowledge and understanding to make a product.

Costing
Determining the costs involved in making a product, process or system.

Creates
Realises ideas and concepts.

Cutting list
The list of materials required to make the chosen design; a bill of materials; materials list; parts list.

Describes
Tells or writes about; shows an understanding about.

Design brief
The way tasks are presented to or negotiated with students (eg PRIDME—Problem, Requirements/restrictions, Investigations, Devising, Making, Evaluation; or PRISMA—Problem, Requirements, Investigations, Solution, Making, Appraisal).

Designing
Applying a process to devise a solution to an identified need or want, in order to create a product.

Development
A developed state, form or product; the term applied to detailed drawings in sheet metal work.

Devises
Applies knowledge and understanding to create solutions.

Differentiates
Considers differences between objects to distinguish between them; distinguishes relevant from irrelevant.

Discusses
Considers something from different points of view, by talking or writing about it.

Draws
Communicates ideas through sketches, technical drawings, pictures, patterns or diagrams.

Electrical materials
Batteries, bulbs, bulb holders, alligator clips, switches, breadboards.

Evaluation
The act of appraising or critiquing a product, process or system against set criteria.

Examines
Looks at closely and carefully using tools of inquiry.

Explains
Interprets; gives reason for; makes meaning clear or plain (eg ‘Explain how?’ usually asks for the sequence, ‘Explain why?’ usually asks for the cause).

Exploded drawing
A technical drawing showing the order in which components come apart (eg those found in ‘flat pack’ furniture).

Exploded view
A drawing of a 3-D view that shows all of the components as if they were about to fit together.

Graphic organiser
Any number of ways to graphically record ideas, brainstorms, components and procedures (eg Future’s wheels, Consequence wheel, Mind Mapping, Y chart, Fishbone diagram, flow-charts.

Hazard identification
The process by which hazardous situations or potentially dangerous aspects of activities are identified; a part of risk assessment and risk management.

Health and safety
The activities carried out in any learning environment (eg classroom, excursion, workshop) must meet health and safety requirements. You can ensure requirements are met by carrying out risk assessments and organising activities so that all risks are controlled.
Ideas
Any conception existing in the mind; a plan of action; an intention.

Identifies
Recognises patterns, facts, details or objects.

Illustrates
Makes clear by examples or drawings; compares, designs or explains.

Interprets
The analysis of collected and recorded information using skills such as comparing proposed solutions.

Investigation
To do research using a systematic inquiry approach.

Isometric drawing
A method of drawing in 3-D maintaining proportion where the bottom lines are in a vee shape (30 degrees to the horizontal) and correct dimensions are used.

Lap joint
A lap joint has two over-lapping parts which give a greater glue area and therefore a stronger joint.

Makes
Applies knowledge and understanding to manufacture a product; builds; creates; constructs; produces.

Manufacture
The process of making products, processes or systems using tools, equipment or machinery; manipulating materials into form for use.

Materials
The items used in making products, processes or systems.

MDF
Medium density fibreboard.

Mitre joint
A 45° joint of two materials (eg a picture frame corner).

Modifies
Alters a design based on understanding and knowledge of factors influencing the final outcome.

Monitors
Regularly checks how something is changing or progressing.

Oblique projection/drawing
A method of drawing in 3-D where maintaining proportion is enabled by adjusting the depth of the object (50% usually) and is drawn at 45 degrees to the front view.

Organises
Arranges parts of a whole according to chosen criteria.

Orthogonal
A view showing either top or bottom, and two sides.

Problem
The issue to be addressed within the design brief.

Realises
Turns ideas and concepts into reality.

Records
Puts information into a permanent form of reference.

Reflects
Considers ideas, thoughts and opinions.

Researches
Collects and analyses facts and information to gain new knowledge and understanding.

Risk assessment
The process by which you consider the seriousness of any risks in a learning activity and then through risk management devise ways to reduce the hazard (eg clear instruction and close supervision or removal of the activity).

Risk management
The process of devising ways to reduce any hazard (eg clear instruction and close supervision or removal of the activity).

Selects
Chooses between options based on certain criteria.

Shows
Illustrates or demonstrates ideas or knowledge.

Sketch
A preliminary drawing; a spontaneous representation of a subject.

SOP
Standard Operating Procedure.

Specification
A detailed description setting forth the materials and dimensions for a proposed product.

Style
The distinctive manner in which a product was created. There are many recognisable, documented styles, often related to a historic era, construction method, form or materials used.

Sustainability
Where social, economic and environmental issues are addressed in the design and realisation of a product, process or system in order that it does not deplete the Earth’s resources; where priority is given to maintaining resources for future generations.

Synthesise
To form or combine ideas/thoughts and knowledge into a complex whole.

Techniques
Mechanical or manipulative skills in the manufacture or realisation of ideas, designs, products, processes and systems.

Technological literacy
The three dimensions of being able to operate, being critically and culturally aware of technologies.

Technology, a piece of
An artefact created to meet an identified need or want.

Triangulate
To make shapes into triangles to increase the strength of structures where possible.

Uses
Applies knowledge, understanding or a procedure to a task; utilises tools, equipment, systems, processes and materials.

Working drawing
A drawing clearly showing the details necessary for manufacturing or constructing a product (eg dimensions and assembly details).
RESOURCES

REFERENCES


Green S (1996) *Getting started in technology: All you need to know to get the ball rolling in your classroom*. Adelaide SA: The Technology Teachers’ Association of South Australia.


EARLY–PRIMARY YEARS SUGGESTED RESOURCES


MIDDLE–SENIOR YEARS SUGGESTED RESOURCES

Ryan T (1990) *Thinker’s keys for kids*. Woodridge Queensland: Logan West School Support Centre

**R–10 SUGGESTED WEBSITES**

Howstuffworks: www.howstuffworks.com
Nuffield Curriculum Centre (free design and technology resources): www.nuffieldcurriculumcentre.org
Nuffield Foundation science: www.nuffieldfoundation.org/
Nuffield Foundation technology has a useful glossary: www.primarydant.org/learn/
Nuffield Foundation secondary design and technology: http://www.secondarydandt.org/
The following site has a number of links and resources behind the subject search button: www.designandtech.com/
Technology Enhancement Program: http://www.tep.org.uk/

R–10 OUTREACH AND OTHER SERVICES

Aboriginal Education Resource Centre (DECS), 5 Harewood Avenue, Enfield SA 5085 Phone (08) 8343 6500 Fax (08) 8343 6515 Web www.aboriginaleducation.sa.edu.au

Adelaide Festival Centre Education Service, King William Road, Adelaide SA 5000 Phone (08) 8216 8861 Fax (08) 8212 7849

Adelaide Zoo Education Service, Frome Road, Adelaide SA 5000 Phone (08) 8267 2434 Fax (08) 8239 1329

Art Gallery of SA Education Service, North Terrace, Adelaide SA 5000 Phone (08) 8207 7033 Fax (08) 8207 7070

Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS), PO Box 553, Canberra ACT Phone (02) 6246 1111 Fax (02) 6261 4285 Web www.aiatsis.gov.au

Botanic Gardens of Adelaide Education Service, North Terrace, Adelaide SA 5000 Phone (08) 8222 9344 Fax (08) 8222 9399

Central Australian Aboriginal Media Association (CAAMA), 12 Robson Road, Hectorville SA Phone (08) 8366 8530 Fax (08) 8365 0571 Web www.lmrc.sa.edu.au

CSIRO Science Education Centre, Days Road, Regency Park SA 5010 Phone (08) 8348 2405 Fax (08) 8346 6311

Languages and Multicultural Resource Centre (DECS), 12 Robson Road, Hectorville SA 5073 Phone (08) 8366 8532 Fax (08) 8365 0571 Web www.lmrc.sa.edu.au

Migration Museum Education Service, 82 Kintore Avenue, Adelaide SA 5000 Phone (08) 8207 7586 Fax (08) 8207 7591

SA Maritime Museum Education Service, 119 Lipson Street, Port Adelaide SA 5015 Phone (08) 8207 6255 Fax (08) 8207 6266

SA Museum Education Service, North Terrace, Adelaide SA 5000 Phone (08) 8207 7429 Fax (08) 8207 7430

Special Education Resource Unit, 72A Marlborough Street, Henley Beach SA 5022 Phone (08) 8235 2871 Fax (08) 8235 1907 Web www.seru.sa.edu.au

Tandanya National Aboriginal Cultural Institute, 253 Grenfell Street, Adelaide SA 5000 Phone (08) 8224 3200 Fax (08) 8224 3250

Tape Services, 266 Port Road, Hindmarsh SA 5007 Phone (08) 8241 5615 Fax (08) 8241 5708 Web www.tapeservices.sa.edu.au

Technology School of the Future, Education Development Centre, Milner Street, Hindmarsh SA 5007 Phone (08) 8463 5999 Fax (08) 8463 5900

The Investigator Science and Technology Centre, Days Road, Regency Park SA 5010 Phone (08) 8348 2400 Fax (08) 8346 6311

Umeewarra Media Association, Flinders Street, Port Augusta SA 5700 Web www.umeewarra.com.au

Wiltja Program, 11 Actil Avenue, Woodville SA 5011 Phone (08) 8347 1520 Fax (08) 8347 3896

Women’s Studies Resource Centre, 64 Pennington Terrace, North Adelaide SA 5006 Phone (08) 8267 3633 Fax (08) 8267 2997 Web www.wsrc.net.au