# CONTENTS

Introduction .................................................................................................................................................. 1  
Subject Description ...................................................................................................................................... 1  
Capabilities .............................................................................................................................................. 2  
Literacy in Design and Technology ......................................................................................................... 3  
Numeracy in Design and Technology ...................................................................................................... 4  
Aboriginal and Torres Strait Islander Knowledge, Cultures, and Perspectives ...................................... 4

## Stage 1 Design and Technology ........................................................................................................ 5
Learning Scope and Requirements ........................................................................................................... 6  
  Learning Requirements ........................................................................................................................... 6  
  Content .................................................................................................................................................... 6  
Assessment Scope and Requirements ....................................................................................................... 12  
  Evidence of Learning ............................................................................................................................. 12  
  Assessment Design Criteria .................................................................................................................. 12  
  School Assessment ............................................................................................................................... 14  
  Performance Standards .......................................................................................................................... 17  
  Assessment Integrity .............................................................................................................................. 21  
Support Materials ................................................................................................................................... 22  
  Subject-specific Advice ......................................................................................................................... 22  
  Advice on Ethical Study and Research ................................................................................................. 22

## Stage 2 Design and Technology ........................................................................................................ 23
Learning Scope and Requirements ........................................................................................................... 24  
  Learning Requirements ........................................................................................................................... 24  
  Content .................................................................................................................................................... 24  
Assessment Scope and Requirements ....................................................................................................... 30  
  Evidence of Learning ............................................................................................................................. 30  
  Assessment Design Criteria .................................................................................................................. 30  
  School Assessment ............................................................................................................................... 32  
  External Assessment .............................................................................................................................. 34  
  Performance Standards .......................................................................................................................... 35  
  Assessment Integrity .............................................................................................................................. 39  
Support Materials ................................................................................................................................... 40  
  Subject-specific Advice ......................................................................................................................... 40  
  Advice on Ethical Study and Research ................................................................................................. 40
INTRODUCTION

SUBJECT DESCRIPTION

Design and Technology is a 10-credit subject or a 20-credit subject at Stage 1, and a 10-credit subject or a 20-credit subject at Stage 2.

In Design and Technology, students apply their knowledge and understanding of technological concepts to the investigation, analysis, development, and communication of ideas for product or systems design, production, and evaluation. This involves a model of learning that incorporates knowledge, skills, design principles, and production techniques in problem-solving contexts.

Design in technology involves working within parameters or according to requirements to satisfy human needs and wants. It is an interactive decision-making process that involves investigating, planning, creating, and producing, together with continuous evaluation and modification.

Students learn about the products, processes, and systems of the natural and designed world. They develop an understanding of how the use of technology has created new and rapidly changing opportunities in local, national, and global contexts. Students develop the skills and knowledge to use tools, materials, and systems appropriately, safely, and competently to create a product or system. (A product may also be a model, prototype, part, or process.)

Students develop the ability to use, manage, assess, and understand the implications, applications, and consequences of current and emerging technologies. They consider their social responsibilities towards the use of resources, materials, and systems, including recycling and waste disposal, and analyse the impact of technological practices, products, or systems on individuals, society, and/or the environment. Students have opportunities to develop insights into the uses of technology in future contexts.

A technologically literate student is able to draw on knowledge and understanding developed through different disciplines to realise solutions through applied problem-solving. Students are able to enhance their manipulative and other practical skills in Design and Technology, and reflect on what they have learnt to make informed decisions and develop their capabilities for life and work.

Design and Technology has three focus areas: communication products, material products, and systems and control products. Each of these focus areas provides enrolment options for students.

Student achievement is reported as:

- Design and Technology — Communication Products
- Design and Technology — Material Products
- Design and Technology — Systems and Control Products.
Within each subject, a specific context (e.g. photography, furniture, or electrical systems) is chosen by the school to meet student needs and interests, taking into account the resources available.

CAPABILITIES
The capabilities connect student learning within and across subjects in a range of contexts. They include essential knowledge and skills that enable people to act in effective and successful ways.

The five capabilities that have been identified are:
- communication
- citizenship
- personal development
- work
- learning.

The different enrolment options available in Design and Technology provide students with opportunities to develop all five capabilities, with a particular focus on personal development, work, and learning.

Communication
In this subject students develop their capability for communication by, for example:
- using a range of sketches and graphical, digital, or computer-generated images to communicate product or systems design ideas to suit particular contexts and audiences
- understanding and using language and terminology specific to design and technology in written or oral forms to communicate ideas about product or systems design
- applying a range of numeracy skills and concepts required to complete a designed product or system.

Citizenship
In this subject students develop their capability for citizenship by, for example:
- applying an understanding of personal and group safety in a work environment
- gaining an understanding of issues of environmental responsibility and sustainable use of technology through considered selection and use of materials, processes, and production techniques
- analysing the impact of technological practices, products, or systems on individuals, society, and/or the environment
- gaining insights into the uses of technology in future contexts.

Personal Development
In this subject students develop their capability for personal development by, for example:
- having opportunities to interact with people in different contexts and building the confidence to be involved in product and systems development
• participating in inquiry-based activities that foster problem-solving and practical application skills
• planning and working in productive, creative, collaborative, and independent ways
• working safely
• enhancing manipulative and other practical skills.

Work
In this subject students develop their capability for work by, for example:
• exploring and applying practical skills and processes
• working individually and collaboratively to create a product or system
• understanding and demonstrating safe and ethical work practices, individually and with others
• understanding, reflecting, and acting on change through workplace investigation
• extending their employability skills and career awareness.

Learning
In this subject students develop their capability for learning by, for example:
• applying knowledge and skills in a range of practical contexts
• investigating, selecting, organising, and evaluating information to design and create a product or system
• seeking and appraising alternatives and explaining improvements or changes to a product or system design
• gaining experience in solving problems within a chosen context in appropriate domains (e.g. construction methods, data sorting, numerical calculations, electrical components, imaging).

LITERACY IN DESIGN AND TECHNOLOGY
In Design and Technology, students have opportunities to develop and refine the following literacy skills:
• using appropriate technical language when involved in discussion or communication with other people
• interpreting and applying specific instructions in relation to systems, processes, and safe operating procedures
• analysing, interpreting, and evaluating technical information
• using technical terminology to communicate, in a variety of forms, ideas and designs for creating a product or system
• writing reports and acknowledging sources appropriately
• using a broad range of graphical communication techniques.
NUMERACY IN DESIGN AND TECHNOLOGY

In Design and Technology, students have opportunities to develop and refine the following numeracy skills:
• selecting and using appropriate measurement tools
• applying numerical calculations appropriate to the context and task
• displaying numerical information according to correct technical standards and procedures
• analysing and interpreting numerical data for relevance (i.e. application to product or systems development)
• understanding and using graphs, spreadsheets, diagrams, and statistics to analyse and communicate technical data, properties of materials, or systems information
• understanding numerical control systems and numerical instrumentation methods.

ABORIGINAL AND TORRES STRAIT ISLANDER KNOWLEDGE, CULTURES, AND PERSPECTIVES

In partnership with Aboriginal and Torres Strait Islander communities, and schools and school sectors, the SACE Board of South Australia supports the development of high-quality learning and assessment design that respects the diverse knowledge, cultures, and perspectives of Indigenous Australians.

The SACE Board encourages teachers to include Aboriginal and Torres Strait Islander knowledge and perspectives in the design, delivery, and assessment of teaching and learning programs by:
• providing opportunities in SACE subjects for students to learn about Aboriginal and Torres Strait Islander histories, cultures, and contemporary experiences
• recognising and respecting the significant contribution of Aboriginal and Torres Strait Islander peoples to Australian society
• drawing students’ attention to the value of Aboriginal and Torres Strait Islander knowledge and perspectives from the past and the present
• promoting the use of culturally appropriate protocols when engaging with and learning from Aboriginal and Torres Strait Islander peoples and communities.
Stage 1 Design and Technology
LEARNING SCOPE AND REQUIREMENTS

LEARNING REQUIREMENTS

The learning requirements summarise the knowledge, skills, and understanding that students are expected to develop and demonstrate through their learning in Stage 1 Design and Technology.

In this subject, students are expected to:

1. investigate the purpose, design concepts, processes, and production techniques of existing products or systems
2. create, test, validate, modify, and communicate design ideas for an identified need, problem, or challenge
3. recognise and use the differing functional characteristics and properties of materials, components, techniques, and equipment to create a product or system safely
4. use the design process to gather, analyse, and apply information to solve technological problems
5. apply appropriate knowledge and understanding of skills, processes, procedures, and techniques to a range of technological activities
6. evaluate the product or system development and outcome with reference to the design brief
7. analyse the impact of technological practices, products, or systems on individuals, society, and/or the environment.

CONTENT

Design and Technology is a 10-credit subject or a 20-credit subject at Stage 1. Students design and create products or systems that meet a design brief, and develop the knowledge and skills associated with using different processes and production techniques. They combine their designing and creating skills with knowledge and understanding of materials, information, and equipment to make high-quality products or systems for intended purposes. They analyse the impact of technological practices, products, or systems on individuals, society, and/or the environment now, and develop insights into the uses of technology in future contexts.

Students investigate and analyse a range of products or systems and use the information gained to create original solutions. They use appropriate technical language and graphic, written, and oral techniques that incorporate information and communication technologies to create and communicate design proposals.

The learning requirements for Stage 1 Design and Technology emphasise the importance of the design process as a preliminary to the realisation process.
A product or system is the outcome of applying technological skills to meet the requirements of a design brief created in response to an identified need, problem, or challenge, and then validated.

A product in this subject is an item, or a set of items, that demonstrates a unifying concept, theme, action, or purpose and is brought into being as the realisation of a validated design brief. A product may also be a model, prototype, part, or process (i.e. procedures to output a product).

A system is a set of interacting items that form a single entity, and act to perform a task or tasks specified in a validated design brief.

Although evaluation and redesigning may occur as a part of realisation, it is essential to have a validated design brief before the realisation process begins.
Focus Areas

The content of Stage 1 Design and Technology is organised into three focus areas: communication products, material products, and systems and control products.

The focus areas are practically based and emphasise the development of skills and understanding in investigating materials, processes, and production techniques, and planning, creating, and evaluating technological products and systems. Within each focus area, a context is chosen by the school to meet student needs and interests, taking into account the resources available.

The focus area and context will determine the type of materials to be used. For this subject a material is any component, constituent element, or substance from which a product is or can be created.

Stage 1 Design and Technology is an opportunity for teachers, in negotiation with students, to develop a program to meet local needs or interests. Teaching and learning programs may also incorporate opportunities for students to investigate practical applications that relate to an industry context.

All programs should have a practical focus that enables students to solve technological problems, use design strategies, and develop solutions to their design brief.

Communication Products

This focus area involves the use of materials such as symbols, signs, behaviour, speech, light, images, sound, or other data to design and make products that communicate information.

Examples of contexts for communication products include:
- computer-aided design
- graphics
- multimedia
- photography
- sound
- web design.

Material Products

This focus area involves the use of a diverse range of manufacturing technologies such as tools, machines, equipment, and/or systems to design and make products with resistant materials such as metals, plastics, wood, composites, ceramics, textiles, and foods.

Examples of contexts for material products include:
- building and construction
- ceramics
- clothing
- foods
- timber and timber products
- metals
- textiles
- polymers.
Systems and Control Products

This focus area involves the use of devices such as electrical, electronic, mechanical, pneumatic, hydraulic, and interface components, including programmable control devices, to design and make systems and control products. Students produce outcomes that demonstrate the knowledge and skills associated with using control systems, processes, and materials such as electronic components, chips, circuitry, robotic components, gears, levers, and fluids.

Examples of contexts for systems and control products include:

- computer systems
- electrical systems
- electronic systems
- energy
- mechanical systems
- mechatronics
- pneumatic, hydraulic, or fluidic systems.
The Design Process

The design process as outlined below is essential to the subject. Designing in technology is purposeful, systematic, creative, and cyclic, with many possible solutions. A four-part designing model — investigating, planning, producing, and evaluating — is used in this subject.

The four parts of the design process are components of a coherent and dynamic progression. The process is rarely linear, and designing should be seen as an interactive loop, rather than as a simple step-by-step process.

The design process should begin with the identification of a need, problem, or challenge, followed by an initial investigation, and then the writing of an open design brief that may specify parameters or requirements.

Investigating

Activities may include:
- identifying a need, problem, or challenge
- developing a design brief
- analysing existing product or system characteristics
- investigating the impact of technological practices, products, or systems on individuals, society, and/or the environment
- specifying plans, purposes, and criteria from a needs analysis
- researching and analysing information in design and technology and the manufacturing sector
- validating the design brief.

Planning

Activities may include:
- developing flexible, imaginative, innovative, and enterprising outcomes
- preparing sequences, sketches, concept drawings, and working drawings
- testing, modifying, and validating ideas
- selecting appropriate solutions
- defining product specifications.

Producing

Activities may include:
- creating products or systems to the design specifications
- developing skills and applying them to a range of situations
- developing solutions to technical problems that may arise
- controlling quality, reliability, safety, and cost
- interpreting information of various kinds
- devising and using procedures, processes, or sequences
- applying concepts and/or principles to new situations
- working individually or collaboratively
• implementing schemes or plans
• using resources, equipment, or materials.

**Evaluating**

Activities may include:
• evaluating how well the requirements of the design brief specifications have been met
• reviewing criteria, standards, reliability, safety, quality, and cost-effectiveness
• taking action based on what has been learnt by modifying or redeveloping designs, ideas, or procedures
• involving other people in the evaluation process
• evaluating the effectiveness of the product or system realisation process (what worked well, what did not go according to plan, what was learnt)
• analysing the impact of technological practices, products, or systems on individuals, society, and/or the environment.
ASSESSMENT SCOPE AND REQUIREMENTS

Assessment at Stage 1 is school based.

EVIDENCE OF LEARNING

The following assessment types enable students to demonstrate their learning in Stage 1 Design and Technology:

• Assessment Type 1: Skills and Applications Tasks
• Assessment Type 2: Folio
• Assessment Type 3: Product.

For a 10-credit subject, students should provide evidence of their learning through four assessments. Each assessment type should have a weighting of at least 20%. Students undertake:

• two skills and applications tasks
• one folio
• one product.

For a 20-credit subject, students should provide evidence of their learning through six to eight assessments. Each assessment type should have a weighting of at least 20%. Students undertake:

• at least three skills and applications tasks
• one folio
• two products.

ASSESSMENT DESIGN CRITERIA

The assessment design criteria are based on the learning requirements and are used by teachers to:

• clarify for the student what he or she needs to learn
• design opportunities for the student to provide evidence of his or her learning at the highest possible level of achievement.

The assessment design criteria consist of specific features that:

• students should demonstrate in their learning
• teachers look for as evidence that students have met the learning requirements.

For this subject the assessment design criteria are:

• investigating
• planning
• producing
• evaluating.

The specific features of these criteria are described below.

The set of assessments, as a whole, must give students opportunities to demonstrate each of the specific features by the completion of study of the subject.

Investigating
The specific features are as follows:
I1 Identification of a need, problem, or challenge.
I2 Creation and validation of an initial design brief.
I3 Investigation of the functional characteristics and properties of existing products, materials, processes, systems, and/or production techniques.
I4 Investigation into the impact of technological practices, products, or systems on individuals, society, and/or the environment.

Planning
The specific features are as follows:
Pl1 Use of investigated information to create individual design ideas for a product or system.
Pl2 Compilation of sketches, concept drawings, plans, and sequences for planned outcomes.
Pl3 Use of technical language relevant to the context and purpose.
Pl4 Testing, modification, and validation of ideas or procedures.

Producing
The specific features are as follows:
Pr1 Application of skills, processes, procedures, and techniques to create a product or system to a chosen standard and specification.
Pr2 Use of a range of materials, components, techniques, and equipment to create a product or system safely and accurately.
Pr3 Development of solutions to problems that arise during product or system realisation.

Evaluating
The specific features are as follows:
E1 Evaluation of how well the design brief requirements have been met.
E2 Evaluation of the effectiveness of the product or system realisation process.
E3 Consideration of possible modifications to improve ideas or procedures.
E4 Analysis of the impact of technological practices, products, or systems on individuals, society, and/or the environment.
SCHOOL ASSESSMENT

Assessment Type 1: Skills and Applications Tasks

Skills and applications tasks consist of processes and techniques assessments, and materials applications.

For a 10-credit subject, students undertake two skills and applications tasks: one processes and techniques assessment, and one materials application.

For a 20-credit subject, students undertake at least three skills and applications tasks: at least one processes and techniques assessment, and at least one materials application.

Processes and Techniques

Students negotiate with their teacher the processes and production techniques to explore. These processes and techniques may be in preparation for the realisation of their product(s) or system(s). Students and teachers negotiate whether it would be appropriate to demonstrate these processes and techniques in a single session, or over a more extended period of time. This assessment could consist of one activity or a series of activities.

Evidence of student learning could be presented in the form of a completed product, annotated photographs of a product or completed processes, or a checklist.

Materials Application

Students investigate and analyse the functional characteristics and properties of two or more materials or components they are considering for use in the creation of their product(s) or system(s). They report on how their research into and testing of the characteristics and properties of these materials or components will affect their selection for use in the realisation of their product(s) or system(s).

Presentation of this information could be in the form of annotated images, computer-generated information, scanned images, annotated visual displays, multimedia presentations, web pages, oral presentations, or written reports.

The materials application should be a maximum of 400 words if written or a maximum of 2 minutes if oral, or the equivalent in multimodal form.

For this assessment type, students demonstrate evidence of learning primarily in relation to the following assessment design criteria:

- investigating
- producing
- evaluating.
Assessment Type 2: Folio

For the folio, students document the investigating and planning of ideas for a product or system to be created in Assessment Type 3, with evidence of ongoing evaluation throughout the process.

For a 10-credit subject, the folio consists of documentation of the design of the product in Assessment Type 3.

For a 20-credit subject, the folio consists of documentation of the design of the major product in Assessment Type 3.

For the minor product in Assessment Type 3, students do not prepare a separate design brief for the folio. The design brief for the minor product may be based on the design brief for the major product, or may be provided by the teacher.

Students identify a need, problem, or challenge relevant to the context of their study and create an initial design brief for their product. They investigate and analyse a range of similar products, for ideas and possible solutions. They describe and analyse the purpose of the product, and the selection of appropriate materials and production techniques. They make recommendations for adoption, modification, or redevelopment to validate their design brief, based on their ongoing evaluation of the process.

An investigation of the impact of technological issues relevant to the product is also required. The investigation should include analysis of the impact on individuals, society, and/or the environment of the product or system, and/or related technological practices.

Planning involves creating product design ideas from recommendations made in the investigating stage. The focus is on the presentation and quality of the design ideas for a product or system. Technical language, when used, should be relevant to the context and purpose. Students select appropriate means to present their ideas, concepts, and design proposals to a given audience.

Students should evaluate how well the requirements of the design brief have been met (what worked well, what did not go according to plan, and what was learnt). Students should consider possible modifications to improve the outcome, and discuss how the outcome will be used.

For a 10-credit subject, the folio should contain a maximum of three pieces of evidence that illustrate the key design phases of investigating, planning, and evaluating. The combined evidence should be a maximum of 800 words if written or a maximum of 5 minutes of recorded oral communication, or the equivalent in multimodal form.

For a 20-credit subject, the folio should contain a maximum of six pieces of evidence that illustrate the key design phases of investigating, planning, and evaluating. The combined evidence should be a maximum of 1600 words if written or a maximum of 10 minutes of recorded oral communication, or the equivalent in multimodal form.

For this assessment type, students provide evidence of their learning primarily in relation to the following assessment design criteria:

- investigating
- planning
- evaluating.
Assessment Type 3: Product

For a 10-credit subject, students create one product, supported by a product record documenting the producing process and evaluating the product.

For a 20-credit subject, students create two products: a minor product and a major product. The minor product may be in preparation for the major product or be unrelated to the major product, enabling students to develop different knowledge, ideas, techniques, and skills. The minor product and the major product are each supported by a product record documenting the producing process and evaluating the product.

The product (or minor product and major product) may be a product or system. A product may also be a model, prototype, process, or part.

Students present for assessment the product(s) they have made in response to the design brief developed for their folio in Assessment Type 2. (For a 20-credit subject, a separate design brief may be used for the minor product.)

Development of the product(s) should enable students to demonstrate a range of skills and techniques; however, a product does not need to be large or complex for this to occur.

In working individually or collaboratively to produce their product(s), students choose and use appropriate materials; safely use a range of tools, equipment, and systems; and apply appropriate processes and production techniques.

Each product is supported by a product record that provides evidence of planning and producing during the creation of the product. Students document any testing or modification conducted when planning the outcome. The product record demonstrates the skills, processes, procedures, and techniques that the student uses to create the product. Students document the materials, components, and techniques used, and reflect on any problem-solving strategies used during the production process. Students should reflect on the effectiveness of the system realisation process.

Whether they work individually or collaboratively, students present individual product records.

For a 10-credit subject, the product record should be a maximum of 600 words if written or a maximum of 3 minutes of recorded multimedia material, or the equivalent in multimodal form.

For a 20-credit subject, the product records should be a maximum, in total, of 1000 words or 6 minutes of recorded multimedia material, or the equivalent in multimodal form. The 1000 words or 6 minutes are divided between the two products, but emphasis is put on the record for the major product.

For this assessment type, students provide evidence of their learning primarily in relation to the following assessment design criteria:

- planning
- producing
- evaluating.
PERFORMANCE STANDARDS

The performance standards describe five levels of achievement, A to E.

Each level of achievement describes the knowledge, skills, and understanding that teachers refer to in deciding how well a student has demonstrated his or her learning on the basis of the evidence provided.

During the teaching and learning program the teacher gives students feedback on their learning, with reference to the performance standards.

At the student’s completion of study of a subject, the teacher makes a decision about the quality of the student’s learning by:

• referring to the performance standards
• taking into account the weighting of each assessment type
• assigning a subject grade between A and E.

Teachers can use a SACE Board school assessment grade calculator to help them to assign the subject grade. The calculator is available on the SACE website (www.sace.sa.edu.au).
## Performance Standards for Stage 1 Design and Technology

<table>
<thead>
<tr>
<th>Investigating</th>
<th>Planning</th>
<th>Producing</th>
<th>Evaluating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Comprehensive and well-considered identification of a need, problem, or challenge.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creation and insightful validation of a clear and well-considered initial design brief.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-depth investigation into the functional characteristics and properties of existing products, materials, processes, systems, and/or production techniques.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planned and thorough investigation into the impact of technological practices, products, or systems on individuals, society, and/or the environment.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insightful use of relevant investigated information to create individual design ideas for a product or system.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thoughtful compilation of broad, varied, and refined sketches, concept drawings, plans, and sequences for planned outcomes.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polished use of technical language most relevant to the context and purpose.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broad and varied testing, modification, and validation of ideas or procedures.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highly proficient application of skills, processes, procedures, and techniques to create a product or system to a chosen standard and specification.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sophisticated use of a variety of materials, components, techniques, and equipment to create a product or system safely and accurately.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of sophisticated solutions to problems that arise during product or system realisation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehensive evaluation of how well the design brief requirements have been met.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insightful and detailed evaluation of the effectiveness of the product or system realisation process.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sophisticated and focused consideration of possible modifications to improve ideas or procedures.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceptive analysis of the impact of technological practices, products, or systems on individuals, society, and/or the environment.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| <strong>B</strong> Clear and considered identification of a need, problem, or challenge. |
| Well-considered creation and validation of an initial design brief. |
| Some depth of investigation into the functional characteristics and properties of existing products, materials, processes, systems, and/or production techniques. |
| Detailed investigation into the impact of technological practices, products, or systems on individuals, society, and/or the environment. |
| Thoughtful use of relevant investigated information to create individual design ideas for a product or system. |
| Well-considered compilation of quality sketches, concept drawings, plans, and sequences for planned outcomes. |
| Capable use of technical language relevant to the context and purpose. |
| Considered testing, modification, and validation of ideas or procedures. |
| Proficient application of skills, processes, procedures, and techniques to create a product or system to a chosen standard and specification. |
| Thorough use of different materials, components, techniques, and equipment to create a product or system safely and mostly accurately. |
| Development of thoughtful solutions to problems that arise during product or system realisation. |
| Well-informed evaluation of how well the design brief requirements have been met. |
| Well-considered and detailed evaluation of the effectiveness of the product or system realisation process. |
| Thorough and focused consideration of possible modifications to improve ideas or procedures. |
| Well-considered analysis of the impact of technological practices, products, or systems on individuals, society, and/or the environment. |</p>
<table>
<thead>
<tr>
<th>Investigating</th>
<th>Planning</th>
<th>Producing</th>
<th>Evaluating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C</strong> Considered identification of a need, problem, or challenge.</td>
<td>Use of relevant investigated information to create individual design ideas for a product or system.</td>
<td>Competent application of skills, processes, procedures, and techniques to create a product or system to a chosen standard and specification.</td>
<td>Informed evaluation of how well the design brief requirements have been met.</td>
</tr>
<tr>
<td>Considered creation and validation of an initial design brief.</td>
<td>Considered compilation of sketches, concept drawings, plans, and sequences for planned outcomes.</td>
<td>Appropriate use of materials, components, techniques, and equipment to create a product or system safely and sometimes accurately.</td>
<td>Considered evaluation of the effectiveness of the product or system realisation process.</td>
</tr>
<tr>
<td>Informed investigation into the functional characteristics and properties of existing products, materials, processes, systems, and/or production techniques.</td>
<td>Competent use of technical language relevant to the context and purpose.</td>
<td>Development of appropriate solutions to problems that arise during product or system realisation.</td>
<td>Some focus in consideration of possible modifications to improve ideas or procedures.</td>
</tr>
<tr>
<td>Generally competent investigation into the impact of technological practices, products, or systems on individuals, society, and/or the environment.</td>
<td>Competent testing, modification, and validation of ideas or procedures.</td>
<td></td>
<td>Considered analysis of some of the impacts of technological practices, products, or systems on individuals, society, and/or the environment, with mostly relevant detail.</td>
</tr>
<tr>
<td><strong>D</strong> Partial identification of a need, problem, or challenge.</td>
<td>Some use of identified information to create one or more individual design ideas for a product or system that may be only partially completed.</td>
<td>Basic application of some skills in some processes, procedures, and techniques to create part of a product or system to a basic standard and specification.</td>
<td>Some description of how well the design brief requirements have been met.</td>
</tr>
<tr>
<td>Development and some testing of a basic, or perhaps incomplete, initial design brief.</td>
<td>Some sketches, concept drawings, plans, and/or sequences for planned outcomes are completed.</td>
<td>Some use of basic materials, components, techniques, and equipment to create part of a product or system with some elements of safety and accuracy considered.</td>
<td>Some description of the effectiveness of the product or system realisation process.</td>
</tr>
<tr>
<td>Identification of a few of the functional characteristics or properties of existing products, materials, processes, systems, or production techniques.</td>
<td>Use of basic technical language with some relevance to the context and purpose.</td>
<td>Some endeavour to solve problems that arise during product or system realisation.</td>
<td>Some consideration of a possible modification to improve ideas or procedures.</td>
</tr>
<tr>
<td>Some accessing of information on the impact of aspects of technological practices, products, or systems on individuals, society, or the environment.</td>
<td>Some basic testing, modification, and validation of aspects of one or more ideas or procedures.</td>
<td></td>
<td>Identification and description of one or more impacts of technological practices, products, or systems on individuals, society, or the environment.</td>
</tr>
<tr>
<td>Investigating</td>
<td>Planning</td>
<td>Producing</td>
<td>Evaluating</td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>E</strong> Limited identification of a need, problem, or challenge.</td>
<td>Limited use of information to create an individual design idea for a product or system that may not be completed.</td>
<td>Limited application of emerging skills and/or techniques to attempt to create part of a product or system to a limited standard or specification.</td>
<td>Identification of some aspects of the design brief requirements that were attempted.</td>
</tr>
<tr>
<td>Attempted development and testing of a design brief.</td>
<td>Compilation of one or more sketches, concept drawings, plans, or sequences for planned outcomes.</td>
<td>Attempted use of one or more basic materials, components, techniques, or equipment, with limited consideration of safety procedures.</td>
<td>Identification of some aspects of the effectiveness of the product or system realisation process.</td>
</tr>
<tr>
<td>Attempted identification of one or more functional characteristics or properties of existing products, materials, processes, systems, or production techniques.</td>
<td>Limited use of technical language.</td>
<td>Some attempted description of problems that arise during product or system realisation.</td>
<td>Emerging recognition of the need for modification to improve ideas or procedures.</td>
</tr>
<tr>
<td>Isolated and disjointed evidence of accessing information on the impact of an aspect of a technological practice, product, or system on individuals, society, or the environment.</td>
<td>Recognition of the need for testing, modification, and validation of ideas or procedures, with some limited attempts.</td>
<td>Emerging recognition of one or more impacts of technological practices, products, or systems on individuals, society, or the environment.</td>
<td></td>
</tr>
</tbody>
</table>
ASSESSMENT INTEGRITY

The SACE Assuring Assessment Integrity Policy outlines the principles and processes that teachers and assessors follow to assure the integrity of student assessments. This policy is available on the SACE website (www.sace.sa.edu.au) as part of the SACE Policy Framework.

The SACE Board uses a range of quality assurance processes so that the grades awarded for student achievement in the school assessment are applied consistently and fairly against the performance standards for a subject, and are comparable across all schools.

Information and guidelines on quality assurance in assessment at Stage 1 are available on the SACE website (www.sace.sa.edu.au).
SUPPORT MATERIALS

SUBJECT-SPECIFIC ADVICE
Online support materials are provided for each subject and updated regularly on the SACE website (www.sace.sa.edu.au). Examples of support materials are sample learning and assessment plans, annotated assessment tasks, annotated student responses, and recommended resource materials.

ADVICE ON ETHICAL STUDY AND RESEARCH
Advice for students and teachers on ethical study and research practices is available in the guidelines on the ethical conduct of research in the SACE on the SACE website (www.sace.sa.edu.au).
Stage 2 Design and Technology
LEARNING SCOPE AND REQUIREMENTS

LEARNING REQUIREMENTS

The learning requirements summarise the knowledge, skills, and understanding that students are expected to develop and demonstrate through their learning in Stage 2 Design and Technology.

In this subject, students are expected to:

1. investigate and critically analyse the purpose, design concepts, processes, and production techniques of existing products or systems
2. create, test, validate, modify, and communicate design ideas for an identified need, problem, or challenge
3. investigate, analyse, and use the differing functional characteristics and properties of materials, components, processes, and equipment to create products or systems safely
4. use the design process to select materials, components, processes, techniques, and equipment, to develop and implement solutions and ideas for products or systems
5. apply appropriate knowledge and understanding of skills, processes, procedures, and techniques to a range of technological activities
6. evaluate product or system development and outcome, and reflect on technological ideas and procedures used, with reference to the design brief
7. analyse the impact of technological practices, products, or systems on individuals, society, and/or the environment.

CONTENT

Design and Technology is a 10-credit subject or a 20-credit subject at Stage 2.

Students develop design briefs, demonstrating their design and technological ability through activities in contexts that have a practical outcome. They make sound decisions about materials and techniques, based on their testing and understanding of the physical properties and working characteristics of materials. Students identify product characteristics and make critical judgments about the design and creation of products and systems.

They work with a range of tools, materials, equipment, and components to a high degree of precision, while implementing safe working practices. They demonstrate an understanding of the needs and values of a range of users to design and create products or systems that fit an identified design brief. They develop their ability to evaluate outcomes against the design brief.

Students investigate and critically analyse a range of products, processes, and production techniques used in industrial situations. This information is used to create potential solutions through the design and creation of products and systems. Students
identify demands on their design, taking cost, ethical, cultural, and environmental issues into account. They explain how their ideas address these demands, and use their analysis to produce proposals for the present and future.

The learning requirements for Stage 2 Design and Technology emphasise the importance of the design process as a preliminary to the realisation process.

A product or system is the outcome of applying technological skills to meet the requirements of a design brief created in response to an identified need, problem, or challenge, and then validated.

A *product* in this subject is an item, or a set of items, that demonstrates a unifying concept, theme, action, or purpose and is brought into being as the realisation of a validated design brief. A product may also be a model, prototype, part, or process (i.e. procedures to output a product).

A *system* is a set of interacting items that form a single entity, and act to perform a task or tasks specified in a validated design brief.

Although evaluation and redesigning may occur as a part of realisation, it is essential to have a validated design brief before the realisation process begins.
Focus Areas

The content of Stage 2 Design and Technology is organised into three focus areas: communication products, material products, and systems and control products.

The focus areas are practically based and emphasise the development of skills and understanding in using a design process to investigate, plan, and evaluate technological materials, products, or systems. Within each focus area, a context is chosen by the school to meet student needs and interests, taking into account the resources available.

The focus area and context determine the type of materials to be used. For this subject a material is any component, constituent element, or substance from which a product is or can be created.

For both a 10-credit subject and a 20-credit subject, teachers develop a teaching and learning program based on the design and technology processes and other key elements of Stage 2 Design and Technology outlined on the following pages.

Stage 2 Design and Technology is an opportunity for teachers, in negotiation with students, to develop a program to meet local needs or interests. Teaching and learning programs may also incorporate opportunities for students to investigate practical applications that relate to an industry context.

Communication Products

This focus area involves the use of materials, such as symbols, signs, behaviour, speech, light, images, sound, or other data to design and make products that communicate information. Students produce outcomes that demonstrate the knowledge and skills associated with manipulation of communication media, both manual and digital.

Examples of contexts for communication products include:
- computer-aided design
- graphics
- multimedia
- photography
- sound
- web design.

Material Products

This focus area involves the use of a diverse range of manufacturing technologies such as tools, machines, and/or systems to convert resistant materials into useful products. Students produce outcomes that demonstrate the knowledge and skills associated with using systems, processes, and resistant materials such as metals, plastics, wood, composites, ceramics, textiles, and foods.

Examples of contexts for material products include:
- building and construction
- ceramics
- clothing
- foods
- timber and timber products
• metals
• textiles
• polymers.

Systems and Control Products
This focus area involves the use of devices such as electrical, electronic, mechanical, pneumatic, hydraulic, and interface components, including programmable control devices, to design and make systems and control products. Students produce outcomes that demonstrate the knowledge and skills associated with using control systems, processes, and materials such as electronic components, chips, circuitry, robotic components, gears, levers, and fluids.

Examples of contexts for systems and control products include:
• computer systems
• electrical systems
• electronic systems
• energy
• mechanical systems
• mechatronics
• pneumatic, hydraulic, or fluidic systems.
The Design Process

The design process as outlined below is essential to the subject. Designing in technology is purposeful, systematic, creative, and cyclic, with many possible solutions. A four-part designing model — investigating, planning, producing, and evaluating — is used in this subject.

The four parts of the design process are components of a coherent and dynamic progression. The process is rarely linear, and designing should be seen as an interactive loop, rather than as a simple step-by-step process.

The design process should begin with the identification of a need, problem, or challenge, followed by an initial investigation, and then the writing of an open design brief that may specify parameters or requirements.

Investigating
Activities may include:
- identifying a need, problem, or challenge
- investigating and interpreting relevant information
- creating a design brief that includes key criteria and/or constraints
- analysing existing product or system characteristics
- specifying plans, purposes, and criteria from a needs analysis
- researching and analysing information in design and technology and the manufacturing sector
- validating the design brief
- investigating the impact of technological practices, products, or systems on individuals, society, and/or the environment.

Planning
Activities may include:
- developing flexible, imaginative, innovative, and enterprising outcomes
- preparing sequences, sketches, concept drawings, and working drawings
- testing, modifying, and validating ideas
- selecting and justifying appropriate solutions
- defining product specifications.

Producing
Activities may include:
- creating products or systems to the design specifications
- developing skills and applying them to a range of situations
- developing solutions to technical problems that may arise
- controlling quality, reliability, safety, and cost
- interpreting information of various kinds
- devising and using procedures, processes, or sequences
- applying concepts and principles to new situations
• working individually and/or collaboratively
• implementing schemes or plans
• using resources, equipment, or materials.

**Evaluating**

Activities may include:

• evaluating, individually and/or collaboratively, how well the requirements of the design brief specifications have been met
• reviewing criteria, standards, reliability, safety, quality, and cost-effectiveness
• reflecting on outcomes to recommend modifying or redeveloping designs, ideas, or procedures
• evaluating product success and reflecting on the effectiveness of technological ideas and procedures used in the realisation process
• analysing and reflecting on the impact of technological practices, products, or systems on the individual, society, and/or the environment.
ASSESSMENT SCOPE AND REQUIREMENTS

All Stage 2 subjects have a school assessment component and an external assessment component.

EVIDENCE OF LEARNING

The following assessment types enable students to demonstrate their learning in Stage 2 Design and Technology:

School Assessment (70%)
- Assessment Type 1: Skills and Applications Tasks (20%)
- Assessment Type 2: Product (50%)

External Assessment (30%)
- Assessment Type 3: Folio (30%).

For a 10-credit subject, students should provide evidence of their learning through five assessments, including the external assessment component. Students undertake:
- two skills and applications tasks
- one product
- two assessments for the folio

For a 20-credit subject, students should provide evidence of their learning through seven or eight assessments, including the external assessment component. Students undertake:
- three or four skills and applications tasks
- two products
- two assessments for the folio.

ASSESSMENT DESIGN CRITERIA

The assessment design criteria are based on the learning requirements and are used by:
- teachers to clarify for the student what he or she needs to learn
- teachers and assessors to design opportunities for the student to provide evidence of his or her learning at the highest possible level of achievement.

The assessment design criteria consist of specific features that:
- students should demonstrate in their learning
- teachers and assessors look for as evidence that students have met the learning requirements.
For this subject the assessment design criteria are:

- investigating
- planning
- producing
- evaluating.

The specific features of these criteria are described below.

The set of assessments, as a whole, must give students opportunities to demonstrate each of the specific features by the completion of study of the subject.

**Investigating**

The specific features are as follows:

I1 Identification of a need, problem, or challenge.
I2 Creation and validation of an initial design brief based on needs analysis and task identification.
I3 Investigation and critical analysis of the characteristics of existing products, processes, systems, and/or production techniques.
I4 Investigation of product material options and analysis for product use.
I5 Investigation into the impact of products or systems on individuals, society, and/or the environment.

**Planning**

The specific features are as follows:

Pl1 Analysis of information to develop solutions to an identified design brief.
Pl2 Communication of product design ideas, using relevant technical language.
Pl3 Testing, modification, and validation of ideas or procedures.

**Producing**

The specific features are as follows:

Pr1 Application of skills, processes, procedures, and techniques to create a product or system to a chosen standard and specification.
Pr2 Use of resources, equipment, and materials to create a product or system safely and accurately.
Pr3 Development of solutions to technical problems that may arise during product or system realisation.

**Evaluating**

The specific features are as follows:

E1 Evaluation of product success against design brief requirements.
E2 Evaluation of the effectiveness of the product or system realisation process.
E3 Reflection on materials, ideas, or procedures, with recommendations.
E4 Analysis of the impact of the product or system on individuals, society, and/or the environment.
SCHOOL ASSESSMENT

Assessment Type 1: Skills and Applications Tasks (20%)

Skills and applications tasks consist of specialised skills applications and materials applications.

For a 10-credit subject, students undertake two skills and applications tasks: one specialised skills application and one materials application.

For a 20-credit subject, students undertake three or four skills and applications tasks: at least one specialised skills application and at least one materials application.

Students demonstrate skills and understanding of the materials and components, techniques, and equipment that they consider for use in Assessment Type 2.

Specialised Skills Application

Students, in consultation with their teachers, identify an area of learning to develop and demonstrate skills and knowledge of processes and production techniques for realisation of their product(s) or system(s). The skills area chosen may provide further development of existing skills or develop new skills required for the product realisation. Students and teachers may negotiate whether it would be appropriate to demonstrate these skills in a single session, or over a more extended period of time. This assessment covers aspects of the investigating, planning, and producing parts of the design cycle and could consist of one activity or a series of activities.

Evidence of student learning could be presented in the form of a completed product, annotated photographs of a product or completed processes, or a checklist.

Materials Application

Students investigate and analyse the functional characteristics and properties of two or more materials or components they are considering for use in the creation of their product(s) or system(s). They report on how their research into and testing of the functional characteristics and properties of these materials or components will affect their selection for use in the realisation of their product(s) or system(s).

Presentation of this information could be in the form of annotated images, computer-generated information, scanned images, annotated visual displays, multimedia presentations, web pages, oral presentations, or written reports.

The materials application covers aspects of the investigating and planning parts of the design cycle and should be a maximum of 800 words if written or a maximum of 5 minutes if oral, or the equivalent in multimodal form.

For this assessment type, students provide evidence of their learning in relation to the following assessment design criteria:

- investigating
- planning
- producing
- evaluating.
Assessment Type 2: Product (50%)

For a 10-credit subject, students create one product that allows them to demonstrate an appropriate range of skills, techniques, knowledge, and ideas. The product is supported by a product record that documents the process, including modifications, planning, and production.

For a 20-credit subject, students create one minor product and one major product that allow them to demonstrate an appropriate range of skills, techniques, knowledge, and ideas. The products are each supported by a product record that documents the process, including modifications, planning, and production. The minor product may be a component of, or designed to complement, the major product.

The product (or minor product and major product) may be a product or system. A product may also be a model, prototype, process, or part.

Students present for assessment the product(s) they have made in response to the design brief developed for their folio in Assessment Type 3. (For a 20-credit subject, a separate design brief may be used for the minor product.)

The product record(s) may include, as appropriate, evidence related to:
- development of any skills that were not included in Assessment Type 1
- selection and use of appropriate components, specialised processes, or production techniques
- application of knowledge and understanding to create the product
- the specifications of a prepared design brief
- safe and accurate use of appropriate equipment and processes
- modification of the design brief as a result of technical problems that arise
- use of materials with appropriate functional characteristics and properties
- ongoing reflection on ideas and procedures.

A product record is used to provide evidence of modification and planning, production, and/or evaluation aspects of the design process that occur during the creation of the product, to inform assessment of the product(s) and support the evaluation in Assessment Type 3. It may consist of a range of different forms of documentation appropriate to the product(s), for example:
- a journal or work notes
- annotated images of production processes
- computer-generated information with scanned images
- annotated visual displays
- multimedia presentations
- web pages
- oral presentations
- a flow chart
- reports.

For this assessment type, students provide evidence of their learning primarily in relation to the following assessment design criteria:
- planning
- producing
- evaluating.
EXTERNAL ASSESSMENT

Assessment Type 3: Folio (30%)

The folio consists of documentation and analysis of the product design process and product evaluation.

For both a 10-credit subject and a 20-credit subject, the investigation section of the design process includes an analysis of the impact of the product or system, and/or technologies related to it, on the individual, society, and/or the environment.

For a 10-credit subject, students undertake and document one product design process and one product evaluation for the product in Assessment Type 2.

For a 20-credit subject, students undertake one product design process and one product evaluation for the major product in Assessment Type 2. For the minor product, students do not include a separate design brief in the folio. The design brief for the minor product may be based on the design brief for the major product, or may be provided by the teacher.

This assessment type is designed to enable students to further develop and refine their use of the design process. They investigate technical skills, analyse possible applications of these skills, and evaluate ways in which their own skills have developed and improved.

Product Design (Analysis and Documentation)

For both a 10-credit subject and a 20-credit subject, students create a design brief and document their investigation and planning, based on the skills and activities outlined in ‘The Design Process’ section in Learning Scope and Requirements.

The design brief should include a statement of intent, functional outcomes, aesthetic considerations, and constraints. It can be presented in dot point form.

The investigating part of the design process should include an investigation into the impact on individuals, society, and/or the environment of technological practices related to the type of product that the student is designing. The analysis involved in investigation can be included in the product design documentation or in the product evaluation.

Product Evaluation

For both a 10-credit subject and a 20-credit subject, students evaluate their producing skills, using evidence from the product record in Assessment Type 2, and evaluate their realised product.

The evaluation should include:

- a critical comparison of the realised product with the requirements of the design brief, and an explanation of and justification for any changes made
- a review of criteria, standards, reliability, safety, quality, and cost-effectiveness
- reflection on outcomes, with recommendations for possible improvement or redevelopment of designs or procedures
- analysis of the impact of the product on individuals, society, and/or the environment (if not part of product design documentation)
- evaluative observations about the student’s own skills development.
Evidence of development, with supporting written or oral summaries that explain, analyse, and evaluate the process and product, could take the form of:

- all or sections of the product record
- photographic or electronic or digitally generated materials
- audiovisual evidence
- materials
- products
- models
- sketches, diagrams, or annotations.

Oral summaries may emerge from teacher-led discussion questions.

For a 10-credit subject, the combined evidence in the folio should be a maximum of 1000 words if written or a maximum of 6 minutes of recorded oral documentation of the design process and evaluation, or the equivalent in multimodal form.

For a 20-credit subject, the combined evidence in the folio should be a maximum of 2000 words if written or a maximum of 12 minutes of recorded oral documentation of the design process and evaluation, or the equivalent in multimodal form.

Students should submit their folio evidence either on A4 paper stapled at the top left-hand corner, or in a CD or DVD.

All specific features of the ‘investigating’, ‘planning’, and ‘evaluating’ assessment design criteria for this subject are assessed in the folio.

**PERFORMANCE STANDARDS**

The performance standards describe five levels of achievement, A to E.

Each level of achievement describes the knowledge, skills, and understanding that teachers and assessors refer to in deciding how well a student has demonstrated his or her learning on the basis of the evidence provided.

During the teaching and learning program the teacher gives students feedback on their learning, with reference to the performance standards.

At the student’s completion of study of each school assessment type, the teacher makes a decision about the quality of the student’s learning by:

- referring to the performance standards
- assigning a grade between A+ to E− for the assessment type.

The student’s school assessment and external assessment are combined for a final result, which is reported as a grade between A+ to E−.
### Performance Standards for Stage 2 Design and Technology

<table>
<thead>
<tr>
<th>Investigating</th>
<th>Planning</th>
<th>Producing</th>
<th>Evaluating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Clear, comprehensive, and well-considered identification of a need, problem, or challenge.</td>
<td>In-depth analysis of information to develop imaginative, innovative, and enterprising solutions to an identified design brief.</td>
<td>Sophisticated application of appropriate skills, processes, procedures, and techniques to create a product or system to a precise or polished standard and specification.</td>
<td>Insightful and well-considered evaluation of product success against design brief requirements.</td>
</tr>
<tr>
<td>Thorough and insightful creation and validation of initial design brief based on needs analysis and task identification.</td>
<td>Accomplished communication of a variety of refined product design ideas, consistently using relevant technical language.</td>
<td>Accomplished use of resources, equipment, and materials to create a product or system safely and accurately.</td>
<td>Insightful and detailed evaluation of the effectiveness of the product or system realisation process.</td>
</tr>
<tr>
<td>Purposeful investigation and critical analysis of the characteristics of a broad variety of existing products, processes, systems, and/or production techniques.</td>
<td>Purposeful testing and refined modification and validation of ideas or procedures.</td>
<td>Accomplished and resourceful development of solutions to technical problems that may arise during product or system realisation.</td>
<td>Refined and well-considered reflection on materials, ideas, and procedures, with sophisticated recommendations.</td>
</tr>
<tr>
<td>In-depth investigation into product material options and focused and thorough critical analysis for product use.</td>
<td>Focused and perceptive investigation into the impact of products or systems on individuals, society, and/or the environment.</td>
<td>Resourceful and well-informed analysis of the impact of the product or system on individuals, society, and/or the environment.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>Well-considered identification of a need, problem, or challenge.</th>
<th>Thoughtful analysis of information to develop enterprising solutions to an identified design brief.</th>
<th>Capable application of appropriate skills, processes, procedures, and techniques to create a product or system to a mostly precise or polished standard and specification.</th>
<th>Well-considered evaluation of product success against design brief requirements.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-considered creation and validation of an initial design brief based on needs analysis and task identification.</td>
<td>Capable communication of different quality product design ideas, using relevant technical language.</td>
<td>Capable use of resources, equipment, and materials to create a product or system safely and mostly accurately.</td>
<td>Well-considered and detailed evaluation of the effectiveness of the product or system realisation process.</td>
<td></td>
</tr>
<tr>
<td>Thoughtful investigation and analysis of the characteristics of a variety of existing products, processes, systems, and/or production techniques.</td>
<td>Thoughtful testing, modification, and validation of ideas or procedures.</td>
<td>Thoughtful development of solutions to technical problems that may arise during product or system realisation.</td>
<td>Well-considered reflection on materials, ideas, and procedures, with thoughtful recommendations.</td>
<td></td>
</tr>
<tr>
<td>Detailed investigation into product material options and thorough analysis for product use.</td>
<td>Some depth of investigation into the impact of products or systems on individuals, society, and/or the environment.</td>
<td>Well-informed analysis of the impact of the product or system on individuals, society, and/or the environment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investigating</td>
<td>Planning</td>
<td>Producing</td>
<td>Evaluating</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
<td>-----------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Considered identification of a need, problem, or challenge.</td>
<td>Analysis of information to develop appropriate solutions to an identified design brief.</td>
<td>Competent application of skills, processes, procedures, and techniques to create a product or system to an appropriate standard and specification.</td>
<td>Considered evaluation of product success against design brief requirements.</td>
<td></td>
</tr>
<tr>
<td>Considered creation and validation of an initial design brief based on needs analysis and task identification.</td>
<td>Competent communication of product design ideas, using appropriate technical language.</td>
<td>Competent use of resources, equipment, and materials to create a product or system safely and generally accurately.</td>
<td>Considered evaluation of the effectiveness of the product or system realisation process.</td>
<td></td>
</tr>
<tr>
<td>Competent investigation of the characteristics of some existing products, processes, systems, and/or production techniques.</td>
<td>Competent testing, modification, and validation of ideas or procedures.</td>
<td>Development of appropriate solutions to technical problems that may arise during product or system realisation.</td>
<td>Considered reflection on materials, ideas, and procedures, with appropriate recommendations.</td>
<td></td>
</tr>
<tr>
<td>Competent investigation into product material options and analysis for product use.</td>
<td>Generally thoughtful investigation into the impact of products or systems on individuals, society, and/or the environment.</td>
<td>Informed analysis of the impact of the product or system on individuals, society, and/or the environment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generally thoughtful investigation into the impact of products or systems on individuals, society, and/or the environment.</td>
<td></td>
<td>Description of product progress, with elements of basic testing against design brief requirements.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identification of a basic need, problem, or challenge.</td>
<td>Some identification of information to attempt basic solutions to an identified design brief.</td>
<td>Partial application of skills, processes, procedures, and techniques to make one or more articles to a limited standard and specification.</td>
<td>Some description of the effectiveness of the product or system realisation process.</td>
<td></td>
</tr>
<tr>
<td>Creation of a basic initial design brief with some consideration of a needs analysis.</td>
<td>Basic communication of some product design ideas with some use of appropriate technical language.</td>
<td>Some use of basic resources, equipment, or materials to create a product or system, with some consideration of safety aspects.</td>
<td>Superficial reflection on or description of materials, ideas, or procedures, with basic recommendations.</td>
<td></td>
</tr>
<tr>
<td>Identification of the characteristics of some existing products, processes, systems, or production techniques.</td>
<td>Partial testing and some modification of ideas or procedures.</td>
<td>Partial development of some basic solutions to technical problems that may arise during product or system realisation.</td>
<td>Some consideration of the impact of the product on individuals, society, or the environment.</td>
<td></td>
</tr>
<tr>
<td>Some basic description of material options.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some description of the impact of products or systems on individuals, society, or the environment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investigating</td>
<td>Planning</td>
<td>Producing</td>
<td>Evaluating</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>E Limited identification of a need, problem, or challenge.</td>
<td>Attempted identification of some information to develop limited solutions to an identified design brief.</td>
<td>Attempted application of one or more skills, to follow an appropriate process, procedure, or technique.</td>
<td>Identification of some product progress, with limited testing.</td>
<td></td>
</tr>
<tr>
<td>Creation of a very basic initial design brief, with support.</td>
<td>Limited communication of one or more product design ideas.</td>
<td>Attempted use of resources, equipment, or materials, with emerging awareness of safety issues.</td>
<td>Identification of some aspects of the effectiveness of the product or system realisation process.</td>
<td></td>
</tr>
<tr>
<td>Statement of one or more characteristics of an existing product, process, system, or production technique.</td>
<td>Some attempt at testing and limited modification of an idea or procedure.</td>
<td>Some attempted description of problems that may arise during product or system realisation.</td>
<td>Identification rather than description of materials, ideas, or procedures, with one or more recommendations.</td>
<td></td>
</tr>
<tr>
<td>Limited description of one or more product material options.</td>
<td></td>
<td></td>
<td>Emerging recognition of one or more of the impacts of the product on individuals, society, or the environment.</td>
<td></td>
</tr>
<tr>
<td>Identification of one impact of a product or system on individuals, society, or the environment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ASSESSMENT INTEGRITY

The SACE Assuring Assessment Integrity Policy outlines the principles and processes that teachers and assessors follow to assure the integrity of student assessments. This policy is available on the SACE website (www.sace.sa.edu.au) as part of the SACE Policy Framework.

The SACE Board uses a range of quality assurance processes so that the grades awarded for student achievement, in both the school assessment and the external assessment, are applied consistently and fairly against the performance standards for a subject, and are comparable across all schools.

Information and guidelines on quality assurance in assessment at Stage 2 are available on the SACE website (www.sace.sa.edu.au).
SUPPORT MATERIALS

SUBJECT-SPECIFIC ADVICE
Online support materials are provided for each subject and updated regularly on the SACE website (www.sace.sa.edu.au). Examples of support materials are sample learning and assessment plans, annotated assessment tasks, annotated student responses, and recommended resource materials.

ADVICE ON ETHICAL STUDY AND RESEARCH
Advice for students and teachers on ethical study and research practices is available in the guidelines on the ethical conduct of research in the SACE on the SACE website (www.sace.sa.edu.au).