

NSW Syllabus for the Australian Curriculum

Technology Mandatory Years 7–8 Syllabus (2017)



Implementation in 2026

The new [Technology 7–8 Syllabus \(2023\)](#) is to be implemented in 2026.

2024 and 2025 – Plan and prepare to teach the new syllabus

2026 – Start teaching new syllabus

School sectors are responsible for implementing syllabuses and are best placed to provide schools with specific guidance and information on implementation given their understanding of their individual contexts.

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Introduction

K–10 Curriculum

The NSW Education Standards Authority (NESA) syllabuses are developed with respect to some overarching views about education. These include the NESA *K–10 Curriculum Framework* and *Statement of Equity Principles*, and the *Melbourne Declaration on Educational Goals for Young Australians* (December 2008).

NESA syllabuses include agreed Australian Curriculum content and content that clarifies the scope, breadth and depth of learning. The Australian Curriculum achievement standards underpin the syllabus outcomes and the Stage statements for Early Stage 1 to Stage 5.

In accordance with the *K–10 Curriculum Framework* and the *Statement of Equity Principles*, the syllabus takes into account the diverse needs of all students. It identifies essential knowledge, understanding, skills, values and attitudes. It outlines clear standards of what students are expected to know and be able to do in Years 7–8. It provides structures and processes by which teachers can provide continuity of study for all students.

The framework also provides a set of broad learning outcomes that summarise the knowledge, understanding, skills, values and attitudes essential for all students in all learning areas to succeed in and beyond their schooling.

The continued relevance of the *K–10 Curriculum Framework* is consistent with the intent of the *Melbourne Declaration on Educational Goals for Young Australians* (December 2008), which sets the direction for Australian schooling for the next ten years. There are two broad goals:

- Goal 1: Australian schooling promotes equity and excellence
- Goal 2: All young Australians become successful learners, confident and creative individuals, and active and informed citizens.

The way in which learning in the *Technology Mandatory Years 7–8 Syllabus* will contribute to the curriculum, and to students' achievement of the broad learning outcomes, is outlined in the syllabus rationale.

Diversity of Learners

NSW syllabuses are inclusive of the learning needs of all students. Syllabuses accommodate teaching approaches that support student diversity, including students with special education needs, gifted and talented students, and students learning English as an additional language or dialect (EAL/D). Students may have more than one learning need.

Students with Special Education Needs

All students are entitled to participate in and progress through the curriculum. Under the *Disability Standards for Education 2005*, schools are required to provide additional support or adjustments to teaching, learning and assessment activities for some students with special education needs.

[Adjustments](#) are measures or actions taken in relation to teaching, learning and assessment that enable a student with special education needs to access syllabus outcomes and content and demonstrate achievement of outcomes.

Students with special education needs can access outcomes and content from Years 7–8 syllabuses in a range of ways. Students may engage with:

- syllabus outcomes and content from their age-appropriate stage with adjustments to teaching, learning and/or assessment activities; or
- selected syllabus outcomes and content from their age-appropriate stage, relevant to their learning needs; or
- syllabus outcomes from an earlier Stage, using age-appropriate content; or
- selected Years 7–8 Life Skills outcomes and content from one or more syllabuses for students in Stages 4 and 5.

Decisions regarding curriculum options, including adjustments, should be made in the context of [collaborative curriculum planning](#) with the student, parent/carer and other significant individuals to ensure that syllabus outcomes and content reflect the learning needs and priorities of individual students.

Further information can be found in support materials for:

- [Technology](#)
- [Special education](#)
- [Life Skills](#).

Gifted and Talented Students

Gifted and talented students have specific learning needs that may require adjustments to the pace, level and content of the curriculum. Differentiated educational opportunities assist in meeting the needs of gifted and talented students.

Generally, gifted and talented students demonstrate the following characteristics:

- the capacity to learn at faster rates
- the capacity to find and solve problems
- the capacity to make connections and manipulate abstract ideas.

There are different kinds and levels of giftedness and talent. Gifted and talented students may also have learning disabilities and/or English as an additional language or dialect. These needs should be addressed when planning appropriate teaching, learning and assessment activities.

Curriculum strategies for gifted and talented students may include:

- differentiation: modifying the pace, level and content of teaching, learning and assessment activities
- acceleration: promoting a student to a level of study beyond their age group
- curriculum compacting: assessing a student's current level of learning and addressing aspects of the curriculum that have not yet been mastered.

School decisions about appropriate strategies are generally collaborative and involve teachers, parents/carers and students with reference to documents and advice available from NESA and the education sectors.

Gifted and talented students may also benefit from individual planning to determine the curriculum options, as well as teaching, learning and assessment strategies, most suited to their needs and abilities.

Students Learning English as an Additional Language or Dialect (EAL/D)

Many students in Australian schools are learning English as an additional language or dialect (EAL/D). EAL/D students are those whose first language is a language or dialect other than Standard Australian English and who require additional support to assist them to develop English language proficiency.

EAL/D students come from diverse backgrounds and may include:

- overseas and Australian-born students whose first language is a language other than English, including creoles and related varieties
- Aboriginal and Torres Strait Islander students whose first language is Aboriginal English, including Kriol and related varieties.

EAL/D students enter Australian schools at different ages and stages of schooling and at different stages of English language learning. They have diverse talents and capabilities and a range of prior learning experiences and levels of literacy in their first language and in Standard Australian English. EAL/D students represent a significant and growing percentage of learners in NSW schools. For some, school is the only place they use Standard Australian English.

EAL/D students are simultaneously learning a new language and the knowledge, understanding and skills of a syllabus through that new language. They require additional time and support, along with informed teaching that explicitly addresses their language needs, and assessments that take into account their developing language proficiency.

The *ESL Scales* and the [English as an Additional Language or Dialect: Teacher Resource](#) provide information about the English language development phases of EAL/D students. These materials and other resources can be used to support the specific needs of EAL/D students and to assist students to access syllabus outcomes and content.

Technology Mandatory Key

The following codes and icons are used in the *Technology Mandatory Years 7–8 Syllabus*.

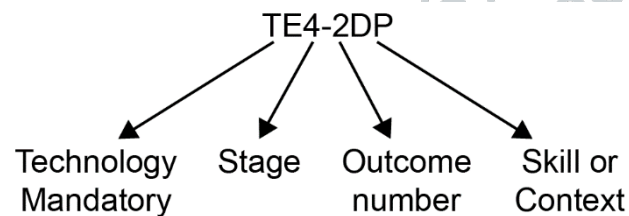
Outcome Coding

Syllabus outcomes are coded in a consistent way. The code identifies the subject, Stage, outcome number and the way content is organised.

Stage 4 and Life Skills are represented by the following codes:

Stage	Code
Stage 4	4
Life Skills	LS

In the *Technology Mandatory Years 7–8 Syllabus*, outcome codes indicate subject, Stage and outcome number. For example:

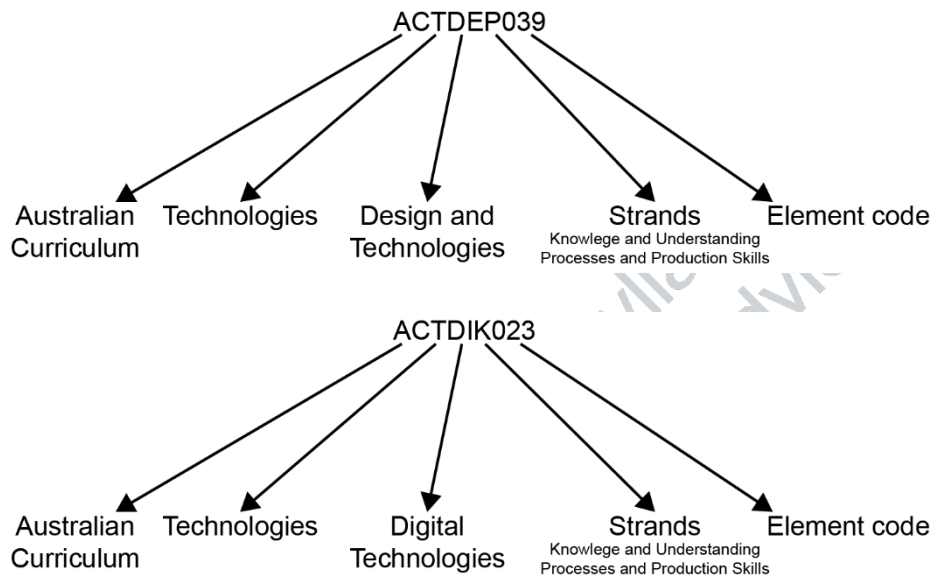


Outcome code	Interpretation
TE4-2DP	Technology Mandatory, Stage 4 – Outcome number 2, Design and Production
TELS-3DP	Technology Mandatory, Life Skills – Outcome number 3, Design and Production

Coding of Australian Curriculum Content

The syllabus includes Australian Curriculum content descriptions for Technologies. The content descriptions are identified by an Australian Curriculum code which appears in brackets at the end of each content description, for example:

- investigate the ways in which products, services and environments evolve locally, regionally and globally and how competing factors including social, ethical and sustainability considerations are prioritised in the development of technologies and designed solutions for preferred futures (ACTDEK029)






Where a number of content descriptions are jointly represented, all description codes are included, eg (ACTDEK001, ACTDEP005).

Coding Thinking Skills

The syllabus provides opportunities for types of thinking to be incorporated into the knowledge, understanding and skills of the syllabus. These opportunities are identified by codes at the end of the relevant content descriptions.

Course tools	Code
Computational thinking	CT
Design thinking	DT
Systems thinking	ST




For example:

- develop models, prototypes or products using a range of tools, materials and equipment to test the functionality of design ideas and consider innovative applications of advancing technologies (ACTDEP037) **DT**   








Learning Across the Curriculum Icons

Learning across the curriculum content, including the cross-curriculum priorities, general capabilities and other areas identified as important learning for all students, is incorporated and identified by icons in the *Technology Mandatory Years 7–8 Syllabus*.




Cross-curriculum priorities

-  Aboriginal and Torres Strait Islander histories and cultures
-  Asia and Australia's engagement with Asia
-  Sustainability

General capabilities

-  Critical and creative thinking
-  Ethical understanding
-  Information and communication technology capability
-  Intercultural understanding
-  Literacy
-  Numeracy
-  Personal and social capability

Other learning across the curriculum areas

-  Civics and citizenship
-  Difference and diversity
-  Work and enterprise

Rationale

Technology encompasses a diverse collection of knowledge, skills and processes that people use to satisfy their needs and to extend human capabilities. Technology Mandatory is a rich and complex subject that provides students with opportunities to become technologically literate individuals capable of developing creative solutions to identified problems and situations.

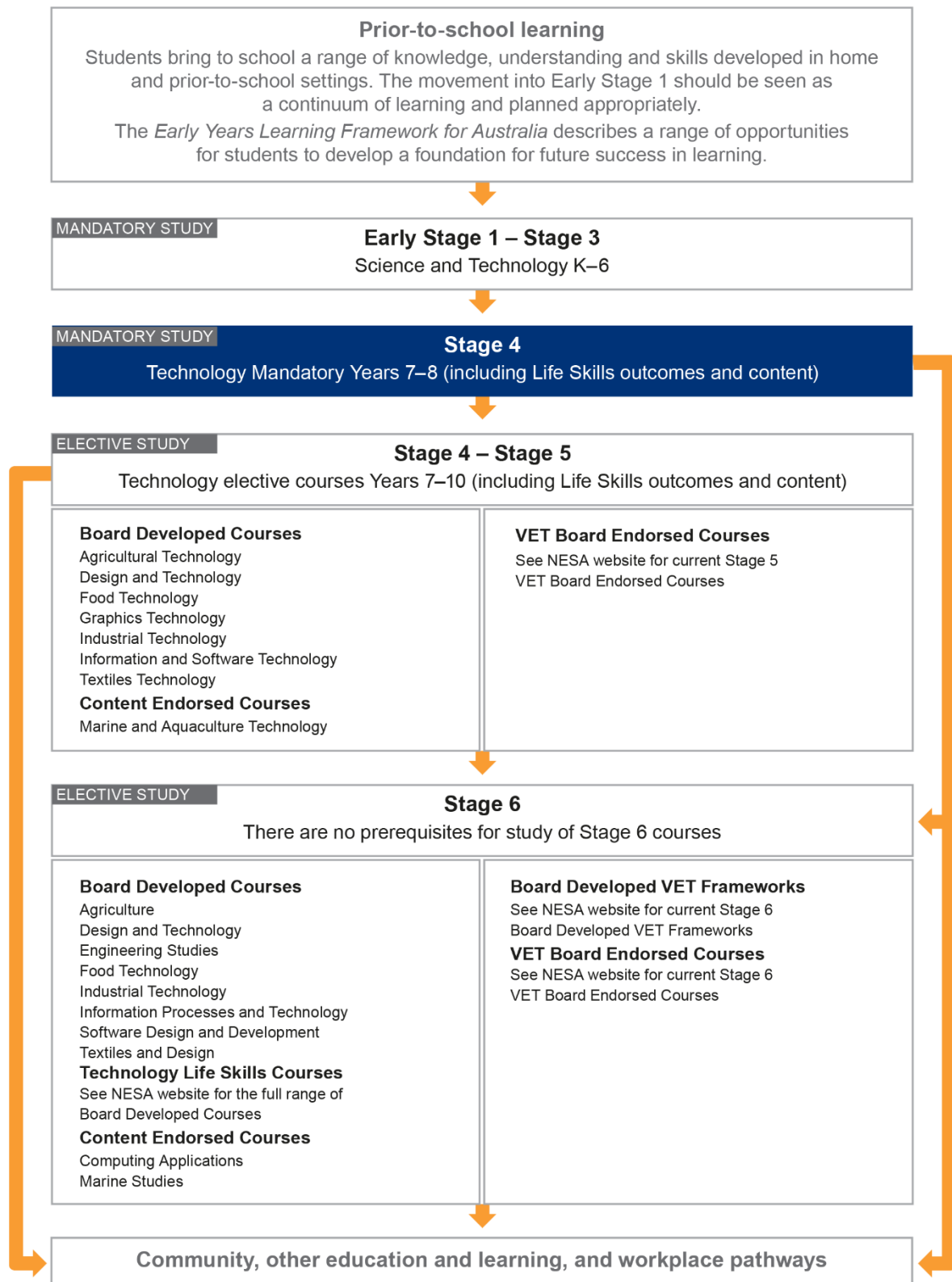
Technologies affect and enrich the lives of people and societies globally and contribute to shaping preferred futures. Through the study of Technology Mandatory, students develop the capacity for action and a critical appreciation of the processes through which technologies evolve and how they contribute to society.

Knowledge and understanding of technological content is developed through pedagogical approaches, such as project and problem-based learning. Through the production of innovative solutions to contextually relevant problems, students are provided with opportunities to use a variety of thinking strategies, embrace new concepts and learn through trialling, testing and refining ideas. The practical nature of Technology Mandatory engages students in design and production activities as they develop safe practices and refine skills working with varied materials and production technologies. These authentic learning experiences provide students with a sense of satisfaction and are the foundation for life-long learning.

The Technology Mandatory syllabus provides opportunities to reinforce and integrate knowledge and understanding from other subjects in the Years 7–10 curriculum. The diversity of learning experiences provided in Technology Mandatory encourages both independent and collaborative learning and the skills in designing, planning, managing and evaluating are transferrable across the curriculum. Technology Mandatory builds on Science and Technology K–6 and provides broad experiences in a range of contexts that are further explored in Technology electives in Years 7–12.

The opportunity to investigate problems, generate ideas and produce sustainable solutions develops skills and attitudes that are valued in our society and are integral to Australia's economic future. The skills and capabilities developed by students through the study of a variety of technology contexts can be applied to further education, and career opportunities in design, technology, engineering, science, mathematics and related fields.

The Place of the Technology Mandatory Years 7–8 Syllabus in the K–12 Curriculum



Aim

The study of Technology Mandatory in Years 7–8 enables students to become responsible users of technologies and designers of solutions. Through the practical application of knowledge and understanding, students develop skills in the safe use of a range of technologies to design, produce and evaluate solutions to identified needs and opportunities.

Before teaching this syllabus
refer to implementation advice
on curriculum.nsw.edu.au

Objectives

Skills

Students:

- develop practical skills with tools, materials and processes while working safely, independently and collaboratively on design projects
- develop thinking skills when designing and producing digital and non-digital solutions
- develop and apply skills in project management and evaluation when designing and producing solutions.

Knowledge and Understanding

Students develop knowledge and understanding of:

- how traditional, contemporary and advancing technologies are used when designing sustainable products and solutions
- how data is used in the development and automation of digital solutions
- the role of people and technologies in developing innovative solutions for preferred futures.

Values and Attitudes

Students:

- appreciate the contribution and impact of innovation and technologies now and in the future
- appreciate the dynamic nature of design and production processes and how they are used to develop solutions to personal, social and global issues
- appreciate the finite nature of some resources and the impact of their use on the environment and society
- value the development of skills and gain satisfaction from their use to solve problems and create quality products.

Outcomes

Table of Objectives and Outcomes – Continuum of Learning

Objectives Students: <ul style="list-style-type: none">• develop practical skills with tools, materials and processes while working safely, independently and collaboratively on design projects• develop thinking skills when designing and producing digital and non-digital solutions• develop and apply skills in project management and evaluation when designing and producing solutions
Outcomes Design and Production Skills A student: TE4-1DP designs, communicates and evaluates innovative ideas and creative solutions to authentic problems or opportunities TE4-2DP plans and manages the production of designed solutions TE4-3DP selects and safely applies a broad range of tools, materials and processes in the production of quality projects TE4-4DP designs algorithms for digital solutions and implements them in a general-purpose programming language

Objectives

Students develop knowledge and understanding of:

- how traditional, contemporary and advancing technologies are used when designing sustainable products and solutions
- how data is used in the development and automation of digital solutions
- the role of people and technologies in developing innovative solutions for preferred futures

Outcomes

Knowledge and Understanding

A student:

TE4-5AG investigates how food and fibre are produced in managed environments

TE4-6FO explains how the characteristics and properties of food determine preparation techniques for healthy eating

TE4-7DI explains how data is represented in digital systems and transmitted in networks

TE4-8EN explains how force, motion and energy are used in engineered systems

TE4-9MA investigates how the characteristics and properties of tools, materials and processes affect their use in designed solutions

TE4-10TS explains how people in technology related professions contribute to society now and into the future

Outcomes	Code
Agriculture Technologies	AG
Design and Production	DP
Digital Technologies	DI
Engineered Systems	EN
Food Technologies	FO
Material Technologies	MA
Technology and Society	TS

Stage Statements

Stage statements are summaries of the knowledge, understanding, skills, values and attitudes that have been developed by students as a result of achieving the outcomes for the relevant Stage of learning.

Prior-to-school Learning

Students bring to school a range of knowledge, understanding and skills developed in home and prior-to-school settings. The movement into Early Stage 1 should be seen as a continuum of learning and planned for appropriately.

The *Early Years Learning Framework for Australia* describes a range of opportunities for students to learn and develop a foundation for future success in learning.

The *Early Years Learning Framework for Australia* has five learning outcomes that reflect contemporary theories and research evidence about children's learning. The outcomes are used to guide planning and to assist all children to make progress.

The outcomes are:

1. Children have a strong sense of identity.
2. Children are connected with and contribute to their world.
3. Children have a strong sense of wellbeing.
4. Children are confident and involved learners.
5. Children are effective communicators.

In addition, teachers need to acknowledge the learning that children bring to school, and plan appropriate learning experiences that make connections with existing language and literacy development, including language used at home.

Early Stage 1 – Science and Technology K–6

By the end of Early Stage 1, students engage in the processes of Working Scientifically, and Design and Production to make sense of the world around them. They explore their immediate surroundings and ask questions about their observations and experiences. They collect data and communicate their ideas and observations in a variety of ways. Students investigate possibilities and solutions, individually and in collaboration with others, and use the design process to develop solutions. They effectively use a range of classroom equipment and learn to work safely when using resources and materials.

Students recognise that living things have different features and basic needs which can be met. They recognise that plants and animals can be used for food, clothing and shelter. Students identify that objects are made from materials that have observable properties, and that these properties influence their design and use. They describe how objects move and observe the effects of push and pull forces. Students identify daily and seasonal changes in the environment. Students also identify familiar digital systems and follow a simple set of instructions.

Stage 1 – Science and Technology K–6

By the end of Stage 1, students learn about and engage in the processes of Working Scientifically, and Design and Production. They participate in guided investigations, pose and respond to questions and make predictions. Students collect and represent information using a variety of methods. They safely manipulate equipment and materials, making sustainable and time-efficient choices. Students generate and develop design ideas and solutions that they communicate with labelled drawings and models and through the use of digital technologies where appropriate. They provide explanations about what they have done and evaluate their ideas using predetermined criteria.

Students describe the external features, changes and growth of living things and how their environments provide for their needs. They identify how plants and animals are produced for food and fibre. Students investigate the characteristics and properties of materials, how they can be changed and combined for a purpose. Students identify heat, light and sound energy and explore how forces and energy can be used. They are able to identify observable changes that occur on the Earth and in the sky and how humans care for the environment and Earth's resources. Students identify the components of digital systems and explore how data is represented through pictures, symbols and diagrams. They describe, follow and represent algorithms that are needed to solve problems.

Stage 2 – Science and Technology K–6

By the end of Stage 2, students engage in the processes of Working Scientifically, and Design and Production by asking questions, predicting outcomes and undertaking guided investigations with increasing independence. Students make and record observations, using formal units where appropriate, and compare results with predictions. They reflect on whether methods undertaken are fair and identify ways to improve subsequent investigations. Students organise and identify patterns in data and create tables to organise and represent information.

Students develop solutions that address specific criteria. They generate and develop ideas, using research to inform their design ideas, which are represented using sketches, brainstorming and where appropriate, digital technologies. Students select materials appropriate for their purposes, with consideration of sustainability and constraints to produce designed solutions. They are guided to develop specific criteria to critically evaluate designed solutions.

Students compare living things and identify the life cycles which support the survival of plant and animal species. They describe how agricultural processes are used to grow plants and raise animals for food, clothing and shelter. Students identify the physical properties of materials and how heat can alter their state. They investigate the suitability of natural and manufactured materials for specific purposes. They explain how energy is transferred from one place to another, and how forces affect objects and the behaviour of a product or system. Students describe the regular changes caused by interactions between the Earth and the Sun, and the changes to the Earth's surface that are caused over time by natural processes and human activity. They describe how digital systems transmit data, explore different types of data and how data patterns can be represented and interpreted.

Stage 3 – Science and Technology K–6

By the end of Stage 3, students develop an appreciation of the role of Science and Technology in local, national and global issues relevant to their lives and a sustainable future. Students engage in the skills of Working Scientifically, and Design and Production independently and collaboratively. They pose questions for investigation, predict likely outcomes, and demonstrate accuracy and honesty when collecting, recording and analysing data and information. Students plan and conduct fair tests, isolate variables and select appropriate measurement methods. They construct tables and graphs to organise data and are able to identify patterns, using evidence to compare with predictions, draw conclusions and develop explanations. Students develop criteria to evaluate success based on their intended outcome. They examine needs and opportunities for design projects, using research and existing solutions to inform their ideas. Students are able to reflect on their processes to identify risks and improve their design ideas, methods and findings. They communicate their ideas in tables, graphs, diagrams and multimodal texts, using digital technologies where applicable.

Students examine how environmental conditions affect the growth, adaptations, structural features and survival of living things. They explain how food and fibre are produced sustainably in managed environments for health and nutrition. Students examine the properties of materials and observe how changes of state occur and new substances are formed. Students explain how energy is transformed, describe the difference between contact and non-contact forces and investigate how electrical energy can control movement. They compare the regular events in the solar system with the irregular events that cause rapid changes to the Earth's surface. Students collect, store and interpret different types of data and explain how digital systems connect to form networks that transmit data. They define problems, and design, modify and follow simple algorithms that involve branching, iteration and user input.

Stage 4

By the end of Stage 4, students explore problems and opportunities considering functional, economic, environmental, social, technical and/or usability constraints. They investigate, select, justify and safely use a range of tools, materials, components, equipment and processes to develop, test and communicate design ideas using appropriate technical terms and technologies. Students plan, manage and evaluate the production of design solutions. They develop thinking skills to communicate the development of digital and non-digital solutions.

Students investigate how managed systems are used to sustainably produce food and fibre. They explain food selection and preparation, food safety, and make informed and healthy food choices. Students collect and interpret data from a range of sources to assist in making informed judgements. They explain how data is represented in digital systems, and transmitted and secured in networks.

Students explain how force, motion and energy can be used in systems, machines and structures. They investigate characteristics and properties of a range of materials, develop skills and techniques in the use of a broad range of tools and safely apply them in the production of projects.

Students are responsible users of technology, capable of designing and producing solutions to identified needs or opportunities. They develop an appreciation of the contribution of technologies on their lives now and the impact of innovations for creating preferred futures. They develop an appreciation of the dynamic nature of design and production processes and how thinking skills are used to develop solutions to personal, social and global issues.

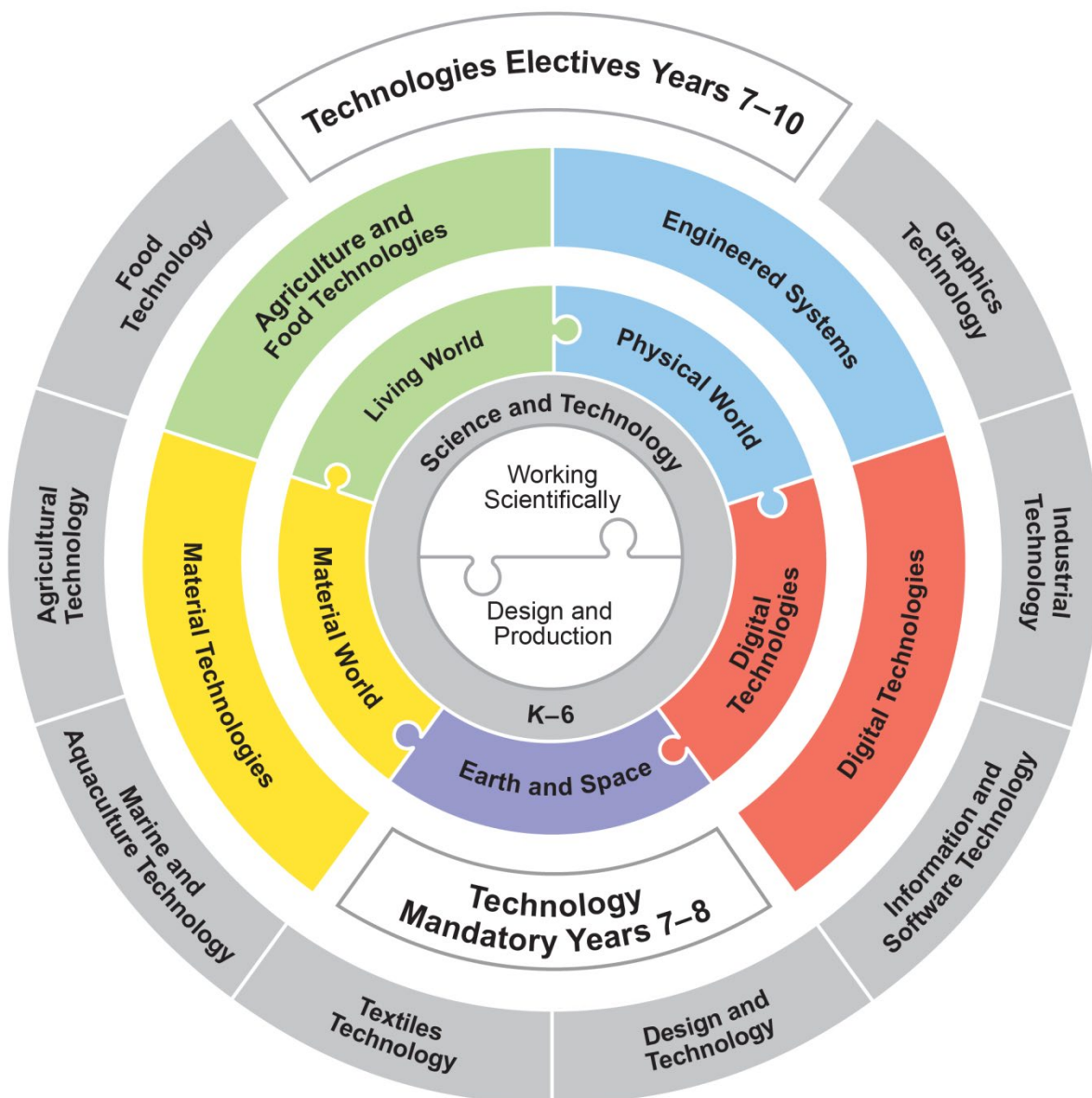
Content

For Kindergarten to Year 10, courses of study and educational programs are based on the outcomes of syllabuses. The content describes in more detail how the outcomes are to be interpreted and used, and the intended learning appropriate for the Stage. In considering the intended learning, teachers will make decisions about the sequence, the emphasis to be given to particular areas of content, and any adjustments required based on the needs, interests and abilities of their students.

The knowledge, understanding and skills described in the outcomes and content provide a sound basis for students to successfully move to the next stage of learning.

Organisation of Content

The following diagram provides an illustrative representation of elements of the course and their relationship.



The content modules in Science and Technology K–6 are the basis for the continuum of learning for Technology Mandatory Years 7–8. Students can choose to continue their learning in Technology Stage 5 electives.

The continuum for Technology Mandatory Years 7–8 contexts are identified below:

Science and Technology K–6	Technology Mandatory Years 7–8
Working Scientifically Design and Production	Design and Production
Living World	Agriculture and Food Technologies
Digital Technologies	Digital Technologies
Physical World	Engineered Systems
Material World	Material Technologies

Content structure for Technology Mandatory Years 7–8

The Technology Mandatory Years 7–8 syllabus outcomes are presented as:

- Skills
- Knowledge and Understanding

Context	Indicative hours
Digital Technologies	50
Agriculture and Food Technologies Engineered Systems Material Technologies	150
Course Delivery <ul style="list-style-type: none">• All four technology contexts must be delivered across Years 7–8.• Digital Technologies must be delivered for a minimum of 50 indicative hours.• Technology contexts may be taught individually.• Technology contexts may be taught concurrently.• Technology contexts may be repeated.• At least four design projects must be produced across Years 7–8, one for each of the four contexts.• If technology contexts are combined, a single design project that addresses each context may be undertaken. This combined project must provide opportunities to assess student achievement of the specific context outcomes.• At least four design and production folios must be developed across Years 7–8.	

Design Projects

Design Projects involve the design, production and evaluation of quality solutions that are functional and meet identified needs or opportunities. Students must undertake a minimum of four design projects across Years 7–8.

Design and Production Folios

Students should develop design and production folios documenting evidence of the application of a design process and the specific technologies used in production. Students must produce a minimum of four design and production folios across Years 7–8.

A design and production folio may include ideas, sketches, drawings, experimentation, samples, research, photographs, details of construction and evaluation. These may be presented in a notebook, printed booklet, display folder, digital presentation, online record (blog) or a combination of these to provide evidence of the design and production process.

It is anticipated that as students develop their skills, design and production folios may increase in complexity from a scaffolded document to a more detailed record of the design, planning, production and evaluation of the design project.

Practical Experiences

To satisfy the requirements of the syllabus, students must undertake a range of practical experiences that occupy the majority of course time. Practical experiences allow students to develop skills and confidence in the use of a range of hand and machine tools. Student capability, confidence and expertise at their current stage of development are important considerations in determining the teaching and learning sequences in the course. Students with special education needs may require adjustments and/or additional support in order to engage in practical experiences.

Safety

Schools have a legal obligation in relation to safety. Teachers need to ensure that they comply with relevant legislation as well as system and school requirements in relation to safety and risk management when implementing their programs. This includes legislation and guidelines relating to Work Health and Safety, and the handling and storage of chemicals and dangerous goods. Teachers need to be aware of activities that may require notification, certification, permission, permits and licences.

Schools need to be aware of legal, ethical and cyber security considerations of digital solutions, including copyright and intellectual property, cultural considerations, accessibility, privacy issues and digital footprints.

Teachers need to be aware that students may have food or other allergies that can result in anaphylaxis, a severe and sometimes sudden allergic reaction which is potentially life-threatening and always requires an emergency response. This is an important consideration in selecting foods or other resources.

Animal Welfare

Schools have a legal responsibility in relation to the welfare of animals. The keeping of animals and all practical activities involving animals must comply with relevant guidelines and legislation that are interpreted for schools on the Animals in Schools website.

Design and Production Process

The practical nature of Design and Production engages students in critical and creative thinking, including understanding interrelationships between systems when solving complex problems.

Design and Production enables students to demonstrate their knowledge and understanding of technology through consideration of how solutions are created to enable preferred futures. Students should be provided with opportunities to identify the potential benefits and risks of creating solutions.

Design and Production is not necessarily a linear process. It should involve a systematic approach to research, problem-solving, prototyping and evaluation to provide opportunities for students to learn about the value of planning and reviewing processes as they produce designed solutions.

The Technology Mandatory syllabus content in each context has been structured using the following Design and Production processes:

Identifying and defining

Students reflect on design solutions, explore needs and opportunities, and evaluate the purpose and operation of technologies. Students:

- question and review existing products, processes and systems as they consider the future needs of society
- investigate problems and opportunities considering function, economic, environmental, social, technical and/or usability constraints
- develop criteria to evaluate design ideas, processes and solutions.

Researching and planning

Students should be provided with opportunities to conduct research, generate and communicate ideas, and develop project management skills. They should be encouraged to be creative, propose new approaches to problems and explore new design opportunities. Students:

- investigate, select and justify the use of a range of tools, materials, components, equipment and processes
- develop, test and communicate design ideas using appropriate technical terms and technologies
- use graphical representation techniques including drawing, sketching, storyboarding and/or modelling
- design and represent algorithms and steps for the development of design solutions
- develop plans to safely manage the production of design solutions.

Producing and implementing

Students should be provided with opportunities to learn about and apply a variety of skills and techniques to produce products, services and/or environments to meet specific purposes and user needs. Students:

- safely use a range of tools, materials, components, equipment and processes in the production of design solutions
- individually and collaboratively manage the production of designed solutions
- implement and modify user interfaces
- plan and manage projects that involve communicating ideas and sharing information online.

Testing and evaluating

Students should be provided with opportunities to evaluate and make judgements throughout design and production about the quality and effectiveness of their designed solutions and those of others.

Students:

- evaluate design solutions against the developed criteria
- evaluate the effectiveness and suitability of choices made during the development and production of the solution.

Thinking Skills

Productive, purposeful and intentional thinking underpins effective learning in Technology Mandatory. Students are provided with opportunities to apply thinking skills and develop an understanding of the processes they can use as they encounter problems, unfamiliar information and new ideas.

Thinking skills are coded throughout the syllabus content. Where appropriate, teachers are encouraged to identify further opportunities to develop these skills in their students.

Computational thinking – CT

Computational thinking is a process where a problem is analysed and solved so that a human, machine or computer can effectively implement the solution. It involves using strategies to organise data logically, break down problems into parts, interpret patterns and design and implement algorithms to solve problems.

Design thinking – DT

Design thinking involves a process where a need or opportunity is identified and a design solution is developed. The consideration of economic, environmental and social impacts that result from designed solutions are core to design thinking. Design thinking methods can be used when trying to understand a problem, generate ideas and refine a design based on evaluation and testing.

Systems thinking – ST

Systems thinking is an understanding of how related objects or components interact to influence how a system functions. Students are provided with opportunities to recognise the connectedness of, and interactions between phenomena, people, places and events in local and wider contexts and to consider the impact of their decisions. Understanding the complexity of systems and the interdependence of components is important for scientific research and for the creation of solutions to technical, economic and social issues.

Technologies and Society

Technologies and society content is embedded in each of the context areas and provides opportunities for students to consider both the positive and negative impacts of technologies.

The technologies and society content focuses on how people in general and those in technology related professions use and develop technologies. These include taking into account social, economic, environmental, ethical, legal, aesthetic and functional factors and the impact of technologies on individuals; families; local, regional and global communities; the economy; and the environment – now and into the future.

Learning Across the Curriculum

Learning across the curriculum content, including the cross-curriculum priorities and general capabilities, assists students to achieve the broad learning outcomes defined in the NESA *K–10 Curriculum Framework* and *Statement of Equity Principles*, and in the *Melbourne Declaration on Educational Goals for Young Australians* (December 2008).

Cross-curriculum priorities enable students to develop understanding about and address the contemporary issues they face.

The cross-curriculum priorities are:

- Aboriginal and Torres Strait Islander histories and cultures 🇺🇸
- Asia and Australia's engagement with Asia 🌏
- Sustainability 🌱

General capabilities encompass the knowledge, skills, attitudes and behaviours to assist students to live and work successfully in the 21st century.

The general capabilities are:

- Critical and creative thinking 🧠
- Ethical understanding 🏛️
- Information and communication technology capability 💻
- Intercultural understanding 🌐
- Literacy 📖
- Numeracy 📊
- Personal and social capability 🧑

NESA syllabuses include other areas identified as important learning for all students:

- Civics and citizenship 🇺🇸
- Difference and diversity 🌈
- Work and enterprise ⭐

Learning across the curriculum content is incorporated, and identified by icons, in the content of the *Technology Mandatory Years 7–8 Syllabus* in the following ways.

Aboriginal and Torres Strait Islander Histories and Cultures

The syllabus provides students with opportunities to learn about how Aboriginal and Torres Strait Islander Peoples have developed and refined knowledge about the world through observation, making predictions, testing and responding to environmental factors within specific contexts. It emphasises the relationships people have with places and their interconnectedness with the environments in which they live. Students learn about Aboriginal and Torres Strait Islander Peoples' understanding of the environment and the ways that traditional knowledge and western knowledge can be complementary. Students learn that there are different ways of interacting with the environment and how this can influence sustainability.

When planning and programming content relating to Aboriginal and Torres Strait Islander histories and cultures, teachers are encouraged to:

- involve local Aboriginal communities and/or appropriate knowledge holders in determining suitable resources, or to use Aboriginal or Torres Strait Islander authored or endorsed publications
- read the [Principles and Protocols](#) relating to teaching and learning about Aboriginal and Torres Strait Islander histories and cultures and the involvement of local Aboriginal communities.

Asia and Australia's Engagement with Asia

Students have opportunities to explore the links that exist between Australia and Asia and appreciate how our interactions help to shape Australia's economy, areas of research and technological advancement. Students identify how the Asia region plays an important role in research and technological developments in areas such as medicine, natural resource management and natural disaster prediction and management.

Sustainability

Sustainability content is focused on renewable resources, the protection of the environment and sustainable patterns of living and requires consideration of environmental, social, cultural and economic systems and their interdependence. Students learn about the actions required to improve sustainability, helping them to take a more active role in shaping preferred futures. Students investigate the relationships between system components, consider how systems respond to change and develop an appreciation of the impact that design solutions can have on the Earth's resources.

Critical and Creative Thinking

Critical thinking is at the core of most activities where students recognise or develop an argument, use evidence in support of an argument, draw reasoned conclusions, and use information to solve problems. Students are provided with opportunities to generate and apply new ideas in specific contexts, view existing situations in a new way, identify alternative explanations, and make links that generate a positive outcome. The skills and processes of Design and Production provide critical and creative thinking opportunities as students pose questions, make predictions, engage in first-hand investigations, design projects, solve problems and make evidence-based decisions.

Ethical Understanding

Students develop capacity to behave ethically as they identify and investigate ethical concepts, values and principles, and understand how reasoning can assist ethical judgement. The syllabus provides opportunities for students to form and make ethical judgements in relation to design solutions, codes of practice, use of digital technologies and online collaborative environments. They apply ethical guidelines as they design projects, particularly when considering the implications for others and the environment. Students are encouraged to demonstrate ethical digital citizenship, follow social and ethical protocols and understand the need to protect data and intellectual property.

Information and Communication Technology Capability

Students engage with information and communication technology (ICT) when they develop design ideas and solutions, solve problems, collaborate online and communicate information and ideas. ICT, through animations and simulations, provides opportunities to view phenomena, test predictions and visualise designs that cannot be investigated or produced through practical experiences in the classroom, and may enhance students' understanding and engagement with technology.

The ICT capability enables students to become effective users of information and communication technologies. The Digital Technologies context is distinguished by providing students with the skills to become confident developers of digital solutions.

Intercultural Understanding

Students develop intercultural understanding and value their own culture and those of others as they engage with people from diverse cultural backgrounds in ways that recognise similarities and differences, create connections and cultivate respect. The syllabus provides opportunities for students to appreciate the contribution that diverse cultural perspectives have made to the development, breadth and diversity of technological knowledge and its applications. Students learn about and engage with issues requiring cultural sensitivity and recognise that people in technology related professions work in culturally diverse teams. They learn about the interactions between technologies and society, and are provided with opportunities to take responsibility for securing positive outcomes for members of all cultural groups.

Literacy

The syllabus provides students with opportunities to develop skills in literacy to effectively communicate and comprehend using a variety of modes and media. Being 'literate' is more than the acquisition of technical skills – it includes the ability to identify, understand, interpret, create and communicate effectively using written, visual and/or digital forms of expression. The language of technology is often technical and includes specific terms for concepts, processes and features of the world. Students use subject-specific vocabulary to describe, develop and present design solutions. They develop an understanding that technological information can be presented in a variety of forms including diagrams, infographics, flowcharts, models, tables and graphs. Project work and the associated documentation provides an authentic context for development of literacy skills, particularly technological literacy.

Numeracy

Real-world numeracy connections are formed when numerical data is collected and manipulated and numeracy concepts, such as size, proportion and measurement, are used by students as tools in the design and production process. An appreciation of the fundamental importance of numeracy in everyday life is fostered as students develop an understanding of how numeracy is essential to a variety of technologies, such as the functionality of digital technologies and the importance of accurate measurement in the production of quality products. As they develop design projects and solutions, students are provided with opportunities to learn data analysis skills, create technical drawings, work with digital models and use computational thinking.

Personal and Social Capability

Students develop personal and social capability as they learn to understand and manage themselves, their relationships and their lives more effectively. This provides students with opportunities to establish positive relationships, work effectively both individually and collaboratively, and resolve difficult situations. The syllabus encourages students to explore, question, solve problems and develop skills in communication, display initiative, set goals and make responsible decisions.

Civics and Citizenship

The syllabus provides students with opportunities to become self-reliant and active members of a society driven by change, advancing technologies and increasingly sophisticated communication and information systems. Students broaden their understanding of civics and citizenship in relation to the application of technological advances and the development of environmental and sustainable practices. Students have opportunities to develop a sense of local responsibility and global citizenship as they improve and advance Australia through their investigations and future focused solutions.

Difference and Diversity

Difference and diversity comprises gender, ethnicity, ability and socio-economic circumstances. The syllabus provides students with opportunities to develop their awareness, understanding and appreciation of difference and diversity within their lives and the wider community. Students have opportunities to work collaboratively and develop an appreciation of the values and ideas of all group members. This also enables them to identify individual rights, challenge stereotypes and engage with opinions different to their own.

Work and Enterprise

Students develop an understanding of careers associated with technology and learn skills relevant to work and leisure activities. Students are provided with opportunities to learn about careers in a broad range of fields related to technology occupations and study issues related to work and employment. Students are provided with opportunities to safely manage and produce projects, and to appreciate quality of work. The application of design and production processes can provide students with work-related skills including individual and collaborative work practices. Students are encouraged to develop initiative, and to become independent thinkers and confident communicators.

Content for Stage 4

Agriculture and Food Technologies

Outcomes

A student:

- › designs, communicates and evaluates innovative ideas and creative solutions to authentic problems or opportunities TE4-1DP
- › plans and manages the production of designed solutions TE4-2DP
- › selects and safely applies a broad range of tools, materials and processes in the production of quality projects TE4-3DP
- › investigates how food and fibre are produced in managed environments TE4-5AG
- › explains how the characteristics and properties of food determine preparation techniques for healthy eating TE4-6FO
- › explains how people in technology related professions contribute to society now and into the future TE4-10TS

Related Life Skills outcomes: TELS-1DP, TELS-2DP, TELS-3DP, TELS-4DP, TELS-6AG, TELS-7FO, TELS-11TS

Context Focus

The Agriculture and Food Technologies context integrates content from agriculture (food and fibre production) and food technologies to enable delivery with consideration of the school context and available resources.

Agriculture (food and fibre production) focuses on the investigation of managed environments, such as farms and plantations. Students learn about the processes of food and fibre production and investigate the innovative and sustainable supply of agriculturally produced raw materials. Students develop knowledge and understanding about managed systems that produce food and fibre through designing and producing solutions.

Food technologies focuses on the use of resources produced and harvested to sustain human life. Students learn about the characteristics and properties of food. Students are provided with opportunities to develop knowledge and understanding about food selection and preparation, food safety and how to make informed choices when experimenting with and preparing nutritious food.

Content

Identifying and defining

Students:

- investigate the importance of food and fibre production to Australia's food security and economy including Asia's imports and exports (ACTDEK029) 🌐 🌱 🌾
- investigate how food and fibre production is managed in environments as a system and how sustainability can be improved, for example: (ACTDEK032) **ST** 🌱 🌾 🌿
 - plants and/or animal species grown in managed environments
 - land management by Aboriginal and/or Torres Strait Islander Peoples
 - boundaries, inputs, outputs, processes and feedback occurring in a managed environment
- evaluate environments that have been designed in consultation with community groups, for example: 🌱 🌿
 - a bush tucker garden
 - a school or community garden
- investigate the characteristics and properties of a variety of nutritious foods, for example: **CT**
 - high in fibre, eg fruits and vegetables
 - high in protein, eg meat and meat alternatives
- explore the nutritional needs of a group of people, eg adolescents, toddlers **CT** 🌐 🌱 🌿
- develop criteria to evaluate design ideas, processes and solutions, the functionality, aesthetics and a range of constraints, eg accessibility, cultural, economic, resources, safety, social, sustainability, technical (ACTDEP038, ACTDIP027, ACTDIP031) **DT ST** 🌱 🌿 🌾 🌱

Researching and planning

Students:

- design and plan a product associated with agricultural production (ACTDEP036) **DT ST** 🌱 🌿 🌾 🌱
- research legal and ethical requirements associated with agricultural production, eg keeping animals 🌐 🌱 🌿
- investigate ideal conditions for growth and development of an agricultural plant or animal (ACTDEK032) **ST** 🌱 🌿 🌾
- develop a schedule or calendar for ongoing care of a plant or animal species associated with an agricultural project (ACTDEP039) **ST** 🌱 🌿 🌾
- acquire and interpret data, for example: (ACTDIP025, ACTDIP026) **CT ST** 🌐 🌱 🌿
 - local environmental and/or physical conditions, eg rainfall, temperature
 - nutrition information panels, eg saturated fat, sugar content
- plan nutritious dish(es) to suit a group within society, for example: **DT** 🌱 🌿 🌾 🌱
 - high calcium and iron for adolescents
 - food for cultural celebrations
- identify a range of food preparation techniques and analyse the impact on nutrient value (ACTDEK033) **CT** 🌱 🌿 🌾
- investigate and communicate how a recipe can be improved to enhance nutritional value, and justify the recipe adjustment, for example: (ACTDEP039) **DT** 🌱 🌿 🌾 🌱
 - using wholemeal flour instead of white flour for increased dietary fibre

Producing and implementing

Students:

- produce and implement an agricultural project and/or produce nutritious food (ACTDEP039) **DT** ✨
🌱🌱🌱
- select, justify and use a range of appropriate tools and techniques in an agricultural project and/or food preparation (ACTDEK037) **DT ST**
- identify and apply safe and ethical work practices, for example: **DT** ⚖️🌱🌱
 - correct use of tools and equipment
 - food safety and hygiene practices

Testing and evaluating

Students:

- evaluate the effectiveness and suitability of choices made during the development and production of the solution
- assess the solution against the predetermined criteria 🌱

Before teaching this syllabus
refer to implementation advice
on curriculum.nsw.edu.au

Digital Technologies

Outcomes

A student:

- › designs, communicates and evaluates innovative ideas and creative solutions to authentic problems or opportunities TE4-1DP
- › plans and manages the production of designed solutions TE4-2DP
- › designs algorithms for digital solutions and implements them in a general-purpose programming language TE4-4DP
- › explains how data is represented in digital systems and transmitted in networks TE4-7DI
- › explains how people in technology related professions contribute to society now and into the future TE4-10TS

Related Life Skills outcomes: TELS-1DP, TELS-2DP, TELS-3DP, TELS-5DP, TELS-8DI, TELS-11TS

Context Focus

The Digital Technologies context encourages students to develop an empowered attitude towards digital technologies, use abstractions to represent and decompose real-world problems, and implement and evaluate digital solutions. Students have the opportunity to become innovative creators of digital technologies in addition to effective users of digital systems and critical consumers of the information they convey.

Students are provided with opportunities to develop fluency in a general-purpose programming language and use these skills to solve information problems and to automate repetitive tasks.

Digital Technologies content must be delivered for a minimum of 50 indicative hours by the end of Stage 4.

Content

Identifying and defining

Students:

- evaluate how existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDEK029, ACTDIP031) ✦ ⚙️ 📊
- define and decompose real-world problems, taking into account functional requirements and a range of constraints, eg economic, environmental, social, technical and usability (ACTDIP027) ✦ ⚙️ 🏠 🌱
- evaluate the suitability of hardware with particular performance characteristics against the needs of different users, for example: (ACTDIK023) 🖥️
 - high-powered systems for gaming and computation
 - energy-efficient systems for travel and productivity
 - small and light systems for health monitoring
- develop criteria to evaluate design ideas, processes and solutions, the functionality, aesthetics and a range of constraints, eg accessibility, cultural, economic, resources, safety, social, sustainability, technical (ACTDEP038, ACTDIP027, ACTDIP031) **DT ST** ✦ ⚙️ 🏠 🌱

Researching and planning

Students:

- investigate how digital systems represent text, image and audio with whole numbers, for example: (ACTDIK024) 🖥️
 - representing letters, digits, symbols and emojis in Unicode
 - representing colours and pixels as amounts of red, green, blue and alpha
 - representing audio signals using sampling and quantisation
- explain how and why whole numbers are represented in binary in digital systems (ACTDIK024) **ST** ⚙️ 📊
- explore how data is transmitted and secured in wired, wireless and mobile networks, for example: (ACTDIK023) ⚙️ 🖥️
 - how data is transferred over the internet with TCP/IP
 - how transmission media affects the reliability and speed of data transfer
 - how data is secured in wireless networks with WPA
- design algorithms that use a range of data types, branching and iteration and represent them diagrammatically and in English (ACTDIP029) **CT DT** ⚙️ 🏠 📊
- design the user experience of a digital solution, generating, evaluating and communicating alternative ideas (ACTDEP036, ACTDIP028, ACTDIP032) **CT DT** ⚙️ 🖥️
- collect and access data from a range of sources, for example: (ACTDIP025) 🖥️
 - using sensors to collect temperature data
 - downloading public datasets from the internet
- evaluate the authenticity, accuracy and timeliness of data (ACTDIP025) ⚙️ 📊
- interpret and visualise data using a range of software to create information, for example: (ACTDIP026) **CT ST** ⚙️ 🖥️ 🏠
 - using a graph to identify patterns, trends and outliers
 - calculating a budget or numerical simulation
 - summarising or aggregating data to draw conclusions
 - filtering or sorting to answer a specific question
- model objects or events using structured data, for example: (ACTDIP026) ⚙️ 🖥️
 - the properties of characters and objects in a game

Producing and implementing

Students:

- plan and manage projects individually and collaboratively (ACTDEP039) 🏠 ⚙️
- implement and modify programs involving branching, iteration and functions in a general-purpose programming language, for example: (ACTDIP030) CT ⚙️
 - microcontroller
 - robotics
 - app development
- implement a functioning user interface, for example: (ACTDIP030) 🖥️
 - indicator LEDs on a microcontroller
 - website
 - game

Testing and evaluating

Students:

- evaluate how student solutions address defined functional requirements and constraints (ACTDIP031) ⚙️
- trace algorithms to predict output for a given input and to identify errors (ACTDIP029)
- identify social, ethical and cyber security considerations of digital solutions, for example: 🌐 🌍 🛡️
 - copyright and intellectual property
 - cultural considerations, eg Indigenous cultural and intellectual property 🇺🇸
 - accessibility
 - privacy issues and digital footprints

Engineered Systems

Outcomes

A student:

- › designs, communicates and evaluates innovative ideas and creative solutions to authentic problems or opportunities TE4-1DP
- › plans and manages the production of designed solutions TE4-2DP
- › selects and safely applies a broad range of tools, materials and processes in the production of quality projects TE4-3DP
- › explains how force, motion and energy are used in engineered systems TE4-8EN
- › explains how people in technology related professions contribute to society now and into the future TE4-10TS

Related Life Skills outcomes: TELS-1DP, TELS-2DP, TELS-3DP, TELS-4DP, TELS-9EN, TELS-11TS











Context Focus

The Engineered Systems context focuses on how force, motion and energy can be used in systems, machines and structures. Students are provided with opportunities to experiment and develop prototypes to test their solutions. They understand how forces and the properties of materials affect the behaviour and performance of engineered systems, machines and structures. Knowledge of these principles and systems enables the design and production of sustainable, engineered solutions.

Content










Identifying and defining

Students:

- investigate the way in which technologies evolve locally, regionally or globally and how competing factors are prioritised in the development of design solutions, for example: (ACTDEK029) **ST** 
 - automation and data transfer in manufacturing, eg Industry 4.0
 - GPS and drone technologies used in farming
- investigate the role of an engineering professional and their impact on the environment and society 
- investigate the way Aboriginal and/or Torres Strait Islander Peoples use engineered solutions to serve community needs including those of cultural identity, for example: 
 - transport, eg canoe building
 - tools, eg boomerang, woomera
 - structures, eg customary shelters, contemporary architecture
- investigate needs or opportunities for designing an engineered system and investigate and select from a range of materials, components, tools, equipment and processes (ACTDEP035) **DT ST** 
- develop criteria to evaluate design ideas, processes and solutions, the functionality, aesthetics and a range of constraints, eg accessibility, cultural, economic, resources, safety, social, sustainability, technical (ACTDEP038, ACTDIP027, ACTDIP031) **DT ST** 







Researching and planning

Students:

- investigate how force, motion and/or energy are utilised when designing engineered systems, for example: (ACTDEK031) 
 - electronic circuits
 - mechanisms involving simple machines
 - built environments
- select and use a variety of critical and creative thinking strategies to generate innovative design ideas, for example: **DT ST** 
 - brainstorming
 - sketching
 - 3-D modelling
 - experimenting
- generate and communicate the development of design ideas, plans and processes for various audiences using appropriate technical terms and technologies including graphical representation techniques, for example: (ACTDEP036) **CT DT** 
 - sketches, drawings and computer-aided design (CAD)
 - models and prototypes
 - engineering reports
 - digital presentations





Producing and implementing

Students:

- produce products or systems that apply engineering principles, for example: (ACTDEK031, ACTDEP039) **DT**   
 - a product that applies force, motion and/or energy for a purpose, eg toys, windmill
 - aeronautical vehicles designed according to the principles of flight
 - structures designed according to statics and properties of materials
 - electronic circuits designed using electrical laws
- develop models, prototypes or products using a range of tools, materials and equipment to test the functionality of design ideas and consider innovative applications of advancing technologies, for example: (ACTDEP037) **DT**   
 - developing computer-aided design (CAD) files to automate manufacturing technologies
 - programming a microcontroller to collect data or automate a task
 - computer-aided manufacturing (CAM)

Testing and evaluating

Students:

- develop and apply testing procedures to evaluate an engineered system   
- evaluate the effectiveness and suitability of choices made during the development and production of the engineered solution
- assess the solution against the predetermined criteria 

Material Technologies

Outcomes

A student:

- › designs, communicates and evaluates innovative ideas and creative solutions to authentic problems or opportunities TE4-1DP
- › plans and manages the production of designed solutions TE4-2DP
- › selects and safely applies a broad range of tools, materials and processes in the production of quality projects TE4-3DP
- › investigates how the characteristics and properties of tools, materials and processes affect their use in designed solutions TE4-9MA
- › explains how people in technology related professions contribute to society now and into the future TE4-10TS

Related Life Skills outcomes: TELS-1DP, TELS-2DP, TELS-3DP, TELS-4DP, TELS-10MA, TELS-11TS

Context Focus











The Material Technologies context focuses on the application of specialist skills and techniques to a broad range of traditional, contemporary and advancing materials. Students develop knowledge and understanding of the characteristics and properties of a range of materials through research, experimentation and practical investigation, and when they make products to satisfy identified needs and opportunities.

The Material Technologies context can include but is not limited to electronics, graphics, metals, multimedia, polymers, textiles, timber.

Content












Identifying and defining

Students:

- investigate products and services for the individual and/or the community, considering ethical and social factors (ACTDEK029) **ST**   
- investigate a current and innovative product developed by an Aboriginal and/or Torres Strait Islander designer that is influenced by their cultural identity  
- investigate the role of the professional in the related technology, and their impact on the environment and society  
- develop criteria to evaluate design ideas, processes and solutions, the functionality, aesthetics and a range of constraints, eg accessibility, cultural, economic, resources, safety, social, sustainability, technical (ACTDEP038, ACTDIP027, ACTDIP031) **DT ST**   








Researching and planning

Students:

- investigate the characteristics and properties of a range of materials and products (ACTDEK034)
- select from a range of materials, components, tools, equipment and processes to develop design solutions (ACTDEP035) **ST**   
- experiment with a range of appropriate techniques to produce a design solution **DT** 
- generate and communicate the development of design ideas, plans and processes for various audiences using appropriate technical terms and technologies including graphical representation techniques, for example: (ACTDEP036) **CT DT**     
 - sketches, drawings and computer-aided designs (CAD)
 - patterns
 - models
 - digital presentations
- use appropriate project management processes when working both individually and collaboratively to coordinate the production of a designed solution (ACTDEP039) **CT ST**  
- select and justify the safe use of tools and equipment used to create a design solution


Producing and implementing

Students:

- demonstrate safe, independent and collaborative work practices in the production of designed solutions (ACTDEP037)  
- apply appropriate tools, equipment, materials, techniques and processes in the production of a design project, for example: (ACTDEP034) **ST**   
 - contemporary, traditional and/or advancing manufacturing techniques
 - surface preparation techniques, finishes, embellishments and/or decorations
 - materials to meet a specific need
- consider innovative applications of advancing technologies to increase efficiency of time and/or materials in the production of models or products **DT**  

Testing and evaluating

Students:

- evaluate the effectiveness and suitability of choices made during the development and production of the solution
- assess the solution against the predetermined criteria 

Years 7–8 Life Skills Outcomes and Content

The Years 7–8 Life Skills outcomes and content are developed from the objectives of the *Technology Mandatory Years 7–8 Syllabus*.

Before deciding that a student should undertake a course based on Life Skills outcomes and content, consideration should be given to other ways of assisting the student to engage with the regular course outcomes. This assistance may include a range of adjustments to teaching, learning and assessment activities.

If the adjustments do not provide a student with sufficient access to some or all of the Stage 4 outcomes, a decision can be explored for the student to undertake Life Skills outcomes and content. This decision should be made through the collaborative curriculum planning process involving the student and parent/carer and other significant individuals. School principals are responsible for the management of the [collaborative curriculum planning process](#).

The following points need to be taken into consideration:

- students are required to demonstrate achievement of one or more Life Skills outcomes
- specific Life Skills outcomes should be selected based on the needs, strengths, goals, interests and prior learning of each student
- achievement of an outcome may be demonstrated through selected Life Skills content
- outcomes may be demonstrated independently or with support.

Further information in relation to planning, implementing and assessing Life Skills outcomes and content can be found in support materials for:

- [Technology](#)
- [Special education](#)
- [Life Skills](#).

Years 7–8 Life Skills Outcomes

Table of Objectives and Outcomes

Objectives

Students:

- develop practical skills with tools, materials and processes while working safely, independently and collaboratively on design projects
- develop thinking skills when designing and producing digital and non-digital solutions
- develop and apply skills in project management and evaluation when designing and producing solutions

Skills

A student:

TELS-1DP communicates ideas and solutions to authentic problems or opportunities

TELS-2DP participates in planning for the production of designed solutions

TELS-3DP participates in the production of designed solutions

TELS-4DP follows safe practices in the use of tools, materials and processes for design projects

TELS-5DP follows simple algorithms in a range of contexts

Objectives

Students develop knowledge and understanding of:

- how traditional, contemporary and advancing technologies are used when designing sustainable products and solutions
- how data is used in the development and automation of digital solutions
- the role of people and technologies in developing innovative solutions for preferred futures

Knowledge and Understanding

A student:

TELS-6AG describes how food and fibre are produced

TELS-7FO designs or prepares solutions for healthy eating

TELS-8DI identifies how information is communicated by digital systems

TELS-9EN explores how force, motion or energy are used in everyday engineered systems

TELS-10MA selects and uses a range of tools, materials and processes appropriately in the development of products

TELS-11TS investigates how technology has contributed to improvements in our way of life

Values and Attitudes Objectives

Students:

- appreciate the contribution and impact of innovation and technologies now and in the future
- appreciate the dynamic nature of design and production processes and how they are used to develop solutions to personal, social and global issues
- appreciate the finite nature of some resources and the impact of their use on the environment
- value the development of skills and gain satisfaction from their use to solve problems and create quality products.

Years 7–8 Life Skills and Related Syllabus Outcomes

Objectives Students: <ul style="list-style-type: none"> develop practical skills with tools, materials and processes while working safely, independently and collaboratively on design projects develop thinking skills when designing and producing digital and non-digital solutions develop and apply skills in project management and evaluation when designing and producing solutions 	
Life Skills outcomes A student:	Related Stage 4 outcomes A student:
TELS-1DP communicates ideas and solutions to authentic problems or opportunities	TE4-1DP designs, communicates and evaluates innovative ideas and creative solutions to authentic problems or opportunities
TELS-2DP participates in planning for the production of designed solutions TELS-3DP participates in the production of designed solutions	TE4-2DP plans and manages the production of designed solutions
TELS-4DP follows safe practices in the use of tools, materials and processes for design projects	TE4-3DP selects and safely applies a broad range of tools, materials and processes in the production of quality projects
TELS-5DP follows simple algorithms in a range of contexts	TE4-4DP designs algorithms for digital solutions and implements them in a general-purpose programming language

Objectives Students develop knowledge and understanding of: <ul style="list-style-type: none"> • how traditional, contemporary and advancing technologies are used when designing sustainable products and solutions • how data is used in the development and automation of digital solutions • the role of people and technologies in developing innovative solutions for preferred futures 	
Life Skills outcomes A student:	Related Stage 4 outcomes A student:
TELS-6AG describes how food and fibre are produced	TE4-5AG investigates how food and fibre are produced in managed environments
TELS-7FO designs or prepares solutions for healthy eating	TE4-6FO explains how the characteristics and properties of food determine preparation techniques for healthy eating
TELS-8DI identifies how information is communicated by digital systems	TE4-7DI explains how data is represented in digital systems and transmitted in networks
TELS-9EN explores how force, motion or energy are used in everyday engineered systems	TE4-8EN explains how force, motion and energy are used in engineered systems
TELS-10MA selects and uses a range of tools, materials and processes appropriately in the development of products	TE4-9MA investigates how the characteristics and properties of tools, materials and processes affect their use in designed solutions
TELS-11TS investigates how technology has contributed to improvements in our way of life	TE4-10TS explains how people in technology related professions contribute to society now and into the future

Years 7–8 Life Skills Content

The Years 7–8 Life Skills content is suggested.

Content describes the intended learning for students as they work towards achieving one or more of the Life Skills outcomes. It provides the foundations for students to progress to the next stage of schooling or post-school opportunities.

Teachers will make decisions about the choice of outcomes and selection of content regarding the sequence, emphasis and any adjustments required based on the needs, strengths, goals, interests and prior learning of students. Examples provided in the content are suggestions only. Teachers may use the examples provided or use other examples to meet the particular needs of individual students.

Contexts

The Years 7–8 Life Skills content has been organised around the four contexts of:

- Agriculture and Food Technologies
- Digital Technologies
- Engineered Systems
- Material Technologies.

The contexts provide possible frameworks for addressing the Years 7–8 Life Skills outcomes and content and are suggestions only. Contexts used to deliver Life Skills outcomes and content do not have indicative hours, enabling teachers to develop relevant, accessible and meaningful age-appropriate programs for their students.

Design projects and practical experiences

Where appropriate, students should have the opportunity to develop their knowledge, understanding and skills of Design and Production through engaging in a range of practical experiences and design projects. Students with special education needs may require adjustments and/or additional support in order to engage in practical experiences.

Agriculture and Food Technologies

Outcomes

A student:

- › communicates ideas and solutions to authentic problems or opportunities TELS-1DP
- › participates in planning for the production of designed solutions TELS-2DP
- › participates in the production of designed solutions TELS-3DP
- › follows safe practices in the use of tools, materials and processes for design projects TELS-4DP
- › describes how food and fibre are produced TELS-6AG
- › designs or prepares solutions for healthy eating TELS-7FO
- › investigates how technology has contributed to improvements in our way of life TELS-11TS

Related Stage 4 outcomes: TE4-1DP, TE4-2DP, TE4-3DP, TE4-5AG, TE4-6FO, TE4-10TS

Context Focus

The Agriculture and Food Technologies context integrates content from agriculture (food and fibre production) and food technologies to enable delivery with consideration of the school context and available resources.

Agriculture (food and fibre production) focuses on investigating managed environments, such as farms and plantations. Students recognise the differences between natural and managed environments and explore the characteristics and properties of a range of foods and fibres. Students are provided with opportunities to plan and design an agricultural project.

Food Technologies focuses on the use of resources produced and harvested to sustain human life. Students are provided with opportunities to develop knowledge, understanding and skills in food selection and preparation, food safety, and how to prepare food to meet an identified need.

Content






Identifying and defining

Students:

- recognise where food comes from, for example:
 - animals, plants
- recognise natural and managed environments
- identify managed environments used in the production of food and fibre, for example: ✦
 - orchard
 - cattle farm
 - cotton farm
- identify plants and animals that are grown or bred in managed environments
- explore how food and fibre is produced in a managed environment, eg growing, harvesting, marketing cattle **ST** ✨ ✨ ✨
- recognise the characteristics of a range of foods and fibres, for example:
 - texture
 - appearance, eg colour
 - taste
 - aroma
- use their senses to explore characteristics of foods and fibres, for example: ✨ ✨ ✨
 - feel the roughness of a woven fabric, eg a dilly bag ✦
 - smell a variety of fruits
 - taste different vegetables
 - observe the colour of textiles
- explore how food and fibre can be sustainably produced, for example: **ST** ✦ ✦
 - land management techniques
 - Aboriginal Peoples' cultural practices regarding totems
- identify nutritional needs for groups of people, eg adolescents, toddlers **CT** 🍴 🍴
- explore how an environment has been designed to meet a particular need, eg a school or community garden ✦
- explore the factors that influence design in the context of making a design project, for example:
DT ST ✦ ✨ ✨ ✨ ✨
 - function
 - aesthetics
 - available resources
 - cultural and social appropriateness
 - environmental impact










Researching and planning

Students:

- recognise conditions for growth and development of an agricultural plant or animal **ST**
- recognise and record data related to the growth and development of an agricultural plant or animal, eg weight, rainfall, temperature **ST**
- explore ethical issues relating to agricultural production, eg care of animals 
- participate in planning for the care of a plant or animal associated with an agricultural project **ST** 
- participate in some steps to plan a product associated with agricultural production, using ICT as appropriate, for example: **DT ST**     
 - communicate design ideas
 - select tools, materials and equipment
 - plan a timeline for completing the project
 - develop a budget to identify costs in completing the project
- communicate design ideas to meet an identified need, using ICT as appropriate, for example: **DT**   
 - use a graphic organiser to brainstorm ideas
 - collect images
- recognise and interpret data related to food production, eg nutritional information panels **CT ST**
- participate in planning dishes to suit an identified need, using ICT as appropriate, for example: **DT**    
 - a main meal for a child
 - a meal for a dinner party that includes guests who are vegetarian
 - a pre-race meal for a marathon runner
 - food for cultural celebrations
- identify a range of food preparation techniques and their purposes 
- select tools and equipment appropriate for a design project, for example: **DT**  
 - utensils, measuring implements, gas and electric appliances

Producing and implementing

Students:

- follow a sequence to implement an agricultural project or produce nutritious food **DT**  
- participate in producing an agricultural project or nutritious food, for example: **DT ST**   
 - grow vegetables for use in food preparation
 - make a healthy meal
 - make an environment suitable for keeping fish
- use appropriate food preparation techniques, for example: **DT ST**
 - cut, slice, dice, mix, stir, whisk, cook, present
- identify risks in an agricultural project or food preparation and ways to improve safety **DT** 
- use tools and equipment safely in an agricultural project or food preparation **DT** 
- use safe food handling, for example: **DT** 
 - storage of food or produce
 - cleaning techniques, eg washing hands, surfaces, utensils
 - cooking methods, eg boil, mix
 - preparation methods, eg avoid cross contamination
- manage resources and time to complete a design solution **DT** 

Testing and evaluating

Students:

- evaluate their design and production skills, for example: 🧰 ⭐
 - time management
 - collaboration
 - safe use of tools and processes
- reflect on the design solution in terms of function, aesthetics, available resources, social and cultural appropriateness and/or environmental impact, for example: 🌱
 - collect feedback on the design solution from a variety of sources, eg peers, surveys, interviews
 - use feedback to evaluate the produced design solution, eg Are modifications to the design required? Does the finished product require adjustments? Does the product meet the identified need?

Before teaching this syllabus
refer to implementation advice
on curriculum.nsw.edu.au

Digital Technologies

Outcomes

A student:

- › communicates ideas and solutions to authentic problems or opportunities TELS-1DP
- › participates in planning for the production of designed solutions TELS-2DP
- › participates in the production of designed solutions TELS-3DP
- › follows simple algorithms in a range of contexts TELS-5DP
- › identifies how information is communicated by digital systems TELS-8DI
- › investigates how technology has contributed to improvements in our way of life TELS-11TS

Related Stage 4 outcomes: TE4-1DP, TE4-2DP, TE4-4DP, TE4-7DI, TE4-10TS

Context Focus













The Digital Technologies context encourages students to develop an empowered attitude towards digital technologies, use abstractions to represent and decompose real-world problems, and implement and evaluate digital solutions. Students have the opportunity to recognise the purpose and uses of a range of digital technologies in our everyday lives, and to use digital systems to perform a range of functions, including communication.

Students are provided with opportunities to create and communicate ideas and information using a range of digital systems and are encouraged to recognise and use social and ethical protocols in online environments.

Content













Identifying and defining



Students:

- recognise digital systems used for everyday purposes, eg mobile devices, assistive technology
- recognise that everyday tasks are supported by digital technologies, for example: 
 - money withdrawal
 - online shopping
 - communication, including the use of augmentative communication
 - phone calls
- recognise the function and purpose of a range of digital technologies, for example: 
 - social media links people across the internet
 - photographs capture an image
 - remote storage systems enable data to be accessed anywhere
 - screen readers and voice-recognition programs assist with reading and writing
 - software programs enable data to be manipulated and stored
- explore how digital systems meet personal or community needs **ST**   
- explore the factors that influence the design of digital solutions, for example: **DT**    
 - function
 - available resources, eg cost, skills, time
 - rules and regulations, eg copyright
 - audience and appeal
 - accessibility
- investigate how digital system innovation has improved our everyday life   

Researching and planning









Students:

- recognise that digital technologies can be used to communicate with others **ST** 
- use digital technologies to communicate, for example:  
 - use mobile devices to send messages
 - use augmentative and alternative communication aids
- recognise that data can be communicated in a variety of ways, eg codes, symbols  
- explore a range of data types to communicate information, for example: **CT** 
 - symbols
 - Morse code
 - musical notation
- identify sequences for everyday actions, for example: **ST** 
 - routines, such as getting ready for work
 - cooking a meal
- recognise that digital systems use a sequence to enable an action, for example: **CT** 
 - a series of settings enable a phone to play a set ringtone
 - a series of numbers or tones makes a unique code which corresponds to a phone number
 - a series of steps enable a consumer to apply a filter to a photographic image
- follow and represent a sequence of steps and decisions (algorithm) to solve a simple problem, for example: **CT**   
 - draw a flowchart using a yes/no pathway
 - write a series of prompts to explain how to change a password
- use digital systems to perform a variety of functions, for example: **ST** 
 - capture a video using a camera
 - play a video through a smartphone
 - transfer a video onto a computer

- explore features of design that enhance the user experience in a range of digital solutions, for example: **DT**  
 - features of an effective game, eg storyline, setting
 - the use of colour and images in a website
- collect data from a range of sources, eg experiments, surveys, public data sets
- represent data using a range of software, eg numbers, characters

Producing and implementing

Students:

- participate in creating and communicating ideas and information online following social and ethical protocols, for example:  
 - applying safe practices when communicating online
 - managing privacy settings when using social media
 - demonstrating appropriate digital citizenship when collaborating and sharing online
- follow a sequence in the production of a digital solution **DT** 
- participate in producing a digital solution using algorithms, for example: **CT**   
 - guiding a robot
 - putting visual programming blocks together to develop elements of an interactive story
- manage resources and time to complete a digital solution  

Testing and evaluating

Students:

- explore social and ethical issues associated with digital solutions, for example:   
 - cyber safety
 - appropriate digital communication
 - privacy when using social media
 - accessibility of online content
 - copyright when using online images and media
- evaluate their design and production skills, for example: **DT**  
 - time management
 - collaboration
 - safe use of tools and processes
- reflect on the digital solution in terms of function, available resources, rules and regulations, audience and appeal and/or accessibility, for example: **DT**    
 - collect feedback on the digital solution from a variety of sources, eg peers, surveys, interviews
 - use feedback to evaluate the produced digital solution

Engineered Systems

Outcomes

A student:

- › communicates ideas and solutions to authentic problems or opportunities TELS-1DP
- › participates in planning for the production of designed solutions TELS-2DP
- › participates in the production of designed solutions TELS-3DP
- › follows safe practices in the use of tools, materials and processes for design projects TELS-4DP
- › explores how force, motion or energy are used in everyday engineered systems TELS-9EN
- › investigates how technology has contributed to improvements in our way of life TELS-11TS

Related Stage 4 outcomes: TE4-1DP, TE4-2DP, TE4-3DP, TE4-8EN, TE4-10TS

Context Focus

The Engineered Systems context focuses on how force, motion and energy can be used in systems, machines and structures. Students are provided with opportunities to identify engineered systems in our daily lives and communicate and test design ideas that apply a range of engineering principles. Knowledge of these principles and systems enables the design and production of sustainable, engineered solutions.

Content

Identifying and defining

Students:

- recognise engineered systems in our daily lives, for example:
 - bicycles
 - cars
 - buildings
 - home appliances
- explore the role of professionals in engineering industries, for example: ⚙️ ⚙️
 - electrical engineer
 - mechanical engineer
 - automotive engineer
 - mining engineer
- explore how engineered systems improve our everyday life, for example: **ST** ⚙️ ⚙️
 - wheels and axles on cars
 - mobile devices
 - house frames
- identify opportunities for designing engineered systems within a local context **DT ST** ⚙️
- explore the factors that influence an engineered system in the context of a design solution, for example: **DT ST** 🤖 ⚙️ ⚙️ 🌐 🌐 🌐
 - function
 - aesthetics
 - available resources, eg cost, skills, time
 - cultural and social considerations, eg Indigenous cultural and intellectual property
 - environmental impact
 - audience
 - sustainability
 - accessibility

Researching and planning

Students:

- explore how light, sound, heat or movement are produced in engineered systems ⚙️ ⚙️
- investigate how engineered systems use force, motion and energy to meet a particular need, for example: **ST** ⚙️ ⚙️
 - move a toy car using a variety of systems and materials, eg magnets, wind, water, gravity, cogs, ratchets, batteries (force)
 - design a simple circuit to illuminate a globe using a variety of materials, eg copper wire, aluminium foil, salt solution, batteries, power source (electricity)
- communicate design ideas to meet an identified need, using ICT as appropriate, for example: **DT** ⚙️ 🖥️ 🖱️
 - use a graphic organiser to brainstorm ideas
 - sketch designs
 - collect images
- identify tools and equipment appropriate for producing an engineered solution ⚙️ ⚙️

- participate in some steps to plan the production of a design idea that tests an engineering principle, for example: **DT** ⚙️ 🛠️ 📐 ⚡
 - communicate design ideas
 - select tools, materials and equipment
 - plan a timeline for completing the design solution
 - develop a budget to identify costs in producing the design solution

Producing and implementing

Students:

- participate in producing a product or system that demonstrates force, motion or energy, for example: **DT** ⚙️ ⚡
 - design a car that travels the furthest of those tested
- participate in producing a model or prototype to test a design idea, for example: **DT** ⚙️ 🛠️ 📐
 - a prototype of a windmill
 - a model of a park that is accessible to people with disability
- follow a sequence in the production of a model, prototype or product **DT** ⚡
- identify risks in the production of a model, prototype or product and ways to improve safety **DT** 🛠️ ⚡
- use appropriate techniques in the development of models, prototypes or products, for example: ⚙️
 - measure, cut, shape, join, finish, embellish, decorate and glue
- use tools and equipment safely in the development of models, prototypes or products, for example: ⚡
 - wear personal protective equipment (PPE)
 - report faulty equipment
- manage resources and time to produce a model, prototype or product **DT ST** 🛠️ ⚡

Testing and evaluating

Students:

- evaluate their design and production skills, for example: 🛠️ ⚡
 - time management
 - collaboration
 - safe use of tools and processes
- reflect on an engineered solution in terms of function, aesthetics, available resources, social and cultural appropriateness, environmental impact, audience, accessibility and/or sustainability for example: ⚙️ 🛠️ 📐
 - collect feedback on the design solution from a variety of sources, eg peers, surveys, interviews
 - use feedback to evaluate the produced design solution

Material Technologies

Outcomes

A student:

- › communicates ideas and solutions to authentic problems or opportunities TELS-1DP
- › participates in planning for the production of designed solutions TELS-2DP
- › participates in the production of designed solutions TELS-3DP
- › follows safe practices in the use of tools, materials and processes for design projects TELS-4DP
- › selects and uses a range of tools, materials, processes and systems appropriately in the development of products TELS-10MA
- › investigates how technology has contributed to improvements in our way of life TELS-11TS

Related Stage 4 outcomes: TE4-1DP, TE4-2DP, TE4-3DP, TE4-9MA, TE4-10TS

Context Focus

The Material Technologies context focuses on the application of specialist skills and techniques to a broad range of traditional, contemporary and advancing materials. Students develop knowledge and understanding of the characteristics and properties of a range of materials and consider how products are designed to meet identified needs. Students develop skills in planning and communicating design ideas, as well as using a range of techniques, tools and equipment in the production of a design solution.

The Material Technologies context can include but is not limited to electronics, graphics, metals, multimedia, polymers, textiles, timber.

Content

Identifying and defining








Students:

- recognise the function and purpose of everyday objects made from materials
- explore how the design of an object is related to its function and purpose, for example: 🖐️ ⚙️
 - a teapot has a spout to assist pouring
 - different lengths of didgeridoos produce different sounds
 - an oven mitt is shaped for a hand and is made of heat-resistant material
 - a stool has three legs for stability
- explore how a design solution can meet a particular need in their class or school community, for example: **ST** ⚙️ 🌱
 - the need for class equipment to be stored
 - the need for a large surface in the classroom for collaborative work
 - the need for shelter in the schoolyard during inclement weather
- investigate products developed by Aboriginal and/or Torres Strait Islander designers that communicate cultural identity 🖐️
- explore the role of professionals in the material technologies industries, for example: 🌱
 - product designer
 - industrial designer
 - fashion designer
- explore the factors that influence design in the context of a design solution, for example: **DT ST** 🖐️
🖐️ ⚙️ 🌱
 - function
 - aesthetics
 - available resources, eg cost, skills, time
 - cultural and social appropriateness, eg Indigenous cultural and intellectual property
 - environmental impact
 - audience
 - sustainability
 - accessibility

Researching and planning










Students:

- recognise everyday items are made from materials
- use their senses to explore the different characteristics of materials, for example: ⚙️ 🌱
 - feel smoothness of sanded timber
 - test the hardness of balsa wood by pressing fingernail into the wood
 - observe the colour of fabrics
 - listen to the sound made by different metals, eg by tapping an aluminium can or pole
- identify properties of materials, for example:
 - absorbency
 - colour
 - density
 - durability
 - flexibility
 - strength
 - transparency
- select appropriate materials in the production of a design solution, eg metals, polymers, textiles, timber ⚙️
- select tools and equipment appropriate for a design solution **DT** ⚙️ 🌱

- explore a range of techniques that can be used in the production of a design solution, eg measure, cut, shape, join, finish **DT**
- communicate design ideas to meet an identified need, using ICT as appropriate, for example: **CT**
DT   
 - use a graphic organiser to brainstorm ideas
 - sketch designs
 - collect images
- participate in some steps to plan the production of a design solution, using ICT as appropriate, for example: **DT ST**    
 - communicate design ideas
 - select tools, materials and equipment
 - plan a timeline for completing the design solution
 - develop a budget to identify costs in producing the design solution







Producing and implementing

Students:

- follow a sequence in the production of a design solution **DT** 
- participate in producing a design solution to meet an identified need **DT**
- identify risks in the production of a design solution and ways to improve safety **DT**  
- use appropriate techniques in the production of a design solution **ST** 
- use tools and equipment safely in the production of a specific design solution, for example: **ST** 
 - wear personal protective equipment (PPE)
 - report faulty equipment
- manage resources and time to complete a design solution  
- investigate the role technology plays in the manufacture and design of products, for example:  
 - laser cutting
 - 3D printing
 - colouration and dyeing techniques, eg batik, bleach, tie-dye

Testing and evaluating

Students:

- evaluate their design and production skills, for example:  
 - time management
 - collaboration
 - safe use of tools and processes
- reflect on the design solution in terms of function, aesthetics, available resources, cultural and social appropriateness, environmental impact, audience, sustainability and/or accessibility, for example:    
 - collect feedback on the design solution from a variety of sources, eg peers, surveys, interviews
 - use feedback to evaluate the produced design solution

Assessment

Standards

The NSW Education Standards Authority (NESA) *K–10 Curriculum Framework* is a standards-referenced framework that describes, through syllabuses and other documents, the expected learning outcomes for students.

Standards in the framework consist of three interrelated elements:

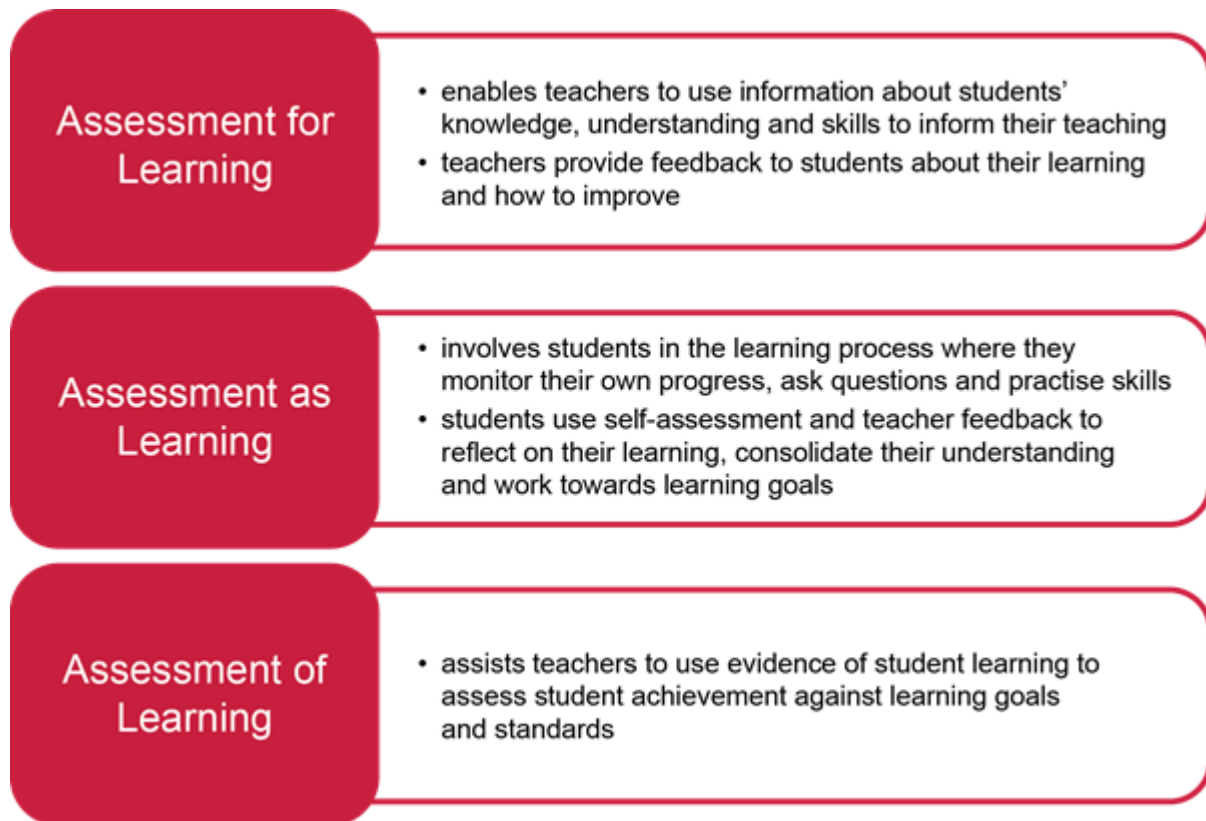
- outcomes and content in syllabuses showing what is to be learned
- Stage statements that summarise student achievement
- samples of work on the NESA Assessment Resource Centre (ARC) website which provide examples of levels of achievement within a Stage.

Syllabus outcomes in Science and Technology contribute to a developmental sequence in which students are challenged to acquire new knowledge, understanding and skills.

Assessment

Assessment is an integral part of teaching and learning. Well-designed assessment is central to engaging students and should be closely aligned to the outcomes within a Stage. Effective assessment increases student engagement in their learning and leads to enhanced student outcomes.

Assessment for Learning, *Assessment as Learning* and *Assessment of Learning* are three approaches to assessment that play an important role in teaching and learning. The NESA Years K–10 syllabuses particularly promote *Assessment for Learning* as an essential component of good teaching.



Further advice on programming and appropriate assessment practice is provided on the NESA website. This support material provides general advice on assessment as well as strategies to assist teachers in planning education programs.

Assessment for Students with Special Education Needs

Some students with special education needs will require adjustments to assessment practices in order to demonstrate what they know and can do in relation to syllabus outcomes and content. The type of adjustments and support will vary according to the particular needs of the student and the requirements of the activity. These may be:

- adjustments to the assessment process, for example scaffolded instructions, additional guidance provided, highlighted keywords or phrases, the use of specific technology, extra time in an examination
- adjustments to assessment activities, for example rephrasing questions, using simplified language, fewer questions or alternative formats for questions
- alternative formats for responses, for example written point form instead of essays, scaffolded structured responses, short objective questions or multimedia presentations.

It is a requirement under the *Disability Standards for Education 2005* for schools to ensure that assessment tasks are accessible to students with disability. Schools are responsible for any decisions made at school level to offer adjustments to coursework, assessment activities and tasks, including in-school tests. Decisions regarding adjustments should be made in the context of [collaborative curriculum planning](#).

Further examples of adjustments to assessment for students with special education needs and information on assessment of students undertaking Life Skills outcomes and content can be found in support materials for:

- [Technology](#)
- [Special education](#)
- [Life Skills](#).

Reporting

Reporting is the process of providing feedback to students, parents/carers and other teachers about student progress.

Teachers use assessment evidence to extend the process of Assessment for Learning into their Assessment of Learning. In a standards-referenced framework, teachers make professional judgements about student achievement at key points in the learning cycle. These points may be at the end of a Year or Stage, when schools may wish to report differentially on the levels of knowledge, understanding and skills demonstrated by students.

Descriptions of student achievement provide schools with a useful tool to report consistent information about student achievement to students and parents/carers, and to the next teacher to help plan the future steps in the learning process.

The A–E grade scale or equivalent provides a common language for reporting by describing observable and measurable features of student achievement at the end of a Stage, within the indicative hours of study. Teachers use the descriptions of the standards to make a professional, on-balance judgement, based on available assessment information, to match each student's achievement to a description. Teachers use the Common Grade Scale (A–E) or equivalent to report student levels of achievement from Stage 1 to Stage 5.

For students with special education needs, teachers may need to consider, in consultation with their school and sector, the most appropriate method of reporting student achievement. It may be deemed more appropriate for students with special education needs to be reported against outcomes or goals identified through the collaborative curriculum planning process. There is no requirement for schools to use the Common Grade Scale (A–E) or equivalent to report achievement of students undertaking Life Skills outcomes and content.

Glossary

Glossary term	Definition
Aboriginal and/or Torres Strait Islander Peoples	<p>Aboriginal Peoples are the first peoples of Australia and are represented by over 250 language groups, each associated with a particular Country or territory. Torres Strait Islander Peoples are represented by five major island groups, and are associated with island territories to the north of Australia's Cape York which were annexed by Queensland in 1879.</p> <p>An Aboriginal and/or Torres Strait Islander person is someone who:</p> <ul style="list-style-type: none"> • is of Aboriginal and/or Torres Strait Islander descent • identifies as an Aboriginal person and/or Torres Strait Islander person, and • is accepted as such by the Aboriginal and/or Torres Strait Islander community(ies) in which they live.
abstraction	Abstraction is the process by which data and programs are defined with a representation similar in form to its meaning while hiding away the implementation details. Abstraction tries to temporarily ignore details so that the programmer can focus on a few concepts at a time. Algorithms must ultimately be broken down into simple instructions for a digital system to execute.
accessibility	The extent to which a system, environment or object may be used irrespective of a user's capabilities or abilities. For example the use of assistive technologies to allow people with disabilities to use computer systems, or the use of icons in place of words to allow young children to use a system.
advancing technologies	New technologies that are still immature or will be developed over the next five to ten years, which may deliver significant value and substantially alter the business and social environment.
aesthetics	Aesthetics is concerned with the visual impact or appeal of a product or environment and is influenced by social, emotional and demographic factors.
algorithm	A step-by-step procedure required to solve a problem. Algorithms may be presented in many ways, for example written instructions, flowcharts or using a computer programming language.
app	A software program designed for a specific purpose to run on mobile devices or on a personal computer. An abbreviation of the word 'application'.
automate	In Digital Technologies, any process of transforming and manipulating data that does not require user intervention. For example through the use of formulae in a spreadsheet, new sets of data can be processed and the results recalculated automatically, or a webcam can be turned on as a result of movement sensor input.

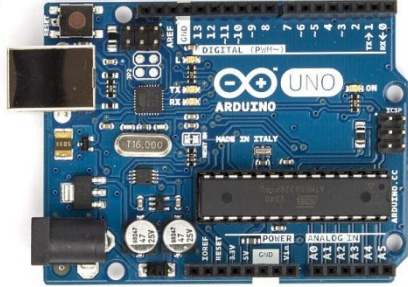
Glossary term	Definition												
binary	<p>The method a digital system uses to store and manipulate data. Binary (or base-2) is a numeric system that uses only two digits, 0 and 1, which can easily be presented within a computer as an on or off state. Binary can be used to represent: small to very large numbers, Boolean values (true or false), the colour values of a pixel on a screen, or the letters used when you type on a keyboard.</p> <p>Some examples of binary numbers:</p> <table> <tr> <th>Decimal</th><th>Binary</th></tr> <tr> <td>0</td><td>0</td></tr> <tr> <td>1</td><td>1</td></tr> <tr> <td>2</td><td>10</td></tr> <tr> <td>3</td><td>11</td></tr> <tr> <td>10</td><td>1010</td></tr> </table>	Decimal	Binary	0	0	1	1	2	10	3	11	10	1010
Decimal	Binary												
0	0												
1	1												
2	10												
3	11												
10	1010												
bitmap	A digital image composed of a matrix of dots (pixels). Each pixel is represented by a number or set of numbers representing its colour (see pixel).												
branching	<p>An instruction in a computer program or algorithm that causes different actions to be performed depending on specified conditions. For example, in testing whether a light works, the following <i>algorithm</i> uses branching:</p> <pre> graph TD BEGIN([BEGIN]) --> Test[Test the light] Test --> IsLight{Is the light on?} IsLight -- Yes --> Working[It's working] Working --> END([END]) IsLight -- No --> IsSwitch{Is the switch turned on?} IsSwitch -- No --> TurnSwitch[Turn switch on] TurnSwitch --> END IsSwitch -- Yes --> IsBulbInstalled{Is the bulb installed?} IsBulbInstalled -- No --> InstallBulb[Install bulb correctly] InstallBulb --> END IsBulbInstalled -- Yes --> IsBulbBlown{Is the bulb blown?} IsBulbBlown -- No --> CallElectrician[Call electrician] CallElectrician --> END IsBulbBlown -- Yes --> ReplaceBulb[Replace bulb] ReplaceBulb --> END </pre>												
built environment	The manufactured artefacts and surroundings that provide the setting for human activity.												

Glossary term	Definition
characteristics	<p>When discussing materials, the characteristics are the qualities used to determine their use and the way people work with them. They might include colour, hardness and strength.</p> <p>When discussing food, the characteristics are the nutritional qualities used to determine their use in preparing nutritious food.</p>
components	Parts or elements that make up a system or whole object. At the simplest level a computer has two main components: the hardware and the software. The components of a computer system may include a central processing unit, hard disk, monitor, keyboard and mouse (see hardware).
computer-aided design (CAD)	Software used by designers, architects and engineers to create lines, shapes and planes that can be combined, moved, rotated, adjusted and rendered. Measurements and calculations can be included. CAD can be used to create two- and three-dimensional models and drawings, such as floor plans, interiors and garden designs, and to represent objects and structures. Also known as computer-assisted design.
computer-aided manufacturing (CAM)	A use of geometric design data (coordinates) to control computer numerically control (CNC) machine tools for manufacturing components and objects.
copyright	The protection provided to the creators of original works that offers a legal framework for the control and reproduction or transmission of their creations. Copyright protects written works, computer programs and artistic works such as: architecture, broadcasts, computer programs, drawings, films, music, paintings, photographs, sound recordings and videos.
criteria	A descriptive list of essential features against which success can be measured and evaluated.
customary	Relates to customs or practices associated with a particular society, place or set of circumstances.
data	Raw, unorganised facts and figures. Data is the facts or details from which information is derived. For data to become information, data needs to be put into context. A list of temperatures recorded in a city for the past ten years is data – it does not provide any information until it is analysed so that patterns are visible and conclusions can be drawn.
decompose	To break a complex problem or solution into parts that are easier to understand, design and implement.
design and production folio	Ongoing evidence of the application of a design and production process and the specific technologies used.
design process	The process of designing (see designing).
design thinking	Thought process involved in understanding and developing solutions to design needs and opportunities.

Glossary term	Definition
designed solution	A product, service or environment that has been created for a specific purpose or intention as a result of design thinking, and design and production processes.
designing	A process that typically involves identifying and defining, researching and planning, producing and implementing, and testing and evaluating to create a designed solution that considers social, cultural and environmental factors.
digital citizenship	An acceptance and upholding of the norms of appropriate, responsible behaviour with regard to the use of digital technologies. Digital citizenship includes appropriate online etiquette, literacy in how digital technologies work and how to use them, an understanding of ethics and related law, knowing how to stay safe online, and advice on related health and safety issues, such as online predators and the permanence of data.
digital footprint	Traces of data left behind by a person using a digital system. A person's digital footprint includes all information actively provided by that person, such as interactions on social networks, online purchases, emails and instant messages. It also includes passive information, such as logs of software installed and used on a computer, metadata associated with files, a user's internet protocol (IP) address, a device being used to access a webpage, and a user's browsing history stored as cookies or by internet service providers.
digital information	The nature and forms of information stored digitally, and processes that transform digital data into information for various purposes and meanings, including structures, properties, features and conventions of particular forms of digital information and appropriate methods of storage, transmission and presentation of each form.
digital solution	A result (or output) of transforming data into information or action using digital systems, skills, techniques and processes to meet a need or opportunity.
digital system	Computer hardware and software components (internal and external) used to transform data into a digital solution. When digital systems are connected, they form a network.
digital technologies	The term digital technologies refers to electronic tools, systems, devices and resources that generate, process or store data, and may include applications, games, microcontrollers, mobile devices, multimedia, networks, robotics.
disability	An umbrella term for any or all of the following components: <ul style="list-style-type: none"> • impairments: challenges in body function or structure • activity limitations: difficulties in executing activities • participation restrictions: challenges an individual may experience in involvement in life situations.

Glossary term	Definition
diversity	Differences that exist within a group, for example, age, sex, gender, gender expression, sexuality, ethnicity, ability/disability, body shape and composition, culture, religion, learning differences, socioeconomic background, values and experiences.
engineering	A practical application of scientific and mathematical understanding and principles as a part of the process of developing and maintaining solutions for an identified need or opportunity.
environment	The surroundings or conditions in which a person, animal or plant lives or operates. An environment may also be natural, managed, constructed or digital.
evaluate	Assessing performance against predetermined criteria.
fibre	Plant or animal-based materials that can be used for clothing or construction. Animal-based (protein) fibres include silk and wool. Plant-based (cellulosic) fibres include bamboo, cotton, hemp and timber.
food and fibre production	A process of producing food or fibre as natural materials for later use in the design and development of a range of products.
function	A term used in programming to describe a self-contained sequence of instructions that performs a specific task or tasks and is designed to be able to be reused throughout the program. Functions often accept some kind of input, perform some process on that input, and return a result that can be used by other parts of a program. Most programming languages allow for user-defined functions, but will also provide pre-defined functions.
general-purpose programming language	A coding or programming language used to write computer software. It uses letters, numbers and symbols arranged in a prescribed format (language) to instruct a computer how to carry out specific tasks. Also known as text-based programming.
graphical representation technique	A technique used to communicate ideas and plans, for example sketching, drawing, modelling, making patterns, technical drawing and computer-aided design.
hardware	The collection of physical components that constitute a computer system, all of which are tangible objects. Hardware includes both internal components (eg computer data storage, graphic cards, motherboard) and external components (eg monitor, keyboard, mouse) of the system, as well as any peripheral devices (eg cameras, printers) that can be connected (see components).
health	A state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity (World Health Organization 1948).
healthy eating	Dietary patterns that aim to promote health and wellbeing, including types and amounts of foods and food groups that reduce the risk of diet-related conditions and chronic disease (National Health and Medical Research Council 2013).

Glossary term	Definition
Indigenous	Internationally recognised term for the first people of a land. In New South Wales the term 'Aboriginal person/Peoples' is preferred.
Indigenous cultural and intellectual property	Includes objects, sites, cultural knowledge, cultural expression and the arts, that have been transmitted or continue to be transmitted through generations as belonging to a particular Indigenous group or Indigenous people as a whole or their territory (see intellectual property).
Industry 4.0	Industry 4.0 (the 'fourth industrial revolution') refers to the current trend of improved automation, machine-to-machine and human-to-machine communication, artificial intelligence, continued technological improvements in advanced manufacturing technologies.
information system	The combination of digital systems, people and processes that collect, manage and analyse data.
input	Data or information put into a digital system to activate or modify a process.
intellectual property	Non-material assets such as forms of cultural expression that belong to a particular individual or community. Intellectual property rights refer to the rights that the law grants to individuals for the protection of creative, intellectual, scientific and industrial activity, such as inventions (see Indigenous cultural and intellectual property, and copyright).
iteration	<p>A repetition of a process in computer programming where each repeated cycle builds towards a desired result. An example of an iterative process with code designed to add the numbers from 1 to 9 is shown below.</p> <pre> sum = 0 for number = 1 to 9 sum = sum + number </pre>
land management	A process of developing land and monitoring its use in a sustainable way, usually for purposes of producing food and providing fibre for clothing and housing. Includes providing protection for flora and fauna, and preventing and controlling weeds.
managed environment	An environment coordinated by humans for a purpose, for example a farm or orchard.
material	A substance from which something can be made. Materials can be manipulated and are used to create products or environments.

Glossary term	Definition
microcontroller	<p>A microcontroller is a small computer built for the purpose of dealing with specific tasks, such as managing the engine in a car, displaying information in a microwave control panel or receiving information from a television's remote control. Microcontrollers process data inputted by users (eg keypad) or sensors (eg light).</p>  <p>Description: English: Arduino Uno Date: 14 April 2014, 13:49 Source: ARDU-UNO-03-Front Author: oomlout</p>
model	A mathematical, conceptual or physical representation that describes, simplifies, clarifies or provides an explanation of the structure, workings or relationships within an object, system or idea. Models can provide a means of testing and predicting behaviour within limited conditions. Models may be physical or exist in digital form.
multimedia	The use of digital technologies to present combinations of text, graphics, video, animation and/or sound in an integrated way. Where there is facility for a user to interact with multimedia, the term 'interactive multimedia' may be used. Examples include interactive games, media-rich websites, electronic books (eBooks) and animated films.
nutritious foods	Foods that supply the nutrients needed by a body to grow, develop and maintain health.
output	A result of something (physical or virtual), such as power, energy, action, material or information produced by a person, machine or a system.
peripheral device	A digital component that can be connected to a digital system but is not essential to the operation of the system, for example digital camera, printer, scanner.
personal protective equipment (PPE)	Equipment used or worn by a person to minimise risk to the person's health or safety, for example apron, ear muffs, face shield, gloves, goggles, hard hat.
pixel	A physical point in a bitmap image or on a display device that corresponds to the smallest addressable element within the bitmap. On a computer screen a pixel represents a single dot or point (see bitmap).
preferred futures	A selected future identified by a student, used to inform the creation and evaluation of solutions.

Glossary term	Definition
producing	Actively realising (making) designed solutions, using appropriate resources and means of production.
product	The tangible end results of natural, human, mechanical, manufacturing, electronic or digital production and processes.
production process	A technologies context-specific process used to transform technologies into a product, service or environment, for example the steps used for producing a product.
programming language	Programming languages in common use are designed to solve a wide range of problems. They include procedural, functional and object-oriented programming languages, including scripting and/or dynamically typed languages (see general-purpose programming language).
project	An individual or collaborative problem-solving activity undertaken by students that is planned to achieve an articulated aim.
project management	The process of planning, organising, controlling resources, monitoring timelines and activities, and completing a project to achieve a goal that meets identified criteria.
properties	Distinctive characteristics of a material that can be identified, tested and used to help people select the one most suitable for a particular use.
protocol	A set of generally accepted standards or 'rules' that govern relationships and interactions between and within information systems.
prototype	A trial product or model built to test an idea or process to inform further design development. Its purpose is to see if and how well the design works and is tested by users and systems analysts. A prototype can be both a physical object or exist in digital form (see model).
pseudocode	An informal high-level description of a computer program, process or algorithm. It is intended for humans to understand the flow of operations without necessarily needing to understand a programming language (see structured English).
real-world problem	A question raised for inquiry, consideration or solution in a context that students can relate to through their knowledge, social experience or environmental familiarity.
resources	Materials, data, systems, components, tools and equipment used to create solutions for identified needs and opportunities, and the knowledge, understanding and skills used by people involved in the selection and use of these. Resources can also include energy, finance and time.
sampling and quantisation	In digital signal processing, sampling and quantisation are two steps used in the conversion of an analog signal to a digital signal.

Glossary term	Definition
sensor	A sensor is a device that detects and responds to some type of input from the physical environment. The specific input could be heat, light, moisture, motion or pressure. The output is generally a signal that is converted to human-readable display at the sensor location or transmitted electronically over a network for further processing. For example a motion sensor used on automatic doors and light sensors to automatically control garden lights.
services	A system supplying a public need, such as transport, communications, or utilities such as electricity and water. Services are a less tangible outcome of design and production processes (compared to products) but are still designed to meet a need or want.
simple machines	Any of the basic mechanical devices for applying a force: the lever, the wheel and axle, the inclined plane, the wedge, the pulley and the screw.
structured data	Data with a high degree of organisation, such that it can easily be analysed and processed using algorithms. The organisation of the data takes on a form that captures the properties and behaviours of the source the data represents.
structured English	<p>A form of pseudocode that uses the English language to describe the steps of an algorithm in clear, unambiguous statements that can be read by non-technical users. The use of keywords such as BEGIN, END, IF, THEN and ELSE provides a syntax similar to that of a programming language to assist with identifying logical steps necessary to properly describe the algorithm. An example of the use of structured language can be demonstrated using the following problem.</p> <p>Description of the problem: Describing the decision a person makes about how to get to a destination based on the weather and the distance from their current location to their destination.</p> <p>Structured English (pseudocode) example:</p> <pre> BEGIN IF it is raining outside THEN Catch the bus ELSE IF it is less than 2km to the destination THEN Walk ELSE IF it is less than 10km to the destination THEN Ride a bicycle ELSE Catch the bus ENDIF ENDIF ENDIF END </pre> <p>The structured English description can easily be translated into code using a programming language (see pseudocode).</p>

Glossary term	Definition
sustainable	Supporting the needs of the present without compromising the ability of future generations to meet their needs.
TCP/IP	Transmission Control Protocol/Internet Protocol is the basic communication language or protocol of the internet. A protocol is an agreed-upon set of procedures and rules. When two computers follow the same protocols they can understand each other and exchange data (see protocol).
trace algorithm	Following an algorithm to check its logic and correctness. This may be done on paper, using a diagram, or mentally trying a sample of typical inputs to see what the outputs would be.
transmission media	The means through which data is sent from one system to another on a network.
Unicode	An international encoding standard for use with different languages and scripts, by which each letter, digit or symbol is assigned a unique numeric value that applies across different platforms and programs.
user experience	The usability, ease of use, and pleasure provided in the interaction between the customer and the product.
user interface	The means by which users interact with computer hardware or software. In software, this usually comprises fields for text and number entry, mouse pointers, buttons and other graphical elements. In hardware, switches, dials and light-emitting diodes (LEDs) provide information about the interactions between a user and a machine.
viewing	Observing and comprehending a visual text, for example diagram, illustration, photograph, film, television documentary, multimedia. This sometimes involves listening to and reading accompanying written text.
visualise	The presentation of data or information through pictures or graphics to help the intended audience understand its significance.
wi-fi	A technology for wireless networking of devices. Wi-fi devices connect via a wireless access point (WAP) or hotspot.
WPA	Wi-fi Protected Access (WPA) is a security protocol designed to create secure wireless (wi-fi) networks.