NSW Education Standards Authority

NSW GOVERNMENT

NSW Syllabus for the Australian Curriculum

Agricultural Technology

Years 7–10 Syllabus

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Introduction

The 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 7–10. 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 *Agricultural Technology Years 7–10 Syllabus* contributes 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 disability, 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 disability

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 disability. Adjustments are measures or actions taken in relation to teaching, learning and assessment that enable a student with disability to access syllabus outcomes and content and demonstrate achievement of outcomes.

Students with disability can access outcomes and content from Years 7–10 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 7–10 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:

- Technologies
- 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.

Agricultural Technology Key

The following codes and icons are used in the *Agricultural Technology Years 7–10 Syllabus*.

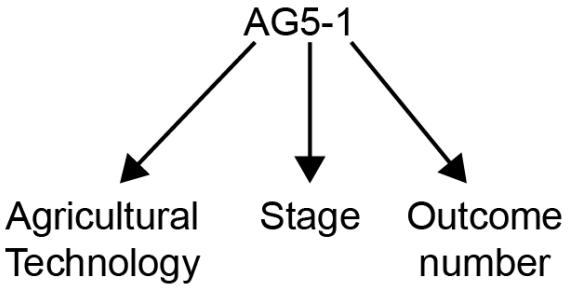
Outcome coding

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

Stage 4, Stage 5 and Life Skills are represented by the following codes:

Stage	Code
Stage 4	4
Stage 5	5
Life Skills	LS

In the Agricultural Technology syllabus, outcome codes indicate subject, Stage and outcome number. For example:

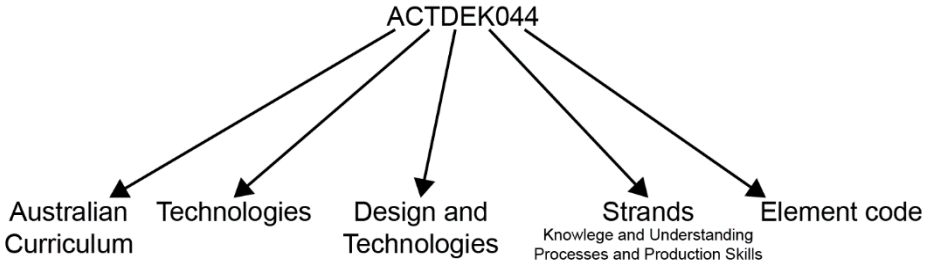


Outcome code	Interpretation
AG5-1	Agricultural Technology, Stage 5 – Outcome number 1
AGLS-3	Agricultural Technology, Life Skills – Outcome number 3

Coding of Australian Curriculum content

The syllabus includes Australian Curriculum content for Design and Technologies with Australian Curriculum codes in brackets at the end of each content description, for example:

- Investigate and make judgements on the ethical and sustainable production and marketing of food and fibre (ACTDEK044)



Where a number of content descriptions are jointly represented, all description codes are included, eg (ACTDEK044, ACTDEP051).

For example:

- evaluate the impact of current technologies on sustainability, for example: (ACTDEK041, ACTDEK044, ACTDEP051)
  - controlled traffic farming
  - precision farming
  - Global Positioning System (GPS) technologies

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 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

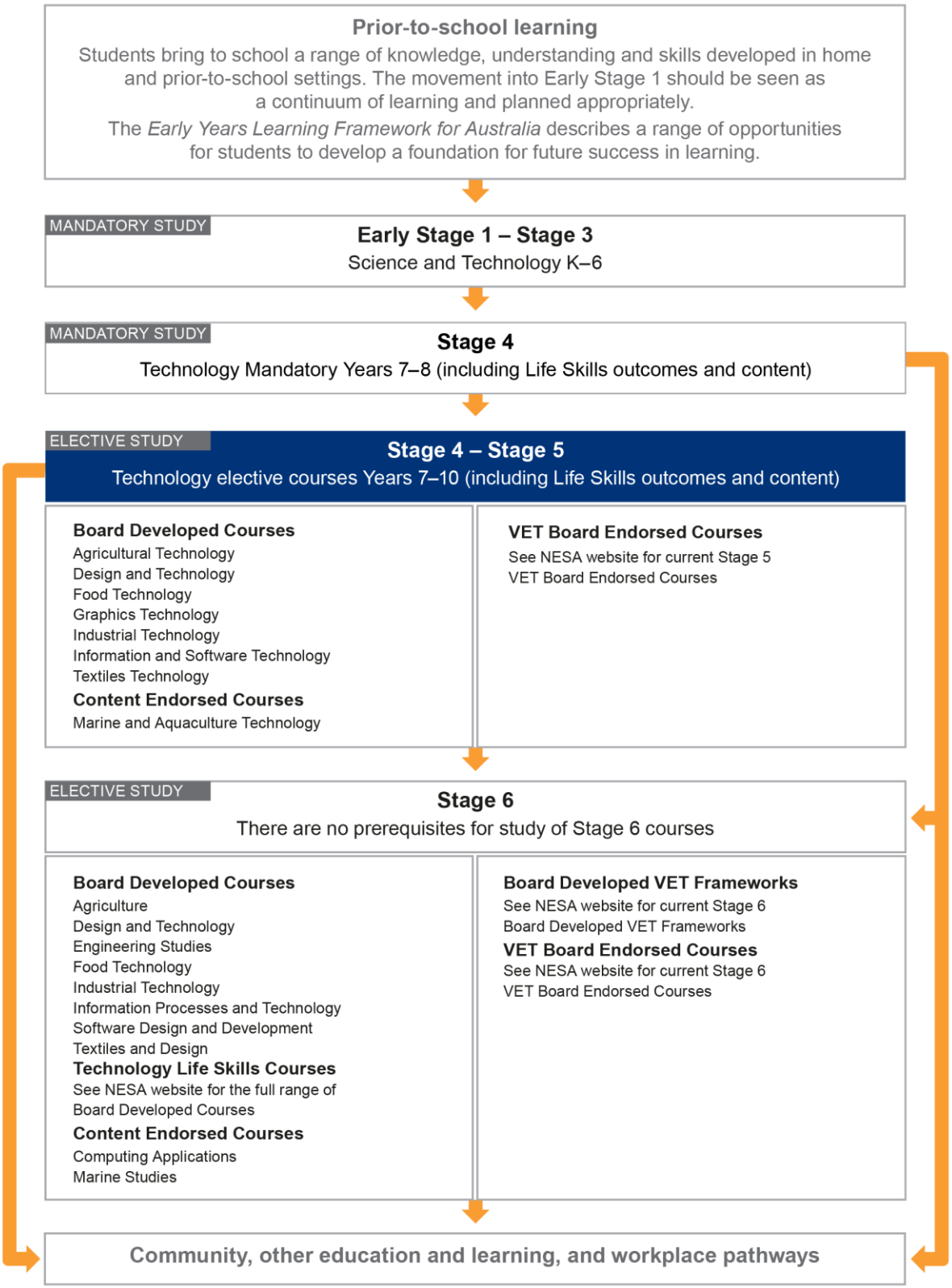
Through the study of Agricultural Technology in Years 7–10 students develop knowledge, understanding and skills which enable them to contribute positively to their own lifestyle and to the social, economic and environmental future of Australia. This syllabus provides scope for students to explore the many and varied career opportunities in agriculture and related service industries. It also provides students with an opportunity to experience aspects of an agricultural lifestyle through direct contact with plants and animals and a variety of related outside activities.

Agriculture and its associated industries contribute significantly to Australia's economic, social and cultural development and influence Australia's prosperity through investment, employment of skilled workers, consumption of products from other sectors of the economy, and export of raw products and processed goods. The continued viability of Australian agriculture can be strengthened through the careful management of long-term issues relating to the sustainability of agricultural systems including environmental impact and evolving economic and social factors.

The dynamic nature of modern agriculture results from the increasing knowledge and application of current and emerging technologies to the production, processing and marketing of products. An understanding of the relationships between production, processing and consumption enables informed debate about the impact of agricultural practices on society and the environment.

The study of Agricultural Technology develops students' knowledge and understanding about a range of agricultural practices. It promotes the ability to respond to human needs and emerging opportunities. The syllabus provides opportunities to develop students' knowledge, understanding and skills in the management of plant and animal enterprises and the technologies associated with these enterprises. Through the study of agriculture students are encouraged to develop skills in order to solve problems, plan, organise and conduct scientific investigations, research, collect and organise information, work as a member of a team and communicate information to a variety of audiences. Students investigate and consider the impact of agricultural practices on the basic resources of soil, air and water. The syllabus also provides opportunities for students to make responsible decisions about the appropriate use of current and emerging agricultural technologies.

The Place of the Agricultural Technology Years 7–10 Syllabus in the K–12 Curriculum



Aim

The aim of the *Agricultural Technology Years 7–10 Syllabus* is to develop students' knowledge and understanding of agricultural enterprises and the practices and skills required to produce plant and animal products. Students develop skills in the effective management of sustainable production and marketing practices that are environmentally and socially responsible.

Objectives

Knowledge, understanding and skills

Students develop:

- knowledge and understanding of agriculture as a dynamic and interactive system that uses plants and animals to produce food, fibre and other derivatives
- knowledge and understanding of the local and global interaction of agriculture with Australia's economy, culture and society
- knowledge of and skills in the effective and responsible production and marketing of agricultural products
- an understanding of sustainable and ethical practices that support productive and profitable agriculture
- skills in problem-solving, including investigating, collecting, analysing, interpreting and communicating information in agricultural contexts
- knowledge and skills in implementing collaborative and safe work practices in agricultural contexts.

Values and attitudes

Students:

- appreciate the contribution and impact of innovation and technologies now and in the future
- appreciate the dynamic nature of agricultural enterprises 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

Knowledge, understanding and skills

Objective

Students develop:

- knowledge and understanding of agriculture as a dynamic and interactive system that uses plants and animals to produce food, fibre and other derivatives

Stage 4 outcomes A student:	**Stage 5 outcomes** A student:
AG4-1 describes a range of plant species and animal breeds used in agricultural enterprises	**AG5-1** explains why identified plant species and animal breeds have been used in agricultural enterprises and developed for the Australian environment and/or markets
AG4-2 outlines the interactions within and between agricultural enterprises and systems	**AG5-2** explains the interactions within and between agricultural enterprises and systems

Objective

Students develop:

- knowledge and understanding of the local and global interaction of agriculture with Australia's economy, culture and society

Stage 4 outcome A student:	**Stage 5 outcome** A student:
AG4-3 identifies and explains interactions between the agricultural sector and Australia's economy, culture and society	**AG5-3** explains the interactions within and between the agricultural sector and Australia's economy, culture and society

Objective

Students develop:

- knowledge of and skills in the effective and responsible production and marketing of agricultural products

Stage 4 outcomes A student:	**Stage 5 outcomes** A student:
AG4-4 implements responsible production of plant and animal products	**AG5-4** investigates and implements responsible production systems for plant and animal enterprises
AG4-5 identifies how agricultural products are used in industry and by consumers	**AG5-5** investigates and applies responsible marketing principles and processes
AG4-6 identifies and uses skills to manage the interactions within plant production enterprises	**AG5-6** explains and evaluates the impact of management decisions on plant production enterprises
AG4-7 identifies and uses skills to manage the interactions within animal production enterprises	**AG5-7** explains and evaluates the impact of management decisions on animal production enterprises

Objective

Students develop:

- an understanding of sustainable and ethical practices that support productive and profitable agriculture

Stage 4 outcomes A student:	**Stage 5 outcomes** A student:
AG4-8 examines the impact of past and current agricultural practices on agricultural sustainability	**AG5-8** evaluates the impact of past and current agricultural practices on agricultural sustainability
AG4-9 identifies aspects of profitability, technology, sustainability and ethics that affect management decisions	**AG5-9** evaluates management practices in terms of profitability, technology, sustainability, social issues and ethics
AG4-10 implements and appreciates the application of animal welfare guidelines to agricultural practices	**AG5-10** implements and justifies the application of animal welfare guidelines to agricultural practices

Objective

Students develop:

- skills in problem-solving, including investigating, collecting, analysing, interpreting and communicating information in agricultural contexts

Stage 4 outcomes A student:	**Stage 5 outcomes** A student:
AG4-11 undertakes controlled experiments in agricultural contexts	**AG5-11** designs, undertakes, analyses and evaluates experiments and investigates problems in agricultural contexts
AG4-12 communicates experimental data using a range of information and communication technologies	**AG5-12** collects and analyses agricultural data and communicates results using a range of technologies

Objective

Students develop:

- knowledge and skills in implementing collaborative and safe work practices in agricultural contexts.

Stage 4 outcomes A student:	**Stage 5 outcomes** A student:
AG4-13 follows safety and hygiene instructions when using chemicals, tools and agricultural machinery in accordance with Work Health and Safety requirements	**AG5-13** applies Work Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery
AG4-14 demonstrates plant and/or animal management practices safely and in collaboration with others	**AG5-14** demonstrates plant and/or animal management practices safely and in collaboration with others

Stage 4 outcomes have been provided to assist the assessment and reporting of student achievement in those schools that choose to begin elective study before Year 9. Teachers are advised to select from the syllabus content to target the specific needs of students who commence study in Stage 4.

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.

Stage 4 – Technology Mandatory

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.

Stage 4 – Agricultural Technology

By the end of Stage 4, knowledge, skills and attitudes developed in the *Science and Technology K–6 Syllabus* are enhanced and expanded through the study of plant and animal production enterprises in an agricultural setting.

Students demonstrate an understanding of Australian agricultural enterprises and the impact of technology on the ongoing development of Australian agriculture. Students develop an appreciation of a range of technologies and their role in Australian agricultural production. They recognise that the viability of an agricultural enterprise is dependent on the application and implementation of sustainable agricultural practices.

Students demonstrate safe work practices and apply appropriate Work Health and Safety (WHS) guidelines when engaged in practical activities. They use appropriate technologies in conducting simple agricultural experiments and the recording and communication of information and ideas. Students develop awareness of the issues and processes that guide ethical considerations in agricultural production.

Stage 5 – Agricultural Technology

By the end of Stage 5, the knowledge, skills and attitudes developed in the Technology Mandatory Years 7–8 course are further enhanced through the study of agricultural enterprises and implementation of associated practical activities.

Students at Stage 5 demonstrate a detailed understanding of the diverse and dynamic nature of Australian agriculture. Students analyse the management of agricultural enterprises and the marketing of a range of products. They use a variety of techniques and associated technologies in the demonstration of workplace practices associated with agricultural enterprises and recognise the impact of current and emerging technologies on local and global environments. Students make considered decisions and responsible judgements on the use of sustainable and ethical management practices.

Students demonstrate safe work practices and apply appropriate WHS guidelines whenever engaged in practical activities. They conduct agricultural experiments and investigations based on sound experimental methods, and collect and draw valid and reliable conclusions. Students develop an appreciation of the value of working collaboratively with others on a common task.

Students identify hazards and apply risk management strategies when using chemicals, tools and agricultural machinery, when handling animals and undertaking animal and plant husbandry procedures.

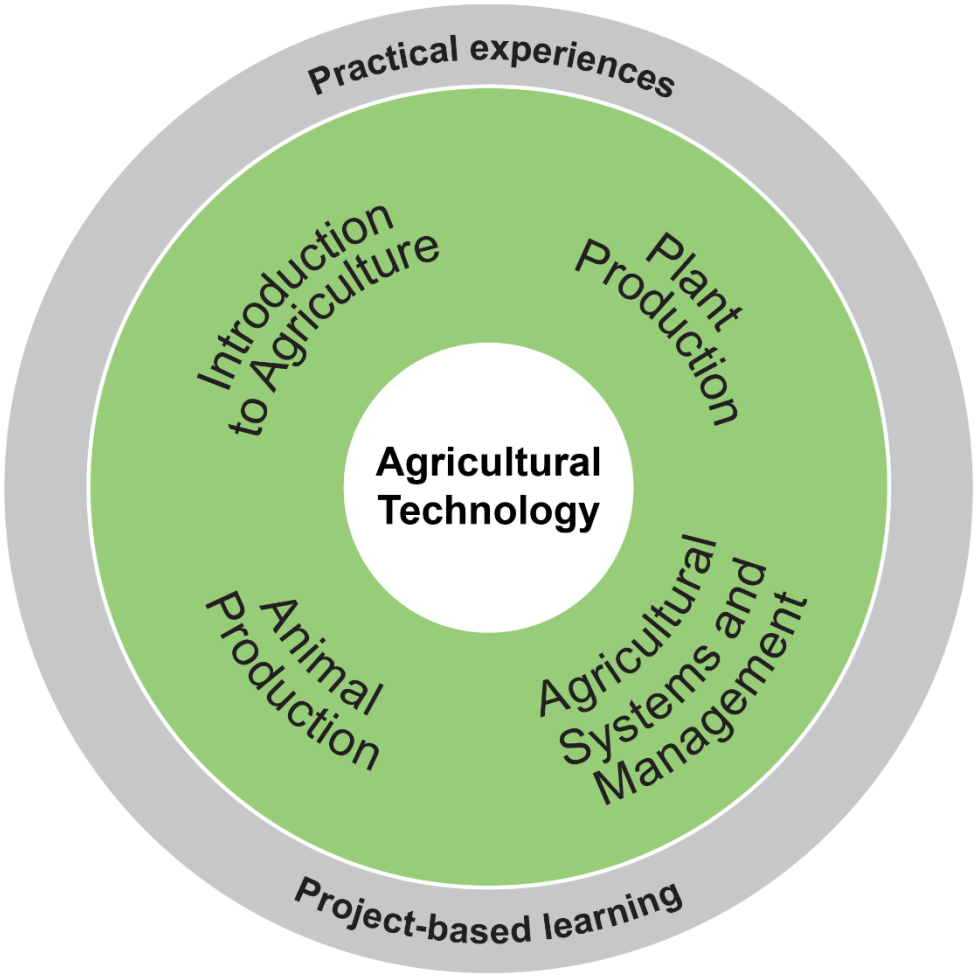
Content

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.



Course structure and requirements

Agricultural Technology is an elective course designed to build upon the *Technology Mandatory Years 7–8 Syllabus*. Outcomes for Stage 4 have been included to allow flexibility for those schools who wish to offer the course in Years 7 and 8.

Agricultural Technology Years 7–10 may be studied as a 100-hour course or as a 200-hour course in Stage 5.

To satisfy the mandatory requirements of a 100-hour course students must complete:

Core A

- Introduction to Agriculture
- Plant Production 1
- Animal Production 1

To satisfy the mandatory requirements of a 200-hour course students must complete:

Core A

- Introduction to Agriculture
- Plant Production 1
- Animal Production 1

AND

Core B

- Agricultural Systems and Management
- Plant Production 2 and/or
- Animal Production 2

100-hour course delivery
• Students must undertake a range of practical experiences that occupy the majority of the course time. • Core A must be delivered. • The content in Core A may be taught individually, concurrently or integrated. • Plant Production 1 content may be delivered using one or more plant enterprises. • Animal Production 1 content may be delivered using one or more animal enterprises. • A variety of intensive and extensive enterprises are to be incorporated into the course of study.

200-hour course delivery
• Students must undertake a range of practical experiences that occupy the majority of the course time. • Core A must be delivered. • The content in Core A may be taught individually, concurrently or integrated. • Plant Production 1 content may be delivered using one or more plant enterprises. • Animal Production 1 content may be delivered using one or more animal enterprises. • Core B must be delivered. • The content in Core B may be taught individually, concurrently or integrated. • Plant Production 2 and/or Animal Production 2 content may be delivered using one or more enterprises. • A variety of intensive and extensive enterprises are to be incorporated into the course of study.

The content integrates the study of interactions, management and sustainability within the context of agricultural enterprises. Students also undertake a range of related practical activities.

Interactions – the relationship between biological, physical and social components in agriculture are fundamental to balancing the economic viability with sustaining the biological and physical basis of the farming systems employed.

Management – informed decision-making and effective management of agricultural enterprises. Physical, biological, economic, environmental, ethical and social factors must be considered in the management of agricultural enterprises.

Sustainability – practices that conserve soil and water quality and protect the environment, ensuring adequate and safe food supplies to consumers, while generating profitable returns for producers both now and in the foreseeable future.

Agricultural enterprises

Agricultural enterprises are characterised by the production and sale or exchange of agricultural goods or services. Agricultural enterprises may focus on plants or animals or integrated plant/animal systems. Teachers should select agricultural enterprises that include those that are important to students' local environment or region and some that extend students' knowledge about the broad context of Australian agriculture. Intensive and extensive enterprises are to be incorporated into the course of study for students to gain an understanding of the diverse nature of Australian agriculture.

The nature of school resources, student interest, teacher expertise and the local community determine the proportion of intensive and extensive enterprises delivered and the balance between plant and animal enterprises undertaken in the course. While many of the essential content statements will be applicable to a wide range of agricultural enterprises, some will explicitly relate to plant or animal applications. These factors also affect the depth of study, the number of enterprises studied and the time allocated to each enterprise.

Practical experiences

To satisfy the requirements of the syllabus, students must undertake a range of practical experiences that occupy the majority of course time.

It is expected that students engage in experiences relevant to all aspects of the enterprises studied. Practical experiences may include fieldwork, small plot activities, laboratory work, plant and animal husbandry activities, and visits to commercial farms and other parts of the production and marketing chain. These experiences should be used to develop the skills of designing, investigating, using technology and communicating.

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 disability 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 information and communication technologies, 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 resources for plant or animal enterprises.

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.

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 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 cultural 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 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.

Students consider problems about, and the solutions to, issues associated with the interaction between agriculture and the environment. Students learn about the processes of planning and strategies that assist in achieving sustainability and that can be used to monitor and conserve natural and farm environments in Australia.

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.

Investigating agricultural enterprises provides critical thinking opportunities as students pose questions, make predictions, engage in firsthand investigations, 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 agricultural enterprises, animal welfare and the environment. They learn about intellectual property, including Indigenous cultural and intellectual property and the protection of cultural knowledge and designs. 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

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

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.

Students learn about and engage with issues requiring cultural sensitivity and recognise that people in agricultural-related professions work in culturally diverse teams. Students investigate the impact of other cultures on Australian agricultural production and changing consumer preferences due to our diverse cultural society.

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. Students use metalanguage associated with agriculture, including specific terms, concepts and processes.

Students develop an understanding that agricultural information can be presented in a variety of forms including diagrams, infographics, flow charts, models, tables and graphs.

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. An appreciation of the fundamental importance of numeracy in everyday life is fostered as students develop an understanding of how numeracy is essential to agricultural enterprises. Students are provided with opportunities to develop data-analysis skills, create technical drawings, use computer software, work with digital models and learn the importance of accurate measurement in the production of quality products.

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, emerging 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 examine the implication of current agricultural issues and assess animal welfare involved in intensive and extensive systems. Students have opportunities to consider 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 socioeconomic circumstances. The investigation of agricultural enterprises 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 in agriculture and learn skills relevant to work and leisure activities. As part of their studies, students are given opportunities to investigate agricultural enterprises, developing knowledge and understanding of the workplace practices, issues, legislation and the changing nature of work within this industry. Students are provided with opportunities to learn about current careers in a broad range of fields related to agricultural 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.

Students experience individual and collaborative work practices to build an appreciation of the opportunities that exist in agricultural careers. Students are encouraged to develop initiative, and to become independent thinkers and confident communicators through self-evaluation and practical application of knowledge.

Content for Years 7–10

Core A: Introduction to Agriculture

Outcomes

A student:

› explains why identified plant species and animal breeds have been used in agricultural enterprises and developed for the Australian environment and/or markets AG5-1
› explains the interactions within and between agricultural enterprises and systems AG5-2
› explains the interactions within and between the agricultural sector and Australia's economy, culture and society AG5-3
› investigates and implements responsible production systems for plant and animal enterprises AG5-4
› applies Work Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery AG5-13
› demonstrates plant and/or animal management practices safely and in collaboration with others AG5-14

Related Stage 4 outcomes: AG4-1, AG4-2, AG4-3, AG4-4, AG4-13, AG4-14

Related Life Skills outcomes: AGLS-1, AGLS-2, AGLS-3, AGLS-4, AGLS-5, AGLS-11, AGLS-12, AGLS-13, AGLS-14

Content focus

Introduction to Agriculture provides a broad overview of plant and animal-related concepts to encourage students to develop an appreciation of the complexity of agriculture. Students have opportunities to investigate the industries involved in agriculture, how plants and animals are produced and to follow Work Health and Safety (WHS) guidelines.

Content

Students:

- identify the characteristics of animal breeds and plant types specific to chosen enterprises, for example:
  - identify pasture types
  - associate plant growth patterns with local climate patterns
- collect climatic data that affects plant and animal production and relate it to the selection of plants and animals for a particular location, for example: (ACTDEK044)
  - Bureau of Meteorology website
  - actual rainfall and temperature recordings for the school
  - characteristics of Bos indicus cattle related to tropical environments
- identify the impact of a range of cultures, including those of Aboriginal and/or Torres Strait Islander Peoples, on Australian agricultural production, for example: (ACTDEK040)
  - Aboriginal land management
  - Italian/Asian market gardeners' influence on vegetable production
  - Aboriginal bush tucker influence and initiatives on contemporary diets

- research and illustrate using models, the interactions within and between school farm enterprises to include plants, animals, soils, climate and microorganisms, for example: (ACTDEK046)
  - create a model of the school farm to highlight the complex relationships between soil, plants, animals and the management of pests, weeds and disease
- explain the significance of agricultural industries and products, and their intended markets, for example: (ACTDEK044)
  - create a market chain for a range of agricultural products
  - use the Australian Bureau of Statistics website to find data about agricultural industries
- research a range of current and future employment opportunities in agriculture, for example:
  - agricultural practices employing Aboriginal knowledge
  - development of automation, eg irrigation, milking
  - operating unmanned aerial vehicles (UAV)
  - precision farming and Global Positioning System (GPS) technologies
- research the required assets, infrastructure and management techniques required for plant and animal production (ACTDEK047)
- evaluate intensive and extensive production systems, for example:
  - broadacre cropping
  - intensive versus free-range meat bird production
  - extensive cattle and sheep production versus feedlot production systems
- research an agricultural problem and develop possible solutions, for example: (ACTDEP048)
  - the Murray–Darling Basin
  - dryland and irrigation salinity
  - proximity to markets
  - mulesing of merino lambs
  - the live export trade
- identify and apply ethical and WHS practices, for example: (ACTDEP050)
  - demonstrate correct methods of operating and maintaining agricultural tools, equipment and machinery
  - demonstrate safe and ethical handling of animals
- conduct safe handling and storage of agricultural chemicals by interpreting chemical labels and correctly calibrating equipment, for example:
  - diluting chemicals for weed control
  - using appropriate personal protective equipment (PPE)
- investigate procedures in the management of plants and animals within animal welfare guidelines (ACTDEP048, ACTDEP050)

Plant Production 1

Outcomes

A student:

› investigates and applies responsible marketing principles and processes AG5-5
› explains and evaluates the impact of management decisions on plant production enterprises AG5-6
› evaluates the impact of past and current agricultural practices on agricultural sustainability AG5-8
› evaluates management practices in terms of profitability, technology, sustainability, social issues and ethics AG5-9
› designs, undertakes, analyses and evaluates experiments and investigates problems in agricultural contexts AG5-11
› collects and analyses agricultural data and communicates results using a range of technologies AG5-12
› applies Work Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery AG5-13
› demonstrates plant and/or animal management practices safely and in collaboration with others AG5-14

Related Stage 4 outcomes: AG4-5, AG4-6, AG4-8, AG4-9, AG4-11, AG4-12, AG4-13, AG4-14

Related Life Skills outcomes: AGLS-5, AGLS-6, AGLS-7, AGLS-8, AGLS-10, AGLS-11, AGLS-12, AGLS-13, AGLS-14

Content focus

Plant Production 1 provides students with opportunities to develop an understanding of plant production in the context of plant-based enterprises. This includes the environmental sustainability, financial viability, marketing, available technologies and ethical considerations of plant enterprises.

Students are provided with opportunities to gain firsthand practical experiences in growing, tending, harvesting and processing of plants in the context of agricultural enterprises.

Content

Students:

- identify plants relevant to agricultural production, for example:
  - important plant crops in Australia, eg wheat, barley, oats
  - importance of legumes in pastures
  - commercially grown bush plants eg wattle, sandalwood
- explain the function and structure of plants related to the enterprise, for example:
  - the role of leaves, stems, roots
  - the role of fruits and flowers
- implement soil-management operations for a chosen plant enterprise (ACTDEK046)
- investigate and analyse soil quality indicators, eg soil texture, structure, pH and soil profiles
- identify and describe common plant pests and diseases
- evaluate strategies for the management and control of plant pests and diseases (ACTDEP050)
- investigate current agricultural systems and Aboriginal land management practices

- explore the effect of European and Aboriginal agricultural practices on agricultural production and environmental sustainability, for example: (ACTDEK040)
  - the use of fire for managing the land
  - crop rotation
- understand ethical responsibilities surrounding intellectual property, including Indigenous cultural and intellectual property, for example:
  - Aboriginal ownership of cultural knowledge
- evaluate current agricultural methods relevant to the chosen plant enterprise in terms of environmental sustainability, for example: (ACTDEK044)
  - minimum tillage/tramlining
  - integrated pest management
  - flood irrigation
- research the markets available for chosen plant agricultural products
- assess the market specifications required to market chosen plant agricultural products, for example:
  - quality criteria/market specifications for cotton, canola and/or rice related to export and domestic use
  - wheat, eg protein percentage, hardness
- evaluate the social and ethical issues that would be confronted in the chosen plant enterprise, for example: (ACTDEK040)
  - genetically modified plants
  - chemical use
  - urban sprawl/land use conflicts
- research an agricultural issue relevant to the plant enterprise chosen and propose possible solutions, for example: (ACTDEK044)
  - rust in wheat
  - soil-borne diseases
  - changing consumer markets
  - food quality
  - rising cost of inputs
- evaluate the profitability of an agricultural plant enterprise
- investigate technologies that assist in record-keeping and monitoring of the plant enterprise and its performance (ACTDEK047)
- collect accurate evidence and record relevant data relating to the plant enterprise, for example:
  - growth rates
  - yield
  - climatic data through growing period
  - management operations, eg fertilising, watering, weeding
- select and use appropriate software to analyse and present agricultural data related to the plant enterprise (ACTDEP052)
- conduct a controlled agricultural experiment based on a plant-related hypothesis, for example:
  - sowing density
  - fertiliser application
  - plant yield
- identify and apply ethical and WHS practices, for example: (ACTDEP050)
  - demonstrate correct methods of operating and maintaining agricultural tools, equipment and machinery

- conduct safe handling and storage of agricultural chemicals by interpreting chemical labels and correctly calibrating equipment, for example:
  - mixing fertiliser
  - using appropriate PPE
- plan and undertake procedures in the management of a plant enterprise (ACTDEP048, ACTDEP050)
- work collaboratively to perform plant enterprise management activities (ACTDEP050, ACTDEP052)
- manage and monitor crops to raise/grow products on the school farm, for example:
  - grow a crop from seed to harvest

Animal Production 1

Outcomes

A student:

› investigates and applies responsible marketing principles and processes AG5-5
› explains and evaluates the impact of management decisions on animal production enterprises AG5-7
› evaluates the impact of past and current agricultural practices on agricultural sustainability AG5-8
› evaluates management practices in terms of profitability, technology, sustainability, social issues and ethics AG5-9
› implements and justifies the application of animal welfare guidelines to agricultural practices AG5-10
› collects and analyses agricultural data and communicates results using a range of technologies AG5-12
› applies Work Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery AG5-13
› demonstrates plant and/or animal management practices safely and in collaboration with others AG5-14

Related Stage 4 outcomes: AG4-5, AG4-7, AG4-8, AG4-9, AG4-10, AG4-12, AG4-13, AG4-14

Related Life Skills outcomes: AGLS-5, AGLS-6, AGLS-7, AGLS-8, AGLS-9, AGLS-10, AGLS-11, AGLS-12, AGLS-13, AGLS-14

Content focus

Animal Production 1 provides students with opportunities to develop an understanding of animal production in the context of animal-based enterprises. This includes the environmental sustainability, financial viability, marketing, available technologies and ethical considerations of animal enterprises.

Students are provided with opportunities to gain firsthand practical experiences in raising and managing animals in the context of agricultural enterprises.

Content

Students:

- describe an animal enterprise, for example:
  - fresh cow's milk for the domestic market
  - fine wool from Merino sheep
  - bulls for the beef seedstock market
- investigate a range of important animal management skills, for example:
  - monitoring and recording production data, eg growth rates
  - drenching, drafting, mustering, yarding, catching and restraining
- investigate and implement a range of animal husbandry operations, following animal welfare guidelines, including *Animals in Schools* (ACTDEK044)
- investigate technologies that assist in record-keeping and monitoring an animal enterprise and its performance (ACTDEK047)
- select and use ICT in the analysis and presentation of agricultural data related to the animal enterprise (ACTDEP052)

- collect accurate evidence and record relevant data relating to the animal enterprise, for example:
  - weight gains
  - health treatments
  - feeding rations
- research the markets available for chosen animal agricultural products, for example:
  - chilled export lamb market
  - domestic fresh milk market
  - free-range egg market
- assess the market specifications required to market chosen animal agricultural products, for example:
  - quality and quantity criteria for beef, lamb, milk
- examine the profitability of an agricultural animal enterprise
- explore Aboriginal land management practices, for example: (ACTDEK040)
  - social and cultural practices that contribute to land management eg kinship responsibilities to Country
  - the use of Aboriginal knowledge as solutions
- explore the effect of European and Aboriginal agricultural practices on agricultural production and environmental sustainability, for example: (ACTDEK040)
  - seasonal/cyclical occupation to care for Country
  - fish traps which modify the environment to trap specific fish
  - breeding of the wrinkly-skin merino
- evaluate current sustainable and unsustainable agricultural animal management practices, for example: (ACTDEK044)
  - overstocking livestock
  - animal effluent management
  - integrated pest management
  - biosecurity
- investigate the social and ethical issues that affect the chosen animal enterprises, for example: (ACTDEK040)
  - animal stocking rates
  - use of hormonal growth promotants (HGPs)
  - mulesing
  - the use of battery cages in egg production
- research an agricultural issue relevant to the animal enterprise and propose possible solutions, for example: (ACTDEK044)
  - stock theft
  - shearer shortage
  - live exports
  - rising cost of feed
- identify and apply ethical and WHS practices, for example: (ACTDEP050)
  - demonstrate correct methods of operating and maintaining agricultural tools, equipment and machinery
  - demonstrate the safe handling and treatment of animals
- conduct safe handling and storage of agricultural chemicals by interpreting chemical labels and correctly calibrating equipment, for example:
  - use appropriate PPE
  - follow appropriate withholding periods (WHP)
- plan and undertake procedures in the management of an animal enterprise within animal welfare guidelines (ACTDEP048, ACTDEP050)
- work collaboratively to perform animal enterprise management activities (ACTDEP050, ACTDEP052)

Core B: Agricultural Systems and Management

Outcomes

A student:

› explains why identified plant species and animal breeds have been used in agricultural enterprises and developed for the Australian environment and/or markets AG5-1
› explains the interactions within and between agricultural enterprises and systems AG5-2
› explains the interactions within and between the agricultural sector and Australia's economy, culture and society AG5-3
› investigates and implements responsible production systems for plant and animal enterprises AG5-4
› investigates and applies responsible marketing principles and processes AG5-5
› designs, undertakes, analyses and evaluates experiments and investigates problems in agricultural contexts AG5-11
› applies Work Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery AG5-13
› demonstrates plant and/or animal management practices safely and in collaboration with others AG5-14

Related Stage 4 outcomes: AG4-1, AG4-2, AG4-3, AG4-4, AG4-5, AG4-11, AG4-13, AG4-14

Related Life Skills outcomes: AGLS-1, AGLS-2, AGLS-3, AGLS-4, AGLS-10, AGLS-11, AGLS-12, AGLS-13, AGLS-14

Content focus

Agricultural Systems and Management provides students with opportunities to develop a more in-depth appreciation of the complexity of agriculture. Students investigate the industries involved in agriculture, how plants and animals are produced and marketed, and related Work Health and Safety (WHS) requirements.

Content

Students:

- identify animal breeds and plant types specifically developed for a particular climate or market, for example: (ACTDEK044)
  - selection of pasture for the cold temperatures of winter, eg grazing oats
  - Bos indicus cattle for tropical regions
  - fine wool Merinos for hot and dry regions
- investigate the effect of beneficial and harmful microorganisms and invertebrates on plant and/or animal production
- investigate the influences of Australia's developing multicultural society on an increasing variety of agricultural products, for example: (ACTDEK040)
  - halal and kosher products
  - Asian-style products, eg bok choy, coriander
  - increase in goat consumption
- identify opportunities provided by the agricultural sector, both as an employer and as a user of products

- investigate information from secondary sources on agricultural production and Australian export trends in agricultural products, for example:
  - Australian Bureau of Statistics data regarding lamb and beef production and exports
- compare alternative production systems for a plant and animal enterprise, for example: (ACTDEK044)
  - glasshouse plant production
  - biodynamic and organic production
  - commercial worm farming
- evaluate different production techniques for a chosen agricultural system or enterprise, for example:
  - rangeland beef production versus feedlot production
  - caged layers versus free-range layers
  - tramline farming
- identify hazards and apply WHS practices including the use of PPE
- conduct a risk assessment for a designated task, for example:
  - tractor operations
  - livestock handling
- design and conduct a controlled agricultural experiment, for example: (ACTDEP049)
  - the effect of irrigation on a plant enterprise
  - soil testing to determine the influences on plant growth
  - compare the growth rates of yabbies fed on different diets
- conduct a market survey for an agricultural product, for example:
  - survey school staff about consumer needs
  - survey local butchers
- assess the effectiveness of marketing strategies for an agricultural product, for example: (ACTDEK044)
  - direct selling to consumers
  - contracts with processing companies
  - online selling of livestock
- analyse how an agricultural product may be promoted, for example:
  - bush tucker
  - frozen vegetables
  - free-range eggs
  - flavoured milk
  - organic cotton T-shirts
- investigate the role of value-adding in marketing agricultural products, for example:
  - potatoes, eg chips, potato bake, potato flour
  - milk products, eg cheese, butter, ice cream
  - bouquets of cut flowers for special occasions, eg Mother's Day

Plant Production 2

Outcomes

A student:

› explains and evaluates the impact of management decisions on plant production enterprises AG5-6
› evaluates the impact of past and current agricultural practices on agricultural sustainability AG5-8
› evaluates management practices in terms of profitability, technology, sustainability, social issues and ethics AG5-9
› collects and analyses agricultural data and communicates results using a range of technologies AG5-12
› applies Work Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery AG5-13
› demonstrates plant and/or animal management practices safely and in collaboration with others AG5-14

Related Stage 4 outcomes: AG4-6, AG4-8, AG4-9, AG4-12, AG4-13, AG4-14

Related Life Skills outcomes: AGLS-5, AGLS-6, AGLS-7, AGLS-8, AGLS-10, AGLS-11, AGLS-12, AGLS-13, AGLS-14

Content focus

Plant Production 2 provides students with opportunities to gain a more in-depth understanding of plant production in the context of plant-based enterprises. Students investigate environmental sustainability, financial viability, available technologies and ethical considerations of plant enterprises.

Students are provided with opportunities to gain firsthand practical experiences in growing, tending, harvesting and processing of plants in the context of agricultural enterprises.

Content

Students:

- demonstrate a range of propagation techniques, for example:
  - cuttings
  - seed sowing
  - layering
  - grafting
- identify and select technologies to assess the effectiveness of plant production practices, for example: (ACTDEK047)
  - dry matter yield assessment
  - soil-moisture probes
- investigate timing and impact of relevant operations in a plant production cycle, for example:
  - application of fertiliser
  - pruning
  - sowing
  - irrigation

- evaluate the impact of current technologies on sustainability, for example: (ACTDEK041, ACTDEK044, ACTDEP051)
  - controlled traffic farming
  - precision farming
  - Global Positioning System (GPS) technologies
- compare short-term and long-term effects of agricultural production systems on sustainability, for example: (ACTDEK044)
  - growing a green manure crop may reduce short-term profit but will improve soil structure and fertility in the long term
  - continual application of artificial fertilisers may increase short-term yields but may adversely affect soil pH in the long term
- investigate profitability using financial tools, eg gross margins and budgets
- draw conclusions from evidence and the analysis of data, for example: (ACTDEP051)
  - identify fertilisers for optimal plant growth
  - identify optimal irrigation systems
- formulate a solution to an agricultural issue (ACTDEP048)
- examine and analyse data from a range of sources, for example:
  - use primary and secondary data, eg government websites
- communicate an understanding of trends, patterns and relationships in data to a specified audience, for example:
  - write a report
  - develop a presentation
  - create a website
- identify hazards, apply control measures and use PPE when working with chemicals, tools and agricultural machinery, for example: (ACTDEP050)
  - construct an inventory of chemicals
  - create a database of Safety Data Sheets (SDS)
  - develop procedures for the safe use of chemicals, tools and machinery
- conduct a hazard identification and risk assessment task when undertaking a plant production activity (ACTDEP050)

Animal Production 2

Outcomes

A student:

› explains and evaluates the impact of management decisions on animal production enterprises AG5-7
› evaluates the impact of past and current agricultural practices on agricultural sustainability AG5-8
› evaluates management practices in terms of profitability, technology, sustainability, social issues and ethics AG5-9
› implements and justifies the application of animal welfare guidelines to agricultural practices AG5-10
› collects and analyses agricultural data and communicates results using a range of technologies AG5-12
› applies Work Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery AG5-13
› demonstrates plant and/or animal management practices safely and in collaboration with others AG5-14

Related Stage 4 outcomes: AG4-7, AG4-8, AG4-9, AG4-10, AG4-12, AG4-13, AG4-14

Related Life Skills outcomes: AGLS-5, AGLS-6, AGLS-7, AGLS-8, AGLS-9, AGLS-10, AGLS-11, AGLS-12, AGLS-13, AGLS-14

Content focus

Animal Production 2 provides students with opportunities to gain a more in-depth understanding of animal production in the context of animal-based enterprises. Students investigate environmental sustainability, financial viability, available technologies and ethical considerations of animal enterprises.

Students are provided with opportunities to gain firsthand practical experiences in raising and managing animals in the context of agricultural enterprises.

Content

Students:

- identify some of the programs, techniques and tools used in animal breeding and analyse their impact on production, for example: (ACTDEK046)
  - crossbreeding, inbreeding, outbreeding, linebreeding
  - artificial insemination
  - embryo transfer
  - the use of estimated breed values for a particular enterprise
- analyse nutritional requirements for the production cycle of an animal, for example:
  - nutrition for growing animals
  - nutrition for pregnant animals

- investigate timing and impact of relevant operations in an animal production cycle, for example:
  - shearing
  - breeding
  - drenching
  - culling
- select and use technologies to assist effective animal management practices, for example: (ACTDEK047)
  - electronic ear tags to identify animals
  - automated bail feeding systems
  - sheep auto drafters
  - rumination collars
  - virtual fences
  - water point weigh systems
- identify emerging technologies that affect sustainability, for example: (ACTDEK041)
  - genetic engineering, eg sex selection of embryos
  - electronic pasture meters
  - electronic monitoring of sheep
- compare short-term and long-term effects of agricultural production systems on sustainability, for example: (ACTDEK044)
  - high stocking rates may result in higher profits in the short term but may result in pasture degradation in the long term
  - the development of shelter belts may reduce the area available for grazing in the short term but in the long term may lead to increased lamb survival and biodiversity in native animals
- investigate profitability using financial tools, eg gross margins and budgets
- investigate Australian animal welfare codes and their effect on the management of intensive and extensive systems, for example: (ACTDEK044)
  - egg production systems, eg caged, free-range
  - feedlot beef cattle
  - ages for the carrying out of particular husbandry practices
- implement and document practices in accordance with animal welfare codes, for example:
  - vaccination and drenching
  - stocking rates
  - lamb marking
- draw conclusions from evidence and analysis of data, for example:
  - determine the best feed for optimal growth rates
  - determine the suitable stocking rate
- formulate a solution to an agricultural problem (ACTDEP048)
- examine and analyse data from a range of sources, for example:
  - primary and secondary data, eg experiments, websites
- communicate an understanding of trends, patterns and relationships in data to a specified audience, for example:
  - write a report
  - produce a presentation
  - create a website
- identify hazards, apply control measures and use PPE when working with chemicals, tools and agricultural machinery, for example: (ACTDEP050)
  - develop an inventory of chemicals
  - create a database of Safety Data Sheets (SDS)
  - develop procedures for use of chemicals, tools and machinery
- conduct a hazard identification and risk assessment task when undertaking animal husbandry tasks (ACTDEP050)

Years 7–10 Life Skills Outcomes and Content

The Years 7–10 Life Skills outcomes and content are developed from the objectives of the *Agricultural Technology Years 7–10 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 and Stage 5 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:

- Technologies
- Special Education
- Life Skills.

Years 7–10 Life Skills Outcomes

Table of objectives and outcomes

Knowledge, understanding and skills

Objective

Students develop:

- knowledge and understanding of agriculture as a dynamic and interactive system that uses plants and animals to produce food, fibre and other derivatives

Life Skills outcomes A student:
AGLS-1 experiences a range of plant and animal production enterprises **AGLS-2** investigates environmental factors that affect plant and animal production

Objective

Students develop:

- knowledge and understanding of the local and global interaction of agriculture with Australia's economy, culture and society

Life Skills outcomes A student:
AGLS-3 identifies animals and plants commonly used in Australian agricultural production **AGLS-4** explores how agricultural production contributes to our daily lives

Objective

Students develop:

- knowledge of and skills in the effective and responsible production and marketing of agricultural products

Life Skills outcomes
A student:
AGLS-5 participates in the production process of an agricultural enterprise **AGLS-6** participates in marketing an agricultural product

Objective

Students develop:

- an understanding of sustainable and ethical practices that support productive and profitable agriculture

Life Skills outcomes
A student:
AGLS-7 identifies environmental effects of agricultural production **AGLS-8** implements recycling strategies in an agricultural enterprise **AGLS-9** ensures the safe treatment and care of animals while engaging in an agricultural enterprise

Objective

Students develop:

- skills in problem-solving, including investigating, collecting, analysing, interpreting and communicating information in agricultural contexts

Life Skills outcome
A student:
AGLS-10 uses information and communication technologies to collect, organise and present information related to an agricultural enterprise

Objective

Students develop

- knowledge and skills in implementing collaborative and safe work practices in agricultural contexts

Life Skills outcomes A student:
AGLS-11 identifies safe and unsafe conditions in an agricultural setting **AGLS-12** selects appropriate equipment, materials and tools to meet the requirements of an agricultural enterprise **AGLS-13** demonstrates safe practices in the use of equipment, materials and tools **AGLS-14** maintains and cares for equipment, materials and tools

Values and attitudes

Students:

- appreciate the contribution and impact of innovation and technologies now and in the future
- appreciate the dynamic nature of agricultural enterprises 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.

Years 7–10 Life Skills and related syllabus outcomes

Knowledge, understanding and skills

Objective

Students develop:

- knowledge and understanding of agriculture as a dynamic and interactive system that uses plants and animals to produce food, fibre and other derivatives

Life Skills outcomes A student:	**Related Stage 4 and 5 outcomes** A student:
AGLS-1 experiences a range of plant and animal production enterprises	**AG4-1** describes a range of plant species and animal breeds used in agricultural enterprises **AG5-1** explains why identified plant species and animal breeds have been used in agricultural enterprises and developed for the Australian environment and/or markets
AGLS-2 investigates environmental factors that affect plant and animal production	**AG4-2** outlines the interactions within and between agricultural enterprises and systems **AG5-2** explains the interactions within and between agricultural enterprises and systems

Objective

Students develop:

- knowledge and understanding of the local and global interaction of agriculture with Australia's economy, culture and society

Life Skills outcomes A student:	**Related Stage 4 and 5 outcomes** A student:
AGLS-3 identifies animals and plants commonly used in Australian agricultural production **AGLS-4** explores how agricultural production contributes to our daily lives	**AG4-3** identifies and explains interactions between the agricultural sector and Australia's economy, culture and society **AG5-3** explains the interactions within and between the agricultural sector and Australia's economy, culture and society

Objective

Students develop:

- knowledge of and skills in the effective and responsible production and marketing of agricultural products

Life Skills outcomes A student:	**Related Stage 4 and 5 outcomes** A student:
AGLS-5 participates in the production process of an agricultural enterprise **AGLS-6** participates in marketing an agricultural product	**AG4-4** implements responsible production of plant and animal products **AG4-5** identifies how agricultural products are used in industry and by consumers **AG4-6** identifies and uses skills to manage the interactions within plant production enterprises **AG4-7** identifies and uses skills to manage the interactions within animal production enterprises **AG5-4** investigates and implements responsible production systems for plant and animal enterprises **AG5-5** investigates and applies responsible marketing principles and processes **AG5-6** explains and evaluates the impact of management decisions on plant production enterprises **AG5-7** explains and evaluates the impact of management decisions on animal production enterprises

Objective

Students develop:

- an understanding of sustainable and ethical practices that support productive and profitable agriculture

Life Skills outcomes A student:	**Related Stage 4 and 5 outcomes** A student:
AGLS-7 identifies environmental effects of agricultural production	**AG4-8** examines the impact of past and current agricultural practices on agricultural sustainability **AG5-8** evaluates the impact of past and current agricultural practices on agricultural sustainability
AGLS-8 implements recycling strategies in an agricultural enterprise	**AG4-9** identifies aspects of profitability, technology, sustainability and ethics that affect management decision **AG5-9** evaluates management practices in terms of profitability, technology, sustainability, social issues and ethics
AGLS-9 ensures the safe treatment and care of animals while engaging in an agricultural enterprise	**AG4-10** implements and appreciates the application of animal welfare guidelines to agricultural practices **AG5-10** implements and justifies the application of animal welfare guidelines to agricultural practices

Objective

Students develop:

- skills in problem-solving, including investigating, collecting, analysing, interpreting and communicating information in agricultural contexts

Life Skills outcomes A student:	**Related Stage 4 and 5 outcomes** A student:
AGLS-10 uses information and communication technologies to collect, organise and present information related to an agricultural enterprise	**AG4-11** undertakes controlled experiments in agricultural contexts **AG4-12** communicates experimental data using a range of information and communication technologies **AG5-11** designs, undertakes, analyses and evaluates experiments and investigates problems in agricultural contexts **AG5-12** collects and analyses agricultural data and communicates results using a range of technologies

Objective

Students develop:

- knowledge and skills in implementing collaborative and safe work practices in agricultural contexts.

Life Skills outcomes A student:	**Related Stage 4 and 5 outcomes** A student:
AGLS-11 identifies safe and unsafe conditions in an agricultural setting **AGLS-12** selects appropriate equipment, materials and tools to meet the requirements of an agricultural enterprise **AGLS-13** demonstrates safe practices in the use of equipment, materials and tools **AGLS-14** maintains and cares for equipment, materials and tools	**AG4-13** follows safety and hygiene instructions when using chemicals, tools and agricultural machinery in accordance with Work Health and Safety requirements **AG4-14** demonstrates plant and/or animal management practices safely and in collaboration with others **AG5-13** applies Work Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery **AG5-14** demonstrates plant and/or animal management practices safely and in collaboration with others

Years 7–10 Life Skills Content

The Years 7–10 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 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. This allows scope when planning for the breadth of individual capabilities across the Life Skills outcomes.

The Years 7–10 Life Skills content has been organised around the areas of:

- Introduction to Agriculture
- Plant Production
- Animal Production
- Agricultural Systems and Management

The areas provide possible frameworks for addressing the Life Skills outcomes and content, and are suggestions only. Teachers have the flexibility to develop topics that will meet the needs, strengths, goals, interests and prior learning of their students.

Agricultural enterprises

Where appropriate, students should have the opportunity to engage with a range of agricultural enterprises that align with the nature of school resources, student interest, teacher expertise and the local community. Agricultural enterprises are characterised by the production and sale or exchange of agricultural goods or services. Agricultural enterprises may focus on plants or animals or integrated plant/animal systems.

Practical experiences

Where appropriate, students should have the opportunity to develop their knowledge, understanding and skills of principles and techniques associated with agriculture by engaging in a range of practical experiences. Students with disability may require adjustments and/or additional support in order to engage in practical experiences.

Further information can be found in Course Structure and Requirements.

Introduction to Agriculture

Outcomes

A student:

› experiences a range of plant and animal production enterprises AGLS-1
› investigates environmental factors that affect plant and animal production AGLS-2
› identifies animals and plants commonly used in Australian agricultural production AGLS-3
› explores how agricultural production contributes to our daily lives AGLS-4
› participates in the production process of an agricultural enterprise AGLS-5
› identifies safe and unsafe conditions in an agricultural setting AGLS-11
› selects appropriate equipment, materials and tools to meet the requirements of an agricultural enterprise AGLS-12
› demonstrates safe practices in the use of equipment, materials and tools AGLS-13
› maintains and cares for equipment, materials and tools AGLS-14

Related Stage 4/5 outcomes: AG4-1, AG4-2, AG4-3, AG4-4, AG4-13, AG4-14, AG5-1, AG5-2, AG5-3, AG5-4, AG5-13, AG5-14

Content focus

Introduction to Agriculture provides students with the opportunity to identify a range of plant and animal industries important to feeding and clothing people. Students explore the various work opportunities within these industries and related Work Health and Safety (WHS). They are encouraged to identify, select and safely use appropriate tools, materials and equipment, and to maintain a clean, healthy and secure workplace.

Where appropriate, students should be provided with opportunities to gain firsthand practical experiences in growing plants and raising and managing animals.

Content

Students:

- identify a range of established and emerging agricultural enterprises, for example:
  - eggs
  - rice
  - essential oils
  - alpacas
  - honey
  - beef
  - vegetables
  - bush tucker
  - bush medicine
- identify different agricultural products that are derived from animals or plants and their uses, for example:
  - eggs for food
  - wool for clothing
  - leather for footwear
  - timber for building

- identify the range of employment associated with agricultural enterprises, for example:
  - farming
  - shearing
  - grape picking
  - mustering
  - irrigation
  - agronomy
  - Aboriginal cultural tourism/educational programs
  - farm management
  - veterinary practice
  - stock and station agent
- explore Aboriginal agricultural practices and ownership of agricultural knowledge, for example:
  - the use of fire for managing the land
  - social and cultural practices that contribute to land management, eg kinship responsibilities to Country
- measure and collect data relating to climatic factors affecting plant and animal production, for example:
  - soil erosion
  - water temperature and/or levels
  - humidity
  - air temperature
- identify safe and unsafe conditions and practices in an agricultural setting, for example:
  - complete a safety audit checklist and identify possible hazards
  - provide solutions to identified hazards
  - indicate the correct and incorrect use for handling of tools, animals and chemicals
- participate in the production process of an agricultural enterprise, for example:
  - plant seeds in a planter box
  - collect eggs from a coop
  - water and fertilise plants
  - move or handle an animal
  - photograph the growth of plants or video animal movement
  - use a heat lamp to keep layers warm
  - build an irrigation system or planter box
- select and use tools and equipment appropriately in relation to an agricultural project, for example:
  - use a hand saw, electric drill, hammer and nails to construct a nesting box or a roosting perch
  - use a shovel, hammer, stakes and sleepers to construct a herb garden bed
  - select timber and/or metal to construct a frame support for a hydroponic system
  - use a computer program or timing device to set irrigation times for lettuce production
- identify and apply WHS practices in the use of equipment, materials and tools, for example:
  - use gloves when handling chemicals
  - check for obstacles when moving materials
  - identify and respond to safety labels of equipment, materials and tools
  - use mask and gloves when handling potting mixes, fertilisers, pesticides and herbicides
  - use safety glasses and protective clothing when using a saw or drill
  - lock a gate for an animal enclosure

- participate in the regular maintenance of tools and equipment in relation to an agricultural setting, for example:
  - checking electrical cords and plugs for faults
  - inspecting animal housing for cleanliness, safety and security
  - examining food and water dispensers for cleanliness and effectiveness
  - testing irrigation pipes for leakages and blockages
  - inspecting fencing and locks for damage and faults
  - completing charts indicating dates for maintenance
- identify features of equipment, materials and tools that make them dangerous, for example:
  - flammability
  - toxicity
  - sharpness
  - weight
  - temperature
- identify and apply safe storage practices for materials, tools and equipment, for example:
  - chemicals and fertilisers in a secure chemical cabinet
  - fuels in a flameproof cabinet
  - garden tools in racks
- participate in the cleaning of materials, tools and equipment after use, for example:
  - brooders
  - incubators
  - milking equipment
  - garden tools
  - spray and drench equipment
- identify potential hazards and suggest ways to reduce the risks, for example:
  - slippery surfaces
  - unsecured tools
  - unlocked animal enclosures
  - unlabelled chemical containers

Plant Production

Outcomes

A student:

- participates in the production process of an agricultural enterprise AGLS-5
- identifies environmental effects of agricultural production AGLS-7
- implements recycling strategies in an agricultural enterprise AGLS-8
- uses information and communication technologies to collect, organise and present information related to an agricultural enterprise AGLS-10
- identifies safe and unsafe conditions in an agricultural setting AGLS-11
- selects appropriate equipment, materials and tools to meet the requirements of an agricultural enterprise AGLS-12
- demonstrates safe practices in the use of equipment, materials and tools AGLS-13
- maintains and cares for equipment, materials and tools AGLS-14

Related Stage 4/5 outcomes: AG4-5, AG4-6, AG4-8, AG4-9, AG4-11, AG4-12, AG4-13, AG4-14, AG5-6, AG5-8, AG5-9, AG5-11, AG5-12, AG5-13, AG5-14

Content focus

Through the study of Plant Production, students explore a wide range of crops grown to feed and clothe the population. Students have opportunities to grow a variety of plant crops and investigate a range of factors which influence their growth and yield. They consider the manner in which crops can be grown and their possible uses once harvested.

Where appropriate, students should be provided with opportunities to gain firsthand practical experiences in growing plants.

Content

Students:

- identify common agricultural plants, for example:
  - barley
  - wheat
  - cotton
  - herbs
  - vegetables
  - fruits
- identify environmental factors that affect plant growth, for example:
  - sunlight
  - water
  - soil type
  - altitude
  - humidity
  - wind

- investigate the effects of environmental factors on plants, for example:
  - germinate seedlings in two pots and place one in a dark cupboard and the other in full sunlight
  - germinate radish seeds in an incubator, in a classroom and in a refrigerator
- explore the impact of living things on plant growth, for example:
  - bacteria
  - fungi
  - plant viruses
  - earthworms and insects
  - birds
  - human activity
- investigate the role of minerals in plant growth, for example:
  - grow seedlings in perlite/vermiculite medium with and without nutrient solution/fertiliser and record the growth rates over a period of time
- participate in the harvesting of one or more suitable crop plants from seed, for example:
  - lettuce
  - tomatoes
  - beans
  - capsicum
  - wheat/barley
  - sweet corn
  - herbs
- explore the range, varieties and sources of fruit and vegetables available in the local area, for example:
  - vegetables that are seasonal
  - vegetables that grow under or above the ground
  - vegetables or fruit that are grown best in specific areas of Australia
  - native flora
  - local produce for sale
- select information from a range of sources to communicate ideas about a plant enterprise, for example:
  - hydroponic fruits or vegetables
  - field-grown fruits or vegetables
  - mushrooms
  - potato producer
  - vineyard
  - bush tucker
- explore plants harvested and used by Aboriginal and/or Torres Strait Islander Peoples for a variety of purposes, for example:
  - use of plants for medicines, eg tea-tree oil for wounds
  - plants used for foods, eg wild orange or yams
  - plants for tools and equipment

- identify the different types of products that are derived from plants, for example:
  - food
  - natural fibres
  - food colourings and flavourings
  - fragrances
  - cosmetics
  - timber
  - instruments
  - essential oils
  - flowers
  - natural remedies
- identify the link between foods and plants they are derived from, for example:
  - maintain a record of the range of foods eaten over a period of time and determine those foods derived from plants
  - analyse the contents of a meal and identify the plant sources of each food item, eg a pizza may contain wheat, tomato, onion and pepper
- compare raw and value-added foodstuffs, for example:
  - peanuts and peanut butter or peanut oil
  - wheat grain and flour, bread or pasta
  - potatoes and potato chips
  - sugarcane and refined sugar
- identify the source of processed and unprocessed foodstuffs, for example:
  - wheat for flour to make bread and pasta
  - grapes for sultanas, raisins, vinegar
  - pistachios are the seeds of a tree
- explore the use of plant fibres in clothing and fabric production, for example:
  - cotton
  - bamboo
  - hemp
  - jute
  - flax
  - sticks and twigs, eg for fabric painting
- recycle waste products from plant production enterprises, for example:
  - develop a worm farm
  - construct and maintain a compost bin
- measure an aspect of plant production, for example:
  - size and yield of a particular variety of tomato
  - size and yield of a particular variety of lettuce
  - comparative growth of bean plants in response to different fertilisers
- identify, measure and collect data on environmental conditions that affect plant growth, for example:
  - soil and air temperatures using a thermometer
  - humidity in greenhouses or polytunnels using a wet and dry bulb thermometer
  - rainfall using a rain gauge

- explore a plant production enterprise for a particular purpose, for example:
  - select the location and production system to be used, eg choose external or internal location for the project to meet production demands
  - prepare growth media for a preferred production system using appropriate tools and equipment
  - prepare the planting media safely, eg pots, hydroponics and soil; use gloves and masks where appropriate, wash hands, and select and use appropriate tools and equipment
  - select appropriate plant species and strains/varieties for the production system, and then determine what is to be grown
  - calculate requirements to meet the demand and consumer preferences, eg consider issues of ongoing supply, taking account of seasonal factors
  - plant seeds or seedlings using appropriate techniques, eg purchase and germinate seeds or purchase and plant vegetable seedlings, taking account of space and light requirements
  - maintain vegetable plants by feeding, watering, fertilising, weeding and controlling pests
  - select and construct appropriate supporting structures as needed by the selected plants, eg stakes for tomatoes, or a trellis for beans
  - transplant seedlings when necessary, using appropriate techniques
  - harvest crop using appropriate techniques, and select ripe vegetables and carefully remove them from the plant/soil
  - use strategies to control ripening processes and preserve crop post-harvest, eg slow the ripening process through refrigeration, refrigerate vegetables to maintain freshness
  - review project in terms of yield and quality
- identify factors that influence WHS in plant facilities, for example:
  - wet or slippery surfaces
  - machinery and tool maintenance
  - storage and use of chemicals
- identify potential hazards of a school plant production enterprise, for example:
  - taking up space in the school property
  - smell when fertilisers are applied
  - possible risk to people and native animals when pesticides are sprayed on crops

Animal Production

Outcomes

A student:

› participates in the production process of an agricultural enterprise AGLS-5
› identifies environmental effects of agricultural production AGLS-7
› implements recycling strategies in an agricultural enterprise AGLS-8
› ensures the safe treatment and care of animals while engaging in an agricultural enterprise AGLS-9
› uses information and communication technologies to collect, organise and present information related to an agricultural enterprise AGLS-10
› identifies safe and unsafe conditions in an agricultural setting AGLS-11
› selects appropriate equipment, materials and tools to meet the requirements of an agricultural enterprise AGLS-12
› demonstrates safe practices in the use of equipment, materials and tools AGLS-13
› maintains and cares for equipment, materials and tools AGLS-14

Related Stage 4/5 outcomes: AG4-5, AG4-7, AG4-8, AG4-9, AG4-10, AG4-12, AG4-13, AG4-14, AG5-7, AG5-8, AG5-9, AG5-10, AG5-12, AG5-13, AG5-14

Content focus

Animal Production provides opportunities for students to explore the rearing and growing of animals across a range of systems. Students are encouraged to consider the changing requirements as the animals grow and to investigate the range of factors which interact and have an impact on the successful raising of healthy and productive livestock. Students investigate a range of production and management options and the types of products that can be obtained from different breeds of the same species.

Where appropriate, students should be provided with opportunities to gain firsthand practical experiences in raising and managing animals.

Content

Students:

- identify different product types that are derived from animals, for example:
  - food
  - natural fibres
  - food colourings and flavourings
  - bush medicine
  - fragrances
  - cosmetics
  - leather
  - soaps
- identify a range of established and emerging animal enterprises, for example:
  - established rural industries, eg eggs, honeybees
  - emerging new animal industries, eg deer, emu, alpaca

- explore a range of management techniques used to breed stock, for example:
  - rooster to hen ratios
  - incubation and brooding of layers
  - ram to ewe ratios and timing of mating and birth
- identify, measure and record environmental factors that affect animal production systems, for example:
  - climate, temperature, shade, humidity, shelter, ventilation, water, wind, rainfall, soil type, parasites, microbes, predators
  - air temperature in a pig shed in summer or winter
  - air temperature in an incubator
  - relative humidity in a layer shed/coop
- identify changing environmental requirements of farm animals, for example:
  - increased need for food or space
  - change in food associated with weaning or pregnancy
  - cessation of artificial heating for layers as adult feathers grow
  - need for cooling shade and cover from precipitation
  - increased need for water
- compare different production systems for a farm animal, for example:
  - poultry, eg cages, barns or free-range
  - beef cattle, eg field or intensive feedlot systems
- identify the housing requirements for a range of farm animals and their young, for example:
  - brooders for newly hatched layers and barns for adult birds
  - sheds with heat lamps and safety regions for piglets, and yard access for older pigs
- participate in an agricultural project relating to the rearing and managing of livestock, for example:
  - raise a farm animal as part of a school enterprise, eg a poddy calf, poultry
  - develop a case study of an animal production system in the local area, eg poultry for eggs/meat, sheep for meat/fibre, cattle for milk/meat, goats for milk/meat/fibre
  - investigate animal welfare requirements for an animal production system
- identify factors that may cause stress to farm animals, for example:
  - pecking order in hens
  - aggressive behaviour in male pigs
  - higher summer temperatures
  - lack of shade for cattle
  - availability and quality of drinking water
  - lack of space for layers or cattle
- identify potential hazards of a school animal production enterprise, for example:
  - noise from a rooster crowing or hen clucking after laying
  - smell of manure in poultry/pig/cow shed
  - increased numbers of flies and insects
  - loss of habitat of native animals
- participate in a recycling program using waste products from an animal production enterprise, for example:
  - create fertiliser bags from manure
- identify the source of unprocessed animal foodstuffs, for example:
  - milk that is produced by cows and goats
  - beef that is produced by cattle
  - roe that is produced by fish
  - pork that is produced by pigs
  - eggs that are produced by free-range layers

- investigate and/or identify the source of processed animal foods, for example:
  - milk, eg cheese and yoghurt
  - beef, eg sausages
  - pork, eg bacon
- identify the contents of a meal and identify the animal sources of each food item, for example:
  - pizza may contain items from pigs, beef and fish
- explore the use of animal fibres and fabrics in clothing production, for example:
  - mohair
  - silk
  - wool
  - spider silk
  - kangaroo hide
  - possum skin
- explore an animal enterprise for a specific purpose, for example:
  - determine the animal species to be used, eg select layers on the basis of egg production performance such as Isa browns, Hisex or Australian crossbreeds
  - calculate the required number of animals to fulfil demand, eg determine number of layers required to meet identified demand for eggs, purchase day-old layers or point-of-lay pullets that have been vaccinated against common poultry diseases
  - determine the production system to be chosen in response to available resources, eg free-range, barn or cage, and ensuring appropriate temperature, ventilation, space, light levels, security, litter, perches and nesting box requirements are met
  - meet appropriate husbandry requirements for identified animal species, eg provide appropriate space for the number of layers purchased according to the requirements of the *Animal Research Act 1985* (NSW), catch and handle layers appropriately, maintain hygienic conditions in housing area and in relation to food and water dispensers
  - implement strategies to enhance growth and production, eg ensure that a constant supply of food and water is available to meet nutritional needs
  - implement techniques to prevent and control diseases and parasites, eg treat layers appropriately for parasites and worms
  - carry out appropriate processes to harvest animal products, eg collect, carry, date and store eggs appropriately, and review the project in terms of yield and quality
- measure and record an aspect of an animal production system in relation to yield or growth within animal welfare guidelines, for example:
  - size of egg produced by a particular layer breed
  - comparative growth of layers in response to different starter/grower rations
  - comparative growth of cattle in response to feed types
- identify factors that influence WHS in animal agricultural enterprise workplaces, for example:
  - the impact of wet or slippery floors
  - the state of repair of housing material or equipment
  - the operation of electrical equipment
  - the nature and behaviour of animals
  - use of PPE
  - the storage of hazardous materials
  - the practices used when moving animals

- identify and apply WHS practices in the use of equipment, materials and tools relating to an animal enterprise, for example:
  - when moving or handling cattle and other animals
  - when handling chemicals and fertilisers
  - when using heat lamps
  - when cleaning out animal pens and shelters

Agricultural Systems and Management

Outcomes

A student:

› experiences a range of plant and animal production enterprises AGLS-1
› investigates environmental factors that affect plant and animal production AGLS-2
› identifies animals and plants commonly used in Australian agricultural production AGLS-3
› explores how agricultural production contributes to our daily lives AGLS-4
› participates in the production process of an agricultural enterprise AGLS-5
› participates in marketing an agricultural product AGLS-6
› uses information and communication technologies to collect, organise and present information related to an agricultural enterprise AGLS-10
› identifies safe and unsafe conditions in an agricultural setting AGLS-11
› selects appropriate equipment, materials and tools to meet the requirements of an agricultural enterprise AGLS-12
› demonstrates safe practices in the use of equipment, materials and tools AGLS-13
› maintains and cares for equipment, materials and tools AGLS-14

Related Stage 4/5 outcomes: AG4-1, AG4-2, AG4-3, AG4-4, AG4-5, AG4-6, AG4-7, AG4-11, AG4-12, AG4-13, AG4-14, AG5-1, AG5-2, AG5-3, AG5-4, AG5-5, AG5-6, AG5-7, AG5-11, AG5-12 AG5-13, AG5-14

Content focus

Agricultural Systems and Management provides opportunities for students to demonstrate their ability to apply safe work practices for the handling and care of tools, equipment and materials in relation to the maintenance of plant and animal enterprises. Students explore the industries involved in agriculture, how plants and animals are produced, marketing and consider the ways in which technology affects agricultural enterprises.

Where appropriate, students should be provided with opportunities to gain firsthand practical experiences in growing plants and raising and managing animals.

Content

Students:

- identify features of agriculture production in our everyday lives, for example:
  - clothing
  - foods
  - housing
  - soaps and cosmetics
  - turf
- identify properties of materials, equipment and tools that make them dangerous, for example:
  - flammability
  - toxicity
  - sharpness
  - weight
  - temperature

- identify and respond to safety labelling, for example:
  - international symbols
  - safety signage
  - colour coding
- identify and apply safe practices to transfer materials, tools and equipment, for example:
  - carrying objects of varying weights and lengths
  - carrying and transferring gardening tools and equipment safely
  - carrying drenching equipment, fertilisers and pesticides safely
- select and use appropriate PPE when handling prepared potting mixes, fertilisers, pesticides and herbicides
- select and use materials, tools and equipment safely in the context of agricultural projects, for example:
  - construct a brooder, handle a heat lamp with care
  - select bedding material, eg wood shavings
  - locate heat lamp at a safe distance from bedding material to reduce risk of fire
  - electrical appliances, eg egg candlers clear of water, power tools out of the rain
- identify markets for the sale of produce from an agricultural enterprise, for example:
  - supermarkets
  - local markets
  - independent shops
  - restaurants
  - cafes
- explore management system decisions that support sustainable agricultural enterprises, for example:
  - crop rotation
  - water management
  - seasonal migration/totemic systems
  - promoting biodiversity
  - building and maintaining healthy soil
  - integrating livestock and crops
  - managing profit and loss
  - irrigation systems
  - types of fertilisers used
- identify examples of technology that influence agricultural management and production, for example:
  - software applications
  - programmable timers
  - machinery
  - seed and crop development
  - water and waste management
  - controlled traffic farming and precision agriculture
- identify natural and processed pest control products, for example:
  - pesticides
  - animals
  - netting
  - scarecrows

- explore the management and implementation of an agricultural enterprise for a particular purpose, for example:
  - management parts for the enterprise
  - location and production system
  - type of lettuce to be grown for the specific area and purpose
  - record costs for the production of the lettuce
  - local markets for the produce to be sold
- explore marketing components/principles for an agricultural product, for example:
  - role of transport, handling and packaging for a product
  - types of markets for a product
  - price for a product
  - radio and print advertisement
  - social media advertising
  - links with specified vendors relative to the product
  - developing a press release
  - issues of sustainable agriculture and animal welfare
- investigate the production and marketing of a new plant product, for example:
  - bush medicine, eg lemongrass, bush honey, tea-tree oil
  - coconut water and oils
  - hemp oils
  - clothing made from bamboo fibre
  - biofuels

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:

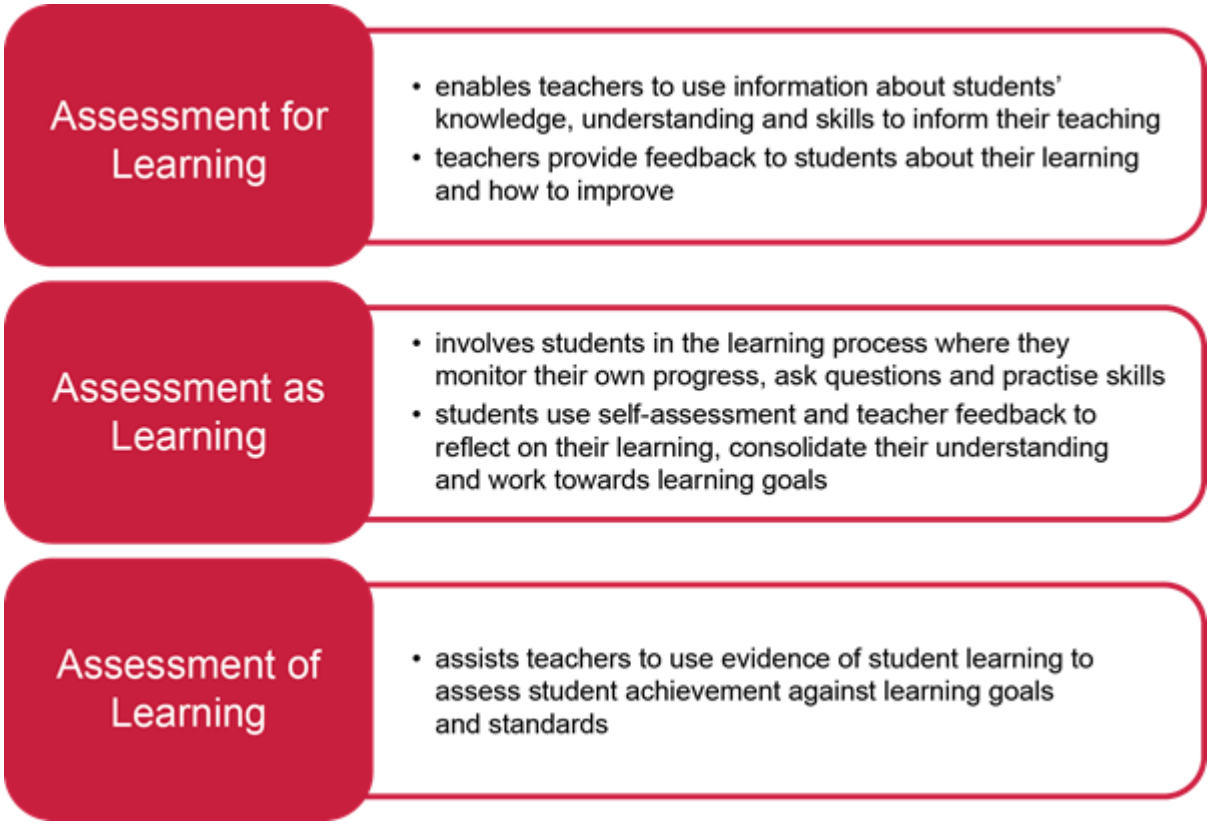
- outcomes and content in syllabuses showing what is to be learned
- Stage statements that summarise student achievement
- samples of work on the NESA website that provide examples of levels of achievement within a Stage.

Syllabus outcomes in Agricultural 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 disability

Some students with disability 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 key-words 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 disability and information on assessment of students undertaking Life Skills outcomes and content can be found in support materials for:

- Technologies
- 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 disability, 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 disability 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 Torres Strait Islander Peoples	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. An Aboriginal and/or Torres Strait Islander person is someone who: • 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.
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.
collaboration	Working with others towards a shared goal, through a variety of modes of communication. This may be achieved using a range of technologies, tools and processes.
controlled agricultural experiment	An experiment where the variables are controlled. An experiment where the person conducting the experiment only changes one variable at a time in order to isolate the results.
controlled traffic farming and precision agriculture	A GPS-based system that allows tractors to be accurately controlled on soil. This restricts compaction of soil and accurately sows seeds and applies fertiliser (*see* Global Positioning System).
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.
Country	Country is used by Aboriginal People to describe their territories and ecosystems – a sum total of spiritual beliefs, including Dreamings, all living things including totems, and all physical factors such as sacred sites, water, air and geographical features.
criteria	A descriptive list of essential features against which success can be measured and evaluated.

Glossary term	Definition
designing	The development of a solution to an identified need or opportunity. Designing involves research and investigation with consideration of human, technical and environmental factors, available resources and time frames. Designs should be tested and evaluated against predetermined criteria.
disability	An umbrella term for any or all of the following components: • 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.
diversity	Differences that exist within a group, eg age, sex, gender, gender expression, sexuality, ethnicity, ability/disability, body shape and composition, culture, religion, learning differences, socioeconomic background, values and experience.
dry matter yield assessment	A process to determine the amount of feed available in pasture or crops. This involves determining the fresh weight of a plant sample and multiplying this by the dry weight percentage.
emerging technology	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.
enterprise	An individual production unit on a farm that produces a product. This could be an animal or plant production unit.
environment	The surroundings or conditions in which a person, animal or plant lives or operates. An environment may also be natural, managed, constructed or virtual.
extensive enterprise	The production of animal and plant products over large areas of land. This is determined by the landscape and topography and the carrying capacity of the land and/or the land capability for cropping. For example, beef cattle in western Queensland or broad acre cropping in southern NSW.
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.
genetically modified	Organisms that have been genetically engineered through the modification of their DNA.
Global Positioning System (GPS)	A Global Positioning System (GPS) is a satellite-based technology that can be used to pinpoint locations on Earth.
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).

Glossary term	Definition
integrated pest management	A holistic approach to managing pests and diseases of plant and animals, using a combination of more than one control method.
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).
intensive enterprise	The production of a large number of plants or animals over a small area of land. This is determined by the space available for production, the need for high quantity of products where environmental variables can be controlled and issues with topography. For example, beef feedlot, hydroponic vegetables in glasshouses.
kinship	A key aspect of Aboriginal culture and values. It includes the importance of all relationships and of being related to and belonging to the land.
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.
layer	An egg laying poultry bird for the purpose of commercial egg production.
market specification	A unique quality and/or quantity standard required by the market for an individual product.
marketing chains	A set of steps involved in the transformation of a raw product to the point of consumption.
marketing strategies	The methods used by farmers to sell the products from the farm.
minimum tillage	A soil conservation method that involves minimal disturbance of soil for crop production.
personal protective equipment (PPE)	Equipment used or worn by a person to minimise risk to the person's health or safety, for example, apron, earmuffs, face shield, gloves, goggles, hard hat.
Place	A space mapped out by physical or intangible boundaries that individuals or groups of Torres Strait Islander Peoples occupy and regard as their own. Places are spaces that have varying degrees of spirituality.
risk assessment	A process to determine the potential hazards that may affect the safety of a workplace.
sustainable	Supporting the needs of the present without compromising the ability of future generations to meet their needs.
sustainable agriculture	The production of food and fibre using production methods that protect the natural ecosystems, animal welfare, human health. This involves sustaining the health of the environment, maintaining economic viability and social wellbeing.

Glossary term	Definition
value-adding	To increase the value of a product by transforming it into another product that is worth more than the raw product.
Work Health and Safety (WHS)	The identification of risks and the management of those risks in a workplace. WHS is concerned with the health, safety and welfare of people in the workplace. The *Work Health and Safety Act 2011* (the WHS Act) provides a framework to protect the health, safety and welfare of all workers at work.