



Agricultural Technology Years 7–10

Syllabus

June 2003

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1 Introduction

1.1 The K–10 Curriculum

This syllabus has been developed within the parameters set by the Board of Studies NSW in its *K–10 Curriculum Framework*. This framework ensures that K–10 syllabuses and curriculum requirements are designed to provide educational opportunities that:

- engage and challenge all students to maximise their individual talents and capabilities for lifelong learning
- enable all students to develop positive self-concepts and their capacity to establish and maintain safe, healthy and rewarding lives
- prepare all students for effective and responsible participation in their society, taking account of moral, ethical and spiritual considerations
- encourage and enable all students to enjoy learning, and to be self-motivated, reflective, competent learners who will be able to take part in further study, work or training
- promote a fair and just society that values diversity
- promote continuity and coherence of learning, and facilitate the transition between primary and secondary schooling.

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

- understand, develop and communicate ideas and information
- access, analyse, evaluate and use information from a variety of sources
- work collaboratively with others to achieve individual and collective goals
- possess the knowledge and skills necessary to maintain a safe and healthy lifestyle
- understand and appreciate the physical, biological and technological world and make responsible and informed decisions in relation to their world
- understand and appreciate social, cultural, geographical and historical contexts, and participate as active and informed citizens
- express themselves through creative activity and engage with the artistic, cultural and intellectual work of others
- understand and apply a variety of analytical and creative techniques to solve problems
- understand, interpret and apply concepts related to numerical and spatial patterns, structures and relationships
- be productive, creative and confident in the use of technology and understand the impact of technology on society
- understand the work environment and be equipped with the knowledge, understanding and skills to evaluate potential career options and pathways
- develop a system of personal values based on their understanding of moral, ethical and spiritual matters.

The ways in which learning in the *Agricultural Technology Years 7–10 Syllabus* contributes to the curriculum and to the student’s achievement of the broad learning outcomes are outlined in the syllabus rationale.

In accordance with the *K–10 Curriculum Framework*, the *Agricultural Technology Years 7–10 Syllabus* takes into account the diverse needs of all students. It identifies essential knowledge, understanding, skills, values and attitudes. It enunciates 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, particularly to ensure successful transition through Years 5 to 8 and from Year 10 to Year 11.

The syllabus also assists students to maximise their achievement in Agricultural Technology through the acquisition of additional knowledge, understanding, skills, values and attitudes. It contains advice to assist teachers to program learning for those students who have gone beyond achieving the outcomes through their study of the essential content.

1.2 Students with Special Education Needs

In the K–6 curriculum, students with special education needs are provided for in the following ways:

- through the inclusion of outcomes and content in syllabuses which provide for the full range of students
- through the development of additional advice and programming support for teachers to assist students to access the outcomes of the syllabus
- through the development of specific support documents for students with special education needs
- through teachers and parents planning together to ensure that syllabus outcomes and content reflect the learning needs and priorities of students.

Students with special education needs build on their achievements in K–6 as they progress through their secondary study and undertake courses to meet the requirements for the School Certificate.

It is necessary to continue focusing on the needs, interests and abilities of each student when planning a program for secondary schooling. The program will comprise the most appropriate combination of courses, outcomes and content available.

Life Skills

For most students with special education needs, the outcomes and content in sections 6 and 7 of this syllabus will be appropriate but for a small percentage of these students, particularly those with an intellectual disability, it may be determined that these outcomes and content are not appropriate. For these students the Life Skills outcomes and content in section 8 and the Life Skills assessment advice below can provide the basis for developing a relevant and meaningful program.

Access to Life Skills outcomes and content in Years 7–10

A decision to allow a student to access the Agricultural Technology Years 7–10 Life Skills outcomes and content should include parents/carers and be based on careful consideration of the student's competencies and learning needs.

The decision should establish that the outcomes and content in sections 6 and 7 of the *Agricultural Technology Years 7–10 Syllabus* are not appropriate to meet the needs of the student. Consideration should be given to whether modifications to programs and to teaching, including adjustments to learning activities and assessment, would enable the student to access the syllabus outcomes and content.

As part of the decision to allow a student to access the Agricultural Technology Years 7–10 Life Skills outcomes and content, it is important to identify relevant settings, strategies and resource requirements that will assist the student in the learning process. Clear time frames and strategies for monitoring progress, relevant to the age of the student, need to be identified and collaborative plans should be made for future needs.

It is not necessary to seek permission of the Office of the Board of Studies for students to undertake the Agricultural Technology Years 7–10 Life Skills outcomes and content, nor is it necessary to submit planning documentation.

Life Skills assessment

Each student undertaking the Agricultural Technology Years 7–10 Life Skills course will have specified outcomes and content to be studied. The syllabus content listed for each outcome forms the basis of learning opportunities for students.

Assessment should provide opportunities for students to demonstrate achievement in relation to the outcomes and to generalise their knowledge, understanding and skills across a range of situations or environments including the school and the wider community.

Students may demonstrate achievement in relation to Agricultural Technology Years 7–10 Life Skills outcomes independently or with support. The type of support will vary according to the particular needs of the student and the requirements of the activity. Examples of support may include:

- the provision of extra time
- physical and/or verbal assistance from others
- the provision of technological aids.

2 Rationale

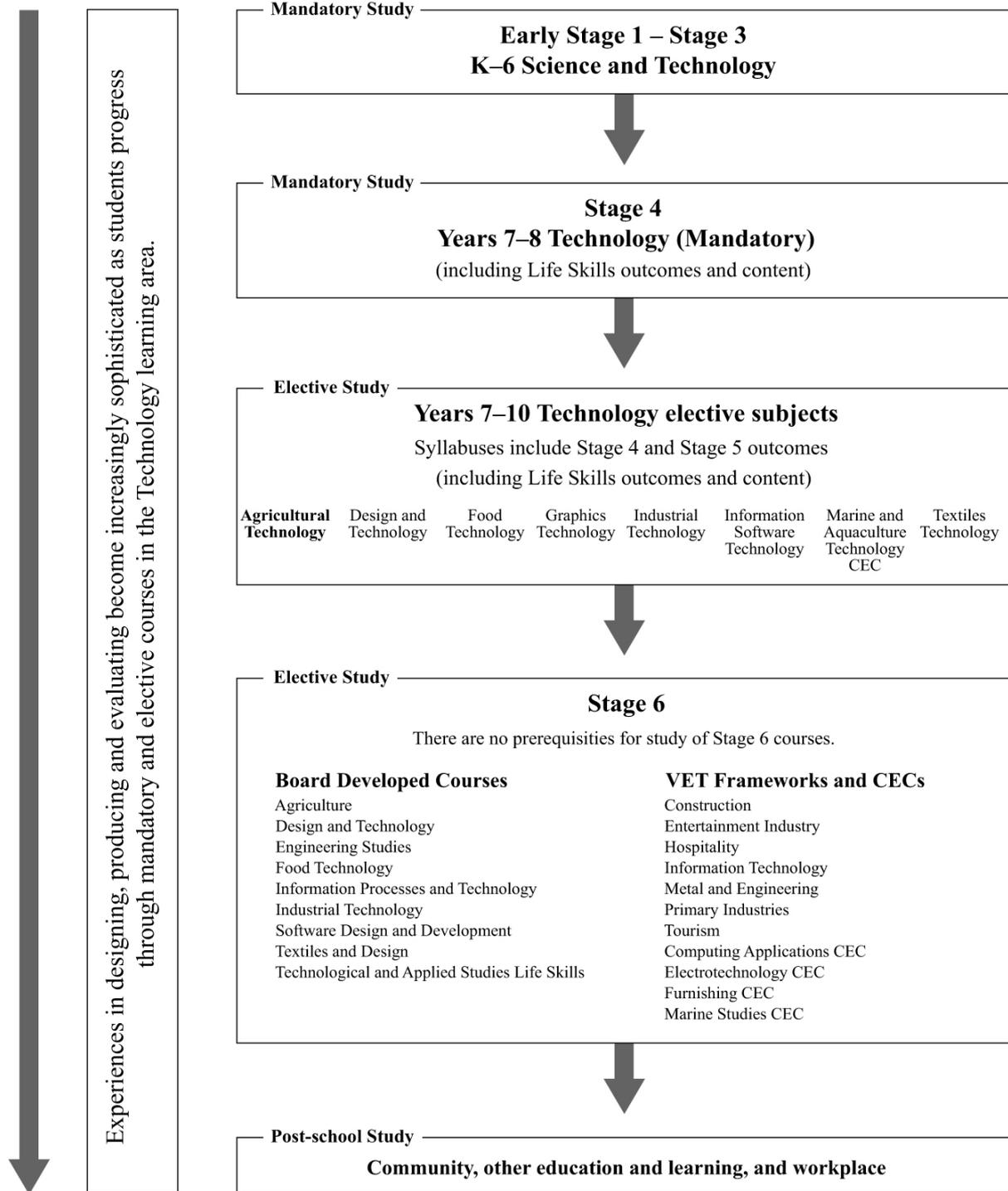
Through the study of Agricultural Technology in Years 7–10 students develop knowledge, understanding and skills which enable them to contribute positively to their own lifestyle and to the social, economic and environmental future of Australia. This syllabus provides scope for students to explore the many and varied career opportunities in agriculture and its 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 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 knowledge and understanding about a range of agricultural practices. It develops the ability to respond to human needs and emerging opportunities. It develops knowledge, understanding and skills in the management of plant and animal enterprises, the technology associated with these enterprises and the marketing of products. The syllabus develops students' ability 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 discuss the impact of agricultural practices on the basic resources of soil, air and water. The syllabus provides opportunity for students to make responsible decisions about the appropriate use of agricultural technologies.

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



4 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 in producing plant and animal products. Students will develop skills in the effective management of sustainable production and marketing practices that are environmentally and socially responsible.

5 Objectives

Knowledge, understanding and skills

Students will develop:

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

6 Outcomes

Objectives	Stage 4 Outcomes	Stage 5 Outcomes
Students will develop:	A student:	A student:
1 knowledge and understanding of agriculture as a dynamic and interactive system that uses plants and animals to produce food, fibre and other derivatives	4.1.1 describes a range of plant species and animal breeds used in agricultural enterprises 4.1.2 outlines the interactions within and between agricultural enterprises and systems	5.1.1 explains why identified plant species and animal breeds have been used in agricultural enterprises and developed for the Australian environment and/or markets 5.1.2 explains the interactions within and between agricultural enterprises and systems
2 knowledge and understanding of the local and global interaction of agriculture with Australia's economy, culture and society	4.2.1 identifies and explains interactions between the agricultural sector and Australia's economy, culture and society	5.2.1 explains the interactions within and between the agricultural sector and Australia's economy, culture and society
3 knowledge of and skills in the effective and responsible production and marketing of agricultural products	4.3.1 implements responsible production of plant and animal products 4.3.2 identifies how agricultural products are used in industry and by consumers 4.3.3 identifies and uses skills to manage the interactions within plant production enterprises 4.3.4 identifies and uses skills to manage the interactions within animal production enterprises	5.3.1 investigates and implements responsible production systems for plant and animal enterprises 5.3.2 investigates and applies responsible marketing principles and processes 5.3.3 explains and evaluates the impact of management decisions on plant production enterprises 5.3.4 explains and evaluates the impact of management decisions on animal production enterprises

Objectives	Stage 4 Outcomes	Stage 5 Outcomes
Students will develop:	A student:	A student:
4 an understanding of sustainable and ethical practices that support productive and profitable agriculture	4.4.1 examines the impact of past and current agricultural practices on agricultural sustainability 4.4.2 identifies aspects of profitability, technology, sustainability and ethics that impact on management decisions 4.4.3 implements and appreciates the application of animal welfare guidelines to agricultural practices	5.4.1 evaluates the impact of past and current agricultural practices on agricultural sustainability 5.4.2 evaluates management practices in terms of profitability, technology, sustainability, social issues and ethics 5.4.3 implements and justifies the application of animal welfare guidelines to agricultural practices
5 skills in problem-solving including investigating, collecting, analysing, interpreting and communicating information in agricultural contexts	4.5.1 performs controlled experiments in agricultural contexts 4.5.2 communicates experimental data using a range of information and communication technologies	5.5.1 designs, undertakes, analyses and evaluates experiments and investigates problems in agricultural contexts 5.5.2 collects and analyses agricultural data and communicates results using a range of technologies
6 knowledge and skills in implementing cooperative and safe work practices in agricultural contexts	4.6.1 follows safety and hygiene instructions when using chemicals, tools and agricultural machinery in accordance with Occupational Health and Safety requirements 4.6.2 performs plant and animal management practices safely and in cooperation with others	5.6.1 applies Occupational Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery 5.6.2 performs plant and animal management practices safely and in cooperation 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.

Life Skills

For some students with special education needs, particularly those students with an intellectual disability, it may be determined that the above outcomes are not appropriate. For these students, Life Skills outcomes and content can provide the basis for the development of a relevant and meaningful program — see section 8.

7 Content

7.1 Organisation of Content

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 the essential content specified in Core A within the context of a **minimum** of two agricultural enterprises.

To satisfy the mandatory requirements of a 200-hour course students must complete the essential content specified in Core A and Core B within the context of a **minimum** of four agricultural enterprises.

Essential content

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

Interactions — the relationship between biological, physical and social components in agriculture. Fundamental to balance the economic viability while 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 and social factors must be considered in the management of agricultural enterprises.

Sustainability — practices that conserve soil and water quality and protect the environment, assure adequate and safe food supplies to consumers, while generating profitable returns for producers.

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. Both 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 will determine the proportion of intensive and extensive enterprises examined 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 will also affect the depth of study, the number of enterprises studied and the time allocated to each enterprise.

Practical experiences should occupy a **minimum of 50 percent of allocated course time**.

To satisfy the requirements of the syllabus students must undertake a range of practical activities. It is expected that students engage in experiences relevant to all aspects of the enterprises studied. These 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. Practical experiences should be used to develop the skills of designing, investigating, using technology and communicating.

Additional content

The provision of examples of additional content recognises that while some students will need all of the available time focusing on the essential content of the syllabus to achieve the course outcomes, others would benefit from extending their learning through engaging with additional material. The additional content presented on pages 27–30 of the syllabus provides suggestions only and should not be considered an exclusive or exhaustive list.

Additional content enables students to broaden and deepen their understanding and skills and to extend their interest in particular aspects of agriculture and should be developed around the particular needs or interests of students, resources and facilities that are available to the school. This content may build on prior learning or provide for future learning.

Additional content addresses the course outcomes and the knowledge, understanding and skills specific to an individual enterprise, relating to interactions, management and sustainability in agriculture, and extends the essential content of the syllabus.

Life Skills

Life Skills outcomes and content are in section 8.

Cross-curriculum content

Cross-curriculum content assists students to achieve the broad learning outcomes defined in the Board of Studies *K–10 Curriculum Framework*. It is incorporated in the content of the *Agricultural Technology Years 7–10 Syllabus* in the following ways:

Information and Communication Technologies (ICT)

ICT content is addressed through students:

- preparing and presenting information in appropriate forms to justify a particular point of view
- utilising computer technologies to format information in spreadsheets, databases, flow charts, tables, graphs and diagrams
- researching using the Internet and other forms of digital media
- performing first-hand investigations and collecting and assessing information from secondary sources using a variety of technologies including the Internet.

Work, Employment and Enterprise

Work, employment and enterprise is embedded in the content and provides opportunities for students to:

- develop agricultural skills associated with the establishment and maintenance of safe and healthy work environments
- explore opportunities for the innovative and creative application of technologies in agriculture-based vocations
- develop educational skills that build opportunities for education and training for employment in the future and the contributions of different groups to work in the rural workplace
- examine the nature and practice of work in agricultural fields
- build an appreciation of the opportunities that exist in agricultural careers.

Aboriginal and Torres Strait Islander

Aboriginal and Torres Strait Islander content is addressed through students:

- contrasting agricultural systems of today with Aboriginal land management practices
- discussing the effects of Europeans and Aboriginal peoples on agricultural production and sustainability.

Civics and Citizenship

Civics and citizenship content is addressed through students:

- examining the implications of current agricultural issues, research and development on society and the environment and, through discussion of current issues, developing values and attitudes towards the ethical behaviour and the evaluation of the consequences of agriculture to society
- assessing animal welfare issues involved in extensive/intensive systems.

Environment

Students examine and consider:

- the potential impact of change on the natural environment
- problems about, and the solutions to, issues associated with the interaction between agriculture and the environment
- impacts on the biosphere of waste from agricultural enterprises
- the relationship between agriculture, society and the environment in terms of present environmental and social issues
- the processes of planning and strategies that assist in achieving sustainability and that can be used to monitor and conserve the natural and farm environments in Australia.

Key Competencies

Key competencies are clearly embedded within the content. The content develops a student's ability to:

- ***collect, analyse and organise information*** from first-hand investigations and secondary sources, organising data using a variety of methods including diagrams, tables and spreadsheets, to draw valid conclusions
- ***communicate ideas*** using a range of text types including explanation, procedure and reports to present data and information from first-hand investigations
- ***plan and organise investigations*** to undertake a simple controlled experiment to test a hypothesis or question that can be researched
- ***work individually and in teams*** in a collaborative setting and working to realistic timelines and goals
- ***use technology*** to assess information.

Literacy

Students are required to use increased subject-specific vocabulary, and through the use of language skills to describe, label, interpret and evaluate information from a variety of sources. Students are also required to communicate knowledge and understanding using appropriate contexts and mediums.

Multicultural

Multicultural content is addressed through students:

- identifying some impacts of other cultures on Australian agricultural production
- investigating changing consumer preferences due to influences from our multicultural society.

Across the Years 7–10 curriculum there are other areas of cross-curriculum content that all students will experience through the mandatory curriculum. The additional areas of cross-curriculum content are Difference and Diversity, Gender and Numeracy.

7.2 Content for Years 7–10

A note to teachers about practical experiences

To satisfy the requirements of the syllabus students must undertake a range of practical experiences that occupy a minimum of 50 percent of course time. Practical experiences will be used to develop knowledge and understanding of and skills in designing, producing and evaluating. Student capability, confidence and expertise at their current stage of development are important considerations in determining the teaching and learning sequences in the course.

In developing and delivering teaching programs teachers should be aware of and adopt relevant guidelines and directives of their education authorities and/or schools. Teaching programs should recognise and reflect relevant State and Commonwealth legislation, regulations and standards including Occupational Health and Safety standards, Chemical Safety in Schools and Animal Welfare guidelines. Teachers need to be aware of activities that may require notification, certification, permission, permits and licences.

Essential content

Core A

To satisfy the mandatory requirements of a 100-hour course students must complete the essential content specified in Core A within the context of a **minimum** of two agricultural enterprises.

Outcomes A student:	Students learn about:	Students learn to:
5.1.1 explains why identified plant species and animal breeds have been used in agricultural enterprises and developed for the Australian environment and/or markets	<ul style="list-style-type: none"> • animal breeds/plant species specific to chosen agricultural enterprises • climatic factors affecting plant and animal production including: <ul style="list-style-type: none"> – humidity – solar radiation – wind patterns – temperature – rainfall • the impacts of a range of cultures including Aboriginal cultures on Australian agricultural production 	<ul style="list-style-type: none"> • identify the characteristics of animal breeds and plant varieties specific to chosen enterprises • measure and assess climatic factors affecting plant and animal production • tabulate and graph climatic conditions in the local region relative to a chosen enterprise • identify some impacts of a range of cultures including Aboriginal cultures on Australian agricultural production

Core A (cont)

<p>Outcomes A student:</p>	<p>Students learn about:</p>	<p>Students learn to:</p>
<p>5.1.2 explains the interactions within and between agricultural enterprises and systems</p>	<ul style="list-style-type: none"> • the interactions between plants, animals, soils, climate and micro-organisms 	<ul style="list-style-type: none"> • identify and discuss interactions within and between agricultural enterprises on the school farm • use drawings, diagrams and flow charts to show relationships between plants, animals, soils, climate and micro-organisms for specific enterprises studied
<p>5.2.1 explains the interactions within and between the agricultural sector and Australia’s economy, culture and society</p>	<ul style="list-style-type: none"> • the role of agriculture within the Australian economy • relevant export and domestic markets • the range of training and employment opportunities in agriculture • the impact of global factors on Australian agriculture 	<ul style="list-style-type: none"> • investigate the significance of agricultural industries and products produced in the local region and their intended markets • investigate the effect of agricultural enterprises on employment patterns
<p>5.3.1 investigates and implements responsible production systems for plant and animal enterprises</p>	<ul style="list-style-type: none"> • the basic requirements of agricultural plants and animals • intensive and extensive production systems for a plant or an animal product 	<ul style="list-style-type: none"> • grow and monitor plants and animals • apply production systems to a plant or animal product
<p>5.3.2 investigates and applies responsible marketing principles and processes</p>	<ul style="list-style-type: none"> • market specifications and the market standards required in marketing a chosen agricultural product • different markets available for a chosen agricultural product • the role of transport, handling and packaging in marketing a chosen agricultural product 	<ul style="list-style-type: none"> • assess product specifications • investigate different types of markets available to enterprise production • select transport, handling and packaging methods for marketing a chosen agricultural product

Core A (cont)

<p>Outcomes A student:</p>	<p>Students learn about:</p>	<p>Students learn to:</p>
<p>5.3.3 explains and evaluates the impact of management decisions on plant production enterprises</p>	<ul style="list-style-type: none"> • plant structure and function • the management and control of significant pests and diseases • the role of soil and water in determining plant management strategies • seasonal variation in crop/pasture production 	<ul style="list-style-type: none"> • perform management operations for a plant enterprise • identify plants relevant to agricultural production • identify plant structure and relate this to production • identify common plant pests and diseases • implement and evaluate strategies for the management and control of plant pests and diseases for a chosen agricultural enterprise • examine soil texture, structure, pH and profiles • demonstrate and apply harvest techniques to plant production
<p>5.3.4 explains and evaluates the impact of management decisions on animal production enterprises</p>	<ul style="list-style-type: none"> • breed selection • digestive systems and reproductive systems of monogastric and ruminant animals • the management and control of significant pests and diseases • climatic management in the production cycle • the use of technology in the production cycle • the calendar of operations in a production cycle • the interaction between plant and animal production systems • the benefits of a calendar of operations indicating management practices and when they will occur throughout the year • management techniques used to modify climate for their specific enterprise • breeding technologies including: <ul style="list-style-type: none"> – artificial insemination – embryo transfer 	<ul style="list-style-type: none"> • identify breeds relevant to a specific enterprise • identify and outline the functions of animal digestive and reproductive systems • identify common animal pests and diseases • implement and evaluate control programs using strategies for pests and diseases • monitor production levels throughout a production cycle • perform simple animal husbandry operations

Core A (cont)

<p>Outcomes A student:</p>	<p>Students learn about:</p>	<p>Students learn to:</p>
<p>5.4.1 evaluates the impact of past and current agricultural practices on agricultural sustainability</p>	<ul style="list-style-type: none"> • the impact of European and Aboriginal practices on the development of Australian agriculture • relationships between resource usage and sustainability of agricultural practices • the impact of agricultural practices on sustainability 	<ul style="list-style-type: none"> • compare agricultural systems of today with Aboriginal land management practices • discuss the effect of European and Aboriginal agricultural practices on agricultural production and sustainability • compare a range of sustainable and unsustainable agricultural practices
<p>5.4.2 evaluates management practices in terms of profitability, technology, sustainability, social issues and ethics</p>	<ul style="list-style-type: none"> • the impact of community demands and attitudes on sustainable agriculture • social issues and ethics involved with the production of chosen agricultural enterprises • profitability as a measure of management success • new technology and its influence on management strategies 	<ul style="list-style-type: none"> • examine the impact of agriculture in the local region • discuss a number of social and ethical issues that would be confronted in chosen agricultural enterprises • assess the profitability of a local agricultural enterprise
<p>5.4.3 implements and justifies the application of animal welfare guidelines to agricultural practices</p>	<ul style="list-style-type: none"> • animal welfare codes of practice applicable to a chosen agricultural enterprise 	<ul style="list-style-type: none"> • apply correct livestock handling methods • evaluate animal housing conditions in accordance with identified codes of practice
<p>5.5.1 designs, undertakes, analyses and evaluates experiments and investigates problems in agricultural contexts</p>	<ul style="list-style-type: none"> • planning and conducting first-hand investigations in agricultural situations 	<ul style="list-style-type: none"> • investigate an agricultural problem and develop possible solutions • conduct a controlled experiment to investigate an enterprise-related problem • gather data using a range of technologies • interpret results from graphs and tables of agricultural data

Core A (cont)

<p>Outcomes A student:</p>	<p>Students learn about:</p>	<p>Students learn to:</p>
<p>5.5.2 collects and analyses agricultural data and communicates results using a range of technologies</p>	<ul style="list-style-type: none"> • technologies that assist in record-keeping and monitoring of enterprise performance 	<ul style="list-style-type: none"> • prepare and present information to justify a particular point of view • make accurate observations and record relevant data relating to specific enterprises • utilise computer technologies in the analysis and presentation of agricultural data
<p>5.6.1 applies Occupational Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery</p>	<ul style="list-style-type: none"> • the safe handling and storage of agricultural chemicals • the correct usage and maintenance of animal husbandry equipment • the correct usage and maintenance of agricultural equipment • the correct method of operating and maintaining agricultural machinery 	<ul style="list-style-type: none"> • interpret chemical labels • calibrate relevant equipment • use agricultural equipment, machinery and techniques correctly and safely
<p>5.6.2 performs plant and animal management practices safely and in cooperation with others</p>	<ul style="list-style-type: none"> • plant and animal management practices 	<ul style="list-style-type: none"> • perform procedures in the management of plants and animals • work cooperatively to perform management operations

Core B

To satisfy the mandatory requirements of a 100-hour course students must complete the essential content specified in Core A within the context of a **minimum** of two agricultural enterprises.

Outcomes A student:	Students learn about:	Students learn to:
5.1.1 explains why identified plant species and animal breeds have been used in agricultural enterprises and developed for the Australian environment and/or markets	<ul style="list-style-type: none"> • animal breeds and/or plant varieties developed for specific climatic conditions and/or markets • the impact of domestic and international markets on agricultural production 	<ul style="list-style-type: none"> • identify different animal breeds/plant varieties specifically developed for a particular climate or market • investigate the influences of Australia’s developing multicultural society on changes in consumer preferences for an increasing variety of agricultural products • research and present information on breeds developed for specific climates and/or markets
5.1.2 explains the interactions within and between agricultural enterprises and systems	<ul style="list-style-type: none"> • the impact and control of micro-organisms on plant and/or animal products in a chosen agricultural enterprise 	<ul style="list-style-type: none"> • investigate the effect of beneficial and harmful micro-organisms and invertebrates on plant and/or animal production
5.2.1 explains the interactions within and between the agricultural sector and Australia’s economy, culture and society	<ul style="list-style-type: none"> • the impact of changing demands and emerging farming practices on the community 	<ul style="list-style-type: none"> • identify opportunities provided by the agricultural sector as an employer in the community and as a user of products • collate and interpret information from secondary sources, including the Internet, on agricultural production and export trends in agricultural products
5.3.1 investigates and implements responsible production systems for plant and animal enterprises	<ul style="list-style-type: none"> • resource use and the sustainability of intensive and extensive enterprises • diversity in production systems 	<ul style="list-style-type: none"> • compare alternative production systems for a plant and animal enterprise • discuss advantages and disadvantages of different production systems

Core B (cont)

<p>Outcomes A student:</p>	<p>Students learn about:</p>	<p>Students learn to:</p>
<p>5.3.2 investigates and applies responsible marketing principles and processes</p>	<ul style="list-style-type: none"> • how market requirements are determined • market appraisal • marketing techniques and strategies related to an agricultural product 	<ul style="list-style-type: none"> • conduct a market survey for an agricultural product • assess the effectiveness of marketing strategies for a designated product • use the Internet and other computer-based technologies in the design and analysis of product promotional material • investigate the role of value adding in marketing agricultural products
<p>5.3.3 explains and evaluates the impact of management decisions on plant production enterprises</p>	<ul style="list-style-type: none"> • technologies related to the production cycle • propagation techniques relevant to a plant enterprise • the role of information and communication technologies (databases and spreadsheets) relevant to the management of plant enterprises 	<ul style="list-style-type: none"> • apply technology to a plant production enterprise • perform different propagation techniques • use technologies to monitor production levels to assess the effectiveness of plant management practices • investigate timing and impact of relevant operations in a plant production cycle
<p>5.3.4 explains and evaluates the impact of management decisions on animal production enterprises</p>	<ul style="list-style-type: none"> • breeding techniques • nutritional requirements of animals • the role of information and communication technologies (databases and spreadsheets) relevant to the management of animal enterprises 	<ul style="list-style-type: none"> • identify breeding programs and their impact on production • design a feeding program for the production cycle of an animal • investigate timing and impact of relevant operations in an animal production cycle • use technologies to monitor production levels to assess the effectiveness of animal management practices
<p>5.4.1 evaluates the impact of past and current agricultural practices on agricultural sustainability</p>	<ul style="list-style-type: none"> • the application of current and emerging technologies to agricultural enterprises 	<ul style="list-style-type: none"> • evaluate the impact of current technologies on sustainability

Core B (cont)

Outcomes A student:	Students learn about:	Students learn to:
5.4.2 evaluates management practices in terms of profitability, technology, sustainability, social issues and ethics	<ul style="list-style-type: none"> • short-term and long-term effects of management practices on sustainability of chosen agricultural enterprises • social and ethical issues associated with changing agriculture 	<ul style="list-style-type: none"> • compare short-term and long-term effects of agricultural production systems on sustainability • compare profitability using tools such as gross margins
5.4.3 implements and justifies the application of animal welfare guidelines to agricultural practices	<ul style="list-style-type: none"> • animal welfare codes and their effect on the management of intensive and extensive systems 	<ul style="list-style-type: none"> • implement and document practices in accordance with animal welfare codes
5.5.1 designs, undertakes, analyses and evaluates experiments and investigates problems in agricultural contexts	<ul style="list-style-type: none"> • experimental design in agricultural situations 	<ul style="list-style-type: none"> • draw conclusions from observations and analysis of data • formulate a solution to an agricultural problem
5.5.2 collects and analyses agricultural data and communicates results using a range of technologies	<ul style="list-style-type: none"> • analysing trends, patterns and relationships in data and information 	<ul style="list-style-type: none"> • examine and analyse data from a range of sources • communicate an understanding of trends, patterns and relationships in data to a specified audience
5.6.1 applies Occupational Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery	<ul style="list-style-type: none"> • hazard identification and risk assessment when using chemicals, tools and agricultural machinery 	<ul style="list-style-type: none"> • identify hazards and apply control measures including the utilisation of personal protective equipment
5.6.2 performs plant and animal management practices safely and in cooperation with others	<ul style="list-style-type: none"> • hazard identification and risk assessment when handling animals and performing plant husbandry techniques 	<ul style="list-style-type: none"> • conduct a risk assessment for a designated task

Additional content

The provision of examples of additional content recognises that while some students will need all of the available time focusing on the essential content of the syllabus to achieve the course outcomes, others would benefit from extending their learning through engaging with additional material.

The additional content presented below provides suggestions only and should not be considered an exclusive or exhaustive list.

Outcomes A student:	Students learn about:	Students learn to:
5.1.1 explains why identified plant species and animal breeds have been used in agricultural enterprises and developed for the Australian environment and/or markets	<ul style="list-style-type: none"> • relationships between climatic patterns and associated pasture varieties • animal breeds and/or plant varieties imported for use in Australian agriculture 	<ul style="list-style-type: none"> • identify pasture types • associate pasture growth patterns with local climate patterns • research, compare and contrast specific animal breeds/plant varieties in relation to their chosen country
5.1.2 explains the interactions within and between agricultural enterprises and systems	<ul style="list-style-type: none"> • the process involved in: <ul style="list-style-type: none"> – silage and haylage making – the process of cheese and yoghurt manufacture – the process of ginger beer brewing • composting and composting techniques • beneficial effects of apiculture 	<ul style="list-style-type: none"> • apply processes involved in silage and haylage making • apply processes involved in cheese and yoghurt making • apply processes involved in ginger beer brewing • make one type of compost • examine the role of bees as an agricultural enterprise
5.2.1 explains the interactions within and between the agricultural sector and Australia’s economy, culture and society	<ul style="list-style-type: none"> • production strategies employed in other countries related to a chosen agricultural product • the impact of changes in production levels on domestic consumption and foreign export 	<ul style="list-style-type: none"> • research world production of an agricultural product and examine the domestic and export-marketing patterns for the product • identify trends in demand and prices for different products produced from an agricultural commodity

Additional content (cont)

<p>Outcomes A student:</p>	<p>Students learn about:</p>	<p>Students learn to:</p>
<p>5.3.1 investigates and implements responsible production systems for plant and animal enterprises</p>	<ul style="list-style-type: none"> • the advantages and disadvantages of different production systems • a metabolic disease related to ruminant animals, eg bloat • various types of local pastures and weed varieties 	<ul style="list-style-type: none"> • investigate a metabolic disease related to a ruminant animal and report on its impact on the animal • discuss and evaluate the advantages and disadvantages of different grazing systems including: <ul style="list-style-type: none"> – rotational grazing – strip grazing – cell grazing – zero grazing • identify different weed and/or pasture types • differentiate between native and introduced pastures
<p>5.3.2 investigates and applies responsible marketing principles and processes</p>	<ul style="list-style-type: none"> • the logos/branding used in marketing agricultural products 	<ul style="list-style-type: none"> • investigate agricultural logos/branding and the criteria that they represent
<p>5.3.3 explains and evaluates the impact of management decisions on plant production enterprises</p>	<ul style="list-style-type: none"> • soil texture and structure • the effect of soil conditioners, eg lime, gypsum and compost • the role of fertilisers in a plant production enterprise • irrigation systems 	<ul style="list-style-type: none"> • assess soil texture and structure • evaluate the effect of soil conditioners • evaluate the plant response and environmental impacts of applying different fertilisers • compare a range of irrigation systems
<p>5.3.4 explains and evaluates the impact of management decisions on animal production enterprises</p>	<ul style="list-style-type: none"> • different methods of internal parasite control • animal behaviours that influence animal management decisions 	<ul style="list-style-type: none"> • research, compare and evaluate two alternative programs for the control of an internal parasite • identify animal behaviour patterns such as pecking order, bullying, stress, maternalistic behaviour and courtship

Additional content (cont)

Outcomes A student:	Students learn about:	Students learn to:
5.4.1 evaluates the impact of past and current agricultural practices on agricultural sustainability	<ul style="list-style-type: none"> alternative methods of plant/animal production 	<ul style="list-style-type: none"> construct a no-dig garden investigate hydroponics and agroforestry investigate aquaculture
5.4.2 evaluates management in terms of profitability, technology, sustainability, social issues and ethics	<ul style="list-style-type: none"> different types of soil/land and river degradation including: <ul style="list-style-type: none"> – gully erosion – rill erosion – sheet erosion – salinity – acidity environmental management strategies such as riverbank stabilisation schemes 	<ul style="list-style-type: none"> identify the different forms of soil/land and river degradation including: <ul style="list-style-type: none"> – gully erosion – rill erosion – sheet erosion – salinity – acidity
5.4.3 implements and justifies the application of animal welfare guidelines to agricultural practices	<ul style="list-style-type: none"> animal husbandry techniques used to minimise livestock injury 	<ul style="list-style-type: none"> evaluate techniques such as de-horning, de-beaking, castration, mulesing, tail docking
5.5.1 designs, undertakes, analyses and evaluates experiments and investigates problems in agricultural contexts	<ul style="list-style-type: none"> planning and conducting first-hand investigations in agricultural situations 	<ul style="list-style-type: none"> assess the validity and reliability of data gathered from a first-hand investigation or information gathered from secondary sources
5.5.2 collects and analyses agricultural data and communicates results using a range of technologies	<ul style="list-style-type: none"> the variation that exists in prices in agricultural products due to seasonal variations 	<ul style="list-style-type: none"> use appropriate information and communication technologies to analyse prices of plant and animal products over a set period

Additional content (cont)

Outcomes A student:	Students learn about:	Students learn to:
5.6.1 applies Occupational Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery	<ul style="list-style-type: none"> • specialist agricultural chemicals used on the school farm 	<ul style="list-style-type: none"> • construct an inventory of agricultural chemicals used on the school farm • compare labels and material safety data sheets • evaluate safety steps when using chemicals, tools and agricultural machinery
5.6.2 performs plant and animal management practices safely and in cooperation with others	<ul style="list-style-type: none"> • alternative methods of pest control 	<ul style="list-style-type: none"> • investigate non-chemical alternatives to plant and animal pest control

Life Skills

For some students with special education needs, particularly those students with an intellectual disability, it may be determined that the above content is not appropriate. For these students, Life Skills outcomes and content can provide the basis for the development of a relevant and meaningful program — see section 8.

8 Life Skills Outcomes and Content

The Board of Studies recognises that a small percentage of students with special education needs may best fulfil the mandatory curriculum requirements for Agricultural Technology by undertaking Life Skills outcomes and content. (Requirements for access to Life Skills outcomes and content are detailed in section 1.2.)

Life Skills outcomes will be selected on the basis that they meet the particular needs, goals and priorities of each student. Students are not required to complete all outcomes. Outcomes may be demonstrated independently or with support.

In order to provide a relevant and meaningful program of study that reflects the needs, interests and abilities of each student, schools may integrate Agricultural Technology Life Skills outcomes and content across a variety of school and community contexts.

8.1 Outcomes

Objectives	Outcomes
Students will develop:	A student:
1 knowledge and understanding of agriculture as a dynamic and interactive system that uses plants and animals to produce food, fibre and other derivatives	LS.1 experiences a range of plant and animal production enterprises LS.2 investigates some environmental factors that affect plant and animal production
2 knowledge and understanding of the local and global interaction of agriculture with Australia's economy, culture and society	LS.3 identifies animals and plants commonly used in Australian agricultural production LS.4 explores how agricultural production contributes to our daily lives
3 knowledge of and skills in the effective and responsible production and marketing of agricultural products	LS.5 participates in the production process of an agricultural enterprise LS.6 participates in marketing an agricultural product
4 an understanding of sustainable and ethical practices that support productive and profitable agriculture	LS.7 identifies some environmental effects of agricultural production LS.8 implements recycling strategies in an agricultural enterprise LS.9 ensures the safe treatment and care of animals while engaging in an agricultural enterprise
5 skills in problem-solving including investigating, collecting, analysing, interpreting and communicating information in agricultural contexts	LS.10 uses information and communication technologies to collect, organise and present information related to an agricultural enterprise

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Objectives Students will develop:	Outcomes A student:
6 knowledge and skills in implementing cooperative and safe work practices in agricultural contexts	LS.11 identifies safe and unsafe conditions in an agricultural setting LS.12 selects appropriate equipment, materials and tools to meet the requirements of an agricultural enterprise LS.13 demonstrates safe practices in the use of equipment, materials and tools LS.14 maintains and cares for equipment, materials and tools

8.2 Content

The content forms the basis for learning opportunities. Content will be selected on the basis that it meets the needs, goals and priorities of each student. Students are not required to complete all of the content to demonstrate achievement of an outcome.

The examples provided are suggestions only.

<p>Outcome LS.1 A student experiences a range of plant and animal production enterprises.</p>	
<p>Students learn about:</p> <ul style="list-style-type: none"> • growing a range of suitable crop plants using a variety of production systems, eg in a garden plot, in pots in potting mix, in nutrient solution hydroponically, in a glasshouse, in the field • plant and animal production systems in the local area • availability of fruit and vegetables in the local area • technologies used in an animal production system • housing requirements of a range of farm animals • nutritional requirements of a range of farm animals • disease management of a range of farm animals • harvesting a range of animal products • breeding procedures used in a range of animal production systems 	<p>Students learn to:</p> <ul style="list-style-type: none"> • participate in a group project to grow a range of suitable crop plants from seed, eg lettuce, tomatoes, capsicum, barley, maize, herbs • explore the range, varieties and sources of fruit and vegetables available in the local area, eg vegetables that are seasonal, vegetables that grow under or above the ground, vegetables or fruit that are grown best in specific areas of Australia • participate in the use of technologies for an animal and/or a plant production system, eg applying the appropriate fertiliser in the correct amounts at the right time of the year, watering the fertiliser into the soil, spraying with appropriate pesticide mixed in the correct ratio to the affected parts of a plant, mixing nutrient solutions in the correct ratio for a hydroponic system, artificially incubating eggs at the right temperature and humidity, setting up an automatic irrigation system that will meet the needs of a particular crop, using farm equipment appropriately and safely, mixing worming mixture in the correct ratio and following manufacturer’s instructions • investigate different production systems for a particular farm animal, eg poultry that are kept for eggs — in cages, in barns or free range, beef cattle in the field or in intensive systems • explore the housing requirements of a range of farm animals and young stock, eg brooders for newly hatched chickens and barns for adult birds, sheds with heat lamps and safety regions for piglets and yard access for older pigs • investigate the feeding requirements of young and adult stock of a range of farm animals • investigate the vaccination and drenching programs that are employed for a range of farm animals

<p>Outcome LS.1 A student experiences a range of plant and animal production enterprises.</p>	
<p>Students learn about:</p> <ul style="list-style-type: none"> • methods of collecting eggs in caged housing, methods of milking cows, methods of shearing sheep 	<p>Students learn to:</p> <ul style="list-style-type: none"> • explore a range of management techniques used to breed stock, eg rooster to hen ratios, incubation and brooding of chickens, ram to ewe ratios and timing of mating and birth • participate in a group project to raise a farm animal as part of a school animal-production enterprise • participate in a group project to construct a compost heap/bin in order to recycle discarded animal and plant materials • participate in a group case study of an animal production system in their local area, eg poultry for eggs/meat, sheep for meat/fibre, cattle for milk/meat • participate in a case study of a commercial plant enterprise, eg hydroponic lettuce and strawberries, glasshouse tomatoes, field-grown tomatoes and cucumbers, hydroponic salad herbs
<p>Outcome LS.2 A student investigates some environmental factors that affect plant and animal production.</p>	
<p>Students learn about:</p> <ul style="list-style-type: none"> • environmental factors that affect plant production 	<p>Students learn to:</p> <ul style="list-style-type: none"> • identify significant environmental factors that affect plant production, eg temperature, sunlight, climate, soil type, drainage, rainfall, wind, soil, water, mineral status of the soil, pests • measure and record some environmental factors using a measuring device, eg soil/air temperature using a thermometer, humidity in a glasshouse using a wet/dry thermometer, rainfall using a rain gauge, a conductivity probe to measure nutrient status of the water in a hydroponics system • measure climatic factors over a period of time and record data, eg soil temperature in different production systems, water temperature in a hydroponics system • participate in an investigation to show the effects of environmental factors on plants, eg germinate seedlings in two pots and place one in a dark cupboard and the other in full sunlight • participate in an investigation to show that temperature has an effect on the germination of seeds, eg germinate radish seeds in an incubator, in a classroom and in a refrigerator

<p>Outcome LS.2 A student investigates some environmental factors that affect plant and animal production.</p>	
<p>Students learn about:</p> <ul style="list-style-type: none"> environmental factors that affect animal production 	<p>Students learn to:</p> <ul style="list-style-type: none"> participate in an investigation to show that minerals are necessary for plant growth, eg grow seedlings in perlite/vermiculite medium with and without nutrient solution or fertiliser and record growth rates over a period of time participate in an investigation of the living things which affect plant production, eg bacteria, fungi, plant viruses identify significant environmental factors that affect animal production, eg climate, temperature, shade, humidity, shelter, ventilation, water, wind, rainfall, soil type, parasites, microbes, predators measure and record some environmental factors in an animal production system, eg air temperature in a chicken/pig shed in summer or winter, air temperature in an incubator/brooder identify changing environmental requirements of farm animals, eg increased need for space and food, change in diet associated with weaning or pregnancy, cessation of artificial heating for chickens as adult feathers grow identify factors that may cause farm animals stress, eg pecking order in hens, aggressive behaviour in male pigs, higher summer temperatures, lack of shade for cattle, availability and quality of drinking water

<p>Outcome LS.3 A student identifies animals and plants commonly used in Australian agricultural production.</p>	
<p>Students learn about:</p> <ul style="list-style-type: none"> a range of farm animals and plants kept for agricultural purposes 	<p>Students learn about:</p> <ul style="list-style-type: none"> use ICT resources to identify some of the established rural industries, eg chicken meat, eggs, cereal, rice, honeybees, fodder crops, pasture seeds, mushrooms use ICT resources to identify some of the emerging new industries, eg Asian foods, deer, tea-tree oil, essential oils and plant extracts, emus, alpacas present information containing graphics on common agricultural plants and animals

Outcome LS.4 A student explores how agricultural production contributes to our daily lives.

Students learn about:

- agricultural products and their uses

Students learn about:

- identify the different types of products that are derived from animals or plants, eg food, natural fibres, food colourings and flavourings, fragrances, cosmetics, leather, timber, essential oils, flowers
- record the range of foods eaten over a period of a few days, eg food derived from animals, food derived from plants
- discriminate between processed and unprocessed foodstuffs
- investigate the source of unprocessed foodstuffs, eg milk is produced by cows, rice is produced by the rice plant, chicken meat is produced by meat birds
- investigate the source of some processed foods, eg wheat is the source of flour to make bread, milk is the source for cheese and yoghurt
- analyse the contents of a meal and identify the animal or plant sources of each food item, eg a ham sandwich contains bread (from wheat), margarine (from canola plant), ham (from pig), lettuce (from the lettuce plant), salt (from sea water) and pepper (from the pepper plant)
- explore the use of animal and plant fibres in producing clothing, eg cotton, wool, mohair
- participate in an investigation of a new animal or plant product, eg tea-tree oil, alpaca fibre, emu meat/feathers

Outcome LS.5 A student participates in the production process of an agricultural enterprise.

Outcome LS.6 A student participates in marketing an agricultural product.

Students learn about:

animal production

- the reasons for animal production
- establishing supply and demand requirements

- different production systems available

- husbandry requirements for identified animal species

- conditions for enhancing growth and production
- techniques to prevent and control disease and parasites
- appropriate processes for harvesting animal products
- techniques for reviewing project processes in relation to yield and quality
- marketing strategies appropriate to the product

Students learn to:

- identify the purpose of the particular animal production enterprise, eg egg production for the school canteen
- determine the animal species to be used, eg select hens on the basis of egg production performance such as Isa browns, Hisex, Australian crossbreeds
- calculate the required number of animals to fulfil demand, eg determine number of hens required to meet identified demand for eggs, purchase day-old chickens or point-of-lay pullets that have been vaccinated against common poultry diseases
- determine the production system to be utilised in the light of 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 hens purchased according to the requirements of the *Animal Research Act 1985* (NSW), catch and handle hens 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 disease and parasites, eg treat hens appropriately for parasites and worms
- carry out appropriate processes to harvest animal products, eg collect, carry, date and store eggs appropriately
- review project in terms of yield and quality

- market product in the context of the project design, eg market eggs in the context of the purpose of the project

<p>Outcome LS.5 A student participates in the production process of an agricultural enterprise.</p> <p>Outcome LS.6 A student participates in marketing an agricultural product.</p>	
<p>Students learn about:</p> <p>plant production</p> <ul style="list-style-type: none"> • reasons for plant production systems • different plant production systems • select plants in context of project • establishing supply and demand requirements • requirements for seed germination • conditions for effective growth and production • processes for transplanting plants • harvesting methods for particular plant species • techniques used to control ripening and preservation post-harvesting • techniques for reviewing project processes in relation to yield and quality • marketing strategies to meet supply, demand and consumer preferences 	<p>Students learn to:</p> <ul style="list-style-type: none"> • identify the purpose of the particular plant production enterprise, eg vegetable production for use in the school canteen, weekly barbecues • 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 preferred production system utilising appropriate tools and equipment, eg prepare media safely (pots, hydroponics, soil), use gloves and masks where appropriate, wash hands, select and use appropriate tools and equipment • select appropriate plant species and strain/varieties for the production system, eg determine the type and strain of vegetables to be grown • calculate requirements to meet the demand, eg determine the number of plants required to meet identified demand and consumer preferences, consider issues of on-going 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, eg feed, water, fertilise, weed and control for pests • select and construct appropriate supporting structures if needed by the selected plants, eg stakes for tomatoes • transplant seedlings when necessary using appropriate techniques • harvest crop using appropriate techniques, eg select ripe vegetables and carefully remove them from the plant/soil • use strategies to control ripening processes and preserve crop post-harvest, eg slow ripening process through refrigeration, undertake post-harvest preservation — refrigerate vegetables to maintain freshness • review project in terms of yield and quality • market product in the context of the purpose of the project

Outcome LS.7 A student identifies some environmental effects of agricultural production.	
<p>Students learn about:</p> <ul style="list-style-type: none"> the effect of school animal and plant production systems on the environment 	<p>Students learn to:</p> <ul style="list-style-type: none"> identify some effects of the school animal production enterprise, eg noise from a rooster crowing or hen clucking after laying, smell of used floor litter in poultry/pig/cow shed, increased numbers of flies and insects, run-off from sheep or cattle yards into local creeks and dams, visual pollution caused by animal facilities, loss of habitat of native animals identify some of the effects of the school plant production enterprise, eg 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

Outcome LS.8 A student implements recycling strategies in an agricultural enterprise.	
<p>Students learn about:</p> <ul style="list-style-type: none"> recycling waste products from animal and plant production enterprises 	<p>Students learn to:</p> <ul style="list-style-type: none"> recycle waste products from animal and plant production enterprises

Outcome LS.9 A student ensures the safe treatment and care of animals while engaging in an agricultural enterprise.	
<p>Students learn about:</p> <ul style="list-style-type: none"> appropriate procedures for handling, transporting and drenching farm animals meeting farm animal nutritional needs meeting farm animals' immunisation and drenching needs meeting farm animals' behavioural needs indicators of stress in animals 	<p>Students learn to:</p> <ul style="list-style-type: none"> handle and transport farm animals for a variety of reasons routinely check and fill feed and water dispensers drench/worm a farm animal monitor environmental factors to ensure that all farm animals' needs are being met, eg shade, space for exercise, appropriate food for age, safety from aggressive behaviours of dominant individuals/males, protection from environmental extremes, protection from predators ensure that animal housing allows farm animals to engage in natural behaviours, eg perches, nesting boxes and dust baths for poultry, litter/bedding for pigs

<p>Outcome LS.10 A student uses information and communication technologies to collect, organise and present information related to an agricultural enterprise.</p>	
<p>Students learn about:</p> <ul style="list-style-type: none"> • using measuring devices to collect data • organising and presenting data collected 	<p>Students learn to:</p> <ul style="list-style-type: none"> • measure an aspect of a plant or animal production system in relation to yield or growth: <ul style="list-style-type: none"> – size of egg produced by a particular strain of hen – size and yield of a particular variety of tomato – comparative growth of bean plants in response to different fertilisers • develop a spreadsheet to enter collected data • use spreadsheet to calculate totals • use spreadsheet to create column charts to present data, eg increase in size and number of eggs • print and display information for an identified purpose
<p>Outcome LS.11 A student identifies safe and unsafe conditions in an agricultural setting.</p>	
<p>Students learn about:</p> <ul style="list-style-type: none"> • factors that influence the safety of conditions in: <ul style="list-style-type: none"> – animal facilities – plant facilities 	<p>Students learn about:</p> <ul style="list-style-type: none"> • identify factors that influence the safety of conditions in animal facilities, eg 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 personal protective equipment, the storage of hazardous materials • identify factors that influence the safety of conditions in plant facilities, eg the impact of wet or slippery conditions, the nature of housing, equipment, machinery and tools, the storage and use of chemicals
<p>Outcome LS.12 A student selects appropriate equipment, materials and tools to meet the requirements of an agricultural enterprise.</p>	
<p>Students learn about:</p> <ul style="list-style-type: none"> • the nature and purpose of a range of tools, equipment and materials: <ul style="list-style-type: none"> – hand tools — shovel, rake, saw, pliers – power tools — electric drill, angle grinder – machinery — tractors and implements, water pumps, milking equipment – appliances — incubators, brooders, candlers – computer equipment — computer, printer, scanner – materials — timber, metal, plastic and concrete 	<p>Students learn about:</p> <ul style="list-style-type: none"> • select tools and equipment in relation to an agricultural project, eg use a hand saw, electric drill, hammer and nails to construct nesting boxes or perches for a chicken shed • select materials in relation to an agricultural project, eg select timber or metal to construct a frame support for a hydroponic system, select shovels, hammers, stakes and sleepers to construct a herb garden bed

Outcome LS.13 A student demonstrates safe practices in the use of equipment, materials and tools.	
<p>Students learn about:</p> <ul style="list-style-type: none"> • the application of Occupational Health and Safety practices in relation to: <ul style="list-style-type: none"> – handling and using a variety of materials safely – handling and using hand tools, power tools and appliances safely – handling and using machines and computer equipment safely 	<p>Students learn to:</p> <ul style="list-style-type: none"> • identify properties of materials, equipment and tools that make them dangerous, eg flammability, toxicity, sharpness, weight, temperature • recognise and respond to safety labelling, eg international symbols, safety signage, colour coding • carry and transfer materials, tools and equipment safely, eg carrying objects of varying weights and lengths, carrying and transferring gardening tools and equipment safely, carrying drenching equipment, fertilisers and pesticides safely • use a mask and gloves when handling prepared potting mixes, fertilisers, pesticides and herbicides • use materials, tools and equipment safely in the context of projects, eg constructing a brooder: handle heat lamp with care, select bedding material such as wood shavings, locate heat lamp at a safe distance from bedding material to reduce risk of fire, keep cords for brooder lamp clear, keep electrical appliances such as candler clear of water

Outcome LS.14 A student maintains and cares for equipment, materials and tools.	
<p>Students learn about:</p> <ul style="list-style-type: none"> • maintenance routines for care of equipment, materials and tools 	<p>Students learn to:</p> <ul style="list-style-type: none"> • undertake regular maintenance, eg check electrical cords and plugs for faults, animal housing for safety and security, food and water dispensers for cleanliness and effectiveness, irrigation pipes for leakages and blockages • store materials, tools and equipment appropriately, eg agricultural chemicals or fertilisers in a secure location, garden tools in a secure location • regularly clean materials, tools and equipment after use, eg brooders, incubators, milking equipment, garden tools, spraying equipment, drenching equipment • keep workplace environments clear and clean, eg floors, benches, tool sheds, animal enclosures, garden areas

9 Continuum of Learning in Agricultural Technology K–10

9.1 Stage Statements

Stage statements illustrate the continuum of learning in the *Agricultural Technology Years 7–10 Syllabus* and are summaries of the knowledge, understanding, skills, values and attitudes that have been developed by students as a consequence of achieving the outcomes for the relevant stage of learning.

Early Stage 1 – Science and Technology

Students who have achieved Early Stage 1 show a growing awareness of, and interest in, the natural and made environments. They demonstrate confidence in proposing ideas for designs they develop through play and modelling. They demonstrate curiosity about artefacts, events, phenomena, places and living things around them.

Early Stage 1 students use play to explore ideas, manipulate materials and trial solutions. They develop and begin to refine their understanding of environments, materials, equipment and other resources through trial and error. They ask questions, suggest ideas, propose their own explanations and are able to report verbally and graphically on their actions and observations.

Students in this stage use their senses to observe features of their immediate environment and to explore the properties of a range of common materials. They identify and group living and non-living things according to some common characteristics.

Students explore and identify the needs of people and other living things. They recognise the use of some forms of energy and their ideas about it are beginning to develop as they experience energy in different contexts.

Students generate their own ideas, using make-believe, and express these verbally, pictorially and through modelling. They are unlikely to perceive the steps in a designing and making process as they often work in situations where these aspects occur at the same time. They identify what they like or dislike about their designs or explorations.

Students in Early Stage 1 recognise that information can come from a variety of sources, including other people and from different media, for example, books and videos. They demonstrate an awareness of a range of uses for computer-based technology as well as showing an emerging confidence in their ability to explore and use computer-based technologies, with assistance, to create text, images and play games.

Students show growing awareness of the appropriate use and maintenance of a range of classroom equipment. They give reasons for safe working practices and organisational procedures related to the use of equipment, resources and materials. Students develop ideas through the use and manipulation of concrete materials as a means of progressing towards abstract thought.

Stage 1 – Science and Technology

Students who have achieved Stage 1 are developing an awareness of the wider world and are applying their scientific and technological understanding to new and different situations. They are starting to develop the social skills required to investigate, design and make products and services.

Students are starting to appreciate the interdependence of living things and their environments. They recognise that people create products, services and environments to meet their own needs. They build on their existing understanding of some of the forms of energy.

Students are able to interpret information and make predictions based on their own observations. They are better able to accept that the result of a test may be different from what was originally expected.

Students are able to recognise the purpose of an investigation and seek further information as a result of their own curiosity. They begin to see that an investigation is a series of orderly steps. They use their senses to identify similarities and differences. Students show curiosity about natural and made environments and seek explanations that allow them to interpret their observations.

Using plans, drawings and models, Stage 1 students begin to generate and select ideas to best meet design task objectives, and give simple explanations of why they have chosen a certain idea. Students in this stage can draw plans for a design and can explain some of the features and materials to be used. They can write labels and simple explanations when creating images.

Students recognise and discuss with others some of the strengths and limitations of what they have done and identify some changes that could be made to improve plans or models, for example in appearance. They make comparisons about what they like and dislike about familiar products, systems or environments.

Students effectively manipulate materials that are available in the classroom environment, and show a growing awareness of the different properties of such materials and how they affect the way in which the materials are used. They recognise that some materials occur naturally, while others are made.

Students have a developing awareness of a range of media and information products. They are able to use computer technology to start and open files or applications, save and shut down. They are able to use computer-based technologies where appropriate for a given task.

They are able to identify the different forms of technology in their immediate environments and explain how they help us. They safely use, maintain and store equipment such as scissors, magnifying glasses, computers and disks.

Stage 2 – Science and Technology

Students who have achieved Stage 2 are able to initiate their own investigations as a result of something that has aroused their curiosity. They ask perceptive questions and respond to design tasks in innovative ways. They identify ways of improving their own scientific and technological activities by considering issues such as how well something works, its appearance and how it might affect the environment.

Students develop the capacity to ask questions to clarify understanding. They predict outcomes by proposing explanations and testing to see if their predicted outcomes eventuate. As students develop skills in predicting, testing, recording results and drawing conclusions, they begin to form understanding about ‘fair testing’ that takes into account the need for consistent conditions combined with one variable, in order to ensure accurate results.

Students who have achieved Stage 2 are able to explore ideas for investigations and their design proposals in order to identify where decisions still need to be made, and to suggest possible courses of action. Students may suggest modifications to improve their initial proposals, including the selection of different solutions to arrive at a suitable outcome.

Students are able to explore the properties, capabilities and working characteristics of both natural and manufactured materials and components. They recognise that materials are varied and have different properties that affect their use. They can select, maintain and safely use classroom tools and equipment, hardware and software, and justify their selection for particular tasks.

Students give consideration to issues such as function and aesthetics when designing and evaluating products, services and environments. They can identify some limitations when carrying out a design task. Students develop plans that show some consideration of the types and quantities of materials required and an awareness of the need for accuracy in a plan for production purposes.

Students recognise the function of some hardware and software and are able to select and use these to meet the requirements of a task. They can discuss the possibilities and limitations of using a range of technology including computer-based technology.

Students are developing a capacity to understand relationships in the natural world. They can identify and describe some aspects of the structure and function of living things and some of the ways living things interact. They can also identify and describe some of the interactions of the Earth with other parts of the solar system. Students in this stage devise systems that inform or utilise their understanding of some forms of energy.

Students also demonstrate a greater understanding of and control over a design process. They recognise the importance of evaluation throughout a design cycle.

Stage 3 – Science and Technology

Students who have achieved Stage 3 are able to undertake investigations independently in order to satisfy their own curiosity. They demonstrate a willingness to initiate their own investigations; this might include designing appropriate fair tests to evaluate a range of possible explanations for the results of their investigations.

Students select and use appropriate language, structures and media and demonstrate skills in critically examining and communicating scientific and technological ideas and issues. Students can relate their scientific and technological understanding to new tasks or different situations.

Students research and investigate to identify phenomena and processes that have influenced Earth over time. They build on their existing understanding of forms of energy.

Students are aware of the skills and processes involved in designing and making, investigating and using technology. They manage the design process including aspects of time management, design constraints and needs of the target audience. At this stage, they can make decisions involving some conflicting interests or issues, for example ethical, aesthetic, environmental and cultural.

Students use two- and three-dimensional drawings and models to develop and modify their design ideas and to communicate details to others. They recognise and use some conventions and symbols related to developing plans and diagrams, such as measurements and some use of scale. They can observe the form and detail of objects carefully in order to produce accurate drawings from different views and they reflect on their drawings, sketches or computer models.

Students are aware of a range of issues related to scientific and technological achievements. They are capable of acquiring information from a variety of sources and are able to experiment with new techniques and skills as technologies change. Students identify emerging trends by using data, diagrams and a range of tools and equipment to assist with observations.

Students recognise that computer-based technologies have a wide range of applications in society and can identify and describe some of the effects of such technologies on individuals and communities. Students who have achieved Stage 3 can confidently and competently use a range of computer-based hardware and applications. Students at this stage can identify alternative uses and can be creative in adapting available software to the requirements of a task.

Students reflect on the methods used and positive and negative results of technological and scientific activity both throughout their own projects and in personal, local and global contexts.

Stage 4 – Technology (Mandatory)

Students at Stage 4 are able to independently initiate design projects and investigations that reflect an understanding of needs and opportunities. They demonstrate the ability to research and extract information from a variety of sources and a willingness to use experiments and tests to enhance the development of a design project. They describe factors that influence design.

Students select and use a broad range of media and method and appropriate language and structures to accurately communicate design ideas to a diverse audience. This may include recounting the process of designing, producing and evaluating used when developing design projects. Students are aware of the skills and processes involved in designing and are able to generate and communicate design ideas and solutions. They develop knowledge and understanding of a range of design processes, roles of designers and associated work opportunities. They can identify what makes good design and are able to creatively develop quality design projects.

Students responsibly, safely, confidently and accurately apply a range of contemporary and appropriate tools, materials and techniques and understand the implications and applications of these in the wider community. Students demonstrate competence when using a range of ICTs and have the ability to select and use them appropriately in developing design projects.

Students recognise the importance of safety, quality and management in the design and production of design projects. They learn to manage their own time by sequencing processes of designing, producing and evaluating to plan ahead. They work collaboratively and learn to work safely with others in technological environments.

Throughout the design process students reflect on and evaluate their design projects. They consider the impact of innovation and emerging technology on society and the environment and identify and explain ethical, social, sustainability and environmental considerations related to design projects.

Stage 4 – Agricultural Technology

The 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 some Australian agricultural enterprises and the impact of technology on the ongoing development of Australian agriculture. Students are aware of a range of technologies and their role in Australian agricultural production. They are aware 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 OHS guidelines when engaged in practical activities. They are able to utilise appropriate technologies in conducting simple agricultural experiments and the recording and communication of information and ideas. Students are aware of the issues and processes that guide ethical considerations in agricultural production.

Stage 5 – Agricultural Technology

The knowledge, skills and attitudes that are 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 are able to 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 are aware of 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 work safely and independently and apply appropriate OHS practices whenever engaged in practical activities. They perform agricultural experiments and investigations based on sound experimental method, collect and draw valid and reliable conclusions. Students demonstrate an appreciation of the value of working cooperatively with others on a common task.

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

10 Assessment

10.1 Standards

The Board of Studies *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 two interrelated elements:

- outcomes and content in syllabuses showing what is to be learnt
- descriptions of levels of achievement of that learning.

Exemplar tasks and student work samples help to elaborate standards.

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

The standards are typically written for two years of schooling and set high, but realistic, expectations of the quality of learning to be achieved by the end of Years 2, 4, 6, 8, 10 and 12.

Using standards to improve learning

Teachers will be able to use standards in Agricultural Technology as a reference point for planning teaching and learning programs, and for assessing and reporting student progress. Standards in Agricultural Technology will help teachers and students to set targets, monitor achievement and, as a result, make changes to programs and strategies to support and improve each student's progress.

10.2 Assessment for Learning

Assessment for learning in Agricultural Technology is designed to enhance teaching and improve learning. It is assessment that gives students opportunities to produce the work that leads to development of their knowledge, understanding and skills. *Assessment for learning* involves teachers in deciding how and when to assess student achievement, as they plan the work students will do, using a range of appropriate assessment strategies including self-assessment and peer assessment.

Teachers of Agricultural Technology will provide students with opportunities in the context of everyday classroom activities, as well as planned assessment events, to demonstrate their learning.

In summary, *assessment for learning*:

- is an essential and integrated part of teaching and learning
- reflects a belief that all students can improve
- involves setting learning goals with students
- helps students know and recognise the standards they are aiming for
- involves students in self-assessment and peer assessment
- provides feedback that helps students understand the next steps in learning and plan how to achieve them
- involves teachers, students and parents in reflecting on assessment data.

Quality assessment practices

The following *Assessment for Learning Principles* provide the criteria for judging the quality of assessment materials and practices.

Assessment for learning:

- **emphasises the interactions between learning and manageable assessment strategies that promote learning**

In practice, this means:

- teachers reflect on the purposes of assessment and on their assessment strategies
- assessment activities allow for demonstration of learning outcomes
- assessment is embedded in learning activities and informs the planning of future learning activities
- teachers use assessment to identify what a student can already do.

- **clearly expresses for the student and teacher the goals of the learning activity**

In practice, this means:

- students understand the learning goals and the criteria that will be applied to judge the quality of their achievement
- students receive feedback that helps them make further progress.

- **reflects a view of learning in which assessment helps students learn better, rather than just achieve a better mark**

In practice, this means:

- teachers use tasks that assess, and therefore encourage, deeper learning
- feedback is given in a way that motivates the learner and helps students to understand that mistakes are a part of learning and can lead to improvement
- assessment is an integral component of the teaching-learning process rather than being a separate activity.

- **provides ways for students to use feedback from assessment**

In practice, this means:

- feedback is directed to the achievement of standards and away from comparisons with peers
- feedback is clear and constructive about strengths and weaknesses
- feedback is individualised and linked to opportunities for improvement.

- **helps students take responsibility for their own learning**

In practice, this means:

- assessment includes strategies for self-assessment and peer assessment emphasising the next steps needed for further learning.

- **is inclusive of all learners**

In practice, this means:

- assessment against standards provides opportunities for all learners to achieve their best
- assessment activities are free of bias.

10.3 Reporting

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

Teachers can use evidence gathered from assessment to extend the process of *assessment for learning* into their *assessment of learning*. In a standards-referenced framework this involves teachers in making professional judgements about student achievement at key points in the learning cycle. These 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 levels of achievement for Stage 4 and Stage 5 in Agricultural Technology have been developed to provide schools with a useful tool to report consistent information about student achievement to students and parents, and to the next teacher to help to plan the next steps in the learning process. These describe observable and measurable features of student achievement at the end of a stage, within the indicative hours of study. Descriptions of levels of achievement provide a common language for reporting.

At Stage 5 there are six levels of achievement. Level 6 describes a very high level of achievement in relation to course objectives and outcomes. Level 2 describes satisfactory achievement, while the level 1 description will help identify students who are progressing towards the outcomes for the stage.

At the end of Year 10, teachers of Agricultural Technology Years 7–10 will make an on-balance judgement, based on the available assessment evidence, to match each student's achievement to a level description. This level will be reported on the student's School Certificate Record of Achievement.

At Stage 4 there are four levels of achievement. Level 4 describes a very high level of achievement; levels 2 and 3 describe satisfactory and high achievement that should provide a solid foundation for the next stage of learning. The level 1 description will help identify students who are progressing towards the outcomes for the stage.

For students undertaking Life Skills outcomes and content in Years 7–10, the content listed for each identified Life Skills outcome forms the basis of the learning opportunities for these students. It also provides examples of activities on which teachers can base judgements to report student progress in relation to individual learning goals.

10.4 Choosing Assessment Strategies

Planning for assessment is integral to programming for teaching and learning. In a standards-referenced framework, teachers assess student performance on tasks in relation to syllabus outcomes and make on-balance judgements about student achievement. Assessment relies on the professional judgement of the teacher and is based on reliable data acquired in a fair and challenging environment, from multiple performances in a variety of contexts. Assessment is fundamental for furthering student learning.

In planning programs, teachers, individually and collaboratively, review the syllabus and standards materials. They use these materials to describe for themselves what students should know and be able to do at a particular stage, and they consider the kinds of evidence their students could produce to show they have learnt what they needed to learn.

Students are provided with a description of the learning expected to be accomplished, opportunities to discuss the criteria on which judgements will be based, time to learn, and where possible, examples of what that learning looks like.

Assessment is used to determine the students' initial knowledge, understanding and skills, to monitor student progress and to collect information to report student achievement. The assessment cycle is continuous; students receive and give themselves feedback on what they have learnt, and what needs to be done to continue their learning. Students gain information about their learning through feedback from teachers and from self-assessment and peer assessment. The challenge and complexity of assessment tasks increase to enable students to develop evaluative independence as they assess their own knowledge, understanding and skills, and determine ways to improve their learning.

Teachers of Agricultural Technology should employ a range of assessment strategies to ensure that information is being gathered regarding the knowledge and understanding that are being acquired, and the skills that are being developed. Strategies should be appropriate to the outcomes being addressed, be manageable in number and be supportive of the learning process. Teachers could work collaboratively in planning appropriate assessment strategies. Working collaboratively leads teachers to develop a shared understanding of the syllabus standards and also supports teachers in making consistent and comparable judgements of student achievement in relation to these standards.

In planning for assessment in Agricultural Technology it is important for teachers to consider:

- the requirements of the syllabus
- the accessibility of the proposed activity in terms of language requirements
- the appropriateness of the challenge presented to individual students
- resource availability
- how the task will be administered
- the way in which feedback will be provided.

In planning for assessment, teachers of Agricultural Technology need to consider how results will be recorded, with a view to ensuring that there is sufficient and appropriate information collected for making an on-balance holistic judgement of the standard achieved by the student at the end of the stage. The evidence collected should enable teachers of Agricultural Technology to make consistent judgements to meet the various reporting requirements that the system, school and community may have.

Agricultural Technology particularly lends itself to the following assessment techniques:

Practical work

Practical work is central to the study of Agricultural Technology. This emphasis should be reflected in the strategies that are chosen to assess student achievement. Practical assessment activities might include participating in the running of a student enterprise, making and applying management decisions within a specific agricultural context and developing solutions to agricultural problems.

When practical work is used for assessment purposes, students could be assessed on their ability to:

- select and apply appropriate strategies and skills
- manage resources.

Fieldwork activities

Fieldwork activities provide opportunities for students to work with others collaboratively and apply the skills and knowledge they have acquired. Assessment activities might include investigating agricultural operations and workplace issues, the preparation of farm study reports and reflecting on the environmental impact of a range of agricultural practices.

When fieldwork activities are used for assessment purposes, students could be assessed on their ability to:

- select and apply appropriate strategies and skills
- make links between new ideas and familiar concepts.

Experimental work

Experimental work provides students with opportunities to examine the relationships between the various aspects of agricultural production. Assessment activities might include the virtual dissection of a plant or animal, the monitoring of the effects of salinity on the productivity of a soil and an investigation into the effectiveness of a range of pest control methods.

When experimental work is used for assessment purposes students could be assessed on their ability to:

- apply appropriate experimental techniques
- present information in a logical manner
- interpret data and draw logical conclusions.

Inquiry-based research assignments and projects

Inquiry-based research provides students with opportunities to investigate a range of issues that impact on modern agriculture and to develop the key competencies of *collecting, analysing and organising information, solving problems* and *communicating ideas and information* while addressing cross-curriculum ICT skills. Assessment activities might include research assignments and farm case studies that focus on both process and product.

When inquiry-based research is used for assessment purposes students could be assessed on their ability to:

- apply basic research techniques
- select and interpret relevant information
- present information in a logical manner
- acknowledge references appropriately.

Written and practical tests

Written and/or practical tests can be used to determine if students have the necessary skills, can use correct techniques and can recall, interpret, comprehend and apply knowledge at a level that is appropriate for them to move on to the next step in the learning process. Tests can provide information prior to commencing a unit of work, or along the way, about students' understanding of concepts and allow the teacher to plan further learning activities. It is important that feedback is provided on test performance in order to enhance student learning.

Peer assessment

Agricultural Technology encourages the active involvement of students in the learning process. Opportunities exist for individual and collaborative work. Activities involving peer assessment might include evaluating the contribution of individuals to a group task and reflecting on a peer presentation.

Self-assessment

In Agricultural Technology students are encouraged to acquire basic skills to become self-directed learners. Opportunities exist for students to reflect on their progress towards the achievement of the syllabus outcomes. This reflection provides the basis for improving their learning. Developing self-assessment skills is an ongoing process, becoming increasingly more sophisticated and self-initiated as a student progresses.