Agricultural Practices 2024 v1.1

Applied senior syllabus

Queensland Government | Queensland Curriculum & Assessment Authority

For all Queensland schools

Contents

1 Queensland syllabuses for senior subjects

In Queensland, a syllabus for a senior subject is an official 'map' of a senior school subject. A syllabus's function is to support schools in delivering the Queensland Certificate of Education (QCE) system through high-quality and high-equity curriculum and assessment.

Syllabuses are based on design principles developed from independent international research about how excellence and equity are promoted in the documents teachers use to develop and enliven the curriculum.

Syllabuses for senior subjects build on student learning in the Prep to Year 10 Australian Curriculum and include General, General (Extension), Senior External Examination (SEE), Applied, Applied (Essential) and Short Course syllabuses.

More information about syllabuses for senior subjects is available at www.qcaa.qld.edu.au/senior/senior-subjects. and in the 'Queensland curriculum' section of the *QCE and QCIA policy and procedures handbook*.

Teaching, learning and assessment resources will support the implementation of a syllabus for a senior subject. More information about professional resources for senior syllabuses is available on the QCAA website and via the QCAA Portal.

2 Course overview

2.1 Rationale

Agricultural Practices provides opportunities for students to explore, experience and learn concepts and practical skills valued in agricultural science, workplaces and other settings. Learning in Agricultural Practices involves creative and critical reasoning; systematically accessing, capturing and analysing information, including primary and secondary data; and using digital technologies to undertake research, evaluate information and present data.

Agricultural Practices students apply scientific knowledge and skills in situations to produce outcomes. Students build their understanding of expectations for work in agricultural settings and develop an understanding of career pathways, jobs and other opportunities available for participating in and contributing to agricultural activities.

Projects and investigations are key features of Agricultural Practices. Projects require the application of a range of cognitive, technical and reasoning skills and practical-based theory to produce real-world outcomes. Investigations follow scientific inquiry methods to develop a deeper understanding of a particular topic or context and the link between theory and practice in real-world and/or lifelike agricultural contexts.

By studying Agricultural Practices, students develop an awareness and understanding of life beyond school through authentic, real-world interactions to become responsible and informed citizens. They develop a strong personal, socially oriented, ethical outlook that assists with managing context, conflict and uncertainty. Students gain the ability to work effectively and respectfully with diverse teams to maximise understanding of concepts, while exercising flexibility, cultural awareness and a willingness to make necessary compromises to accomplish common goals. They learn to communicate effectively and efficiently by manipulating appropriate language, terminology, symbols and diagrams associated with scientific communication.

The objectives of the course ensure that students apply what they understand to explain and execute procedures, plan and implement projects and investigations, analyse and interpret information, and evaluate conclusions and outcomes.

Workplace health and safety practices are embedded across all units and focus on building knowledge and skills in working safely, effectively and efficiently in practical agricultural situations.

2.2 Syllabus objectives

The syllabus objectives outline what students have the opportunity to learn.

1. **Describe ideas and phenomena.**

   Students give an account of agricultural ideas and phenomena and the skills and processes used to complete an agricultural task. They express information in a variety of modes using agricultural language, representations and genre conventions.

2. **Execute procedures.**

   Students demonstrate skills and processes to complete an agricultural task. They collect and collate information from primary and secondary sources. Students follow workplace health and safety procedures and ethical and environmental considerations.

3. **Analyse information.**

   Students recognise a variety of forms of information produced from experiments and research, e.g. words, symbols, pictures, graphs. They identify the key features and components of information and apply processes to identify patterns, relationships, errors and limitations.

4. **Interpret information.**

   Students draw conclusions from their analysis of information from experiments and research. They identify expectations and requirements in scenarios.

5. **Evaluate conclusions and outcomes.**

   Students make judgments about conclusions and outcomes in terms of criteria such as efficiency, effectiveness, cost, safety, industry standards or social, ethical, cultural or environmental impacts. They make recommendations about future investigations and projects.

6. **Plan investigations and projects.**

   Students make decisions about methodologies, sources and processes to reach conclusions and achieve outcomes. They ensure that workplace health and safety and ethical and environmental considerations are incorporated into planning.

2.3 Designing a course of study in Agricultural Practices

Syllabuses are designed for teachers to make professional decisions to tailor curriculum and assessment design and delivery to suit their school context and the goals, aspirations and abilities of their students within the parameters of Queensland's senior phase of learning.

The syllabus is used by teachers to develop curriculum for their school context. The term *course of study* describes the unique curriculum and assessment that students engage with in each school context. A course of study is the product of a series of decisions made by a school to select, organise and contextualise subject matter, integrate complementary and important learning, and create assessment tasks in accordance with syllabus specifications.

It is encouraged that, where possible, a course of study is designed such that teaching, learning and assessment activities are integrated and enlivened in an authentic setting.

2.3.1 Course structure

Agricultural Practices is an Applied senior syllabus. It contains at least four QCAA-developed units from which schools develop their course of study.

Each unit has been developed with a notional time of 55 hours of teaching and learning, including assessment.

Schools select four units from the unit options provided. They decide the order in which the units will be delivered. Once these decisions have been made, the four units selected and their order of implementation determine which units are considered Units 1–4.

Students should complete Unit 1 and Unit 2 before beginning Units 3 and 4. Units 3 and 4 are studied as a pair.

More information about the requirements for administering senior syllabuses is available in the 'Queensland curriculum' section of the *QCE and QCIA policy and procedures handbook*.

2.3.2 Curriculum

Senior syllabuses set out only what is essential while being flexible so teachers can make curriculum decisions to suit their students, school context, resources and expertise.

Within the requirements set out in this syllabus and the *QCE and QCIA policy and procedures handbook*, schools have autonomy to decide:

- how and when subject matter is delivered
- how, when and why learning experiences are developed, and the context in which learning occurs
- how opportunities are provided in the course of study for explicit and integrated teaching and learning of complementary skills.

These decisions allow teachers to develop a course of study that is rich, engaging and relevant for their students.

2.3.3 Assessment

Senior syllabuses set out only what is essential while being flexible so teachers can make assessment decisions to suit their students, school context, resources and expertise.

Applied senior syllabuses contain assessment specifications and conditions for the assessment instruments that must be implemented with Units 3 and 4. These specifications and conditions ensure comparability, equity and validity in assessment.

Within the requirements set out in this syllabus and the *QCE and QCIA policy and procedures handbook*, schools have autonomy to decide:

- specific assessment task details
- assessment contexts to suit available resources
- how the assessment task will be integrated with teaching and learning activities
- how authentic the task will be.

In Unit 1 and Unit 2, schools:

- develop at least two but no more than four assessments
- complete at least one assessment for each unit
- ensure that each unit objective is assessed at least once.

In Units 3 and 4, schools develop four assessments using the assessment specifications and conditions provided in the syllabus.

More information about assessment in senior syllabuses is available in 'The assessment system' section of the *QCE and QCIA policy and procedures handbook*.

2.3.4 Subject matter

Each unit contains a unit description, unit objectives and subject matter. Subject matter is the body of information, mental procedures and psychomotor procedures (see Marzano & Kendall 2007, 2008) that are necessary for students' learning and engagement with the subject. Subject matter itself is not the specification of learning experiences but provides the basis for the design of student learning experiences.

Subject matter has a direct relationship with the unit objectives and provides statements of learning that have been constructed in a similar way to objectives.

2.3.5 Aboriginal perspectives and Torres Strait Islander perspectives

The QCAA is committed to reconciliation. As part of its commitment, the QCAA affirms that:

- Aboriginal peoples and Torres Strait Islander peoples are the first Australians, and have the oldest living cultures in human history
- Aboriginal peoples and Torres Strait Islander peoples have strong cultural traditions and speak diverse languages and dialects, other than Standard Australian English
- teaching and learning in Queensland schools should provide opportunities for students to deepen their knowledge of Australia by engaging with the perspectives of Aboriginal peoples and Torres Strait Islander peoples
- positive outcomes for Aboriginal students and Torres Strait Islander students are supported by successfully embedding Aboriginal perspectives and Torres Strait Islander perspectives across planning, teaching and assessing student achievement.

Guidelines about Aboriginal perspectives and Torres Strait Islander perspectives and resources for teaching are available at www.qcaa.qld.edu.au/k-12-policies/aboriginal-torres-strait-islander-perspectives.

Where appropriate, Aboriginal perspectives and Torres Strait Islander perspectives have been embedded in the subject matter.

2.3.6 Complementary skills

Opportunities for the development of complementary skills have been embedded throughout subject matter. These skills, which overlap and interact with syllabus subject matter, are derived from current education, industry and community expectations and encompass the knowledge, skills, capabilities, behaviours and dispositions that will help students live and work successfully in the 21st century.

These complementary skills are:

- literacy — the knowledge, skills, behaviours and dispositions about language and texts essential for understanding and conveying English language content
- numeracy — the knowledge, skills, behaviours and dispositions that students need to use mathematics in a wide range of situations, to recognise and understand the role of mathematics in the world, and to develop the dispositions and capacities to use mathematical knowledge and skills purposefully
- 21st century skills — the attributes and skills students need to prepare them for higher education, work, and engagement in a complex and rapidly changing world. These skills include critical thinking, creative thinking, communication, collaboration and teamwork, personal and social skills, and digital literacy. The explanations of associated skills are available at www.qcaa.qld.edu.au/senior/senior-subjects/general-subjects/21st-century-skills .

It is expected that aspects of literacy, numeracy and 21st century skills will be developed by engaging in the learning outlined in this syllabus. Teachers may choose to create additional explicit and intentional opportunities for the development of these skills as they design the course of study.

2.3.7 Additional subject-specific information

Additional subject-specific information has been included to support and inform the development of a course of study.

Field work

It is anticipated that approximately five hours of field work will be required for learning and assessment in each unit.

Inquiry and project-management skills

The following list identifies skills that students will typically develop throughout the course of study in Agricultural Practices. This list is:

- not prescriptive — only skills that are relevant to the investigations and projects that students perform should be taught
- not exhaustive — other skills may be relevant.

Describe ideas and phenomena and execute procedures

- Work with others.
- Implement plans, including risk assessments and protocols for working with Aboriginal communities and Torres Strait Islander communities.
- Use specialised equipment to collect primary data and complete processes.
- Avoid or manage bias in data collection.
- Use research tools (e.g. library resources, search engines) to identify sources of secondary information.
- Record information using appropriate units of measurement.
- Present processed information using appropriate representations, e.g. tables, graphs and diagrams.
- Use technology (e.g. word processors, spreadsheets) to collate and process information.
- Process information from primary sources using descriptive statistics such as
  - percentages
  - measures of central tendency, e.g. mean, median and mode
  - measures of dispersion, e.g. range and standard deviation.
- Use appropriate genre conventions, e.g. report format.
- Acknowledge sources, e.g. using in-text referencing, reference lists, bibliographies.

Analyse and interpret information

- Analyse scenarios to identify components and relationships.
- Identify patterns and relationships in information from
  - primary sources, e.g. direct or inverse correlation, percentage difference
  - secondary sources, e.g. similarities, differences.
- Identify the limitations of information from
  - primary sources, e.g. error, uncertainty
  - secondary sources, e.g. relevance, credibility.
- Interpret texts.
- Interpret scenario requirements to select processes, materials and tools.
- Draw conclusions.

Evaluate and plan investigations and projects

- Identify criteria for the evaluation of
  - methodologies, e.g. efficiency, cost, safety
  - sources, e.g. credibility, relevance, age
  - processes, e.g. efficiency, cost, safety.
- Evaluate methodologies, sources, processes and outcomes against identified criteria
- Make recommendations for future investigations and projects.
- Set goals.
- Conduct background research.
- Identify independent variables and dependent variables.
- Select methodologies for experiments.
- Select sources for research.
- Decide on the type and amount of information to be collected.
- Identify appropriate equipment, materials and sources for investigations.
- Manage time and resources to deliver products and performances.
- Manage risk, including
  - identifying hazards
  - selecting appropriate personal protective equipment (PPE)
  - adapting standard operating procedures (SOPs)
  - proposing suitable modifications
  - planning responses to injuries and accidents.
- Apply ethical principles.
- Plan protocols for working with Aboriginal communities and Torres Strait Islander communities.

2.4 Reporting

General information about determining and reporting results for senior syllabuses is provided in the 'Determining and reporting results' section of the *QCE and QCIA policy and procedures handbook*.

2.4.1 Reporting standards

Reporting standards are summary statements that describe typical performance at each of the five levels (A–E).

A
The student selects sufficient and relevant sources, processes, materials and tools to plan for agricultural tasks. They use fluent and concise agricultural language to describe ideas, skills and processes. The student demonstrates confident and precise skills and processes to efficiently, effectively and safely execute experimental/research methodology. They efficiently collect and effective collate information and provide recommendations about future investigations and projects, supported with relevant evidence.
B
The student selects relevant sources, processes, materials and tools to plan for agricultural tasks. They competently use agricultural language to describe ideas, skills and processes. The student demonstrates competent skills and processes to effectively and safely execute experimental/research methodology. They collect and collate information and provide recommendations about future investigations and projects, related to evidence.
C
The student selects sources, processes, materials and tools to plan for agricultural tasks. They use agricultural language to describe ideas, skills and processes. The student demonstrates skills and processes to safely execute experimental/research methodology. They collect information and provide recommendations about future investigations and projects.
D
The student is guided by the teacher when selecting sources, processes, materials and tools to plan for agricultural tasks. They use disjointed language to provide a basic description of ideas, skills and processes. The student is guided by the teacher when executing skills and processes experimental/ research methodology. They provide statements about investigations and projects.
E
The student is directed by the teacher when executing given processes. They provide an incomplete description of ideas, skills or processes and a partial description of investigations and projects.

2.4.2 Determining and reporting results

Unit 1 and Unit 2

Schools make A–E judgments on individual assessment instruments implemented in Unit 1 and Unit 2 using reporting standards.

Schools report results to the QCAA for students who complete Unit 1 and/or Unit 2. Results are reported as satisfactory (S) or unsatisfactory (U). Where appropriate, schools may also report a not rated (NR).

Units 3 and 4

Schools make A–E judgments on each of the four assessment instruments implemented in Units 3 and 4 using instrument-specific standards (ISS).

Schools report instrument results to the QCAA for students enrolled in Units 3 and 4 for each of the four assessments implemented. Where appropriate, schools may also report a not rated (NR).

Schools are also responsible for determining and reporting an A–E final subject result to the QCAA. The subject result is an on-balance judgment about how the pattern of evidence across the four assessments in Units 3 and 4 best matches the characteristics of the reporting standards at one of five levels (A–E).

3 Unit options

3.1 Unit option A: Animal industries

In this unit, students are introduced to animal industries that are valued by Australians for economic, cultural and social reasons. Students explore different animal industries that are significant in their local or regional area and consider factors to achieve long-term sustainability. Students investigate sustainable land management and ways to rehabilitate environmental degradation. They examine the importance of creative and innovative agricultural practices. Students consider the use of land and the sourcing of food, fibre and medicine by Aboriginal peoples and Torres Strait Islander peoples. They investigate agricultural production from past and present perspectives. Students analyse influences on the establishment of industries and explore career pathways and opportunities.

3.1.1 Unit objectives

1. Describe ideas and phenomena in animal industries.
2. Execute procedures in animal industries.
3. Analyse information in animal industries.
4. Interpret information in animal industries.
5. Evaluate conclusions and outcomes in animal industries.
6. Plan investigations and projects in animal industries.

3.1.2 Subject matter

Concepts

- Describe
  - animal industries of local, regional and state importance, e.g. beef, eggs, dairy, wool
  - the economic, cultural and social significance of animal industries
  - animal production systems of local, regional and/or state importance, e.g. intensive, extensive
  - environmental considerations for local industries, e.g. climate, weather, soil, water, pests, diseases
  - the role of relevant government and non-government authorities and agencies in supporting animal industries
  - the role of sustainable property management in determining appropriate land use
  - characteristics of sustainable management for animal industries
  - available techniques for the prevention of environmental degradation and the sustainable management of land and water
  - grazing management (e.g. carrying capacity) for animal production
  - issues of water quality related to animal production, e.g. levels of nitrogen, phosphorus; electrical conductivity (EC)
  - Aboriginal peoples' and Torres Strait Islander peoples' knowledge and sustainable practices, including for different types of vegetation
  - pathways, relevant qualifications and career opportunities in animal industries.

Information

- Analyse and interpret
  - information from practicals, projects and investigations
  - information on awards and conditions for specific animal industry roles
  - evidence of the positive and negative impacts of animal industries on the environment
  - reasons for the locations of animal industries, e.g. climate, proximity to markets and inputs
  - information provided by relevant government and non-government authorities and agencies
  - data gathered in citizen science project, e.g. water quality, landcare
  - effectiveness of grazing management strategies, e.g. continuous vs. rotational
  - environmental data, e.g. climate, soil, water
  - sustainable management practices to prevent soil degradation, e.g. management of run-off, erosion, effluent
  - techniques for environmental control and modification in intensive animal production, e.g. modification of microclimate
  - the impacts of climate change on food and fibre production
  - sustainable strategies in animal industries to address the impacts of climate change.

Procedures and skills

- Execute
  - risk management plans relevant to animal industries
  - protocols for working with Aboriginal communities and Torres Strait Islander communities
  - gathering of information about animal industries, e.g. about
    - the economic value of animal industries of local, regional and/or state importance
    - the effect of animal industries on the surrounding environment
    - employment information and opportunities
    - relevant authorities and agencies, e.g. government and non-government organisations
    - sustainable use of chemicals, e.g. herbicides, pesticides
  - soil and/or water testing.
- Evaluate
  - opportunities for animal industries in the local and/or regional area
  - the effects of current animal industries on the local environment
  - sustainable management practices for animal production
  - factors affecting sustainability across the food and fibre supply chain, e.g. food provenance, carbon footprint, healthy rural and regional communities, food safety standards, safe work practices, commodity prices for primary producers
  - investigations and projects to make recommendations.
- Plan
  - management of risks and hazards
  - protocols for working with Aboriginal communities and Torres Strait Islander communities
  - investigations into animal industries, e.g. What emerging agricultural industries are sustainable?
  - projects in animal industries, e.g. implement sustainable management practices for an animal industry.

3.2 Unit option B: Plant industries

In this unit, students are introduced to plant industries that are valued by Australians for economic, cultural and social reasons. Students explore different plant industries that are significant in their local or regional area and consider factors to achieve long-term sustainability. Students investigate environmental degradation and approaches to sustainable land management and rehabilitation. They examine the importance of creative and innovative practices. Students consider the use of land and the sourcing of food and fibre by Aboriginal peoples and Torres Strait Islander peoples. They investigate agricultural and horticultural production from past and present perspectives. Students analyse influences on the establishment of industries and explore career pathways and opportunities.

3.2.1 Unit objectives

1. Describe ideas and phenomena in plant industries.
2. Execute procedures in plant industries.
3. Analyse information in plant industries.
4. Interpret information in plant industries.
5. Evaluate conclusions and outcomes in plant industries.
6. Plan investigations and projects in plant industries.

3.2.2 Subject matter

Concepts

- Describe
  - plant industries of local, regional and state importance, e.g. sugar cane, tomato, macadamia
  - the economic, cultural and social significance of plant industries
  - plant production systems of local, regional and/or state importance
  - environmental considerations for local industries, e.g. climate, weather, soil, water, pests, diseases
  - the role of relevant government and non-government authorities and agencies in supporting plant industries
  - the role of sustainable property management in determining appropriate land use
  - characteristics of sustainable management for plant industries
  - types of environmental degradation, e.g. erosion, salinity, waterlogging, compaction, soil acidity, soil nutrient depletion
  - available techniques for the prevention of environmental degradation and the sustainable management of land and water
  - issues of water quality related to food and fibre production, e.g. levels of nitrogen, phosphorus; electrical conductivity (EC)
  - relationships and connections that Aboriginal peoples and Torres Strait Islander peoples have with Country and Place
  - pathways, relevant qualifications and career opportunities in plant industries.

Information

- Analyse and interpret
  - information from practicals, projects and investigations
  - the significance of regional plant industries, e.g. value to Queensland economy
  - information on awards and conditions for specific plant industry roles
  - evidence of the positive and negative impacts of plant industries on the environment
  - reasons for the locations of plant industries, e.g. climate, proximity to markets and inputs
  - information provided by relevant government and non-government authorities and agencies
  - sustainable management practices (e.g. stubble management, conservation tillage) to prevent soil degradation (e.g. management of run-off, erosion)
  - areas of ongoing research, e.g. impact of technology on plant production outcomes
  - data from sustainable projects
  - the impacts of climate change on food and fibre production
  - sustainable strategies in plant industries to address the impacts of climate change.

Procedures and skills

- Execute
  - risk management plans relevant to plant industries
  - protocols for working with Aboriginal communities and Torres Strait Islander communities
  - gathering of information about
    - the economic value of plant industries of local, regional and state importance
    - the effect of plant industries on the surrounding environment
    - relevant employment information
    - sustainable use of chemicals and fertilisers, e.g. herbicides, hormones
  - soil and/or water testing.
- Evaluate
  - opportunities for plant industries in the local and/or regional area
  - the effects of current plant industries on the local environment
  - sustainable management practices for plant production
  - techniques for environmental control and modification in horticulture, e.g. modification of microclimate, soil or growing media, topography
  - challenges and opportunities presented by dimensions of sustainability across the food and fibre supply chain, e.g. food provenance, carbon footprint, healthy rural and regional communities, food safety standards, safe work practices, commodity prices for primary producers
  - investigations and projects to make recommendations.
- Plan
  - management of risks and hazards
  - protocols for working with Aboriginal communities and Torres Strait Islander communities
  - investigations into plant industries, e.g. What is the impact of a chosen agricultural industry on the local area?
  - projects in plant industries, e.g. demonstrate skills that are relevant to a local plant industry.

3.3 Unit option C: Land-based animal production

In this unit, students investigate challenges and issues that affect practices and decisions in managing land-based animal production. Students explore animal growth, nutrition, health and principles of selective breeding. Students research reproductive processes and technologies for animals in the contexts of food and fibre production. They undertake practical tasks relating to the growth and management of animals.

3.3.1 Unit objectives

1. Describe ideas and phenomena in land-based animal production.
2. Execute procedures in land-based animal production.
3. Analyse information in land-based animal production.
4. Interpret information in land-based animal production.
5. Evaluate conclusions and outcomes in land-based animal production.
6. Plan investigations and projects in land-based animal production.

3.3.2 Subject matter

Concepts

- Describe
  - animal species (e.g. types of cattle, sheep) that are used in animal production for food and fibre
  - breeds that are used for animal production in local and regional industries, e.g. Holstein, Brahman, Suffolk, Australorp
  - the physical characteristics and adaptations of animal breeds used in local and regional industries
  - the role of relevant government and non-government authorities and agencies in supporting animal industries
  - animal growth and yield
  - animal ethics and welfare
  - the variety of purposes of agricultural animals, e.g. food, fibre, fertiliser
  - livestock enclosures, e.g. hives, chicken sheds
  - the types of fencing used to enclose animals
  - the basic infrastructure requirements for animal production
  - nutritional considerations for relevant stock, e.g. protein and energy
  - types of feed and the function of nutrients in feed sources, i.e. feeding for purpose
  - feed management, e.g. assessing intake, feed scheduling, self-feeder management
  - pasture management, i.e. assessing pasture quality and quantity
  - characteristics of a healthy animal, e.g. behaviour, appearance, clinical signs
  - causes of ill health relevant to stock, e.g. hereditary, metabolic, infections, metazoal, environmental
  - pests and diseases
  - pathways, relevant qualifications and career opportunities in land-based animal production.

Information

- Analyse and interpret
  - information from practicals, projects and investigations
  - data collected for the effect of changes in animal husbandry techniques in response to differing requirements or values
  - information from operational manuals for machinery
  - information on the development of agricultural technologies over time, e.g. animal identification, recording data
  - quantitative and qualitative data of various animal industries
  - carrying capacity data for a range of agricultural animals
  - animal breeding cycles, e.g. calving, weaning

- strategies to prevent and treat ill health, e.g. welfare, breeding program, vaccination, drenching, antibiotics
- existing infrastructure plans and requirements for infrastructure scenarios to construct appropriate solutions
- information on reproduction techniques
- chemical information for the control of animal pests and diseases.

Procedures and skills

- Execute
  - risk management plans, e.g. for animal identification and animal husbandry procedures
  - use of equipment
  - identification of specific animals with husbandry identification procedures, e.g. NLIS tagging, branding, tattooing
  - preparation of machinery
  - operation of machinery
  - maintenance and storage of equipment
  - identification of appropriate feeds for selected animal production
  - identification and application of appropriate chemicals for selected animal production.
- Evaluate
  - animal physical characteristics and adaptations
  - characteristics of a healthy, productive animal
  - animal welfare
  - outcomes of maintenance and infrastructure activities
  - investigations and projects to make recommendations.
- Plan
  - management of risks and hazards for land-based animal production
  - investigations into land-based animal production, e.g. What characteristics of a chosen animal species make it suitable to use in the local area?
  - projects in land-based animal production, e.g. identify animals (e.g. breeds of cattle) with appropriate husbandry identification procedure.

3.4 Unit option D: Water-based animal production

In this unit, students investigate challenges and issues that affect practices and decisions in managing water-based animal production. Students explore animal growth, nutrition and health. They research the use of different technologies for producing freshwater and saltwater marine species and technologies for animals in the contexts of food production. Students undertake practical tasks relating to the growth and management of animals.

3.4.1 Unit objectives

1. Describe ideas and phenomena in water-based animal production.
2. Execute procedures in water-based animal production.
3. Analyse information in water-based animal production.
4. Interpret information in water-based animal production.
5. Evaluate conclusions and outcomes in water-based animal production.
6. Plan investigations and projects in water-based animal production.

3.4.2 Subject matter

Concepts

- Describe
  - animal species that are of local or regional importance, e.g. red claw, silver perch, prawns
  - environmental conditions for freshwater and/or saltwater species in a natural system, e.g. light, water temperature, pH, dissolved oxygen, salinity
  - the physical characteristics and adaptations of selected freshwater and/or saltwater species used in an aquacultural system
  - types of aquacultural production systems, e.g. cage/pond farming, open/closed systems
  - sourcing of juveniles for selected species
  - the role of relevant government and non-government authorities and agencies in supporting animal industries
  - components of the agricultural environment that affect stock, equipment and machinery, e.g. predation by birds in pond systems
  - animal growth and yield
  - animal ethics and welfare
  - sources for quality organisms, feed and other resources
  - types of feed
  - nutritional considerations for relevant stock, e.g. protein and energy
  - feed/nutrition contamination and its effects on organisms and systems
  - feed/nutrition preparation and storage
  - water quality parameters, e.g. pH, dissolved oxygen, nitrates
  - causes of ill health and disease, e.g. biofouling, microorganisms, parasites
  - Aboriginal peoples' and Torres Strait Islander peoples' relationships with, connections to and understanding of waterways
  - pathways, relevant qualifications and career opportunities water-based animal production.

Information

- Analyse and interpret
  - information from practicals, projects and investigations
  - information on aquacultural industries, e.g.
    - production trends over time for prominent freshwater and/or saltwater species in Queensland
    - effects of environmental conditions on aquacultural production systems
    - yields in aquacultural production systems
    - changes in water quality and appearance, e.g. pH, nitrates, turbidity
    - changes in animal growth rate, behaviour and appearance
  - rules and regulations associated with aquacultural production systems.

Procedures and skills

- Execute
  - risk management plans, e.g. for animal production activities, such as maintenance and operation of a water-based production system
  - protocols for working with Aboriginal communities and Torres Strait Islander communities
  - gathering of secondary data on animal industries of local, regional and state importance relevant to their value to the economy
  - identification of animal species of local or regional importance
  - monitoring of growth rates for selected species
  - operation of machinery, e.g. pumps operated to manufacturer specifications in accordance with supervisor's instructions and standard operating procedures
  - maintenance and storage of equipment, e.g. identifying faults, maintaining equipment and keeping appropriate records (e.g. servicing and repair), determining appropriate action and keeping records, repairing faults
  - testing and adjusting water quality, e.g. temperature, pH, nitrates
  - feeding schedule for animals
  - strategies to prevent and treat disease, e.g. cleaning tanks, altering pH, administering supplements.
- Evaluate
  - systems for aquacultural production, e.g. cage/pond farming, open/closed systems
  - opportunities for growth of freshwater and/or saltwater enterprises in local or regional areas
  - performance of different freshwater and/or saltwater species in a production system
  - management of freshwater and/or saltwater species in a production system
  - nutritional requirements for optimising production of freshwater and/or saltwater species
  - investigations and projects to make recommendations.
- Plan
  - management of risks and hazards for water-based animal production
  - protocols for working with Aboriginal communities and Torres Strait Islander communities
  - investigations into water-based animal production, e.g. How does a chosen set of environmental conditions (e.g. climate change) affect a chosen aquacultural production system?
  - projects in water-based animal production, e.g. design a production system for water-based animals by identifying the required equipment, machinery and materials.

3.5 Unit option E: Land-based plant production

In this unit, students gain a broad understanding of plant production practices, with a focus on the selection of suitable plant varieties and factors affecting plant production. Students explore systems and production cycles, best practices for health and safety, and the factors that influence plant growth. Through practical tasks, students make decisions about testing soils and selecting suitable plants. Students also consider tools for and methods of testing and measuring quality and improvement in horticultural practices.

3.5.1 Unit objectives

1. Describe ideas and phenomena in land-based plant production.
2. Execute procedures in land-based plant production.
3. Analyse information in land-based plant production.
4. Interpret information in land-based plant production.
5. Evaluate conclusions and outcomes in land-based plant production.
6. Plan investigations and projects in land-based plant production.

3.5.2 Subject matter

Concepts

- Describe
  - agricultural plants that are used in local and regional industries
  - a selection of local plants used by Aboriginal peoples and Torres Strait Islander peoples
  - the physical characteristics and adaptations of plants used for local and regional industries
  - how agricultural plants are used for a variety of purposes, e.g. food, fibre, green manure crops
  - soil properties and types
  - plant establishment, e.g. seed depth, density
  - planting methods, e.g. seeds, runners, tubers, cuttings, seedlings
  - plant propagation e.g. sexual; asexual propagation through cuttings and seeds
  - plant growth and yield
  - types of nutrient sources
  - nutritional considerations for selected plants, e.g. major and minor plant nutrients
  - function of nutrients for plant production, i.e. plant nutrient requirements
  - factors affecting nutrient uptake, e.g. temperature, soil moisture
  - water requirements for agricultural plants
  - characteristics of a healthy plant, e.g. appearance and clinical signs
  - causes of ill health relevant to plants, e.g. pests, diseases
  - pests and diseases
  - strategies to treat pests and diseases, e.g. chemical, genetic modification, biological
  - equipment, machinery and materials for agricultural plants
  - rules and regulations associated with plant production activities, e.g. chemical application, registration of machinery
  - agricultural infrastructure, e.g. greenhouses, chemical or storage sheds, green walls
  - relationships and connections that Aboriginal peoples and Torres Strait Islander peoples have with Country and Place
  - pathways, relevant qualifications and career opportunities in land-based plant production.

Information

- Analyse and interpret
  - information from practicals, projects and investigations
  - information about land-based plant production, e.g. plant varieties of a selected crop or pasture; primary data from a plant varietal trial; data on environmental adaptations (e.g. disease resistance, insect resistance, water requirements) for plant selection; growth of plants throughout the production cycle; soil analysis data; plant production data
  - commercial product information on chemicals for production.

Procedures and skills

- Execute
  - risk management plans, e.g. for plant establishment and plant production
  - protocols for working with Aboriginal communities and Torres Strait Islander communities
  - plant establishment techniques
  - agronomic practices associated with production of agricultural plant varieties or native plants
  - testing soil characteristics, e.g. pH level, soil structure and texture
  - sexual and asexual propagation techniques, e.g. grafting, cuttings
  - agronomic practices, e.g. fertiliser application, irrigation, pesticide application, harvesting
  - maintenance and operation of equipment and machinery, i.e. identifying and selecting in accordance with supervisor's instructions
  - operation of irrigation systems.
- Evaluate
  - crop or pasture production
  - suitability of plant species for a local or regional area
  - management procedures for plant production
  - opportunities for using native plants for plant production
  - the effects of environmental factors on plant production
  - the effects of management (e.g. nutrient management) on plant production
  - infrastructure for plant production
  - investigations and projects to make recommendations.
- Plan
  - management of risks and hazards
  - protocols for working with Aboriginal communities and Torres Strait Islander communities
  - investigations into land-based plant production, e.g. Which agricultural crop or pasture variety is best for a chosen setting?
  - projects in land-based plant production, e.g. demonstrate skills for establishment of a chosen crop or pasture species.

3.6 Unit option F: Water-based plant production

In this unit, students gain a broad understanding of hydroponic and aquaponic production practices and investigate how, these production practices are an alternative to conventional soil-based agricultural production systems. Students examine production systems, plant varieties used and factors affecting plant production. Students explore systems and production cycles, best practices for health and safety, and factors that influence plant growth. Through practical tasks, students make decisions about testing water and selecting suitable plants. Students also consider tools for and methods of testing and measuring quality and improvement in water-based plant production practices.

3.6.1 Unit objectives

1. Describe ideas and phenomena in water-based plant production.
2. Execute procedures in water-based plant production.
3. Analyse information in water-based plant production.
4. Interpret information in water-based plant production.
5. Evaluate conclusions and outcomes in water-based plant production.
6. Plan investigations and projects in water-based plant production.

3.6.2 Subject matter

Concepts

- Describe
  - hydroponic and aquaponic systems, e.g. NFT, rockwool
  - equipment, machinery and materials for hydroponics and aquaponics
  - mediums for plant growth, e.g. rockwool, vermiculite
  - agricultural infrastructure, e.g. greenhouses, outdoor netted enclosures, chemical or storage sheds, green walls
  - agricultural plants for use in hydroponic and aquaponic production
  - the physical characteristics (e.g. growth and yield) and adaptations of plant species used for hydroponic and aquaponic production
  - rules and regulations associated with hydroponic and aquaponic activities, e.g. chemical application, registration of machinery
  - components of the environment that affect hydroponic and/or aquaponic systems, e.g. salts, water quality, temperature, sunlight
  - plant establishment, e.g. planting techniques, growing medium
  - planting materials, e.g. seed, seedlings
  - types of nutrient sources
  - nutritional considerations for selected plants, e.g. major and minor plant nutrients
  - function of nutrients for plant production, i.e. plant nutrient requirements
  - factors affecting nutrient uptake, e.g. temperature
  - water quality requirements for different plants
  - characteristics of a healthy plant, e.g. appearance and clinical signs
  - causes of ill health relevant to plants, e.g. pests, diseases
  - strategies to manage pests and diseases, e.g. chemical, genetic modification, biological
  - pathways, relevant qualifications and career opportunities in water-based plant production.

Information

- Analyse and interpret
  - information from practicals, projects and investigations
  - chemical information for aquaponic and/or hydroponic systems
  - information on
    - nutrient levels in water-based systems
    - different growing mediums for hydroponic systems
    - growth and yield for plants in hydroponic or aquaponic production systems.

Procedures and skills

- Execute
  - risk management plans, e.g. for operating hydroponic or aquaponic systems.
  - monitoring and application of nutrients in a hydroponic system
  - monitoring of water flow around each plant, e.g. NFT
  - checking, cleaning and storage of hydroponic and/or aquaponic equipment and machinery
  - operation of hydroponic or aquaponic systems
  - plant production practices, e.g. planting, pest, control, nutrient management, harvesting
  - water quality testing
  - application of nutrients.
- Evaluate
  - design features of hydroponic or aquaponic systems
  - the quantity and quality of plant product from a hydroponic or aquaponic system
  - plant growth rates using different nutrients
  - water flow rate needed to sustain viable water quality
  - plant production practices for a water-based production system
  - investigations and projects to make recommendations.
- Plan
  - management of risks and hazards for plant establishment
  - protocols for working with Aboriginal communities and Torres Strait Islander communities
  - investigations into water-based plant production, e.g. Which nutrient regime is best for a selected hydroponic and/or aquaponic crop grown at the school?
  - projects in water-based plant production, e.g. construct a hydroponic or aquaponic system.

3.7 Unit option G: Animal agribusiness

In this unit, students examine management of animal production, business challenges and opportunities across the animal food and fibre supply chain, with a focus on sustainability. Students consider a range of influences on the decisions of animal producers. They consider the role of strategic business planning and the effective use of marketing and communications tools. Students research quality assurance programs and regulations relating to sustainable animal food and fibre industries.

3.7.1 Unit objectives

1. Describe ideas and phenomena in animal agribusiness.
2. Execute procedures in animal agribusiness.
3. Analyse information in animal agribusiness.
4. Interpret information in animal agribusiness.
5. Evaluate conclusions and outcomes in animal agribusiness.
6. Plan investigations and projects in animal agribusiness.

3.7.2 Subject matter

Concepts

- Describe
  - the selection and use of agricultural animals for local and regional industries
  - consumer demand and requirements for different markets
  - breed characteristics best suited to a specific animal product
  - animal production husbandry practices (e.g. tail docking, vaccinations, drenching) required for selected animal species
  - production systems used for different animals, e.g. free-range, barn-raised and caged chickens
  - innovations in animal production, e.g. renewable energy sources such as biomass, solar, enviro-shelters
  - physical and financial budgets
  - basic infrastructure requirements
  - social, economic and environmental sustainability considerations related to animal business practices
  - the influence of social media, pressure groups and consumers on decisions made by food and fibre producers
  - diversification of animal production
  - the different post-harvest processes used for animal products
  - packaging and handling of animal products for market, e.g. straining and bottling honey; grading and placing eggs in cartons
  - markets for animal production
  - food traceability and supply chains
  - quality assurance processes for animal products
  - preparing products for transportation, e.g. loading cattle onto truck, baling wool
  - value-adding processes for different animal products, e.g. non-homogenisation of milk, graded beef
  - pathways, relevant qualifications and career opportunities in animal agribusiness.

Information

- Analyse and interpret
  - information from practicals, projects and investigations
  - the relationship between changing consumer trends and animal production practices
  - market specifications requirements, processes and procedures, e.g. meat, fibre, eggs
  - information about different production systems, e.g. physical budgets, production costs and returns
  - the effect of different systems on animal production, e.g. free-range vs. caged, feedlot vs. range

- the influence of social media, pressure groups and consumers on decisions made by animal producers
- information on opportunities for processing animal products to add value, e.g. packaging honey to include the comb
- marketing information and communications tools (e.g. social media platforms) to support and promote Australian food and fibre production and businesses
- rules, regulations and recommendations associated with post-harvest handling of animal products
- challenges and opportunities presented by dimensions of sustainability across the food and fibre supply chain, e.g. food provenance, carbon footprint, healthy rural and regional communities, food safety standards, safe work practices, commodity prices for primary producers.

Procedures and skills

- Execute
  - risk management plans, e.g. for animal production skills and animal post-harvest skills
  - production of physical and financial records
  - preparation of budgets, e.g. gross margin, physical budgets
  - assessment of product quality, e.g. grading beef, grading eggs and classing wool fibre.
- Evaluate
  - the effect of different production systems or husbandry practices on the quality and quantity of animal product
  - the effect of consumers on future animal production
  - production costs and returns for an animal product
  - strategies for marketing animal products
  - opportunities for changing business practices to enhance the sustainability of an animal enterprise
  - investigations and projects to make recommendations.
- Plan
  - management of risks and hazards.
  - investigations into animal agribusiness, e.g. What different production systems or practices can be used for a selected agricultural animal?
  - projects in animal agribusiness, e.g. implement value-adding for an animal product.

3.8 Unit option H: Plant agribusiness

In this unit, students examine management of plant production, business challenges and opportunities across the plant food and fibre supply chain, with a focus on sustainability. Students consider a range of influences on the decisions of plant producers. They consider the role of strategic business planning and the effective use of marketing and communications tools. Students research quality assurance programs and regulations relating to sustainable plant food and fibre industries.

3.8.1 Unit objectives

1. Describe ideas and phenomena in plant agribusiness.
2. Execute procedures in plant agribusiness.
3. Analyse information in plant agribusiness.
4. Interpret information in plant agribusiness.
5. Evaluate conclusions and outcomes in plant agribusiness.
6. Plan investigations and projects in plant agribusiness.

3.8.2 Subject matter

Concepts

- Describe
  - the selection and use of agricultural plants for local and regional industries
  - the variety of purposes of agricultural plants, e.g. food, fibre, fertiliser, compost, mulch
  - different products that can be produced from plants, e.g. olive trees can produce olives, olive oil and olive leaf products
  - plant production practices required for selected agricultural plants
  - timing and type of fertiliser
  - timing and application of water
  - present and future innovations in agriculture, e.g. renewable energy sources (biomass, solar), integrated pest management, precision agriculture
  - basic infrastructure requirements
  - social, economic and environmental sustainability and ethical considerations related to agricultural and horticultural business practices
  - food traceability
  - strategies for broadening markets for food and fibre produce, e.g. value-adding, growing for export and targeting niche markets
  - rules, regulations and recommendations associated with post-harvest handling of plant products
  - packaging and handling of plant products for transport to local and export markets
  - removing contaminants, cooling after harvesting
  - safe storage of plant products, e.g. silos, refrigeration, controlled
  - atmosphere storage and packaging
  - pathways, relevant qualifications and career opportunities in plant agribusiness.

Information

- Analyse and interpret
  - information from practicals, projects and investigations
  - market specifications, e.g. size, appearance of fruit and vegetables
  - changing consumer trends and variety of plants grown
  - physical budgets
  - production costs and returns, e.g. input costs, gross margins
  - information from quality assurance programs to draw conclusions about the quality of plant products, e.g. grading fruit
  - the effect of agronomic practices required for selected plant production
  - problems in plant production

- the influence of social media, pressure groups and consumers on decisions made by plant producers
- market requirements, processes and procedures, e.g. selling agents
- information on opportunities for processing plant products to add value
- value-adding processes for different plant products, e.g. preserving and drying fruit, making sauces and relishes, milling grains
- marketing information and communications tools (e.g. social media platforms) to support and promote Australian food and fibre production and businesses
- challenges and opportunities presented by dimensions of sustainability across the food and fibre supply chain, e.g. food traceability, carbon footprint, healthy rural and regional communities, food safety standards, safe work practices, commodity prices for primary producers.

Procedures and skills

- Execute
  - risk management plans for plant production and post-harvest skills
  - plant production practices
  - production of physical and financial records
  - recording of system requirements, e.g. IPM
  - preparation of budgets, e.g. gross margin, physical
  - procedures for equipment and machinery
  - harvesting techniques used in plant production
  - safe packing and storage of plant products, e.g. packaging for fruit, refrigerated storage
  - post-harvesting techniques used in plant production.
- Evaluate
  - the effectiveness of different production systems or practices on the quality and quantity of plant products
  - costs and returns for a selected plant product
  - strategies for marketing plant products
  - opportunities for changing business practices
  - investigations and projects to make recommendations.
- Plan
  - management of risks and hazards
  - investigations into plant agribusiness, e.g. Which production system or practice should be used for a selected agricultural plant?
  - projects in plant agribusiness, e.g. maintenance for a selected piece of equipment or machinery.

4 Assessment

4.1 Assessment A1: Applied investigation

Students investigate a research question by collecting, analysing and interpreting primary or secondary information.

4.1.1 Assessment objectives

1. Describe ideas and phenomena in animal industries.
2. Execute procedures in animal industries.
3. Analyse information in animal industries.
4. Interpret information in animal industries.
5. Evaluate conclusions in animal industries.
6. Plan investigations in animal industries.

4.1.2 Specifications

This task requires students to:

- investigate a question that
  - is related to animal industries
  - has scope to be refined further
- document the investigation process and conclusion, including
  - selecting a methodology or sources
  - collecting information
  - analysing information
  - drawing a conclusion based on the analysis of information
  - making recommendations for future projects.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides research questions that students select and investigate.

4.1.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- If students are using primary information, the following aspects of the task may be completed as a group
  - selecting methodology
  - collecting primary information.

4.1.4 Response requirements

One of the following:

- Multimodal (at least two modes delivered at the same time): up to 7 minutes, 10 A4 pages, or equivalent digital media
- Written: up to 1000 words

4.1.5 Instrument-specific standards

Execution	Interpretation	Evaluation	Grade
The student response has the following characteristics:			
• selection of sufficient and relevant methodology/ sources • efficient, effective and safe execution of experimental/research methodology • efficient collection and effective collation of information	• thorough and appropriate identification of patterns and relationships in information • thorough and appropriate identification of errors/limitations of information • conclusion supported with relevant evidence	• recommendations for effective future investigations supported with relevant evidence • fluent and concise use of agricultural language • effective use of representations and genre conventions	A
• selection of relevant methodology/sources • effective and safe execution of experimental/ research methodology • collection and collation of information	• appropriate identification of patterns or relationships in information • appropriate identification of errors/ limitations of information • conclusion related to evidence	• recommendations for appropriate future investigations related to evidence • competent use of agricultural language • appropriate use of representations and genre conventions	B
• selection of methodology/sources • safe execution of experimental or research methodology • collection of information	• identification of patterns or relationships in information • identification of errors/limitations of information • conclusion to the research question	• recommendations for future investigations • use of agricultural language • use of representations and genre conventions	C
• guided selection of methodology/sources • guided execution of given experimental or research methodology.	• statements about patterns or relationships in information • statements about errors or limitations • statement about the research question.	• statement about investigations • use of language • disjointed use of basic representations and conventions.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.2 Assessment A2: Practical project

Students use practical skills to complete a project in response to a scenario.

4.2.1 Assessment objectives

1. Describe ideas and phenomena in animal industries.
2. Execute procedures in animal industries.
3. Analyse information in animal industries.
4. Interpret information in animal industries.
5. Evaluate outcomes in animal industries.
6. Plan projects in animal industries.

4.2.2 Specifications

This task requires students to:

- complete a project
  - that is related to a scenario about animal industries
  - with an outcome of either a physical product or the performance of a skill
- document the process used to complete the project, including
  - analysing and interpreting the given scenario
  - describing the relevant concepts and procedures
  - selecting a procedure to follow
  - executing skills and processes to deliver an outcome
  - evaluating the outcome
  - making recommendations for future projects.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides a scenario that students respond to.

4.2.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- The following aspects of the task may be completed as a group
  - analysing and interpreting the scenario
  - selecting a procedure to follow.
  - executing the procedure.

4.2.4 Response requirements

Completed project

One of the following:

- Product: 1
- Performance: up to 4 minutes

Documented process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.2.5 Instrument-specific standards

Planning	Execution	Evaluation	Grade
The student response has the following characteristics:			
• identification of components and relationships in scenarios • selection of effective and appropriate processes, materials and tools • justified decisions	• confident and precise execution of skills • integration of skills into effective processes • management of risks and ethical issues	• fluent and concise description of ideas, skills and processes • discerning evaluation of outcome against appropriate criteria • recommendations for future effective projects	A
• identification of relevant information in scenarios • selection of relevant processes, materials and tools • considered decisions	• competent execution of skills • coordination of skills in relevant processes • assessment of risks and ethical issues	• competent description of ideas, skills and processes • reasonable evaluation of outcome against identified criteria • recommendations for appropriate future projects	B
• identification of task components • selection of processes, materials and tools • appropriate decisions	• execution of skills • execution of processes • execution of safe and ethical processes	• description of ideas, skills and processes • evaluation of outcome • recommendations for future projects	C
• identification of basic information in scenarios • guided selection of processes, materials and tools • inappropriate decisions.	• guided execution of skills • guided execution of processes • guided execution of safe and ethical processes.	• basic description of ideas, skills or processes • statements about outcome • ideas about future projects.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.3 Assessment B1: Applied investigation

Students investigate a research question by collecting, analysing and interpreting primary or secondary information.

4.3.1 Assessment objectives

1. Describe ideas and phenomena in plant industries.
2. Execute procedures in plant industries.
3. Analyse information in plant industries.
4. Interpret information in plant industries.
5. Evaluate conclusions in plant industries.
6. Plan investigations in plant industries.

4.3.2 Specifications

This task requires students to:

- investigate a question that
  - is related to plant industries
  - has scope to be refined further
- document the investigation process and conclusion, including
  - selecting a methodology or sources
  - collecting information
  - analysing information
  - drawing a conclusion based on the analysis of information
  - making recommendations for future projects.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides research questions that students select and investigate.

4.3.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- If students are using primary information, the following aspects of the task may be completed as a group
  - selecting methodology
  - collecting primary information.

4.3.4 Response requirements

One of the following:

- Multimodal (at least two modes delivered at the same time): up to 7 minutes, 10 A4 pages, or equivalent digital media
- Written: up to 1000 words

4.3.5 Instrument-specific standards

Execution	Interpretation	Evaluation	Grade
The student response has the following characteristics:			
• selection of sufficient and relevant methodology/sources • efficient, effective and safe execution of experimental/research methodology • efficient collection and effective collation of information	• thorough and appropriate identification of patterns and relationships in information • thorough and appropriate identification of errors/limitations of information • conclusion supported with relevant evidence	• recommendations for effective future investigations supported with relevant evidence • fluent and concise use of agricultural language • effective use of representations and genre conventions	A
• selection of relevant methodology/sources • effective and safe execution of experimental/ research methodology • collection and collation of information	• appropriate identification of patterns or relationships in information • appropriate identification of errors/limitations of information • conclusion related to evidence	• recommendations for appropriate future investigations related to evidence • competent use of agricultural language • appropriate use of representations and genre conventions	B
• selection of methodology/sources • safe execution of experimental or research methodology • collection of information	• identification of patterns or relationships in information • identification of errors/limitations of information • conclusion to the research question	• recommendations for future investigations • use of agricultural language • use of representations and genre conventions	C
• guided selection of methodology/sources • guided execution of given experimental or research methodology.	• statements about patterns or relationships in information • statements about errors or limitations • statement about the research question.	• statement about investigations • use of language • disjointed use of basic representations and conventions.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.4 Assessment B2: Practical project

Students use practical skills to complete a project in response to a scenario.

4.4.1 Assessment objectives

1. Describe ideas and phenomena in plant industries.
2. Execute procedures in plant industries.
3. Analyse information in plant industries.
4. Interpret information in plant industries.
5. Evaluate outcomes in plant industries.
6. Plan projects in plant industries.

4.4.2 Specifications

This task requires students to:

- complete a project
  - that is related to a scenario about plant industries
  - with an outcome of either a physical product or the performance of a skill
- document the process used to complete the project, including
  - analysing and interpreting the given scenario
  - describing the relevant concepts and procedures
  - selecting a procedure to follow
  - executing skills and processes to deliver an outcome
  - making recommendations for future investigations.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides a scenario that students respond to.

4.4.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- The following aspects of the task may be completed as a group
  - analysing and interpreting the scenario
  - selecting a procedure to follow.
  - executing the procedure.

4.4.4 Response requirements

Completed project

One of the following:

- Product: 1
- Performance: up to 4 minutes

Documented process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.4.5 Instrument-specific standards

Planning	Execution	Evaluation	Grade
The student response has the following characteristics:			
• identification of components and relationships in scenarios • selection of effective and appropriate processes, materials and tools • justified decisions	• confident and precise execution of skills • integration of skills into effective processes • management of risks and ethical issues	• fluent and concise description of ideas, skills and processes • discerning evaluation of outcome against appropriate criteria • recommendations for future effective projects	A
• identification of relevant information in scenarios • selection of relevant processes, materials and tools • considered decisions	• competent execution of skills • coordination of skills in relevant processes • assessment of risks and ethical issues	• competent description of ideas, skills and processes • reasonable evaluation of outcome against identified criteria • recommendations for appropriate future projects	B
• identification of task components • selection of processes, materials and tools • appropriate decisions	• execution of skills • execution of processes • execution of safe and ethical processes	• description of ideas, skills and processes • evaluation of outcome • recommendations for future projects	C
• identification of basic information in scenarios • guided selection of processes, materials and tools • inappropriate decisions.	• guided execution of skills • guided execution of processes • guided execution of safe and ethical processes.	• basic description of ideas, skills or processes • statements about outcome • ideas about future projects.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.5 Assessment C1: Applied investigation

Students investigate a research question by collecting, analysing and interpreting primary or secondary information.

4.5.1 Assessment objectives

1. Describe ideas and phenomena in land-based animal production.
2. Execute procedures in land-based animal production.
3. Analyse information in land-based animal production.
4. Interpret information in land-based animal production.
5. Evaluate conclusions in land-based animal production.
6. Plan investigations in land-based animal production.

4.5.2 Specifications

This task requires students to:

- investigate a question that
  - is related to land-based animal production
  - has scope to be refined further
- document the investigation process and conclusion, including
  - selecting a methodology or sources
  - collecting information
  - analysing information
  - drawing a conclusion based on the analysis of information
  - making recommendations for future investigations.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides research questions that students select and investigate.

4.5.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- If students are using primary information, the following aspects of the task may be completed as a group
  - selecting methodology
  - collecting primary information.

4.5.4 Response requirements

One of the following:

- Multimodal (at least two modes delivered at the same time): up to 7 minutes, 10 A4 pages, or equivalent digital media
- Written: up to 1000 words

4.5.5 Instrument-specific standards

Execution	Interpretation	Evaluation	Grade
The student response has the following characteristics:			
• selection of sufficient and relevant methodology/sources • efficient, effective and safe execution of experimental/research methodology • efficient collection and effective collation of information	• thorough and appropriate identification of patterns and relationships in information • thorough and appropriate identification of errors/limitations of information • conclusion supported with relevant evidence	• recommendations for effective future investigations supported with relevant evidence • fluent and concise use of agricultural language • effective use of representations and genre conventions	A
• selection of relevant methodology/sources • effective and safe execution of experimental/ research methodology • collection and collation of information	• appropriate identification of patterns or relationships in information • appropriate identification of errors/limitations of information • conclusion related to evidence	• recommendations for appropriate future investigations related to evidence • competent use of agricultural language • appropriate use of representations and genre conventions	B
• selection of methodology/sources • safe execution of experimental or research methodology • collection of information	• identification of patterns or relationships in information • identification of errors/limitations of information • conclusion to the research question	• recommendations for future investigations • use of agricultural language • use of representations and genre conventions	C
• guided selection of methodology/sources • guided execution of given experimental or research methodology.	• statements about patterns or relationships in information • statements about errors or limitations • statement about the research question.	• statement about investigations • use of language • disjointed use of basic representations and conventions.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.6 Assessment C2: Practical project

Students use practical skills to complete a project in response to a scenario.

4.6.1 Assessment objectives

1. Describe ideas and phenomena in land-based animal production.
2. Execute procedures in land-based animal production.
3. Analyse information in land-based animal production.
4. Interpret information in land-based animal production.
5. Evaluate outcomes in land-based animal production.
6. Plan projects in land-based animal production.

4.6.2 Specifications

This task requires students to:

- complete a project
  - that is related to a scenario about land-based animal production
  - with an outcome of either a physical product or the performance of a skill
- document the process used to complete the project, including
  - analysing and interpreting the given scenario
  - describing the relevant concepts and procedures
  - selecting a procedure to follow
  - executing skills and processes to deliver an outcome
  - evaluating the outcome
  - making recommendations for future projects.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides a scenario that students respond to.

4.6.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- The following aspects of the task may be completed as a group
  - analysing and interpreting the scenario
  - selecting a procedure to follow.
  - executing the procedure.

4.6.4 Response requirements

Completed project

One of the following:

- Product: 1
- Performance: up to 4 minutes

Documented process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.6.5 Instrument-specific standards

Planning	Execution	Evaluation	Grade
The student response has the following characteristics:			
• identification of components and relationships in scenarios • selection of effective and appropriate processes, materials and tools • justified decisions	• confident and precise execution of skills • integration of skills into effective processes • management of risks and ethical issues	• fluent and concise description of ideas, skills and processes • discerning evaluation of outcome against appropriate criteria • recommendations for future effective projects	A
• identification of relevant information in scenarios • selection of relevant processes, materials and tools • considered decisions	• competent execution of skills • coordination of skills in relevant processes • assessment of risks and ethical issues	• competent description of ideas, skills and processes • reasonable evaluation of outcome against identified criteria • recommendations for appropriate future projects	B
• identification of task components • selection of processes, materials and tools • appropriate decisions	• execution of skills • execution of processes • execution of safe and ethical processes	• description of ideas, skills and processes • evaluation of outcome • recommendations for future projects	C
• identification of basic information in scenarios • guided selection of processes, materials and tools • inappropriate decisions.	• guided execution of skills • guided execution of processes • guided execution of safe and ethical processes.	• basic description of ideas, skills or processes • statements about outcome • ideas about future projects.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.7 Assessment D1: Applied investigation

Students investigate a research question by collecting, analysing and interpreting primary or secondary information.

4.7.1 Assessment objectives

1. Describe ideas and phenomena in water-based animal production.
2. Execute procedures in water-based animal production.
3. Analyse information in water-based animal production.
4. Interpret information in water-based animal production.
5. Evaluate conclusions in water-based animal production.
6. Plan investigations in water-based animal production.

4.7.2 Specifications

This task requires students to:

- investigate a question that
  - is related to water-based animal production
  - has scope to be refined further
- document the investigation process and conclusion, including
  - selecting a methodology or sources
  - collecting information
  - analysing information
  - drawing a conclusion based on the analysis of information
  - making recommendations for future investigations.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides research questions that students select and investigate.

4.7.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- If students are using primary information, the following aspects of the task may be completed as a group
  - selecting methodology
  - collecting primary information.

4.7.4 Response requirements

One of the following:

- Multimodal (at least two modes delivered at the same time): up to 7 minutes, 10 A4 pages, or equivalent digital media
- Written: up to 1000 words

4.7.5 Instrument-specific standards

Execution	Interpretation	Evaluation	Grade
The student response has the following characteristics:			
• selection of sufficient and relevant methodology/sources • efficient, effective and safe execution of experimental/research methodology • efficient collection and effective collation of information	• thorough and appropriate identification of patterns and relationships in information • thorough and appropriate identification of errors/limitations of information • conclusion supported with relevant evidence	• recommendations for effective future investigations supported with relevant evidence • fluent and concise use of agricultural language • effective use of representations and genre conventions	A
• selection of relevant methodology/sources • effective and safe execution of experimental/ research methodology • collection and collation of information	• appropriate identification of patterns or relationships in information • appropriate identification of errors/limitations of information • conclusion related to evidence	• recommendations for appropriate future investigations related to evidence • competent use of agricultural language • appropriate use of representations and genre conventions	B
• selection of methodology/sources • safe execution of experimental or research methodology • collection of information	• identification of patterns or relationships in information • identification of errors/limitations of information • conclusion to the research question	• recommendations for future investigations • use of agricultural language • use of representations and genre conventions	C
• guided selection of methodology/sources • guided execution of given experimental or research methodology.	• statements about patterns or relationships in information • statements about errors or limitations • statement about the research question.	• statement about investigations • use of language • disjointed use of basic representations and conventions.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.8 Assessment D2: Practical project

Students use practical skills to complete a project in response to a scenario.

4.8.1 Assessment objectives

1. Describe ideas and phenomena in water-based animal production.
2. Execute procedures in water-based animal production.
3. Analyse information in water-based animal production.
4. Interpret information in water-based animal production.
5. Evaluate outcomes in water-based animal production.
6. Plan projects in water-based animal production.

4.8.2 Specifications

This task requires students to:

- complete a project
  - that is related to a scenario about water-based animal production
  - with an outcome of either a physical product or the performance of a skill
- document the process used to complete the project, including
  - analysing and interpreting the given scenario
  - describing the relevant concepts and procedures
  - selecting a procedure to follow
  - executing skills and processes to deliver an outcome
  - evaluating the outcome
  - making recommendations for future projects.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides a scenario that students respond to.

4.8.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- The following aspects of the task may be completed as a group
  - analysing and interpreting the scenario
  - selecting a procedure to follow.
  - executing the procedure.

4.8.4 Response requirements

Completed project

One of the following:

- Product: 1
- Performance: up to 4 minutes

Documented process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.8.5 Instrument-specific standards

Planning	Execution	Evaluation	Grade
The student response has the following characteristics:			
• identification of components and relationships in scenarios • selection of effective and appropriate processes, materials and tools • justified decisions	• confident and precise execution of skills • integration of skills into effective processes • management of risks and ethical issues	• fluent and concise description of ideas, skills and processes • discerning evaluation of outcome against appropriate criteria • recommendations for future effective projects	A
• identification of relevant information in scenarios • selection of relevant processes, materials and tools • considered decisions	• competent execution of skills • coordination of skills in relevant processes • assessment of risks and ethical issues	• competent description of ideas, skills and processes • reasonable evaluation of outcome against identified criteria • recommendations for appropriate future projects	B
• identification of task components • selection of processes, materials and tools • appropriate decisions	• execution of skills • execution of processes • execution of safe and ethical processes	• description of ideas, skills and processes • evaluation of outcome • recommendations for future projects	C
• identification of basic information in scenarios • guided selection of processes, materials and tools • inappropriate decisions.	• guided execution of skills • guided execution of processes • guided execution of safe and ethical processes.	• basic description of ideas, skills or processes • statements about outcome • ideas about future projects.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.9 Assessment E1: Applied investigation

Students investigate a research question by collecting, analysing and interpreting primary or secondary information.

4.9.1 Assessment objectives

1. Describe ideas and phenomena in land-based plant production.
2. Execute procedures in land-based plant production.
3. Analyse information in land-based plant production.
4. Interpret information in land-based plant production.
5. Evaluate conclusions in land-based plant production.
6. Plan investigations in land-based plant production.

4.9.2 Specifications

This task requires students to:

- investigate a question that
  - is related to land-based plant production
  - has scope to be refined further
- document the investigation process and conclusion, including
  - selecting a methodology or sources
  - collecting information
  - analysing information
  - drawing a conclusion based on the analysis of information
  - making recommendations for future investigations.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides research questions that students select and investigate.

4.9.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- If students are using primary information, the following aspects of the task may be completed as a group
  - selecting methodology
  - collecting primary information.

4.9.4 Response requirements

One of the following:

- Multimodal (at least two modes delivered at the same time): up to 7 minutes, 10 A4 pages, or equivalent digital media
- Written: up to 1000 words

4.9.5 Instrument-specific standards

Execution	Interpretation	Evaluation	Grade
The student response has the following characteristics:			
• selection of sufficient and relevant methodology/sources • efficient, effective and safe execution of experimental/research methodology • efficient collection and effective collation of information	• thorough and appropriate identification of patterns and relationships in information • thorough and appropriate identification of errors/limitations of information • conclusion supported with relevant evidence	• recommendations for effective future investigations supported with relevant evidence • fluent and concise use of agricultural language • effective use of representations and genre conventions	A
• selection of relevant methodology/sources • effective and safe execution of experimental/ research methodology • collection and collation of information	• appropriate identification of patterns or relationships in information • appropriate identification of errors/limitations of information • conclusion related to evidence	• recommendations for appropriate future investigations related to evidence • competent use of agricultural language • appropriate use of representations and genre conventions	B
• selection of methodology/sources • safe execution of experimental or research methodology • collection of information	• identification of patterns or relationships in information • identification of errors/limitations of information • conclusion to the research question	• recommendations for future investigations • use of agricultural language • use of representations and genre conventions	C
• guided selection of methodology/sources • guided execution of given experimental or research methodology.	• statements about patterns or relationships in information • statements about errors or limitations • statement about the research question.	• statement about investigations • use of language • disjointed use of basic representations and conventions.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.10 Assessment E2: Practical project

Students use practical skills to complete a project in response to a scenario.

4.10.1 Assessment objectives

1. Describe ideas and phenomena in land-based plant production.
2. Execute procedures in land-based plant production.
3. Analyse information in land-based plant production.
4. Interpret information in land-based plant production.
5. Evaluate outcomes in land-based plant production.
6. Plan projects in land-based plant production.

4.10.2 Specifications

This task requires students to:

- complete a project
  - that is related to a scenario about land-based plant production
  - with an outcome of either a physical product or the performance of a skill
- document the process used to complete the project, including
  - analysing and interpreting the given scenario
  - describing the relevant concepts and procedures
  - selecting a procedure to follow
  - executing skills and processes to deliver an outcome
  - evaluating the outcome
  - making recommendations for future projects.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides a scenario that students respond to.

4.10.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- The following aspects of the task may be completed as a group
  - analysing and interpreting the scenario
  - selecting a procedure to follow.
  - executing the procedure.

4.10.4 Response requirements

Completed project

One of the following:

- Product: 1
- Performance: up to 4 minutes

Documented process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.10.5 Instrument-specific standards

Planning	Execution	Evaluation	Grade
The student response has the following characteristics:			
• identification of components and relationships in scenarios • selection of effective and appropriate processes, materials and tools • justified decisions	• confident and precise execution of skills • integration of skills into effective processes • management of risks and ethical issues	• fluent and concise description of ideas, skills and processes • discerning evaluation of outcome against appropriate criteria • recommendations for future effective projects	A
• identification of relevant information in scenarios • selection of relevant processes, materials and tools • considered decisions	• competent execution of skills • coordination of skills in relevant processes • assessment of risks and ethical issues	• competent description of ideas, skills and processes • reasonable evaluation of outcome against identified criteria • recommendations for appropriate future projects	B
• identification of task components • selection of processes, materials and tools • appropriate decisions	• execution of skills • execution of processes • execution of safe and ethical processes	• description of ideas, skills and processes • evaluation of outcome • recommendations for future projects	C
• identification of basic information in scenarios • guided selection of processes, materials and tools • inappropriate decisions.	• guided execution of skills • guided execution of processes • guided execution of safe and ethical processes.	• basic description of ideas, skills or processes • statements about outcome • ideas about future projects.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.11 Assessment F1: Applied investigation

Students investigate a research question by collecting, analysing and interpreting primary or secondary information.

4.11.1 Assessment objectives

1. Describe ideas and phenomena in water-based plant production.
2. Execute procedures in water-based plant production.
3. Analyse information in water-based plant production.
4. Interpret information in water-based plant production.
5. Evaluate conclusions in water-based plant production.
6. Plan investigations in water-based plant production.

4.11.2 Specifications

This task requires students to:

- investigate a question that
  - is related to water-based plant production
  - has scope to be refined further
- document the investigation process and conclusion, including
  - selecting a methodology or sources
  - collecting information
  - analysing information
  - drawing a conclusion based on the analysis of information
  - making recommendations for future investigations.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides research questions that students select and investigate.

4.11.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- If students are using primary information, the following aspects of the task may be completed as a group
  - selecting methodology
  - collecting primary information.

4.11.4 Response requirements

One of the following:

- Multimodal (at least two modes delivered at the same time): up to 7 minutes, 10 A4 pages, or equivalent digital media
- Written: up to 1000 words

4.11.5 Instrument-specific standards

Execution	Interpretation	Evaluation	Grade
The student response has the following characteristics:			
• selection of sufficient and relevant methodology/sources • efficient, effective and safe execution of experimental/research methodology • efficient collection and effective collation of information	• thorough and appropriate identification of patterns and relationships in information • thorough and appropriate identification of errors/limitations of information • conclusion supported with relevant evidence	• recommendations for effective future investigations supported with relevant evidence • fluent and concise use of agricultural language • effective use of representations and genre conventions	A
• selection of relevant methodology/sources • effective and safe execution of experimental/ research methodology • collection and collation of information	• appropriate identification of patterns or relationships in information • appropriate identification of errors/limitations of information • conclusion related to evidence	• recommendations for appropriate future investigations related to evidence • competent use of agricultural language • appropriate use of representations and genre conventions	B
• selection of methodology/sources • safe execution of experimental or research methodology • collection of information	• identification of patterns or relationships in information • identification of errors/limitations of information • conclusion to the research question	• recommendations for future investigations • use of agricultural language • use of representations and genre conventions	C
• guided selection of methodology/sources • guided execution of given experimental or research methodology.	• statements about patterns or relationships in information • statements about errors or limitations • statement about the research question.	• statement about investigations • use of language • disjointed use of basic representations and conventions.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.12 Assessment F2: Practical project

Students use practical skills to complete a project in response to a scenario.

4.12.1 Assessment objectives

1. Describe ideas and phenomena in water-based plant production.
2. Execute procedures in water-based plant production.
3. Analyse information in water-based plant production.
4. Interpret information in water-based plant production.
5. Evaluate outcomes in water-based plant production.
6. Plan projects in water-based plant production.

4.12.2 Specifications

This task requires students to:

- complete a project
  - that is related to a scenario about water-based plant production
  - with an outcome of either a physical product or the performance of a skill
- document the process used to complete the project, including
  - analysing and interpreting the given scenario
  - describing the relevant concepts and procedures
  - selecting a procedure to follow
  - executing skills and processes to deliver an outcome
  - evaluating the outcome
  - making recommendations for future projects.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides a scenario that students respond to.

4.12.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- The following aspects of the task may be completed as a group
  - analysing and interpreting the scenario
  - selecting a procedure to follow.
  - executing the procedure.

4.12.4 Response requirements

Completed project

One of the following:

- Product: 1
- Performance: up to 4 minutes

Documented process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.12.5 Instrument-specific standards

Planning	Execution	Evaluation	Grade
The student response has the following characteristics:			
• identification of components and relationships in scenarios • selection of effective and appropriate processes, materials and tools • justified decisions	• confident and precise execution of skills • integration of skills into effective processes • management of risks and ethical issues	• fluent and concise description of ideas, skills and processes • discerning evaluation of outcome against appropriate criteria • recommendations for future effective projects	A
• identification of relevant information in scenarios • selection of relevant processes, materials and tools • considered decisions	• competent execution of skills • coordination of skills in relevant processes • assessment of risks and ethical issues	• competent description of ideas, skills and processes • reasonable evaluation of outcome against identified criteria • recommendations for appropriate future projects	B
• identification of task components • selection of processes, materials and tools • appropriate decisions	• execution of skills • execution of processes • execution of safe and ethical processes	• description of ideas, skills and processes • evaluation of outcome • recommendations for future projects	C
• identification of basic information in scenarios • guided selection of processes, materials and tools • inappropriate decisions.	• guided execution of skills • guided execution of processes • guided execution of safe and ethical processes.	• basic description of ideas, skills or processes • statements about outcome • ideas about future projects.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.13 Assessment G1: Applied investigation

Students investigate a research question by collecting, analysing and interpreting primary or secondary information.

4.13.1 Assessment objectives

1. Describe ideas and phenomena in animal agribusiness.
2. Execute procedures in animal agribusiness.
3. Analyse information in animal agribusiness.
4. Interpret information in animal agribusiness.
5. Evaluate conclusions in animal agribusiness.
6. Plan investigations in animal agribusiness.

4.13.2 Specifications

This task requires students to:

- investigate a question that
  - is related to animal agribusiness
  - has scope to be refined further
- document the investigation process and conclusion, including
  - selecting a methodology or sources
  - collecting information
  - analysing information
  - drawing a conclusion based on the analysis of information
  - making recommendations for future investigations.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides research questions that students select and investigate.

4.13.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- If students are using primary information, the following aspects of the task may be completed as a group
  - selecting methodology
  - collecting primary information.

4.13.4 Response requirements

One of the following:

- Multimodal (at least two modes delivered at the same time): up to 7 minutes, 10 A4 pages, or equivalent digital media
- Written: up to 1000 words

4.13.5 Instrument-specific standards

Execution	Interpretation	Evaluation	Grade
The student response has the following characteristics:			
• selection of sufficient and relevant methodology/sources • efficient, effective and safe execution of experimental/research methodology • efficient collection and effective collation of information	• thorough and appropriate identification of patterns and relationships in information • thorough and appropriate identification of errors/limitations of information • conclusion supported with relevant evidence	• recommendations for effective future investigations supported with relevant evidence • fluent and concise use of agricultural language • effective use of representations and genre conventions	A
• selection of relevant methodology/sources • effective and safe execution of experimental/ research methodology • collection and collation of information	• appropriate identification of patterns or relationships in information • appropriate identification of errors/limitations of information • conclusion related to evidence	• recommendations for appropriate future investigations related to evidence • competent use of agricultural language • appropriate use of representations and genre conventions	B
• selection of methodology/sources • safe execution of experimental or research methodology • collection of information	• identification of patterns or relationships in information • identification of errors/limitations of information • conclusion to the research question	• recommendations for future investigations • use of agricultural language • use of representations and genre conventions	C
• guided selection of methodology/sources • guided execution of given experimental or research methodology.	• statements about patterns or relationships in information • statements about errors or limitations • statement about the research question.	• statement about investigations • use of language • disjointed use of basic representations and conventions.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.14 Assessment G2: Practical project

Students use practical skills to complete a project in response to a scenario.

4.14.1 Assessment objectives

1. Describe ideas and phenomena in animal agribusiness.
2. Execute procedures in animal agribusiness.
3. Analyse information in animal agribusiness.
4. Interpret information in animal agribusiness.
5. Evaluate outcomes in animal agribusiness.
6. Plan projects in animal agribusiness.

4.14.2 Specifications

This task requires students to:

- complete a project
  - that is related to a scenario about animal agribusiness
  - with an outcome of either a physical product or the performance of a skill
- document the process used to complete the project, including
  - analysing and interpreting the given scenario
  - describing the relevant concepts and procedures
  - selecting a procedure to follow
  - executing skills and processes to deliver an outcome
  - evaluating the outcome
  - making recommendations for future projects.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides a scenario that students respond to.

4.14.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- The following aspects of the task may be completed as a group
  - analysing and interpreting the scenario
  - selecting a procedure to follow.
  - executing the procedure.

4.14.4 Response requirements

Completed project

One of the following:

- Product: 1
- Performance: up to 4 minutes

Documented process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.14.5 Instrument-specific standards

Planning	Execution	Evaluation	Grade
The student response has the following characteristics:			
• identification of components and relationships in scenarios • selection of effective and appropriate processes, materials and tools • justified decisions	• confident and precise execution of skills • integration of skills into effective processes • management of risks and ethical issues	• fluent and concise description of ideas, skills and processes • discerning evaluation of outcome against appropriate criteria • recommendations for future effective projects	A
• identification of relevant information in scenarios • selection of relevant processes, materials and tools • considered decisions	• competent execution of skills • coordination of skills in relevant processes • assessment of risks and ethical issues	• competent description of ideas, skills and processes • reasonable evaluation of outcome against identified criteria • recommendations for appropriate future projects	B
• identification of task components • selection of processes, materials and tools • appropriate decisions	• execution of skills • execution of processes • execution of safe and ethical processes	• description of ideas, skills and processes • evaluation of outcome • recommendations for future projects	C
• identification of basic information in scenarios • guided selection of processes, materials and tools • inappropriate decisions.	• guided execution of skills • guided execution of processes • guided execution of safe and ethical processes.	• basic description of ideas, skills or processes • statements about outcome • ideas about future projects.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.15 Assessment H1: Applied investigation

Students investigate a research question by collecting, analysing and interpreting primary or secondary information.

4.15.1 Assessment objectives

1. Describe ideas and phenomena in plant agribusiness.
2. Execute procedures in plant agribusiness.
3. Analyse information in plant agribusiness.
4. Interpret information in plant agribusiness.
5. Evaluate conclusions in plant agribusiness.
6. Plan investigations in plant agribusiness.

4.15.2 Specifications

This task requires students to:

- investigate a question that
  - is related to plant agribusiness
  - has scope to be refined further
- document the investigation process and conclusion, including
  - selecting a methodology or sources
  - collecting information
  - analysing information
  - drawing a conclusion based on the analysis of information
  - making recommendations for future investigations.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides research questions that students select and investigate.

4.15.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- If students are using primary information, the following aspects of the task may be completed as a group
  - selecting methodology
  - collecting primary information.

4.15.4 Response requirements

One of the following:

- Multimodal (at least two modes delivered at the same time): up to 7 minutes, 10 A4 pages, or equivalent digital media
- Written: up to 1000 words

4.15.5 Instrument-specific standards

Execution	Interpretation	Evaluation	Grade
The student response has the following characteristics:			
• selection of sufficient and relevant methodology/sources • efficient, effective and safe execution of experimental/research methodology • efficient collection and effective collation of information	• thorough and appropriate identification of patterns and relationships in information • thorough and appropriate identification of errors/limitations of information • conclusion supported with relevant evidence	• recommendations for effective future investigations supported with relevant evidence • fluent and concise use of agricultural language • effective use of representations and genre conventions	A
• selection of relevant methodology/sources • effective and safe execution of experimental/ research methodology • collection and collation of information	• appropriate identification of patterns or relationships in information • appropriate identification of errors/limitations of information • conclusion related to evidence	• recommendations for appropriate future investigations related to evidence • competent use of agricultural language • appropriate use of representations and genre conventions	B
• selection of methodology/sources • safe execution of experimental or research methodology • collection of information	• identification of patterns or relationships in information • identification of errors/limitations of information • conclusion to the research question	• recommendations for future investigations • use of agricultural language • use of representations and genre conventions	C
• guided selection of methodology/sources • guided execution of given experimental or research methodology.	• statements about patterns or relationships in information • statements about errors or limitations • statement about the research question.	• statement about investigations • use of language • disjointed use of basic representations and conventions.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.16 Assessment H2: Practical project

Students use practical skills to complete a project in response to a scenario.

4.16.1 Assessment objectives

1. Describe ideas and phenomena in plant agribusiness.
2. Execute procedures in plant agribusiness.
3. Analyse information in plant agribusiness.
4. Interpret information in plant agribusiness.
5. Evaluate outcomes in plant agribusiness.
6. Plan projects in plant agribusiness.

4.16.2 Specifications

This task requires students to:

- complete a project
  - that is related to a scenario about plant agribusiness
  - with an outcome of either a physical product or the performance of a skill
- document the process used to complete the project, including
  - analysing and interpreting the given scenario
  - describing the relevant concepts and procedures
  - selecting a procedure to follow
  - executing skills and processes to deliver an outcome
  - evaluating the outcome
  - making recommendations for future projects.

It is recommended that this task is designed so that students can develop a response in approximately 10–15 hours of class time.

Stimulus specifications

The teacher provides a scenario that students respond to.

4.16.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- The following aspects of the task may be completed as a group
  - analysing and interpreting the scenario
  - selecting a procedure to follow.
  - executing the procedure.

4.16.4 Response requirements

Completed project

One of the following:

- Product: 1
- Performance: up to 4 minutes

Documented process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.16.5 Instrument-specific standards

Planning	Execution	Evaluation	Grade
The student response has the following characteristics:			
• identification of components and relationships in scenarios • selection of effective and appropriate processes, materials and tools • justified decisions	• confident and precise execution of skills • integration of skills into effective processes • management of risks and ethical issues	• fluent and concise description of ideas, skills and processes • discerning evaluation of outcome against appropriate criteria • recommendations for future effective projects	A
• identification of relevant information in scenarios • selection of relevant processes, materials and tools • considered decisions	• competent execution of skills • coordination of skills in relevant processes • assessment of risks and ethical issues	• competent description of ideas, skills and processes • reasonable evaluation of outcome against identified criteria • recommendations for appropriate future projects	B
• identification of task components • selection of processes, materials and tools • appropriate decisions	• execution of skills • execution of processes • execution of safe and ethical processes	• description of ideas, skills and processes • evaluation of outcome • recommendations for future projects	C
• identification of basic information in scenarios • guided selection of processes, materials and tools • inappropriate decisions.	• guided execution of skills • guided execution of processes • guided execution of safe and ethical processes.	• basic description of ideas, skills or processes • statements about outcome • ideas about future projects.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

5 Glossary

The syllabus glossary is available at www.qcaa.qld.edu.au/downloads/senior-qce/common/snr_glossary_cognitive_verbs.pdf.

6 References

Marzano, RJ & Kendall, JS 2007, *The New Taxonomy of Educational Objectives*, 2nd edition, Corwin Press, USA.

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7 Version history

Version	Date of change	Update
1.1	August 2023	Released for implementation with minor updates

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