

STRANDS AND STANDARDS

AGRICULTURAL SCIENCE 1



Course Description

Students will develop knowledge and skills that will provide a foundation for courses in animal science, plant science, horticulture, natural resources, agricultural systems and technology, or Agricultural Science II. Topics covered will be basic animal, plant, and soil science; natural resources; food science technology; agribusiness; personal and leadership development; and agricultural career awareness. Through this course, students will develop agricultural literacy.

Intended Grade Level	9-12
Units of Credit	1.0
Core Code	30.01.00.00.050
Concurrent Enrollment Core Code	N/A
Prerequisite	N/A
Skill Certification Test Number	180
Test Weight	1.0
License Type	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Agriculture (CTE/General)
Endorsement 2	Agriculture Science (Career and Technical)
Endorsement 3	N/A

STRAND 1

Students will explain the role of FFA in agricultural education.

Standard 1

Discuss the history and organization of FFA as it relates to the complete program of agricultural education.

- Explain the interrelationship of classroom and laboratory instruction, supervised agricultural experience, and FFA.
- Describe how, when, and why FFA was organized.
- Identify key FFA historical events.
- Identify the mission and strategies, colors, motto, emblem and parts of the emblem, and organizational structure of FFA.
- Recite and explain the meaning of the FFA Creed.
- Discuss the meaning and purpose of a program of activities and its committee structure.
- List FFA chapter officers, and discuss the role of each.

Standard 2

Identify opportunities in FFA.

- Describe FFA opportunities that develop leadership skills, personal growth, and career success.
- Summarize major state and national activities available to FFA members.

Standard 3

Describe FFA degrees, awards, and career development events (CDEs).

- List and explain the FFA degree areas.
- Identify FFA proficiency awards.
- List and discuss various team and individual CDEs.

Performance Objective

- Attend an FFA activity.
- Recite and explain the FFA Creed and requirements for FFA degree advancement.

STRAND 2

Students will explain the role of supervised agricultural experience (SAE) programs in agricultural education.

Standard 1

Examine the responsibilities and benefits associated with an SAE.

- Explain the meaning and benefits of supervised agricultural experience.
- Explain the characteristics of an effective SAE program and the responsibilities of those involved.

Standard 2

Determine the types of SAE programs.

- Compare entrepreneurship SAEs and placement SAEs.
- Describe research/experimentation SAEs.
- Describe exploratory SAEs.

Standard 3

Plan an SAE program.

- Identify the steps in planning an SAE program.
- Describe the function of a business/training plan and/or agreement in an SAE program.
- Develop a short-range plan and a long-range plan for an SAE program.
- Relate classroom and laboratory instruction to an SAE program.

Standard 4

Maintain and use SAE records.

- Explain the importance of keeping records on an SAE program.
- Explain how SAE records are organized.
- Follow approved procedures to make entries in SAE records.

Performance Objective

- Implement an annual SAE Program and record system.
- Develop a budget.

STRAND 3

Students will describe the relationship of agricultural science to the sciences and the scientific method.

Standard 1

Describe how science is integral to agriculture.

- Describe how life science, including botany and zoology, is integral to agriculture.
- Describe how physical science, including earth science, chemistry, and physics, is integral to agriculture.
- Describe how mathematics, including calculation, measurement, and statistics, is integral to agriculture.
- Describe how the social sciences, including economics, geography, sociology, and psychology, is integral to agriculture.

Standard 2

Apply the scientific method in solving agricultural problems.

- Define the scientific method, and explain why it is used.
- List and explain the steps of the scientific method, including problem identification, information gathering, hypothesis formation, experimentation, and conclusion.

- Maintain laboratory logs, including detailed and precise records of events and observations.
- Use the scientific method to investigate a problem appropriate for entering the National FFA Agriscience Fair and Awards Program.
- Explain the general guidelines for preparing a research report according to the National FFA Agriscience Fair and Awards Program.

Standard 3

Explore the role of research, development, and technology in the agricultural industry.

- Explain the meaning and importance of research and development.
- Identify major providers of agricultural research, such as the USDA's Agricultural Research Service and the Utah Agricultural Experiment Station, and review examples of their research.
- Identify major areas of research in agriculture.
- Define biotechnology, and explore its impact on agriculture.
- Describe current applications of biotechnology in agriculture.
- Describe benefits and risks associated with biotechnology.
- Identify career opportunities in agricultural biotechnology.
- Determine the role of science and technology in agricultural production and processing.
- Describe the application of precision technologies in agriculture.

Standard 4

Apply mathematics skills used in the agricultural industry.

- Convert standard and metric measurements.
- Determine length, area, and volume measurements.
- Calculate interest rates

Standard 5

Describe safety skills needed in the agricultural industry.

- Explain where accidents occur and identify agencies associated with workplace safety.
- Explain why accidents occur and how to prevent them.
- Demonstrate personal and laboratory safety, including correct use of personal protective equipment (PPE) and proper disposal of wastes.

STRAND 4

Students will explain basic principles of agricultural science.

Standard 1

Examine basic soil science principles.

- Explain the components of soil.
- Investigate soil texture and structure.
- Explain soil profile.
- Explain what soil color indicates.
- Examine moisture-holding capacity and the characteristics of soil water.
- Explain soil PH.
- Describe the meaning and importance of soil fertility.
- Investigate soil degradation.
- Describe soil erosion and management practices.
- Identify careers in soil science and determine educational requirements, working conditions, and earning potential for those careers.

Standard 2

Investigate basic principles of the plant science industry.

- Explain plant classification and nomenclature.
- Examine plant structures and functions;
- Classify plants according to plant use; status as annual, biennial, and perennial, and status as monocotyledons or dicotyledons.
- Explain the basic process of photosynthesis and its importance to life on Earth.
- Explain cellular respiration and its importance to plant life.
- Identify careers in plant science and determine educational requirements, working conditions, and earning potential for those careers.

Standard 3

Investigate basic principles of the animal science industry.

- Compare differences between plants and animals.
- Identify basic characteristics of animal cells, tissues, organs, and organ systems.
- Describe the skeletal, muscular, nervous, respiratory, digestive, circulatory, excretory, and reproductive systems of animals.
- Describe the basic physiological functions of animal bodily systems.
- Compare and contrast ruminant and non-ruminant digestive systems.
- Compare and contrast cattle, sheep and swine breeds, uses, and products.
- Compare and contrast nutritional needs of cattle, sheep, and swine.
- Identify careers in animal science and determine educational requirements, working conditions, and earning potential for those careers.

Standard 4

Explain the role of genetics in agricultural science.

- Define genetics, and discuss its importance.
- Identify and discuss the contents of a genome.
- Distinguish heredity type, including genotype and phenotype.
- Describe genetic trait expression and prediction.

Standard 5

Explore means of conserving natural resources.

- Identify types of natural resources.
- Describe components and processes in ecosystems.
- Determine sources of environmental pollution and describe methods for reducing pollution.
- Compare methods of waste disposal.
- Determine how to reduce agricultural pollution.
- Determine the importance and methods of natural resource conservation.
- Identify careers in natural resources and determine educational requirements, working conditions, and earning potential for those careers.

Standard 6

Describe food science technology.

- Research the scope of the food science industry and the world food supply.
- Explain food preservation methods.
- Describe food spoilage prevention.
- Describe food safety and sanitation.
- Identify careers in food science and determine educational requirements, working conditions, and earning potential for those careers.

Performance Objective

- Identify natural resource conservation methods and practices by investigation.
- Label and/or model the anatomy and physiology of animals.
- Label and/or model plant structures and functions.
- Identify soil texture and structure by investigation.

STRAND 5

Students will explain basic agribusiness principles and demonstrate employability skills.

Standard 1

Explore personal finance management.

- Investigate personal finances and goal making.
- Distinguish the pros and cons of borrowing money.
- Determine sources of credit.

Standard 2

Examine business structures and management.

- Describe basic principles of business management.
- Explain different types of business structures.
- Define and explain ethics in agribusiness.

Standard 3

Explain keeping and using records in agricultural occupations.

- Explain the purpose of record keeping.
- Describe net worth, cash flow, income statements, and computerized record keeping.
- Develop a budget for an agricultural enterprise.

Standard 4

Demonstrate communication skills needed for successful employment.

- Define communication and its components and processes.
- Describe effective communication techniques.
- Identify effective speaking techniques.
- Develop listening techniques.
- Organize and present a persuasive message.
- Demonstrate communication skills in appropriate situations.

Performance Objective

- Organize and present a persuasive message.
- Research and debate an agricultural topic.

Skill Certificate Test Points by Strand

Test-Name	Test-#	Number-of-Test-Points-by-Strand										Total-Points	Total-Questions
		1	2	3	4	5	6	7	8	9	10		
Agricultural-Science-1	180	5	4	14	46	8	xx	xx	xx	xx	xx	78	46