

**AGRICULTURAL SCIENCE 1**

**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.

pp. 44-58  
pp. 61-62, 67  
pp. 67-68  
pp. 64-65; 346  
p. 75; 701  
p. 73  
pp. 70-71

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.

pp. 63-64; 74-75; 79-89  
pp. 68-69

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.

pp. 73-75  
p. 75  
p. 74  
pp. 74-75

**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.

p. 45  
pp. 45-47

Standard 2 Determine the types of SAE programs.

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

p. 47  
pp. 47-48

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.

pp. 49-56  
pp. 55-56  
p. 52  
p. 47

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.

pp. 51-53  
pp. 52-55

**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.

pp. 124-125  
pp. 125-127  
pp. 127-129  
p. 129

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, and data analysis.
- 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.

p. 130  
pp. 130-132  
pp. 130-132

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.
- 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.

pp. 134-136  
p. 136; 224  
p. 136  
pp. 136-140  
p. 136  
p. 137

- Determine the role of science and technology in agricultural production and processing. pp. 139-140
  - Describe the application of precision technologies in agriculture. pp. 31-33; pp. 138-140
- Standard 4 Apply mathematics skills used in the agricultural industry.
- Convert standard and metric measurements. pp. 128-129; pp. 574-576
  - Determine length, area, and volume measurements. p. 128
  - Calculate interest rates p. 651
- Standard 5 Describe safety skills needed in the agricultural industry.
- Explain where accidents occur and identify agencies associated with workplace safety. pp. 113-116; 119
  - Explain why accidents occur and how to prevent them. pp. 113-116
  - Demonstrate personal and laboratory safety, including correct use of personal protective equipment (PPE) and proper disposal. pp. 113-118

**STRAND 4: Students will explain basic principles of agricultural science.**

- Standard 1 Examine basic soil science principles.
- Explain the components of soil. pp. 317-320
  - Investigate soil texture and structure. pp. 321-322
  - Explain soil profile. p. 325
  - Explain what soil color indicates. p. 320; 322
  - Examine moisture-holding capacity and the characteristics of soil water. p. 320; 322
  - Explain soil PH. p. 322
  - Describe the meaning and importance of soil fertility. p. 126; 311
  - Investigate soil degradation. pp. 533-534
  - Describe soil erosion and management practices. p. 25; 34; 128; 278; 282; 316
  - Identify careers in soil science and determine educational requirements, working conditions, and earning potential for those careers. p. 4, 286
- Standard 2 Investigate basic principles of the plant science industry.
- Explain plant classification and nomenclature. pp. 172-173; 180
  - Examine plant structures and functions; pp. 157-159
  - Classify plants according to plant use; status as annual, biennial, and perennial, and status as monocotyledons or dicotyledons. pp. 233-235
  - Explain the basic process of photosynthesis and its importance to life on Earth. p. 125; 145; 157; 180; pp. 150-153; 236; 272; 275-277; 509; 537
  - Explain cellular respiration and its importance to plant life. p. 157
  - Identify careers in plant science and determine educational requirements, working conditions, and earning potential for those careers. p. 4, 10, 23; 199; 252
- Standard 3 Investigate basic principles of the animal science industry.
- Compare differences between plants and animals. pp. 124-125
  - Identify basic characteristics of animal cells, tissues, organs, and organ systems. p. 158
  - Describe the skeletal, muscular, nervous, respiratory, digestive, circulatory, excretory, and reproductive systems of animals. pp. 381-383
  - Describe the basic physiological functions of animal bodily systems. pp. 381-383
  - Compare and contrast ruminant and non-ruminant digestive systems. p. 387
  - Compare and contrast cattle, sheep and swine breeds, uses, and products. pp. 169-171
  - Compare and contrast nutritional needs of cattle, sheep, and swine. pp. 400-410
  - Identify careers in animal science and determine educational requirements, working conditions, and earning potential for those careers. p. 4; 10; 115; 137; 183; 199; 386; 412; 429; 459; 468; 486
- Standard 4 Explain the role of genetics in agricultural science.
- Define genetics, and discuss its importance. pp. 187-202
  - Identify and discuss the contents of a genome. p. 196; pp. 200-210; 214; 424
  - Distinguish heredity type, including genotype and phenotype. pp. 196-197
  - Describe genetic trait expression and prediction. pp. 198-199
- Standard 5 Explore means of conserving natural resources.
- Identify types of natural resources. p. 502; pp. 510-511
  - Describe components and processes in ecosystems. p. 146
  - Determine sources of environmental pollution and describe methods for reducing pollution. pp. 515-522
  - Compare methods of waste disposal. pp. 517-519; 692
  - Determine how to reduce agricultural pollution. p. 517
  - Determine the importance and methods of natural resource conservation. p. 502
  - Identify careers in natural resources and determine educational requirements, working conditions, and earning potential for those careers. p. 4; 509; 543; 572; 586; 618
- Standard 6 Describe food science technology.
- Research the scope of the food science industry and the world food supply. pp. 4-7; 224-226; 365; 669
  - Explain food preservation methods. p. 29; 212; 223; 678; 680
  - Describe food spoilage prevention. p. 29; 223; 673

- Describe food safety and sanitation. p. 29; 36-39; pp. 212-215; 409; 470-471; 678; 690-693
- Identify careers in food science and determine educational requirements, working conditions, and earning potential for those careers. p. 4; 104; 106

**STRAND 5: Students will explain basic agribusiness principles and demonstrate employability skills.**

- Standard 1 Explore personal finance management.
- Investigate personal finances and goal making. p. 51
  - Distinguish the pros and cons of borrowing money. p. 651
  - Determine sources of credit. p. 12; 509
- Standard 2 Examine business structures and management.
- Describe basic principles of business management. pp. 55-56
  - Explain different types of business structures. pp. 647- 648
  - Define and explain ethics in agribusiness. p. 102; 212
- Standard 3 Explain keeping and using records in agricultural occupations.
- Explain the purpose of record keeping. pp. 52-55
  - Describe net worth, cash flow, income statements, and computerized record keeping. pp. 52; 650
  - Develop a budget for an agricultural enterprise. pp. 51-52
- Standard 4 Demonstrate communication skills needed for successful employment.
- Define communication and its components and processes. pp. 82-85
  - Describe effective communication techniques. pp. 83-85
  - Identify effective speaking techniques. pp. 87-88
  - Develop listening techniques. p. 85
  - Organize and present a persuasive message. pp. 87-89
  - Demonstrate communication skills in appropriate situations. pp. 81-82