

Standards & Measurement Criteria

Agricultural Business Management-Agriscience

Plant Systems - Option B

SAE and FFA Integrated Skills (Options A-G)

CIP No. 01.0100

These standards are to be integrated into all courses within this program and not taught separately.

1.0 DEVELOP A PLAN FOR A CAREER IN AGRICULTURAL BUSINESS AND MANAGEMENT

- 1.1 Analyze the variety of career options in: agribusiness systems; animal systems; environmental service systems; food products & processing systems; natural resource systems; plant systems; and power, structural & technical systems
- 1.2 Develop career goals based on interests, attitudes and research, and record in the long-ranged annual Supervised Agricultural Experience (SAE) program plan
- 1.3 Write, review and revise plan/goals through an annual long ranged SAE program plan
- 1.4 Manage personal and career goals through an annual long ranged SAE program plan
- 1.5 Describe factors that contribute to job satisfaction & success

2.0 PREPARE FOR EMPLOYMENT IN AGRICULTURAL BUSINESS AND MANAGEMENT

- 2.1 Develop a resume and sample cover letter utilizing data from the SAE Record and Planning book and from the Job Interview CDE
- 2.2 Create a personal portfolio with industry-specific work samples
- 2.3 Complete a job application process, including electronic applications
- 2.4 Demonstrate customer service skills
- 2.5 Demonstrate interviewing skills utilized in any FFA Career Development Event (CDE)
- 2.6 Apply researched company/agency information for the purpose of preparing for the interview process

3.0 PARTICIPATE IN SUPERVISED AGRICULTURAL EXPERIENCES [SAE]

- 3.1 Demonstrate understanding and use of technology appropriate for the SAE or career goals
- 3.2 Demonstrate workplace leadership and teamwork skills and behaviors
- 3.3 Demonstrate positive attitudes in person and through communication technology
- 3.4 Demonstrate positive interpersonal behaviors
- 3.5 Demonstrate safe and healthy workplace behaviors
- 3.6 Recognize and adapt to changes in the workplace
- 3.7 Participate in a variety of SAE paid or non-paid work experiences
- 3.8 List skills and competencies for selected SAE or career
- 3.9 Complete Arizona SAE Record and Planning book

4.0 DEMONSTRATE ORAL COMMUNICATION SKILLS

- 4.1 Through research, collect appropriate topical information and data as would be utilized for any FFA CDE that would require oral communication skills
- 4.2 Use questioning techniques to obtain needed information from audience
- 4.3 Interpret verbal and nonverbal communications of audience
- 4.4 Demonstrate active listening skills
- 4.5 Demonstrate use of technologies for a formal presentation
- 4.6 Deliver presentation incorporating verbal and nonverbal communication techniques
- 4.7 Communicate using effective and suitable language for a diverse audience
- 4.8 Demonstrate effective telephone techniques
- 4.9 List appropriate skills for oral customer communication
- 4.10 Participate in any FFA CDE that requires oral communication

5.0 DEMONSTRATE WRITTEN COMMUNICATION SKILLS

- 5.1 Through research, collect appropriate topical information and data as would be utilized in any FFA CDE event that would require written communication skills
- 5.2 Organize information and develop an outline
- 5.3 Credit sources of information in appropriate written format
- 5.4 Prepare business communication using appropriate written format for the situation
- 5.5 Prepare draft document using established rules for grammar, spelling and sentence construction
- 5.6 List appropriate skills for written customer communication
- 5.7 Utilize electronic format for written and presentation communications
- 5.8 Participate in any FFA CDE that requires written communication

6.0 EVALUATE THE ROLE OF AGRICULTURAL BUSINESS AND MANAGEMENT INDUSTRIES IN THE ECONOMY

- 6.1 Evaluate the roles of agricultural business and management industries in local, state, national and international economies
- 6.2 Compare and contrast the advantages and disadvantages of sole proprietorships, partnerships and corporations
- 6.3 Develop a business plan
- 6.4 Conduct an employee needs analysis for the organization based upon a business plan
- 6.5 Research business locations, facilities and equipment needs for the organization based upon the business plan
- 6.6 Analyze the relationship of customer service and customer satisfaction on the success of a business
- 6.7 Participate in any FFA CDE that requires knowledge or use of business plans, customer service skills and/or customer satisfaction data

7.0 DEMONSTRATE BUSINESS AND FINANCIAL MANAGEMENT PRACTICES NEEDED IN AGRICULTURAL BUSINESS AND MANAGEMENT INDUSTRIES

- 7.1 Research and identify costs associated with supplying services in the Agricultural Business and Management field
- 7.2 Interpret financial information for decision making and planning
- 7.3 Monitor and adjust business operation based on financial performance
- 7.4 Demonstrate knowledge of checking and savings accounts and the ability to balance a checkbook
- 7.5 Develop a Risk Management plan for SAE or business
- 7.6 Utilize the SAE record and planning book to record the business and financial management practices for all SAEs

8.0 EVALUATE LEADERSHIP STYLES APPROPRIATE FOR THE WORKPLACE

- 8.1 Describe how personal characteristics affect leadership ability
- 8.2 Investigate and evaluate leadership and management styles
- 8.3 Describe how cultural and ethnic differences affect leadership styles within a group
- 8.4 Describe how cultural and ethnic differences affect interpersonal interactions, teamwork and communications within a group
- 8.5 Describe different business etiquette practices

9.0 PARTICIPATE IN LEADERSHIP ACTIVITIES AS PROVIDED BY THE FFA ORGANIZATION

- 9.1 Describe roles and responsibilities that FFA leaders and members bring to an organization
- 9.2 Evaluate characteristics and importance of an effective team player
- 9.3 Evaluate characteristics of effective teams
- 9.4 Demonstrate teamwork through participation in CDE teams
- 9.5 Practice techniques to involve each member of the team
- 9.6 Practice effective meeting management through participation at FFA meetings
- 9.7 Develop and implement a personal and professional improvement plan as shown in the SAE Record and Planning book
- 9.8 Participate in FFA Career Development Events
- 9.9 Practice decision-making process
- 9.10 Participate in leadership activities through FFA offices and committees

Standards & Measurement Criteria

Agricultural Business Management-Agriscience

Applied Biological Systems (ABS) Agriculture

CIP No. 01.0100.10 (Introduction to Applied Biological Systems)

CIP No. 01.0100.12 (Applied Biological Systems)

These standards are to be taught over a two year period during grades 9 and 10.

10.0 DEMONSTRATE LABORATORY PROCEDURES AND SAFETY PRACTICES

- 10.1 Demonstrate safe practices in a home, classroom, laboratory and work situation
- 10.2 Identify careers that involve working with hazardous biological materials
- 10.3 Know the value of safety to employees
- 10.4 Discuss the impact of safety compliance on business
- 10.5 Identify safety precautions associated with biotechnology
- 10.6 Safely operate and maintain equipment

11.0 DESCRIBE ANIMAL HEALTH NEEDS

- 11.1 Explore the cells, tissues and organs in animals
- 11.2 Describe the epidermis system
- 11.3 Describe the musculoskeletal system
- 11.4 Describe the nervous system
- 11.5 Describe the circulatory system
- 11.6 Describe the respiratory system
- 11.7 Describe the digestive system
- 11.8 Describe the urinary system
- 11.9 Describe the reproductive system
- 11.10 Describe the endocrine system
- 11.11 Discuss how biotechnology has influenced animal health
- 11.12 Explain how biotechnology has influenced animal medicines
- 11.13 Compare the impact of biotechnology on the length and quality of animal life
- 11.14 Explore careers in the health care field and/or veterinary care field
- 11.15 Explore benefits to health care that have resulted from advances in technology

12.0 DESCRIBE BASIC PRINCIPLES OF NUTRITION

- 12.1 Define the essential nutrients
- 12.2 Explore the nutritional needs of humans
- 12.3 Explore the nutritional needs of animals
- 12.4 Explore the nutritional needs of plants
- 12.5 Explain the process of food digestion
- 12.6 Describe nutrient absorption
- 12.7 Identify common nutrient problems
- 12.8 Compare the impact of biotechnology on the production, processing, storage and preparation of food
- 12.9 Discuss how biotechnology has improved nutrition
- 12.10 Explore careers in the field of nutrition

13.0 EXAMINE THE INTERACTION OF BIOLOGICAL SYSTEMS WITHIN THE ENVIRONMENT

- 13.1 Discuss the different classifications of natural resources in the environment
- 13.2 Identify fossil fuels found in the environment
- 13.3 Describe soil resources found in the environment
- 13.4 Identify the effects of pest control methods on the environment
- 13.5 Discuss environmental issues related to water resources
- 13.6 Identify air and atmospheric resources
- 13.7 Describe the effects of technology and biotechnology on the environment
- 13.8 Explore careers related to natural resources and the environment
- 13.9 Describe benefits to the environment as a result of advances in technology

14.0 DESCRIBE PRINCIPLES OF PLANT GROWTH PRODUCTION

- 14.1 Identify parts of plants and their functions
- 14.2 Explore methods of classifying plants
- 14.3 Recognize the physiological needs of plants
- 14.4 Explain plant reproduction
- 14.5 Investigate plant tissue culture techniques
- 14.6 Explore careers that utilize biotechnology skills in the growth and production of plants
- 14.7 Discuss the effects of plant biotechnology in sustainable agriculture systems

15.0 DESCRIBE PRINCIPLES OF ANIMAL GROWTH AND PRODUCTION

- 15.1 Recognize the physiological needs of living animals
- 15.2 Explore animal health control practices
- 15.3 Explain animal reproduction practices
- 15.4 Describe the use of biotechnology in animal growth and reproduction
- 15.5 Explore careers in animal growth and production

16.0 USE SCIENTIFIC PROCESSES TO ANALYZE DATA

- 16.1 Formulate predictions, questions, or hypotheses based on observations
- 16.2 Evaluate appropriate resources
- 16.3 Illustrate the scientific method
- 16.4 Design and conduct controlled investigations
- 16.5 Identify new and innovative food products developed as a result of advances in technology
- 16.6 Analyze data to explain results and propose further investigations.
- 16.7 Design models
- 16.8 Communicate results of investigations

17.0 ANALYZE THE RELATIONSHIPS WITHIN LIVING SYSTEMS

- 17.1 Explain the role of the cell and cellular processes
- 17.2 Examine the molecular basis of heredity and resulting genetic diversity
- 17.3 Analyze the relationships among various organisms and their environment
- 17.4 Portray the scientific principles and processes involved in biological evolution
- 17.5 Analyze the organization of living systems
- 17.6 Recognize the role of energy within living systems

18.0 DISCUSS BIOETHICAL ISSUES

- 18.1 Explore the ethical considerations related to using biotechnology to improve human health
- 18.2 Discuss ethical considerations related to using biotechnology to produce and process human food
- 18.3 Identify ethical considerations related to using biotechnology to improve the production of animals
- 18.4 Describe the ethical considerations businesses face when deciding to sell food produced using biotechnology techniques

Standards & Measurement Criteria

Agricultural Business Management-Agriscience

Laboratory-Based Integrated Science I

CIP No. 01.0100.14

These standards are to be taught during grades 11 and 12. Whichever option is chosen, will affect how these standards are taught.

19.0 DESCRIBE FOOD SAFETY AND PROCESSING PRACTICES

- 19.1 Identify food safety practices
- 19.2 Describe food-processing practices
- 19.3 Examine the effects of biotechnology on food safety and processing techniques
- 19.4 Explore careers in the food industry

20.0 INVESTIGATE ETHICS IN THE AGRICULTURE INDUSTRY

- 20.1 Assess ethics
- 20.2 Evaluate business dealings with friends, family, or competitors
- 20.3 Evaluate pricing and sales incentives
- 20.4 Evaluate potential environmental damage of agriculture practices
- 20.5 Evaluate sustainable agriculture

21.0 INVESTIGATE APPROVED BIOTECHNOLOGY TECHNIQUES

- 21.1 Specify methods and requirements by which an organism's genetic code can be altered using biotechnology techniques
- 21.2 Explain the process of embryo transfer techniques
- 21.3 Demonstrate propagation techniques using tissue culture
- 21.4 Detect biotechnology techniques that have contributed to improved health
- 21.5 Explore methods of using biotechnology to improve production
- 21.6 Justify the purposes and processes of growth regulators
- 21.7 Describe how scientists continue to investigate and critically analyze DNA cloning
- 21.8 Express the use of jumping genes
- 21.9 Examine careers in the biotechnology industry
- 21.10 Analyze how specific cultural and/or social issues promote or hinder scientific advancements
- 21.11 Report new agricultural products developed as a result of advances in technology

22.0 INVESTIGATE APPROVED PRACTICES OF DISEASE CONTROL

- 22.1 Differentiate between common diseases
- 22.2 Assess symptoms of common diseases and parasites
- 22.3 Evaluate economic impact of diseases on production
- 22.4 Compare methods by which diseases are spread
- 22.5 Evaluate the most economical and environmentally safe disease control and prevention methods
- 22.6 Conduct an investigation on an infected field/organism
- 22.7 Record observations, notes, sketches, questions, and ideas during the investigation
- 22.8 Propose corrective actions needed to treat an infected field/organism

23.0 INVESTIGATE APPROVED NUTRITIONAL PRACTICES

- 23.1 Determine the essential nutrients for organisms and describe their importance
- 23.2 Research common nutrient deficiency symptoms and treatment options
- 23.3 Recommend nutrient and quantity requirements
- 23.4 Evaluate diagnosis, treatment, and prevention of nutrient deficiency
- 23.5 Inspect supplemental and additive ration/fertilizer composition
- 23.6 Prepare tissue samples for testing and diagnosis
- 23.7 Test methods of fertilizer/nutrient application
- 23.8 Compare the relationship between nutrient practices and yield amounts

24.0 ANALYZE THE INTERACTION AMONG ENVIRONMENTAL AND NATURAL RESOURCES SCIENCES

- 24.1 Evaluate environmental and natural resource sciences
- 24.2 Demonstrate how dynamic processes such as weathering, erosion, and sedimentation relate to redistribution of materials in the earth system
- 24.3 Investigate soil morphology
- 24.4 Illustrate land-use and water-use planning
- 24.5 Explain factors that impact current and future water quantity and quality including surface, ground, and local water issues
- 24.6 Define bio-fuels and how they are affecting the environment
- 24.7 Describe how human activities and natural causes can lead to pollution
- 24.8 Evaluate the effectiveness of conservation practices on environmental quality and biodiversity
- 24.9 Research careers in environmental sciences

25.0 INVESTIGATE ENVIRONMENTAL AND ECONOMICAL IMPACTS OF INTEGRATED PEST MANAGEMENT OPTIONS

- 25.1 Classify common pests, including insects and noxious weeds
- 25.2 Evaluate economic impact of pests on plant production
- 25.3 Predict methods by which pests spread
- 25.4 Recognize signs of pest damage
- 25.5 Identify thresholds created for specific pests
- 25.6 Select and propose the most economical and environmentally safe pest control method
- 25.7 Identify GMO crops and their role in the agriculture industry
- 25.8 Read and interpret pesticide labels
- 25.9 Select and wear protective clothing for applying pesticides
- 25.10 Apply pesticide effectively

26.0 DEMONSTRATE AGRISCIENCE MECHANIC APPLICATIONS

- 26.1 Demonstrate personal and group safety
- 26.2 Develop a bill of materials for a specific task
- 26.3 Develop a structural plan for a specific task
- 26.4 Demonstrate appropriate wood fabrication techniques
- 26.5 Demonstrate appropriate metal fabrication techniques
- 26.6 Demonstrate appropriate oxy-fuel cutting techniques used in agriculture
- 26.7 Demonstrate appropriate plasma cutting techniques used in agriculture
- 26.8 Demonstrate appropriate plumbing fabrication techniques used in agriculture
- 26.9 Demonstrate appropriate safe connection of electrical components including motors, timers, and valves in both high and low voltage circuits used in agriculture
- 26.10 Demonstrate appropriate concrete and masonry practices commonly used in agriculture
- 26.11 Demonstrate operation and maintenance of appropriate mechanical systems used in agriculture
- 26.12 Demonstrate service and repair of appropriate mechanical systems
- 26.13 Demonstrate appropriate land measurement and construction techniques commonly used in agriculture which are to include optical, laser, and global positioning satellite systems
- 26.14 Demonstrate principles and applications of various engines and machinery used in agriculture

Standards & Measurement Criteria

Agricultural Business Management-Agriscience

Laboratory-Based Integrated Science II

Plant Systems - Option B

CIP No. 01.0100.30

These standards should be taught throughout the Agriscience program and will affect how the other standards are taught.

27.B APPLY PRINCIPLES OF ANATOMY AND PHYSIOLOGY TO PRODUCE AND MANAGE PLANTS IN BOTH A DOMESTICATED AND A NATURAL ENVIRONMENT

27.1b Analyze and evaluate nutritional requirements and environmental conditions to develop and implement a fertilization plan

- 27.1.1b Describe nutrient sources
- 27.1.2b Determine plant nutrient requirements for optimum growth
- 27.1.3b Identify function of plant nutrients in plants
- 27.1.4b Determine the environmental factors that influence and optimize plant growth
- 27.1.5b Apply nutrients to plants for economic growth
- 27.1.6b Describe nutrient application methods and appropriate practices

27.2b Test appropriate materials or examine data to evaluate and manage soil/media nutrients

- 27.2.1b Collect and test soil/media and/or plant tissue
- 27.2.2b Interpret tests of soil/media and/or plant tissue
- 27.2.3b Identify soil slope, structure and texture
- 27.2.4b Evaluate soil/media permeability and water-holding capacity
- 27.2.5b Determine the chemical properties of soil/media
- 27.2.6b Determine land use capability
- 27.2.7b Determine the biological functions of microorganisms of soil/media

27.3b Explain and use basic methods for reproducing and propagating plants

- 27.3.1b Determine the role of genetics in plants
- 27.3.2b Describe the components and functions of plant reproductive parts
- 27.3.3b Identify and practice methods of asexual/sexual plant propagation
- 27.3.4b Describe the principles of plant micro-propagation
- 27.3.5b Apply principles and practices of biotechnology to plant propagation
- 27.3.6b Distinguish between natural and artificial plant selection

27.4b Develop and use a plan for integrated pest management

- 27.4.1b Identify plant pests (e.g., insects, diseases, weeds, rodents)
- 27.4.2b Determine pest management safety practices
- 27.4.3b Determine pest management methods
- 27.4.4b Develop pest management plans based on pest life cycles
- 27.4.5b Implement pest control plan with appropriate treatments
- 27.4.6b Evaluate pest control plan
- 27.4.7b Prevent, identify and manage pest resistance

28.B ADDRESS TAXONOMIC OR OTHER CLASSIFICATIONS TO EXPLAIN BASIC PLANT ANATOMY AND PHYSIOLOGY

28.1b Examine unique plant properties to identify/describe functional differences in plant structures including roots, stems, flowers, leaves and fruit

- 28.1.1b Identify plant structures (e.g., seeds)
- 28.1.2b Describe physiological functions of plants
- 28.1.3b Describe germination process and conditions

28.2b Classify plants based on physiology for taxonomic or other classifications

- 28.2.1b Investigate the seven levels of classifications (Kingdom, Division, Class, Order, Family, Genus, Species)
- 28.2.2b Investigate the five kingdoms (Monera, Protists, Fungi, Plants, Animals)
- 28.2.3b Classify plants as monocots or dicots
- 28.2.4b Classify plants as annuals, biennials or perennials
- 28.2.5b Classify plants according to growth habit
- 28.2.6b Classify plants by type
- 28.2.7b Classify plants by economic value

28.3b Distinguish between different uses for plants

- 28.3.1b Describe horticultural crops
- 28.3.2b Define agronomic crops
- 28.3.3b Compare and contrast horticultural and agronomic crops

29.B APPLY FUNDAMENTALS OF PRODUCTION AND HARVESTING TO PRODUCE PLANTS

29.1b Research the history of agriculture

- 29.1.1b Discuss the development of agriculture in America
- 29.1.2b Examine Arizona agriculture and its advancements

29.2b Apply fundamentals of plant management to develop a production plan

- 29.2.1b Identify and select seeds and plants
- 29.2.2b Manipulate and evaluate environmental conditions (e.g., irrigation, mulch, shading) to foster plant germination, growth and development
- 29.2.3b Evaluate and demonstrate planting practices (e.g., population rate, germination/seed vigor, inoculation, seed and plant treatments)

- 29.2.4b Evaluate and demonstrate transplanting practices
- 29.2.5b Prepare soil/media for planting
- 29.2.6b Control plant growth (e.g., pruning, pinching, disbudding, topping, detasseling, staking, cabling, shearing, shaping)
- 29.2.7b Prepare plants and plant products for distribution
- 29.2.8b Investigate the production of horticultural crops and agronomic crops