

AGRICULTURE SCIENCE

Curriculum Content Framework

Prepared By

Lonni Davis, Crossett High School
Jennifer Johnson, Camden-Fairview High School
James Pennington, Hope High School
Bill Pruitt, Beebe Junior High School

Facilitated By

Karen Chisholm, Program Manager
Office of Assessment and Curriculum
Arkansas Department of Workforce Education

Edited By

Angela Collins, Program Advisor
Office of Agriculture Science and Technology
Arkansas Department of Workforce Education

Disseminated By

Career and Technical Education
Office of Assessment and Curriculum
Arkansas Department of Workforce Education

Curriculum Content Framework

AGRICULTURAL SCIENCE

Grade Levels: 9, 10, 11, 12
Course Code: 491140

Prerequisites: None

Course Description: A foundation course for all agriculture programs of study. Topics covered include general agriculture, FFA, leadership, record keeping, Supervised Agricultural Experiences, animal science, plant science, and soil science.

Table of Contents

	Page
Unit 1: Introduction to Agriculture.....	1
Unit 2: The National FFA Organization.....	3
Unit 3: Supervised Agricultural Experience Programs.....	6
Unit 4: Animal Science.....	7
Unit 5: Plant Science.....	9
Unit 6: Forestry & Natural Resources.....	10
Unit 7: Agricultural Leadership.....	12
Unit 8: Agricultural Issues.....	13

Unit 1: Introduction to Agriculture

10 Hours

Terminology: Agribusiness, Agriculture, Agriculture mechanics, Agriscience, Animal science, Aquaculture, Commodity, Horticulture, Natural resources

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
1.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
1.2 Explain the importance of agriculture in our everyday lives	1.2.1 Create a collage showing how agriculture is a part of your life	Foundation	Speaking	Asks questions to clarify information [1.5.3] Asks questions to obtain information [1.5.4]
		Thinking	Creative Thinking	Applies personal style to a drawing [4.1.11]
1.3 Discuss changes that have come about in agriculture due to technology	1.3.1 Compare farming techniques in use today with those 100 years ago	Foundation	Reading	Determines what information is needed [1.3.10]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
1.4 Determine the impact of agriculture on the United States' economy	1.4.1 Conduct a scavenger hunt for prices of common commodities, then compare them with foreign markets	Foundation	Arithmetic/ Mathematics	Calculates percentages, ratios, proportions, decimals, and common fractions [1.1.10]
		Personal Management	Responsibility	Sets high standards for self in completion of a task [3.4.9]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
1.5 Identify careers related to agriculture	1.5.1 Research a career in agriculture to determine educational requirements, working conditions, and salary	Foundation	Reading	Applies information to job performance [1.3.4] Uses standard occupational resource materials [1.3.22]
		Personal Management	Career Awareness, Development, & Mobility	Develops skills to locate, evaluate, and interpret career information [3.1.4] Explores career opportunities [3.1.6]

Unit 2: The National FFA Organization 15 Hours

Terminology: CDE, FFA, Leadership

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
2.1 Explain the relationship of the National FFA Organization to agricultural education	2.2.1 Reinforce by analyzing the FFA mission statement	Foundation Thinking	Reading Reasoning	Draws conclusions from what is read [1.3.12] Sees relationship between two or more ideas, objects, or situations [4.5.5]
2.2 State the official colors of the FFA	2.3.1 Explain the significance of national blue and corn gold	Foundation Personal Management	Listening Organizational Effectiveness	Listens for content [1.2.3] Adapts to the organization's goals, values, culture, and traditional modes of operation [3.3.1]
2.3 Explain what the parts of the official FFA emblem symbolize	2.4.1 Label the parts of the FFA emblem	Foundation Personal Management	Reading Organizational Effectiveness	Locates pertinent information in documents, such as manuals, graphs, and schedules, to perform tasks [1.3.18] Adapts to the organization's goals, values, culture, and traditional modes of operation [3.3.1]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
2.4 Outline the history of the FFA	2.5.1 Refer to the FFA chronological timeline in the National FFA Manual	Foundation	Writing	Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6]
		Thinking	Knowing how to Learn	Develops personal learning strategies—note taking, clustering related items, flash cards, etc. [4.3.2]
2.5 Discuss the proper use of the FFA jacket	2.6.1 Refer to the National FFA Manual	Foundation	Reading	Comprehends written information for main ideas [1.3.7]
		Personal Management	Self-esteem	Creates self-confidence and positive self-image through proper grooming [3.5.3]
2.6 Explain the significance of the FFA Creed	2.7.1 Recite the FFA Creed from memory	Foundation	Speaking	Speaks in a clear, concise manner [1.5.12]
		Personal Management	Integrity/Honesty/ Work Ethic	Describes/Explains significance of integrity, honesty, and work ethics [3.2.4]
2.7 Identify Career Development Events in which FFA members may participate	2.8.1 List all CDE areas offered at the state and national levels	Foundation	Reading	Locates pertinent information in documents, such as manuals, graphs, and schedules, to perform tasks [1.3.18]
		Personal Management	Career Awareness, Development, & Mobility	Sets well-defined and realistic personal/career goals (short-term and long-term) [3.1.11]
2.8 Discuss the duties of FFA Chapter officers	2.9.1 Refer to the duties outlined in the National FFA Manual	Foundation	Speaking	Interprets nonverbal cues, such as eye contact, posture, and gestures, for meaning [1.5.6]
		Personal Management	Responsibility	Is punctual to class, school meetings, and work [3.4.6]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
2.9 List the degrees an FFA member may earn	2.10.1 Discuss and describe the criteria for each degree that members may earn	Foundation Personal Management	Writing Career Awareness, Development, & Mobility	Writes/Prints legibly [1.6.24] Establishes and implements a plan of action [3.1.5]

Unit 3: Supervised Agricultural Experience Programs

9 Hours

Terminology: Entrepreneurship, Placement, Production, Record book, SAE

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
3.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
3.2 Explain the difference between the production, entrepreneurship, and placement SAEs	3.2.1 List examples of projects students may have as SAEs	Foundation	Speaking	Asks questions to clarify information [1.5.3] Asks questions to obtain information [1.5.4]
		Thinking	Problem Solving	Draws conclusions from observations, evaluates conditions, and gives possible solutions [4.4.5]
3.3 Explain the purpose of the SAE record book	3.3.1 Complete the preliminary pages of the record book	Foundation	Arithmetic/ Mathematics	Enters figures/calculations from one form of chart to another [1.1.21]
		Thinking	Seeing Things in the Mind's Eye	Imagines the flow of work activities from narrative descriptions [4.6.1]
3.4 Explain the relationship between SAEs and the FFA Proficiency Award program	3.4.1 Analyze a Proficiency Award application to determine the information it should contain	Foundation	Arithmetic/ Mathematics	Applies addition, subtraction, multiplication, and division to real-world situations [1.1.1]
		Personal Management	Career Awareness, Development, & Mobility	Monitors progress toward goal attainment [3.1.10]

Unit 4: Animal Science 17 Hours

Terminology: Artificial insemination, Breed, Gestation, Lactation, Non-ruminant, Polled, Ruminant, Vaccination

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
4.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
4.2 Discuss digestive systems of common classes of livestock	4.2.1 Compare the digestive tracts of ruminants, nonruminants, and poultry	Foundation	Reading	Draws conclusions from what is read [1.3.12]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
4.3 List the major classes of nutrients	4.3.1 Discuss the role of nutrients in livestock health	Foundation	Writing	Uses technical words and symbols [1.6.20]
		Thinking	Problem Solving	Draws conclusions from what is read and gives possible solutions [4.4.4]
4.4 Discuss gender terminology of beef and dairy cattle, swine, sheep, goats, horses, and poultry		Foundation	Reading	Draws conclusions from what is read [1.3.12]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
4.5 Identify retail cuts of beef, pork, and poultry		Foundation	Speaking	Organizes ideas, and communicates oral messages to listeners [1.5.7]
		Thinking	Creative Thinking	Makes connections between seemingly unrelated ideas [4.1.6]
4.6 Describe gestation periods and characteristics of cattle, swine, sheep, goats, and horses		Foundation	Reading	Draws conclusions from what is read [1.3.12]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
4.7 Identify common breeds of beef and dairy cattle, swine, sheep, goats, horses, and poultry		Foundation	Reading	Draws conclusions from what is read [1.3.12]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
4.8 Discuss management practices of beef and dairy cattle, swine, sheep, goats, horses, and poultry		Foundation	Reading	Draws conclusions from what is read [1.3.12]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
4.9 List and describe common animal diseases	4.9.1 Invite a veterinarian to speak to your class about diseases in the animal community	Foundation	Reading	Draws conclusions from what is read [1.3.12]
	4.9.2 Evaluate a sick animal and diagnose the disease	Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]

Unit 5: Plant Science

10 Hours

Terminology: Annual, Biennial, Dicot, Fertilizer, Monocot, Perennial, Photosynthesis, Respiration, Transpiration

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
5.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
5.2 Identify the four major parts of a plant and their functions	5.2.1 Label the parts of the root, stem, leaf, and flower	Foundation	Science	Describes/Explains scientific principles related to plant functions [1.4.14]
		Thinking	Knowing how to Learn	Locates appropriate learning resources to acquire or improve knowledge and skills [4.3.3]
5.3 Discuss the basic concepts of photosynthesis and respiration	5.3.1 Describe the chemical equations and how they sustain the plant	Foundation	Science	Describes/Explains scientific principles related to photosynthesis [1.4.14]
		Thinking	Seeing Things in the Mind's Eye	Visualizes a system's operation from schematics [4.6.3]
5.4 Compare monocot and dicot plants	5.4.1 Conduct a germination experiment to compare the seed leaves of monocots and dicots	Foundation	Science	Acquires and processes scientific data [1.4.1]
		Thinking	Knowing how to Learn	Uses available resources to acquire new skills or improve skills [4.3.4]
5.5 Identify requirements for plant growth	5.5.1 Discuss the 16 essential nutrients	Foundation	Reading	Follows written directions [1.3.13]
		Interpersonal	Teamwork	Works effectively with others to reach a common goal [2.6.6]
5.6 Explain the role of fertilizers and their importance	5.6.1 Conduct a soil test and analyze results	Foundation	Science	Solves practical problems using scientific methods and techniques [1.4.22]

Unit 6: Forestry & Natural Resources 8 Hours

Terminology: Conservation, Forestry, Non-renewable resource, Renewable resource, Soil, Water, Wildlife

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
6.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
6.2 Explain the importance of soil and water conservation	6.2.1 Discuss the role of conservation acts and the agencies that regulate them	Foundation	Science	Analyzes environmental issues (ecology, pollution, waste management) [1.4.2]
		Personal Management	Integrity/Honesty/Work Ethic	Chooses ethical course of action [3.2.1]
6.3 Discuss the importance of forestry	6.3.1 Identify major species of trees in the local area	Foundation	Speaking	Organizes ideas, and communicates oral messages to listeners [1.5.7]
	6.3.2 List major forestry products	Thinking	Knowing how to Learn	Uses available resources to acquire new skills or improve skills [4.3.4]
6.4 List the major species of wildlife in Arkansas	6.4.1 Identify important species of wildlife in the local area	Foundation	Writing	Writes/Prints legibly [1.6.24]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
6.5 Discuss recreational use of natural resources	6.5.1 Highlight Arkansas' own natural resources and their role in the economy	Foundation	Listening	Listens for content [1.2.3] Listens for long-term contexts [1.2.7]
		Personal Management	Responsibility	Exhibits enthusiasm in approaching and completing tasks [3.4.3]

Unit 7: Agricultural Leadership 15 Hours

Terminology: Extemporaneous speech, Minutes, Motion, Opening/closing ceremony, Parliamentary procedure, Prepared speech, Vote

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
7.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
7.2 List the three major parts of a speech	7.2.1 Prepare a three- to five-minute speech	Foundation	Speaking	Uses verbal language and other cues, such as body language, appropriate in style, tone, and level of complexity to the audience and the occasion [1.5.14]
	7.2.2 Present the speech to the class			
7.3 Explain the purpose of parliamentary procedure	7.3.1 Refer to official FFA manual and discuss the order of business	Foundation	Speaking	Applies/Uses technical terms as appropriate to audience [1.5.2]
	7.3.2 Provide a class demonstration	Personal Management	Organizational Effectiveness	Comprehends the organization's modes of operation [3.3.5]
7.4 Explain the purpose of the opening/closing ceremony	7.4.1 Refer to the official FFA manual	Foundation	Speaking	Organizes ideas and communicates oral messages to listeners [1.5.7] Speaks effectively, using appropriate eye contact, gestures, and posture [1.5.11]
	7.4.2 Provide a class demonstration			
7.5 Discuss common leadership traits	7.5.1 Provide examples of famous leaders	Interpersonal	Leadership	Comprehends ideas and concepts related to leadership [2.4.2]

Unit 8: Agricultural Issues 6 Hours

Terminology: Animal rights, Animal welfare, Biotechnology, EPA, FEMA, Food safety, USDA

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
8.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
8.2 Identify past issues in agriculture	8.2.1 Discuss the effect of these on society	Foundation	Reading	Distinguishes between fact and opinion [1.3.11]
		Interpersonal	Teamwork	Contributes to group with ideas, suggestions, and effort [2.6.2]
8.3 Discuss current issues in agriculture	8.3.1 Discuss the pros and cons of these issues	Foundation	Reading	Identifies inaccurate information/entries on written documents [1.3.15]
		Interpersonal	Negotiation	Works to resolve conflict between two or more individuals [2.5.3]

Glossary

Unit 1: Introduction to Agriculture

1. Agribusiness—a businesses that is related to or dependent upon agriculture
2. Agriculture—the science of producing crops and raising livestock
3. Agriculture mechanics—design, construction, repair, and maintenance of machinery used throughout agriculture
4. Agriscience—using new technologies in the production of food, fiber, and shelter
5. Animal science—the science of animal growth, care, and management
6. Aquaculture—the science of producing aquatic plants and animals
7. Commodity—any agricultural product that one can buy, sell, or trade
8. Horticulture—the science of producing fruits, vegetables, and ornamental plants
9. Natural resources—resources found in nature that support life and produce fuel

Unit 2: The National FFA Organization

1. Career Development Event (CDE)—a hands-on team competition designed for FFA members to develop career-related skills
2. FFA—a national organization for students enrolled in agriculture education that promotes leadership, growth, and career success
3. Leadership—the ability to direct and guide others to accomplish a goal

Unit 3: Supervised Agricultural Experience Programs

1. Entrepreneurship—a student-owned business that serves as an SAE
2. Placement—an SAE in which students are employed in an agriculture-related field
3. Production—an SAE in which students learn to raise and manage crops and livestock
4. Record book—the proper place to record all SAE inventory, deposits, and expenditures
5. Supervised Agriculture Experience (SAE)—an opportunity for students designed to develop knowledge and skills in agriculture-related fields while in supervised settings

Unit 4: Animal Science

1. Artificial insemination—reproduction by means other than natural mating
2. Breed—a group of animals having similar physical characteristics that are passed on to their offspring
3. Gestation—length of pregnancy
4. Lactation—period of time when mammals are producing milk
5. Nonruminant—a simple-stomached animal
6. Polled—genetically without horns
7. Ruminant—an animal that has a stomach with more than one compartment
8. Vaccination—an agent administered to prevent disease

Unit 5: Plant Science

1. Annual—a plant that completes its life cycle in one year or less
2. Biennial—a plant that needs two years to complete its life cycle
3. Dicot—a plant with two seed leaves
4. Fertilizer—a material that supplies nutrients to plants
5. Monocot—a plant with one seed leaf
6. Perennial—a plant that needs more than two years to complete its life cycle
7. Photosynthesis—the food-making process of plants
8. Respiration—the process by which plants convert food to energy
9. Transpiration—the process by which a plant loses water vapor

Unit 6: Forestry & Natural Resources

1. Conservation—the control and preservation of natural resources for present and future use
2. Forestry—the production and management of trees for lumber and other related commodities
3. Nonrenewable resource—a resource provided by nature that cannot replace itself
4. Renewable resource—a resource provided by nature that can replace itself
5. Soil—the top layer of the earth's surface suitable for the growth of plants
6. Water—a colorless, odorless liquid essential for all forms of life
7. Wildlife—nondomesticated animals that thrive in natural environments

Unit 7: Agricultural Leadership

1. Extemporaneous speech—a type of speech in which the speaker prepares ideas but does not memorize exact words
2. Minutes—the official written record of a business meeting
3. Motion—a basic proposal that brings business before the assembly
4. Opening/closing ceremony—a traditional contest designed to emphasize the purpose of meetings and duties of officers
5. Parliamentary procedure—a method of conducting meetings in an orderly manner
6. Prepared speech—a type of speech in which the speaker prepares the speech completely beforehand
7. Vote—to give members the right to express approval of or opposition to a particular action

Unit 8: Agricultural Issues

1. Animal rights—a belief that animals have the same rights as humans and should not be eaten, used in research, or killed for fur
2. Animal welfare—a philosophy that protects the care and well-being of animals
3. Biotechnology—the use of cells or components of cells to enhance or transform them into new products
4. EPA—the Environmental Protection Agency
5. FEMA—the Federal Emergency Management Agency
6. Food safety—the monitoring of production and processing to ensure quality food items are available to consumers
7. USDA—the United States Department of Agriculture