Introduction to Agriscience

8002 6 weeks

8009 9 weeks

8011 12 weeks

8013 18 weeks

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Course Description

Suggested Grade Level: 6

Through project-based learning, technical skill development, and academic enrichment activities, students in Introduction to Agriscience will explore the importance of plant and animal agriculture, scientific principles, agricultural mechanics, natural resources management, career opportunities related to agriculture, agriscience, and agribusiness, and the benefits of FFA membership.

Task Essentials Table

8013	8011	8009	8002	Tasks/Competencies
⊕	⊕	⊕	⊕	Identify the role of supervised agricultural experiences (SAEs) in agricultural education.
⊕	⊕	⊕	⊕	Participate in an SAE.
⊕	⊕	⊕	⊕	Identify the benefits and responsibilities of FFA membership.
⊕	⊕	○	○	Describe leadership characteristics and opportunities as they relate to agriculture and FFA.
○	○	○	○	Apply for an FFA degree and/or an agricultural proficiency award.
⊕	⊕	⊕	⊕	Identify class rules, safety precautions, and procedures.
⊕	⊕	⊕	⊕	Explore the vast diversity of agriculture, agriscience, and agribusiness.
⊕	⊕	⊕	⊕	Explain the importance of agriculture to Virginia, the United States, and the world.

⊕	⊕	○	○	Describe the impact of agriculture on the economy.
⊕	⊕	○	○	Identify the key factors that have shaped the agricultural industry.
○	○	○	○	Describe the interdependency of agriculture and other segments of society.
○	○	○	○	Identify current research and development activities in agriculture.
⊕	⊕	⊕	⊕	Explain functions of plant systems.
⊕	⊕	⊕	⊕	Identify basic requirements for plant growth and development.
○	○	○	○	Explain the economic significance of various plants and animals to the community.
⊕	⊕	⊕	⊕	Define basic animal terminology.
○	○	○	○	Identify basic requirements for animal growth and development.
⊕	⊕	⊕	○	Explain the importance of agricultural mechanics technology.
⊕	⊕	⊕	⊕	Identify basic laboratory safety procedures.
○	○	○	○	Describe new agricultural engineering technologies.
⊕	⊕	⊕	⊕	Use basic hand tools for woodworking.
⊕	⊕	○	○	Explain how organisms and the environment work together.
○	○	○	○	Identify conservation measures.
○	○	○	○	Describe how agriculture and the environment are interrelated.
⊕	○	○	○	Define the term *natural resources*.
⊕	○	○	○	Describe the seven natural resources and their importance to the environment.
○	○	○	○	Explain the water cycle.
⊕	○	○	○	List sources of water.
⊕	○	○	○	List uses of water.
⊕	○	○	○	Discuss threats to water quality.
⊕	○	○	○	List important water conservation practices.
○	○	○	○	Explain where local water comes from.
○	○	○	○	List methods for conserving water in home use.

Legend: ⊕Essential ○Non-essential ⊖Omitted

Note: Competencies 39-43 have been added to ensure compliance with federal legislation: National FFA Organization's Federal Charter Amendments Act (Public Law 116-7, https://www.congress.gov/116/plaws/publ7/PLAW-116publ7.pdf). All inquiries may be sent to cte@doe.virginia.gov. Students are provided opportunities for leadership, personal growth, and career success. Instruction is delivered through three major components: classroom and laboratory instruction, supervised agricultural experience (SAE) program, and student leadership (FFA).

Curriculum Framework

Task Number 39

Identify the role of supervised agricultural experiences (SAEs) in agricultural education.

Definition

Identification should include

- defining an SAE program as *an opportunity for students to consider multiple careers and occupations in the agriculture, food, and natural resources (AFNR) industries, learn expected workplace behavior, develop specific skills within an industry, and apply academic and occupational skills in the workplace or a simulated workplace environment*
- researching the Foundational SAE
    - career exploration and planning
    - personal financial planning and management
    - workplace safety
    - employability skills for college and career readiness
    - agricultural literacy
- researching the Immersion SAE
    - entrepreneurship/ownership
    - placement/internships
    - research (experimental, analytical, invention)
    - school business enterprises
    - service learning
- developing a plan to participate in an SAE, based on personal and career goals
- researching available awards and degrees, based on SAE participation.

Teacher resource: SAE Resources, National Council for Agricultural Education

Process/Skill Questions

- What are examples of SAEs related to this course and in the AFNR industries?
- Where can a copy of the Virginia SAE Record Book be found?
- What is an Immersion SAE?
- How does a placement/internship SAE differ from an ownership/entrepreneurship SAE?
- How does an SAE provide relevant work experience and contribute to the development of critical thinking skills?
- How is the SAE an extended individualized instructional component of a student's Career Plan of Study?
- How can an SAE be used to provide evidence of student growth and participation in authentic, work-related tasks?
- What are the four types of SAEs?
- What are the advantages of participating in work-based learning experiences and projects?
- How does one choose an appropriate SAE in which to participate?

Task Number 40

Participate in an SAE.

Definition

Participation should include

- developing, completing, or continuing a plan to participate in an SAE as a work-based learning experience, based on personal and career goals
- documenting experience, connections, positions held, and competencies attained, using the *Virginia SAE Record Book*
- researching available awards and degrees, based on SAE participation.

Teacher resources:
FFA SAE
The Agricultural Experience Tracker

Process/Skill Questions

- What are the advantages of participating in work-based learning experiences and projects?
- How do SAEs help prepare students for the workforce?
- What are some examples of SAEs in AFNR?

Exploring Leadership Opportunities through FFA

Task Number 41

Identify the benefits and responsibilities of FFA membership.

Definition

Identification should include

- benefits
    - listing opportunities to participate in community improvement projects and career development events (CDEs) and leadership development events (LDEs)
    - exploring leadership development opportunities

- responsibilities
    - researching the responsibilities of FFA officers, committees, and members
    - locating resources that guide participation in FFA activities
    - explaining the FFA Creed, Motto, Salute, and mission statement
    - explaining the meaning of the FFA emblem, colors, and symbols
    - explaining significant events and the history of the organization.

Process/Skill Questions

- How does one become an FFA member?
- What is the FFA's mission and how does it accomplish its mission?
- What are the benefits and responsibilities of FFA membership?
- What five FFA activities are available through the local chapter?
- What are some significant events in FFA history? How have these events shaped membership over time?
- What is the FFA program of activities (POA), and how is it used?

Task Number 42

Describe leadership characteristics and opportunities as they relate to agriculture and FFA.

Definition

Description should include

- examples of successful leaders
- types of leadership
    - autocratic
    - participative
    - laissez-faire
    - servant
    - followership
- positive leadership qualities and traits of successful leaders
- opportunities for participating in leadership activities in FFA
- demonstrating methods for conducting an effective meeting.

Process/Skill Questions

- Who are some successful leaders in the agriculture industry?
- What qualities make a successful leader?
- What are leadership traits?
- What is the difference between positive and negative leadership?

Task Number 43

Apply for an FFA degree and/or an agricultural proficiency award.

Definition

Application should include

- identifying types of FFA degrees
    - Greenhand
    - Chapter
    - State
    - American
- identifying proficiency award areas
    - entrepreneurship
    - placement
    - combined
    - agriscience research
- exploring CDEs and LDEs related to this course
- identifying all SAE criteria to be eligible for the award
- identifying the type of award
- applying for an FFA award.

Teacher resource: FFA Agricultural Proficiency Awards

Process/Skill Questions

- Where are the awards and their application criteria located?
- What are the benefits of winning an FFA award?
- What are the benefits and requirements of an FFA degree?
- What FFA awards are available?
- How does the FFA degree program reward FFA members in all phases of leadership, skills, and occupational development?
- What is the highest degree that can be conferred upon an FFA member at the national level?
- What are the requirements for a Greenhand FFA degree?

Becoming Oriented to Agriscience

Task Number 44

Identify class rules, safety precautions, and procedures.

Definition

Identification of rules, safety precautions, and procedures should include teacher and school guidelines.

Process/Skill Questions

- How will you contribute to a positive classroom atmosphere?
- In what ways do classroom rules prepare you for the work world?
- How do school and classroom rules contribute to a safe environment for everyone?

Task Number 45

Explore the vast diversity of agriculture, agriscience, and agribusiness.

Definition

Exploration should include

- defining a*griculture, agriscience,* and *agribusiness*
- describing ideas associated with agriculture, agriscience, and agribusiness.

Process/Skill Questions

- What are some local, regional and state agribusinesses?
- What role does agriscience play in the development of new plant varieties?
- What are some current trends in agriculture, agriscience, and agribusiness?
- What are some controversies regarding agribusiness?
- What effects do agriculture, agribusiness, and agriscience have on our daily lives?

Describing Agriscience

Task Number 46

Explain the importance of agriculture to Virginia, the United States, and the world.

Definition

Explanation should include

- identifying agricultural regions in Virginia
- exploring differences in agricultural regions in Virginia
- analyzing the impact agriculture has on Virginia
- listing 10 agricultural products of Virginia.

Process/Skill Questions

- What products are specific to each of Virginia's agricultural regions?
- What roles do climate and topography play in the production of agricultural products within Virginia's different regions?
- What are the most popular agricultural products from Virginia?
- Where does agriculture rank among industries in Virginia? In the U.S.?
- What role does Virginia agriculture play in providing food for the world?

Task Number 47

Describe the impact of agriculture on the economy.

Definition

Description should include

- defining *import* and *export*
- identifying countries that receive Virginia's agricultural exports
- listing five products exported from Virginia and five products imported to Virginia.

Process/Skill Questions

- What are the five major agriculture commodities that are imported to Virginia and the United States?
- What are the five major agriculture commodities that are exported?
- How do the exporting and importing trade affect the local, state, and national economy?
- Does Virginia export more agriculture products or import more? Explain.

Task Number 48

Identify the key factors that have shaped the agricultural industry.

Definition

Identification should include

- land resources
- diverse climates
- dependable transportation systems
- education
- marketing opportunities
- large- and small-scale operations
- technological advances, innovation, and inventions.

Process/Skill Questions

- How do land, climate, transportation, and markets affect agricultural production?
- How has emerging technology affected the field of agriculture?
- Why is education so important to agriculture today?
- How has transportation contributed to agriculture's efficiency?
- What do large-scale farms and small-scale farms have in common? How do they differ?

Task Number 49

Describe the interdependency of agriculture and other segments of society.

Definition

Description should include

- tracing the flow of an agricultural product from the farm to the table (i.e., production, processing, distribution, and marketing)
- explaining how the money a consumer spends on food is distributed within four divisions of agriculture.

Process/Skill Questions

- What are the four divisions of agriculture?
- What is the process of marketing food products?
- What is the relationship between the cost of an item on the market and the costs associated with producing the item?
- How much money does a farmer receive for a gallon of milk purchased at a grocery store? Where does the rest of the money go?
- What is the "farm-to-table" movement?

Task Number 50

Identify current research and development activities in agriculture.

Definition

Identification should include

- examining current areas of research in agriculture, agriscience, and agribusiness
- generating the connection between emerging technologies and the field of agriculture.

Process/Skill Questions

- What are four major research developments in the fields of agriculture, agriscience, and agribusiness?
- What emerging technologies have had the greatest impact in the field of agriculture?
- Why is research important to agriculture, agriscience, and agribusiness?
- How has research led to the development of new varieties of agricultural crops?

Introducing Plant and Animal Life Cycles

Task Number 51

Explain functions of plant systems.

Definition

Explanation should include

- describing the role of plants in the life cycle
- describing the purpose of the four main parts of a plant
- defining and describing the purpose of *photosynthesis*.

Process/Skill Questions

- What are the functions of the leaves? Of the stem? Of the flowers? Of the roots?
- What role do plants play in the life cycle of Virginia's agricultural livestock and/or wildlife?
- Why do plants have to photosynthesize?
- How does photosynthesis benefit humans?

Task Number 52

Identify basic requirements for plant growth and development.

Definition

Identification should include the effects on plant growth and development of

- air
- water

- light
- nutrients
- temperature.

Process/Skill Questions

- What roles do air, water, light, and media have in growing plants such as tomatoes (both in a greenhouse and a garden)?
- What are some examples of growing media? What are similarities and differences among various media?
- What are the differences between growing plants hydroponically and traditional outdoor production?
- How does temperature affect seed germination?

Task Number 53

Explain the economic significance of various plants and animals to the community.

Definition

Explanation should include

- names of plants and animals that are economically important to your community
- the economic importance of various plants and animals
- classification of garden, landscape, and interior plants, food, fiber, and fuel crops.

Process/Skill Questions

- What are the similarities and differences among agricultural, landscaping, and horticultural plants?
- What are three examples of garden plants? Landscape plants? Interior plants?
- What are three examples of food, fiber, and fuel crops?
- What roles do plants play in the economy? What roles do animals play in the economy?
- What farm-raised animals are important to your region's economy?

Task Number 54

Define basic animal terminology.

Definition

Definitions should include species-specific terms as they relate to animal gender, age, reproductive status and basic anatomy and physiology for

- bovine
- ovine
- caprine
- equine

- porcine
- avian.

Process/Skill Questions

- What agricultural careers, other than farming, might require knowledge of animal terminology?
- What are differences among breeding stock and market animals?
- What is a cow? A bull? A heifer? A steer? A calf?
- What is the rationale behind castration in animal husbandry?

Task Number 55

Identify basic requirements for animal growth and development.

Definition

Identification should include

- comparison of human needs to animal needs
- definition of *nutrition*
- classification of feeds as roughages or concentrates
- major classes of nutrients (water, protein, carbohydrates, minerals, vitamins, fat, additives) and their sources.

Process/Skill Questions

- What nutrients do animals need for proper growth and development?
- What are some consequences of improper nutrition?
- What roles do proteins and carbohydrates play in an animal's nutrition?
- How are nutrition fact labels and feed labels alike?
- What stages of growth and development would require more concentrate feed?
- What are the differences between roughages and concentrates?

Introducing Agricultural Mechanics Technology

Task Number 56

Explain the importance of agricultural mechanics technology.

Definition

Explanation should include

- important developments in agricultural mechanics technology
- careers in agricultural mechanics
- examples of how agricultural mechanics has improved agriculture and quality of life.

Process/Skill Questions

- What are examples of the importance of agricultural mechanics technology?
- What advancements in agricultural mechanization have had the greatest impact on society?
- What are the education and training requirements of various careers in agricultural mechanics technology?
- What careers are related to agricultural mechanics technology?

Task Number 57

Identify basic laboratory safety procedures.

Definition

Identification should include explanation of classroom rules and procedures for the laboratory. A class safety test and/or contract may also be appropriate.

Note: See Virginia Tech's Agricultural Education Laboratory Safety Guide for Agricultural Mechanics.

Process/Skill Questions

- What problems might occur if safety rules are not followed?
- What safety rules are common to all situations regardless of the equipment being used?
- How can your behavior in the lab influence others?

Task Number 58

Describe new agricultural engineering technologies.

Definition

Description should include

- development of new agricultural engineering technologies
- impact of new agricultural engineering technologies on society
- application of scientific principles.

Process/Skill Questions

- What are the major areas of agricultural engineering development?
- What are some inventions that have been developed in these areas?
- How is life different today for American agriculturalists because of advances in agricultural engineering?

- What agricultural invention from Virginia has influenced agriculture around the world?
- How might new technologies change agriculture in the next 10 years?

Task Number 59

Use basic hand tools for woodworking.

Definition

Use should include

- identifying basic woodworking hand tools
- demonstrating use of tools and their safety features
- constructing a wood project using tools
- incorporating scientific principles (e.g., simple machines, leverage).

Process/Skill Questions

- How do hand tools increase efficiency in woodworking?
- What safety rules should apply to working with hand tools?
- What scientific principles are incorporated into woodworking?
- How should hand tools be maintained to ensure long-lasting use?

Introducing Ecology and Conservation

Task Number 60

Explain how organisms and the environment work together.

Definition

Explanation should include

- defining the terms *organism* and *environment*
- describing the relationship between organisms and the environment (ecology)
- identifying examples of how organisms work in balance with each other and/or in balance with the environment.

Process/Skill Questions

- What are several examples of ways plants benefit from animals?
- How do animals help plants grow?
- How do organisms interact with their environment?
- How do organisms adapt to changes in their environments?

Task Number 61

Identify conservation measures.

Definition

Identification should include

- defining *conservation*
- explaining why conservation is essential to the protection of the environment
- listing methods of conservation
- explaining the differences among renewable, exhaustible/nonrenewable, and inexhaustible resources.

Process/Skill Questions

- What examples of conservation do you see taking place around you?
- What conservation practices do you use?
- What are examples of renewable, exhaustible, inexhaustible resources?
- What current events are related to environmental issues?
- What is the agriculture industry's role in conservation?

Task Number 62

Describe how agriculture and the environment are interrelated.

Definition

Description should include

- explaining why agriculture is influenced by the environment
- describing the effects of agriculture on the environment.

Process/Skill Questions

- How do farmers depend on the environment and protect it at the same time?
- What are best management practices?
- What resources are available to agriculturalists to set up practices that are beneficial to the environment?
- What is the agriculture industry's responsibility toward protecting the environment?

Task Number 63

Define the term *natural resources*.

Definition

Definition should include the following characteristics:

- They occur naturally on the earth.
- They are part of the environment.
- They are part of the food chain.
- They are used to improve human life.
- They are a source of recreation.

Process/Skill Questions

- How are natural resources used in society?
- How are natural resources used in your community?
- What role does natural resources have in your life?
- What implications does the food chain/food web have regarding natural resources?
- What is a natural resource you have personally used in your life?
- What is an example of how a natural resource has benefited our ancestors?
- What are natural resources?
- What is sustainable resource use?

Task Number 64

Describe the seven natural resources and their importance to the environment.

Definition

Description should include

- Forests/plants: provide food for animals and humans; add organic matter to soil when they decay; part of the air exchange process; help cool the earth
- Soil: all plant life comes from soil; all growth comes from topsoil
- Air: essential for life; part of the photosynthetic process; oxygen in air is used by animals to convert food to energy
- Water (streams, lakes, oceans, rivers): covers approximately 70 percent of the earth's surface; provides recreation; provides food, minerals, etc.; necessary for all life
- Wildlife/fish: part of the food chain; provide recreation for people
- Minerals: used to make hundreds of products; examples include iron, gold, salt, lead, silver
- Energy: some forms come from plant and animal remains; provided by natural gas, coal, oil, wind, and water.

Process/Skill Questions

- What role does the forest play in your community?

- What is the impact on agriculture if the topsoil is eroded?
- What are the implications of soil loss?
- Why is clean water important to your health?
- What role do you play in maintaining pollution-free water?
- How are minerals used in your community?
- What does "nonrenewable resources" mean? How do nonrenewable resources affect you and your community?
- How does soil affect plant growth?
- What are several examples of recreation that are available due to the presence of water?
- Why is conservation important for future generations?
- What impact do natural resources have on society?

Task Number 65

Explain the water cycle.

Definition

Explanation should include

- defining *water cycle*: the repeated circulation of water from the atmosphere to the earth and back to the atmosphere
- understanding that the amount of water does not change but its location does
- listing the steps in the cycle
    - Water is heated by the sun.
    - The heated water evaporates into the atmosphere.
    - Clouds form in the atmosphere.
    - Clouds move over land and moisture condenses.
    - Moisture is released as rain, snow, sleet, or hail.
    - Water falls to land and (1) runs off to streams, rivers, groundwater, and oceans, or (2) is absorbed by plants and released into the atmosphere by transpiration, or (3) is used by animals and humans.

Process/Skill Questions

- What are the steps in the water cycle?
- How does the water cycle influence your life?
- What role does water play in agriculture?
- What is the importance of the sun in the water cycle?
- Why would the water level of a pond vary throughout the year?
- How does the water cycle impact the environment?
- How does water change as it moves through the water cycle?
- How do all the parts of the water cycle fit together?
- Where does water come from? Where does it go?
- Where does the water on the ground come from? How does precipitation form?

Task Number 66

List sources of water.

Definition

List should include

- oceans
- surface water
- groundwater

Process/Skill Questions

- How do the sources of water play a role in the amount of water available to communities?
- What sources of water are available to you and your community?
- What property of surface water makes it unsuitable for drinking?
- Which type of water is most accessible and abundant?
- What are the main sources of water?
- What is a watershed?
- Where do we naturally find water?
- What do we get the majority of our water?

Task Number 67

List uses of water.

Definition

List should include

- agriculture (e.g., irrigation, livestock production)
- industry (e.g., processing of raw materials)
- hydroelectric plants (e.g., electricity)
- fish and wildlife (i.e., habitat)
- recreation (e.g., boating, fishing, skiing, sailing, swimming)
- domestic (e.g., cooking, cleaning, drinking)

Process/Skill Questions

- What industries in your community use water?
- How does water availability play a role in agriculture?
- What are options are available for industry/agriculture/communities in your community?
- What are some examples of how you use water on a daily basis?
- How is water important in livestock production?
- What are indirect and direct uses of water?
- How does a person use water in their everyday activities?
- What are ways you use water daily?
- How do you think the agricultural industry uses water differently than other segments of society?

Task Number 68

Discuss threats to water quality.

Definition

Discussion should include

- urban pollution
    - sewage
    - dumps and landfills
    - chemicals used on roads
- industrial pollution
    - thermal pollution: returning heated water to lakes and rivers disturbs the reproductive instincts of fish and also causes excess algae
    - radioactive waste: passed on to humans through seafood
    - organic waste: sewage requires oxygen for breakdown, so there is less oxygen in the water for fish
    - other contaminants (e.g., drugs, soaps, paints, fertilizers)
- agricultural pollution
    - disposal of waste and manure
    - pesticide and fertilizer
    - sediment runoff from erosion of topsoil.

Process/Skill Questions

- What is pollution?
- How is pollution created?
- What role do you play in creating and/or minimizing pollution?
- What are the implications of pollution on your health?
- Runoff from a parking lot or street would be an example of what type of pollution?
- What is erosion?
- What is water pollution?
- How do industries cause water pollution?
- What is used in homes that can cause water pollution?
- How can water pollution impact the food chain?
- How can polluted water be treated?
- What are some ways humans negatively impact water quality? What has the biggest negative impact on the quality of water?

Task Number 69

List important water conservation practices.

Definition

List may include, but not be limited to

- dams, ponds, and reservoirs
- desalination
- use and reuse of water

and the advantages and disadvantages of each.

Process/Skill Questions

- What role do you play in conservation practices?
- What are some conservation practices you see your community implementing?
- How does water conservation benefit a farmer?
- What is an example of a system you could construct to gather water for reuse?
- Why is conserving water important?
- How does conserving water benefit the environment?
- What are some ways water is conserved?
- How can some conservation practices be a disadvantage?

Task Number 70

Explain where local water comes from.

Definition

Explanation should include community or public water systems, and private wells.

Process/Skill Questions

- What is local water?
- What is the difference between well water, city water and bottled water?
- What type of water system do you have at your home?
- What are some differences between your home water system and your school water system?
- What are the major sources of water supply?
- How are community water sources connected to a regional watershed?
- How do you access your water?
- What ways does your community access water?

Task Number 71

List methods for conserving water in home use.

Definition

List should include

- laundry
    - wash full loads of clothes
    - use smaller load setting, if available

- shower and bathtub
    - use the shower rather than the tub
    - take shorter showers
    - use flow restrictors on shower heads and faucets
    - for baths, only fill the tub one-quarter full
    - turn off faucets when not in use
- toilets
    - replace old toilets with ones designed to conserve water
    - place a brick or other object in the toilet tank to displace water and reduce the amount used in each flush
    - check for leaks and replace faulty parts
- kitchen
    - avoid letting water run while washing dishes
    - fix leaky faucets
    - collect cold water that runs while waiting for hot and save it for drinking or for watering pets and plants
- around the home
    - water lawns in the early morning when there is less evaporation but not in the evening because it can encourage grass diseases
    - use sprinklers that are low to the ground, such as soaker hoses, to prevent evaporation
    - mulch around plants and in gardens to conserve moisture
    - conserve water when washing the car
    - collect rainwater and use it later to water plants, pets, etc.
    - collect gray water and reuse it

Process/Skill Questions

- What steps can you use to conserve water?
- What steps can you share with your family to help conserve water?
- What are some examples of water conservation practices you currently do to help conserve water?
- How could students in your school help conserve water during the school day?
- What are some ways to conserve household water?
- What is "gray water" and how can it be used to conserve water?
- How can you conserve water?
- What has the largest impact on water usage?

SOL Correlation by Task

39	Identify the role of supervised agricultural experiences (SAEs) in agricultural education.	English: 6.5, 6.6
40	Participate in an SAE.	English: 6.6, 6.7, 6.8, 6.9
41	Identify the benefits and responsibilities of FFA membership.	English: 6.6, 6.7, 6.8, 6.9
42	Describe leadership characteristics and opportunities as they relate to agriculture and FFA.	English: 6.6 History and Social Science: USII.1
43	Apply for an FFA degree and/or an agricultural proficiency award.	English: 6.6

44	Identify class rules, safety precautions, and procedures.	
45	Explore the vast diversity of agriculture, agriscience, and agribusiness.	English: 6.4, 6.5, 6.6, 6.8 History and Social Science: USI.5, USII.6
46	Explain the importance of agriculture to Virginia, the United States, and the world.	English: 6.5, 6.6, 6.7 History and Social Science: USI.2, USI.5, USII.2
47	Describe the impact of agriculture on the economy.	English: 6.3, 6.4, 6.5, 6.6, 6.7 History and Social Science: USI.5, USII.2
48	Identify the key factors that have shaped the agricultural industry.	English: 6.5, 6.6 History and Social Science: USI.2, USI.5, USI.8, USII.2, USII.4, USII.6, USII.8
49	Describe the interdependency of agriculture and other segments of society.	English: 6.5, 6.6 History and Social Science: USI.5, USII.2
50	Identify current research and development activities in agriculture.	English: 6.5, 6.6 Science: 6.1
51	Explain functions of plant systems.	English: 6.4, 6.5, 6.6, 6.7
52	Identify basic requirements for plant growth and development.	History and Social Science: USI.2
53	Explain the economic significance of various plants and animals to the community.	English: 6.5, 6.6 Science: 6.9
54	Define basic animal terminology.	English: 6.4, 6.5, 6.6
55	Identify basic requirements for animal growth and development.	English: 6.4, 6.5 History and Social Science: USI.1
56	Explain the importance of agricultural mechanics technology.	English: 6.5, 6.6 History and Social Science: USI.2, USI.5, USI.8, USII.2, USII.4, USII.6
57	Identify basic laboratory safety procedures.	English: 6.6, 6.8 History and Social Science: USII.1
58	Describe new agricultural engineering technologies.	English: 6.5, 6.6 History and Social Science: USII.2, USII.9
59	Use basic hand tools for woodworking.	
60	Explain how organisms and the environment work together.	English: 6.4, 6.5, 6.6, 6.7 History and Social Science: USI.2
61	Identify conservation measures.	English: 6.4, 6.5, 6.6, 6.7 Science: 6.7, 6.9

62	Describe how agriculture and the environment are interrelated.	English: 6.5, 6.6 History and Social Science: USI.5, USII.2 Science: 6.7
63	Define the term *natural resources*.	English: 6.4, 6.6 Science: ES.6
64	Describe the seven natural resources and their importance to the environment.	English: 6.5, 6.6, 6.7 History and Social Science: USI.2 Science: ES.6, ES.8, ES.11
65	Explain the water cycle.	English: 6.4, 6.5, 6.6, 6.7 Science: ES.6, ES.8
66	List sources of water.	English: 6.5, 6.7 Science: ES.8
67	List uses of water.	English: 6.5, 6.7 History and Social Science: USII.2 Science: ES.8
68	Discuss threats to water quality.	English: 6.5, 6.6 History and Social Science: USII.2 Science: ES.8
69	List important water conservation practices.	English: 6.5, 6.6, 6.7 Science: ES.8
70	Explain where local water comes from.	English: 6.5, 6.6, 6.7 Science: ES.8
71	List methods for conserving water in home use.	English: 6.5, 6.6, 6.7 Science: ES.8

FFA Information

The National FFA is an organization dedicated to preparing members for leadership and careers in the science, business, and technology of agriculture. Local, state, and national activities and award programs provide opportunities to apply knowledge and skills acquired through agriculture education.

For additional information about the student organization, see the National FFA website and the Virginia FFA Association website.

The following middle school guide is available for this course: Virginia Middle School Agriscience FFA Career Development Events.

Appendix: Career Cluster Information

Career Cluster: Agriculture, Food and Natural Resources	
Pathway	**Occupations**
Agribusiness Systems	**Agricultural Commodity Broker** **Agricultural Economist** **Agricultural Loan Officer** **Agricultural Products Sales Representative** **Farm Products Purchasing Agent and Buyer** **Farm, Ranch Manager** **Farmer/Rancher** **Feed, Farm Supply Store Sales Manager** **Sales Manager**
Animal Systems	**Agricultural Products Sales Representative** **Animal Breeder, Husbandry** **Animal Geneticist** **Animal Nutritionist** **Animal Scientist** **Aquacultural Manager** **Poultry Manager** **Veterinarian** **Veterinary Technician**
Environmental Service Systems	**Agricultural Products Sales Representative** **Environmental Compliance Inspector** **Environmental Sampling and Analysis Technician** **Hazardous Materials Handler** **Recycling Coordinator** **Secondary School Teacher** **Toxicologist** **Turf Farmer** **Water Conservationist**
Food Products and Processing Systems	**Biochemist** **Food Scientist**
Natural Resources Systems	**Ecologist** **Fish and Game Officer** **Fisheries Technician** **Forest Manager, Forester** **Forest Technician** **Geological Technician** **Microbiologist** **Outdoor Recreation Guide** **Park Manager** **Park Technician** **Range Technician** **Wildlife Manager**
Plant Systems	**Agricultural Products Sales Representative** **Botanist** **Certified Crop Advisor** **Crop Grower** **Custom Harvester** **Farm, Ranch Manager** **Farmer/Rancher** **Floral Designer** **Floral Shop Manager** **Forest Geneticist** **Golf Course Superintendent**

Career Cluster: Agriculture, Food and Natural Resources	
Pathway	**Occupations**
	Machine Setter, Operator **Nursery and Greenhouse Manager** **Ornamental Horticulturist** **Plant Breeder/ Geneticist** **Secondary School Teacher** **Soil and Plant Scientist** **Tree Surgeon** **Turf Farmer**
Power, Structural, and Technical Systems	**Agricultural Engineer** **Agricultural Equipment Operator** **Agricultural Equipment Parts Manager** **Agricultural Equipment Parts Salesperson** **Machinist** **Parts Manager** **Welder**