

Applied Agricultural Concepts

8072 18 weeks

8073 36 weeks

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Course Description

Suggested Grade Level: 9 or 10 or 11 or 12

Students gain positive experiences through fundamental agricultural competencies needed for rural or urban living. Areas of instruction include food production, handling, and preparation; introduction to the livestock and poultry industry; soil, soil fertility, and cultural practices; mechanical applications; plant systems and disease/pest management for shrubs, lawns, pastures, gardens, and fruit trees. The course emphasizes leadership development and participation in FFA activities. Supervised agricultural experiences will allow for enhanced learning and growth opportunities for students. Electrical, plumbing, carpentry, and metalworking lab competencies are incorporated throughout the course.

As noted in [Superintendent's Memo #058-17 \(2-28-2017\)](#), this Career and Technical Education (CTE) course must maintain a maximum pupil-to-teacher ratio of 20 students to one teacher, due to safety regulations. The 2016-2018 biennial budget waiver of the teacher-to-pupil ratio staffing requirement does not apply.

Task Essentials Table

8072	8073	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.

<input type="radio"/>	<input type="radio"/>	Apply for an FFA degree and/or an agricultural proficiency award.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Explain the purposes and roles of federal agricultural agencies.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Explain the purposes and roles of state agricultural agencies.
<input type="radio"/>	<input checked="" type="radio"/>	Identify non-governmental agricultural partners and their roles in advocacy in the community.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify marked safety areas.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify the location and use of eyewash stations.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify the location of the posted evacuation routes.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Demonstrate knowledge of safety data sheets (SDS).
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Explain the safe use of chemicals.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Demonstrate the safe use of standard and metric hand tools.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Demonstrate the safe use of power tools.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Demonstrate the safe use of precision standard and metric measuring tools.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Demonstrate the safe use of protective clothing and equipment.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Demonstrate the safe use of fire protection equipment.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Demonstrate the safe use of equipment.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Demonstrate safe practices in the agricultural mechanics lab/workshop.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify parts of a soil profile.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify types of soil particles.
<input type="radio"/>	<input checked="" type="radio"/>	Describe characteristics of different soil types.
<input type="radio"/>	<input type="radio"/>	List the major soils found in Virginia.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Explain the purpose of testing soil fertility.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Conduct a soil test.
<input type="radio"/>	<input checked="" type="radio"/>	Interpret results of a soil test.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Explain the purposes for amending the soil.
<input type="radio"/>	<input type="radio"/>	Describe Virginia laws as they apply to fertilizer application on turf and pasture.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	List types of soil erosion.

<input type="radio"/>	<input checked="" type="radio"/>	Explain the consequences of soil erosion.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify methods of controlling erosion.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Explain the use of erosion control techniques and methods used in agriculture.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Describe methods of seeding.
<input type="radio"/>	<input type="radio"/>	Prepare the seedbed for a lawn, pasture, or hayfield.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Select seed.
<input type="radio"/>	<input type="radio"/>	Seed a seedbed.
<input type="radio"/>	<input type="radio"/>	Irrigate a new lawn seedbed.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify techniques for managing a lawn or pasture.
<input type="radio"/>	<input checked="" type="radio"/>	Describe service and maintenance of agricultural equipment.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Describe common problems in grass management.
<input type="radio"/>	<input checked="" type="radio"/>	Design a year-round grass management plan.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify common trees and shrubs.
<input type="radio"/>	<input checked="" type="radio"/>	Explain the importance of pruning.
<input type="radio"/>	<input checked="" type="radio"/>	Identify pruning equipment, supplies, and best-management practices.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Plant a tree and a shrub.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Create a management plan for trees and shrubs.
<input type="radio"/>	<input type="radio"/>	Implement a management plan for trees and shrubs.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Analyze the location of a garden plot.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Calculate food needs for a family.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Estimate the yield of specific garden crops.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Determine the location of crops in the garden plot.
<input type="radio"/>	<input checked="" type="radio"/>	Select seed and plant varieties.
<input type="radio"/>	<input checked="" type="radio"/>	Prepare the seedbed for a garden.
<input type="radio"/>	<input checked="" type="radio"/>	Plant seeds and vegetable plugs.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Determine water and mulch needs for the garden.

<input checked="" type="radio"/>	<input checked="" type="radio"/>	Select appropriate time and method to water the garden.
<input type="radio"/>	<input checked="" type="radio"/>	Manage vegetable and fruit plants in the garden.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify common agricultural pests.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Explain the life cycle of pests.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Describe integrated pest management (IPM).
<input type="radio"/>	<input type="radio"/>	Describe the major types of agricultural pesticides.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Interpret pesticide labels.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Manage agricultural pests using integrated pest management.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify characteristics of ripened vegetables and fruits.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	List factors that affect the quality of vegetables and fruits.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Describe techniques for harvesting fruits and vegetables.
<input type="radio"/>	<input type="radio"/>	Evaluate fruits and vegetables for harvest.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Define <i>food safety</i> .
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Prepare food products for consumption or preservation.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Describe techniques and procedures for the safe handling of food products.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Describe storage of types of food products.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Describe food security issues.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Outline the procedure for processing fruits and vegetables.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify fruit and vegetable varieties.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Describe methods of preserving fruits and vegetables.
<input type="radio"/>	<input type="radio"/>	Demonstrate a method of preservation.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify major cuts of meat.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	List specialized meat products.
<input type="radio"/>	<input checked="" type="radio"/>	Outline the procedure for animal slaughter.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Explain the purposes of meat inspection.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Describe the types of meat inspection.

<input checked="" type="radio"/>	<input checked="" type="radio"/>	Interpret a meat product label.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	List factors to consider when selecting meats.
<input type="radio"/>	<input checked="" type="radio"/>	Rank cuts of meat according to quality grade.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Describe methods for preserving meats.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Demonstrate meat-preservation processes.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Explain common electrical terms.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify safety rules associated with the use of electrical appliances and equipment.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Calculate cost of power consumption.
<input type="radio"/>	<input checked="" type="radio"/>	Demonstrate electrical shock emergency procedures.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify electrical symbols.
<input type="radio"/>	<input type="radio"/>	Identify series and parallel circuits.
<input type="radio"/>	<input type="radio"/>	Identify tools, equipment, and supplies used in the construction and repair of electrical circuits and equipment.
<input type="radio"/>	<input type="radio"/>	Splice wires.
<input type="radio"/>	<input type="radio"/>	Install an electrical fixture.
<input type="radio"/>	<input type="radio"/>	Evaluate electrical problems.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify safety rules associated with the use of plumbing equipment.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify tools, equipment, and supplies used for the installation of plumbing fixtures.
<input type="radio"/>	<input checked="" type="radio"/>	Identify pipe and pipe fittings.
<input type="radio"/>	<input checked="" type="radio"/>	Determine the length of pipe to be cut.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Combine lengths of pipe.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Demonstrate the safe use of woodworking equipment.
<input type="radio"/>	<input checked="" type="radio"/>	Identify tools, equipment, and materials used in woodworking.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Determine materials needed for a project.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Demonstrate layout procedures for a project.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Identify fasteners.

<input checked="" type="radio"/>	<input checked="" type="radio"/>	Demonstrate fastening techniques.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Construct a woodworking project.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Apply a finish to a woodworking project.
<input type="radio"/>	<input type="radio"/>	Demonstrate the safe use of metalworking equipment.
<input type="radio"/>	<input type="radio"/>	Identify tools, equipment, and materials used in metalworking.
<input type="radio"/>	<input type="radio"/>	Demonstrate a metalworking process.
<input type="radio"/>	<input type="radio"/>	Apply a finish to a metalworking project.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Research the history of the domestication of farm animals.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Explain the function of livestock.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Describe the scope and importance of the livestock and poultry industry in the United States.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Analyze commercially important livestock breeds in Virginia.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Describe issues related to animal welfare and animal rights.
<input checked="" type="radio"/>	<input checked="" type="radio"/>	Examine the role of show animals in the development of brood stock.

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](#)

[Virginia SAE Record Book](#)

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?

Identifying the Purposes and Roles of Agricultural Agencies

Task Number 44

Explain the purposes and roles of federal agricultural agencies.

Definition

Explanation should include the types of agencies, the missions and visions of agencies, and the influence of agencies upon the local community. Some agencies include

- U.S. Department of Agriculture (USDA) and its agencies (e.g., service center)
- Food and Drug Administration (FDA)
- Environmental Protection Agency (EPA).

Process/Skill Questions

- What are three federal agricultural agencies that affect agricultural enterprises? What are their purposes and roles?
- What resources do these agencies provide for local residents?

- What types of regulations are these federal agencies responsible for?

Common Career Technical Core

AG1

Analyze how issues, trends, technologies and public policies impact systems in the Agriculture, Food & Natural Resources Career Cluster.

Task Number 45

Explain the purposes and roles of state agricultural agencies.

Definition

Explanation should include the types of agencies based at the state level, the missions and visions of the agencies, and the influence of agencies upon the local community. Some agencies include

- Virginia Department of Agriculture and Consumer Services
- Virginia Department of Environmental Quality
- Virginia Cooperative Extension
- soil and water conservation districts.

Process/Skill Questions

- What are three state agricultural agencies that have an effect on our area?
- What resources do these agencies provide for local residents?

Common Career Technical Core

AG1

Analyze how issues, trends, technologies and public policies impact systems in the Agriculture, Food & Natural Resources Career Cluster.

Task Number 46

Identify non-governmental agricultural partners and their roles in advocacy in the community.

Definition

Identification should include local agencies such as, but not limited to

- farm credit agencies (i.e., Colonial Farm Credit, Farm Credit of the Virginias)
- Virginia Farm Bureau Federation

- various trade associations.

Process/Skill Questions

- How do agricultural service agencies benefit your community?
- How do agricultural service agencies work together to support agriculture in your community?
- How do agricultural service agencies promote involvement in agricultural pursuits?

Applying Safety Practices in the Agricultural Mechanics Lab/Workshop

Task Number 47

Identify marked safety areas.

Definition

Identification should include describing and translating signage and special markings (e.g., floor paint) that identify work and caution areas.

Process/Skill Questions

- What are the different types of work zones?
- How does one know if additional safety equipment or clothing is required to enter a safety area?
- How are walkways identified in the lab/workshop area?

Task Number 48

Identify the location and use of eyewash stations.

Definition

Identification should include describing the signage and operating procedures for the unit.

Process/Skill Questions

- What is the color of the sign that signifies an eyewash station?
- When should one use an eyewash station?
- What safety equipment provides additional eye protection?

Task Number 49

Identify the location of the posted evacuation routes.

Definition

Identification should include

- events that could trigger an evacuation
- the location and interpretation of the posted evacuation route
- the destination and procedures for evacuation.

Process/Skill Questions

- What route should one follow in the event of an evacuation?
- Where should the evacuation route be posted?
- Why is it important to establish a meeting place in the event of an evacuation?

Task Number 50

Demonstrate knowledge of safety data sheets (SDS).

Definition

Demonstration should include identifying

- the location of the sheets within the agricultural mechanics lab/workshop and the purpose they serve
- the administration's (ownership's) responsibility for workers' health and safety
- laws/regulations and practices affecting workers' health and safety
- health and safety hazards
- health and safety programs and the responsibility for environmental stewardship
- environmental laws, regulations, and practices
- sustainability initiatives.

Process/Skill Questions

- What environmental concerns should an industry address?
- What environmentally friendly practices and resources are available to an industry?
- What type of mandatory training should employees receive to motivate them to become involved in effective health, safety, and environmental practices?

Task Number 51

Explain the safe use of chemicals.

Definition

Explanation should include the safe use of different types of solvents, soaps, cleaning solutions, fuel, oils, lubricants, specialty additives, and gases.

Demonstration should also emphasize the correct use, the hazards, and the precautions associated with each, in accordance with manufacturers' instructions and government regulations.

Process/Skill Questions

- Why is it important to read the manufacturer's directions prior to using chemicals?
- What are the possible consequences of using chemicals incorrectly?
- Where should chemicals be stored in the agricultural lab/workshop?
- What is an SDS?

Task Number 52

Demonstrate the safe use of standard and metric hand tools.

Definition

Demonstration should include the various types of hand tools (including specialty tools, fasteners, and measuring tools) used in agricultural mechanics. Demonstration should emphasize the correct use, the hazards, the precautions, and the maintenance procedures associated with each, in accordance with manufacturers' instructions and government regulations.

Hand tools should include

- common end wrenches
- various socket set components
- various wrenches
- various screwdrivers
- various styles of pliers
- various hammers
- various punches and chisels
- specialty cutting tools (e.g., hack saw, tubing cutter, hand reamer, file)
- specialty electrical system tools (e.g., volt/ohmmeter, dwell/tachometer, continuity light, timing light, remote starter switch)
- battery specialty tools (e.g., cable puller, terminal and post cleaner, battery lifting or carrying strap)
- lubrication specialty tools (e.g., transmission funnel, oil filter-removing tool, grease gun)
- other miscellaneous specialty tools (e.g., air nozzle, C-clamp, puller set, pressure gauge, screw extractor).

Process/Skill Questions

- Why is it important to use the proper hand tool for each job?
- When a wrench is used, why should it always be pulled toward the body?
- Why is it necessary to keep hand tools clean and free of grease?

Task Number 53

Demonstrate the safe use of power tools.

Definition

Demonstration should include the various types of power tools (including pneumatic and electric tools) encountered in agricultural mechanics. Demonstration should emphasize the correct use, the hazards, the precautions, and the maintenance procedures associated with each, in accordance with manufacturers' instructions and government regulations.

Power tools could include but are not limited to

- air impact gun
- air hammer
- air ratchet
- air drill
- drop light
- electric drill
- electric grinder.

Process/Skill Questions

- What precautions should be taken when adjustments are made to power tools?
 - Why is training on the use of a power tool necessary before using it?
-

Task Number 54

Demonstrate the safe use of precision standard and metric measuring tools.

Definition

Demonstration should include micrometers, dial indicators, torque wrenches, and other manufacturers' specialty tools.

Process/Skill Questions

- How does heat affect the micrometer?
 - Why are standard and quality tools necessary when repairing agricultural machinery and equipment?
 - What is torque? Why is proper torque important?
-

Task Number 55

Demonstrate the safe use of protective clothing and equipment.

Definition

Demonstration should include the types of protective clothing and equipment (e.g., protection of the eyes, respiratory system, auditory functions, feet, hands, and body) and grooming/hygiene (e.g., precautions related to hair length; loose clothing/jewelry; greasy hands, shoes, or clothing; dirty or scratched eye protection).

Demonstration should include the correct use, the hazards, and the precautions associated with each, in accordance with manufacturers' instructions and government regulations concerning hazardous material and lab safety.

Process/Skill Questions

- What hazards exist due to loose-fitting clothing or long hair?
 - When is it advisable to use goggles in an agricultural mechanics lab/workshop?
 - Would it ever be necessary to wear ear protection in an agricultural mechanics lab/workshop?
 - Why are steel-toed boots or shoes worn in the agricultural mechanics labs/workshops?
-

Task Number 56

Demonstrate the safe use of fire protection equipment.

Definition

Demonstration should include

- different types of fires encountered in the agricultural science and mechanics field (Class A, B, C, and D)
- appropriate types of extinguishers to use with each fire
- hazards and the precautions associated with each
- fire emergency procedures that follow government regulations and instructor's guidelines.

Process/Skill Questions

- What are the different types of fire extinguishers?
 - Is the fire extinguisher in the lab/workshop appropriate for all types of fires? Explain.
 - What procedure should students follow in case of an emergency or accident?
-

Task Number 57

Demonstrate the safe use of equipment.

Definition

Demonstration should include the different types of equipment used in the agricultural mechanics field, along with the correct use, the hazards, and the precautions associated with each, in accordance with manufacturer's specifications and instructor's guidelines. Equipment may include, but is not limited to

- pneumatic equipment (e.g., tire machine, pneumatic jack)
- hydraulic equipment (e.g., floor jack, lift rack, hydraulic press, engine hoist)
- electrical equipment (e.g., bench grinder, drill press, battery testers and chargers).

Process/Skill Questions

- What are unsafe uses of air compressors in the agricultural lab/workshop?
 - What is the safest way to hold a part in a vise?
 - When is the cleaning tank used?
-

Task Number 58

Demonstrate safe practices in the agricultural mechanics lab/workshop.

Definition

Demonstrating safe practices must include

- passing written tests with 100% accuracy on
 - general lab/workshop safety
 - safety and operating procedures for all tools, equipment, and machinery
 - the major parts of all tools, equipment, and machinery
- passing a proficiency/performance test with 100% accuracy for all tools, equipment, and machinery
- following manufacturer's instructions and reviewing safety manuals, when applicable
- following all safety guidelines and procedures when using tools, equipment, and machinery in the agricultural mechanics lab/workshop
- selecting appropriate personal protective equipment (PPE) for the operation of concern
- following the safety standards and regulations of the U.S. Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), the Equipment and Engine Training Council (EETC) Education Committee, and safety data sheets (SDS).

Process/Skill Questions

- What information should be sent with emergency responders to the hospital with the student if a chemical was splashed in an eye or wound?
- Are school labs/workshops required to follow state and national safety standards? Explain.

- What agency requires labs/workshops and businesses to use the services of companies such as Safety-Kleen?
 - What are the dangers of running an engine in a confined space without proper ventilation?
 - Why is it important to achieve 100 percent accuracy on tests regarding safety and operating procedures before using tools, equipment, and machinery?
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Identifying the Components of Soil

Task Number 59

Identify parts of a soil profile.

Definition

Identification should include

- soil horizons
- organic and inorganic components
- parent material.

Process/Skill Questions

- How do soil horizons affect plant growth?
- What are the components of a soil profile?
- How does the parent material affect the makeup of soil?

Task Number 60

Identify types of soil particles.

Definition

Identification should include

- the soil triangle (sand, silt, and clay) and its relationship to soil texture
- pore space (air and water)
- organisms
- organic matter.

Process/Skill Questions

- How can soil particle makeup be determined in a soil sample?
- How do the sizes of sand, silt, and clay compare?
- What effect does air and water space have on the agricultural productivity of a soil?
- How can organisms affect soil quality?
- How does organic matter affect the nutrient- and water-holding capacity and aeration of soil?

Task Number 61

Describe characteristics of different soil types.

Definition

Description should include

- using soil maps and data on [Web Soil Survey](#)
 - soil rating scale
 - area of interest (AOI)
- soil suitability for a given purpose (e.g., production, construction, forestry, drain field)
- major soils found in Virginia.

Process/Skill Questions

- What information can be found on the Web Soil Survey?
- What is the appropriate use for a particular piece of land (e.g., school grounds, a field, a home site)?
- What are the major soil textural classes of Virginia's regions?
- How do land capability classes affect the use of the land?
- How does soil textural class play a role in evaluating the effects of land use on soil quality indicators?
- What is the state soil of Virginia?

Task Number 62

List the major soils found in Virginia.

Definition

List should include

- texture classification
- land capability classes
- agricultural use of Virginia soils
- effects of soil on agricultural production and land development.

Process/Skill Questions

- What are the major textural classes of Virginia's regions?
- How do land capability classes affect the use of the land?
- What agricultural products can be found in Virginia's major soil textural classes?

Interpreting Soil Fertility and Test Results

Task Number 63

Explain the purpose of testing soil fertility.

Definition

Explanation should include

- determining current soil analysis
- identifying lawn or pasture growth needs
- describing conservation of soil amendments.

Process/Skill Questions

- Why should soil be tested prior to application of soil amendments?
- How can soil testing help determine land use?

Task Number 64

Conduct a soil test.

Definition

Conducting a soil test should include

- selecting sample sites
- collecting soil samples
- describing soil collection methods
- selecting a soil analysis lab.

Process/Skill Questions

- How are the number and location of samples sites determined?
- What are the procedures for collecting soil samples?
- What are the available options for soil analysis labs?

Task Number 65

Interpret results of a soil test.

Definition

Interpretation should include

- describing the components of a soil test report
- analyzing recommendations for soil amendments.

Process/Skill Questions

- What information is provided in a soil analysis report?
- How can the needs of the soil be determined after reading a report?
- How can soil test reports save input costs for farmers and landowners?
- How should one explain a soil report's recommendations to a client?

Task Number 66

Explain the purposes for amending the soil.

Definition

Explanation should include

- describing the effects of pH levels on plant growth
- describing macronutrient effects on plant growth
- describing micronutrients effects on plant growth
- describing organic matter content on soil fertility
- describing a fertilizer analysis.

Process/Skill Questions

- How can the pH of soil be altered?
- How long does it take for lime or sulfur to neutralize soil pH?
- What are the effects of nitrogen, phosphorus, and potassium on plant growth?
- What are the essential micronutrients in soil, and how can they affect plant growth?
- What is cation exchange capacity (CEC)? How can it be increased?

Task Number 67

Describe Virginia laws as they apply to fertilizer application on turf and pasture.

Definition

Description should include

- understanding the Virginia Fertilizer Law

- identifying license requirements for distribution and application of fertilizer products (e.g., lime, fertilizer)
- identifying fertilizer products that must be registered before use (e.g., lime, fertilizer).

Process/Skill Questions

- Who needs a license to distribute and apply fertilizer products?
- What are the licensing requirements?
- Why are there licensing requirements?

Conserving and Managing Soil

Task Number 68

List types of soil erosion.

Definition

List should include the following types of erosion and the causes of each:

- splash
- sheet
- rill
- gully
- scalding
- wind
- water
- tillage.

Process/Skill Questions

- How does water erode soil?
- How does wind erode soil?

Task Number 69

Explain the consequences of soil erosion.

Definition

Explanation should include

- describing effects on fertility and land productivity

- describing downstream sedimentation
- describing effects related to water and air pollution.

Process/Skill Questions

- How does erosion affect soil fertility?
- What are the effects of excessive sedimentation on the Chesapeake Bay?
- How does soil erosion affect water quality?

Task Number 70

Identify methods of controlling erosion.

Definition

Identification should include methods for controlling erosion on

- home sites
- agricultural land
- forested land
- construction sites
- industrial sites
- urban sites.

Process/Skill Questions

- How can homeowners control the effects of erosion?
- What agricultural practices can be used to control erosion?
- What governmental regulations affect construction site erosion control?
- How do urban areas affect downstream erosion?

Task Number 71

Explain the use of erosion control techniques and methods used in agriculture.

Definition

Explanation should include

- conservation tillage
 - no-till
 - ridge-till
 - mulch-till
 - strip-till
- cover crops, green manures, and mulches
- crop rotations

- multiple cropping systems
- contour farming
- strip farming
- terrace farming
- grass waterways
- diversion structures
- agricultural best management and sustainability practices.

Process/Skill Questions

- How can multiple cropping systems be used to conserve soil?
- What crops can be used in multiple cropping systems?
- How do no-till systems improve soil retention, fertility, and overall soil health?

Establishing a Lawn, Pasture, or Hayfield

Task Number 72

Describe methods of seeding.

Definition

Description should include

- hydroseeding
- broadcast seeding
- planting with plugs and sprigs
- overseeding existing grasses
- installing sod.

Process/Skill Questions

- Which method of seeding is most effective for a given area (i.e., large vs. small, different types of grasses, different landscapes, etc.)?
- Which types of grasses are more effective when planted as plugs or sprigs?
- When would sod be the best option for a lawn?
- When is the proper time for overseeding a grassed area?

Task Number 73

Prepare the seedbed for a lawn, pasture, or hayfield.

Definition

Preparation should include

- using cultivation techniques
- erosion control methods (e.g., mulch, erosion mats)
- selecting soil amendments (e.g., peat moss, organic matter).

Process/Skill Questions

- What mechanical practices can be used to cultivate a seedbed?
- How can seedbed requirements be determined for a particular seed?
- What factors determine soil-amendment selection for a particular yard or field?

Task Number 74

Select seed.

Definition

Selection should include

- determining growing conditions
- identifying types of grasses
- identifying desired maintenance requirements (e.g., lawn, pasture)
- determining forage quality for livestock, if needed (i.e., for a pasture)
- analyzing seed quality
- testing seed germination
- calculating seeding rates for a given area (density, germination rate, row spacing in inches and metric).

Process/Skill Questions

- How do growing conditions and climate affect seed selection?
- What factors determine the selection of pasture grasses?
- What lawn or pasture grasses work best in your growing area?

Task Number 75

Seed a seedbed.

Definition

Seeding should include

- applying the seed
- identifying components of a starter fertilizer
- applying fertilizer.

Process/Skill Questions

- What methods can be used to apply seed to a seedbed?
- What are the key components of a starter fertilizer?
- Why would a fertilizer specifically designed for starting grasses be selected over a general or multipurpose fertilizer?
- How do different fertilizer application techniques affect plant growth?

Task Number 76

Irrigate a new lawn seedbed.

Definition

Irrigating should include

- identifying types of seeding mulch
- selecting irrigation/watering requirements
- using effective irrigation/watering techniques.

Process/Skill Questions

- What type of seeding mulch should be used for large fields? Half-acre lawns? Small spots in a yard? High-wind areas? Uneven landscapes?
- How can irrigation/watering needs be determined for new lawn seedbeds?
- How can the irrigation/watering method adversely affect seed growth?

Managing an Established Lawn or Pasture

Task Number 77

Identify techniques for managing a lawn or pasture.

Definition

Identification should include

- determining the height of grass
- determining the time between cuttings or after seeding
- selecting the type of equipment used
- studying the topography of the area.

Process/Skill Questions

- How much grass should be removed at each mowing?

- How does the topography of the land affect the choice of mowing equipment?

Task Number 78

Describe service and maintenance of agricultural equipment.

Definition

Description should include, but is not limited to,

- cleaning or changing the air filter
- changing the oil and filter
- sharpening or replacing blades
- inspecting spark plug(s) and changing, if necessary
- inspecting carburetor and cleaning, if necessary
- inspecting fuel filter and replacing, if necessary
- inspecting/checking tire pressure and adding air, if necessary
- using the correct fuel type or mixture.

Process/Skill Questions

- Why is equipment maintenance important?
- How often should one perform maintenance on various pieces of agricultural equipment?

Task Number 79

Describe common problems in grass management.

Definition

Description should include problems with

- pests
 - undesirable plants
 - diseases and fungi
 - insects
 - animals
- soils
 - compaction
 - winter scald
 - summer scald
- moisture
 - irrigation
- mowing
- chemicals.

Process/Skill Questions

- How does thatch develop?
- How does one correct a thatch buildup?
- How does one determine the amount of water that a grass area needs?
- What problem(s) can be solved by aerating a lawn?

Task Number 80

Design a year-round grass management plan.

Definition

Design should include

- soil test
- mowing, trimming, and/or dethatching
- fertilization schedule
- weed management practices
- irrigation/watering schedule
- aeration schedule
- equipment needed.

Process/Skill Questions

- How can a grass management plan be beneficial?
- What equipment is needed for a landscape lawn plan vs. a pasture grass plan?
- How can one use spreadsheet applications to maintain a management schedule?

Managing Trees and Shrubs

Task Number 81

Identify common trees and shrubs.

Definition

Identification should include

- fruit trees
- deciduous trees
- coniferous trees and evergreens
- ornamentals
- trees vs. shrubs
- foliage vs. flowering

- determining where tree and shrub varieties would thrive based on the [USDA Hardiness Zone](#).

Process/Skill Questions

- Why is it important to understand a tree's hardiness zone?
- What elements need to be considered prior to selecting a tree or shrub for a playground? Below a power line? Next to a house?

Task Number 82

Explain the importance of pruning.

Definition

Explanation should include

- shaping
- removing disease
- increasing fruit production
- timing of pruning.

Process/Skill Questions

- Why is timing important in the pruning of spring-flowering shrubs?
- How does pruning affect fruit production?
- How can one influence the shape of a tree by pruning?

Task Number 83

Identify pruning equipment, supplies, and best-management practices.

Definition

Identification could include, but is not limited to,

- pruning saw
- pruners
- loppers
- shears
- pole pruner
- shearing knife
- chainsaw
- cleaners and disinfectants.

Process/Skill Questions

- How does the design of a pruning saw enable it to cut green wood?
- What diameter of limb can a hand pruner safely cut?
- What are possible consequences of pruning with tools that have not been sanitized?

Task Number 84

Plant a tree and a shrub.

Definition

Planting should include

- determining the type of tree planting (e.g., ball and burlap, container, bare root)
- calculating the depth and width of the hole
- identifying required soil amendments
- staking the tree or shrub
- mulching the tree or shrub
- watering the tree or shrub.

Process/Skill Questions

- What determines the planting width and depth of the hole for a tree? Why is this critical?
- What are the differences between ball-and-burlap, container-grown, and bare-root trees? What special considerations are required for each when planting?

Task Number 85

Create a management plan for trees and shrubs.

Definition

Creation of a plan should include species-specific requirements regarding

- irrigation/watering
- mulching
- pruning
- fertilizing
- pest management.

Process/Skill Questions

- What are the benefits of mulching a tree?
- How does one determine the fertilizer needs of a tree or shrub?

Task Number 86

Implement a management plan for trees and shrubs.

Definition

Implementation should include

- irrigation/watering
- mulching
- pruning
- fertilizing
- pest management.

Process/Skill Questions

- What is the depth of mulch that should be applied around a tree or shrub?
 - What obstacles arose while implementing your management plan?
-
-

Designing a Garden Layout

Task Number 87

Analyze the location of a garden plot.

Definition

Analysis should include

- cost of materials, labor, and inputs
- soil type
- water availability
- hours of sunlight
- options for small-space gardening.

Process/Skill Questions

- What gardening alternatives exist for people with limited space?
- What steps can be taken to restore the health of a garden space that has poor quality soil?
- How many hours of sunlight should a garden receive per day?
- Why should one avoid designing a garden right next to a house?

Task Number 88

Calculate food needs for a family.

Definition

Calculation should include

- size of family
- age of family members
- dietary restrictions.

Process/Skill Questions

- How many square feet of garden space does a typical family of four need?
 - What is the typical fruit and vegetable consumption of a person in the United States?
-

Task Number 89

Estimate the yield of specific garden crops.

Definition

Estimation should include

- calculating the pounds/bushels per acre/square foot
- calculating pounds per plant.

Process/Skill Questions

- How many plants would one need to supply fresh tomatoes for a family of four?
- How many pounds of tomatoes would be needed to can 25 quarts of tomato sauce?
- What is the yield in pounds for a 50-foot row of sweet corn?

Task Number 90

Determine the location of crops in the garden plot.

Definition

Determining factors should include

- light requirements
- soil requirements

- water requirements
- crop architecture
- spacing of plants
- risks and constraints.

Process/Skill Questions

- How does the amount of light received affect the placement of plants in the garden?
- What soil factors should one consider prior to placing plants in the garden?
- What problems can arise if plants are not spaced properly?

Planting the Garden

Task Number 91

Select seed and plant varieties.

Definition

Selection should include

- quality
- days to harvest
- heirloom varieties
- cost
- germination rate.

Process/Skill Questions

- What benefits do heirloom varieties have over hybrid varieties?
 - What benefits do hybrid varieties have over heirloom varieties?
 - What factors affect the cost of seed?
-

Task Number 92

Prepare the seedbed for a garden.

Definition

Preparation should include

- tilling
- amending the soil
- mulching.

Process/Skill Questions

- What are different methods of tilling a seedbed?
 - How does proper seedbed preparation increase yield?
-

Task Number 93

Plant seeds and vegetable plugs.

Definition

Planting should include

- identifying planting depth
- spacing
- watering
- applying a starter solution.

Process/Skill Questions

- What are the effects of improper planting depth?
- Why is it necessary to water plants and seeds as soon as they are planted?

Managing the Garden

Task Number 94

Determine water and mulch needs for the garden.

Definition

Determination should include

- crops being grown
- average rainfall
- soil type
- mulch type.

Process/Skill Questions

- How does over-watering affect garden plants?
 - Why does soil type affect the watering needs of garden plants?
-

Task Number 95

Select appropriate time and method to water the garden.

Definition

Selection should include

- identifying the crops being grown
- calculating water needs
- estimating average rainfall
- identifying the soil type
- estimating soil water storage
- determining irrigation method.

Process/Skill Questions

- Why is timing important when watering a garden?
- What methods are available for watering a garden?
- What irrigation methods are most efficient? Why?

Task Number 96

Manage vegetable and fruit plants in the garden.

Definition

Management practices should include

- pruning
- thinning
- training
- weeding.

Process/Skill Questions

- What are the differences between grapevine and fruit tree management?
 - What are different methods and systems used for training grapevines?
-

Managing Agricultural Pests

Task Number 97

Identify common agricultural pests.

Definition

Identification should include, but not be limited to,

- fungi
- weeds
- arthropods, including insects
- bacteria
- viruses
- vertebrates
- mollusks.

Process/Skill Questions

- What is the most common plant pest?
- Why is identification of pests important?
- What is the difference between a harmful and a beneficial organism?

Task Number 98

Explain the life cycle of pests.

Definition

Explanation should include

- the life cycle of bacteria
- weeds (i.e., perennial, annual, and biennial)
- arthropods (complete and partial metamorphosis)

Process/Skill Questions

- Why is it important to understand the life cycle of a pest?
- What are the phases in an insect's life cycle?
- What is the most vulnerable stage of a given pests' life cycle? Explain.

Task Number 99

Describe integrated pest management (IPM).

Definition

Description should include

- scouting and documenting
- monitoring techniques
- pest identification
- management options including, but not limited to, ecological approaches and cultural practices.

Process/Skill Questions

- Why is IPM important to environmental protection?
- What are the strategies associated with IPM?

Task Number 100

Describe the major types of agricultural pesticides.

Definition

Description should include

- identifying the target species (e.g., weeds, insects, rodents)
- differentiating between restricted use and general use
- differentiating between organic and inorganic
- differentiating between selective and non-selective
- identifying available formulations.

Process/Skill Questions

- What are the different modes of delivery for pesticides?
- Why is it important to select the correct pesticide when trying to manage agricultural pests?
- Why is it important to understand the life cycle of a pest when choosing a pesticide?

Task Number 101

Interpret pesticide labels.

Definition

Interpretation should include

- understanding of signal words
- identifying active vs. inert ingredients
- identifying personal protective equipment required
- understanding the application method and rate
- identifying the chemical name vs. trade name
- understanding that the label is a legal document
- stating the first aid procedure for accidental exposure
- describing the formulation of the pesticide.

Process/Skill Questions

- What can happen to a person spraying pesticide without wearing the required PPE as stated on the product label?
- What are the three most common pesticide signal words?

Task Number 102

Manage agricultural pests using integrated pest management.

Definition

Management should include

- identification of pest (scouting)
- selection of control method
- application of selected method.

Process/Skill Questions

- Why is it important to identify the pest?
- What factors are considered when selecting the control method?

Harvesting the Garden

Task Number 103

Identify characteristics of ripened vegetables and fruits.

Definition

Identification should include

- color

- size
- firmness
- aroma.

Process/Skill Questions

- What are the negative effects of over-ripening fruits and vegetables?
- What are the benefits of harvesting fruits and vegetables when ripe?
- What fruits and vegetables can be ripened after being harvested?

Task Number 104

List factors that affect the quality of vegetables and fruits.

Definition

List should include

- water content
- sugar content
- stage of ripeness
- mechanical damage
- size
- disease
- pest damage.

Process/Skill Questions

- How does overall quality affect consumer satisfaction?
- How does quality control increase profit?

Task Number 105

Describe techniques for harvesting fruits and vegetables.

Definition

Description should include

- manual harvesting methods
- mechanical harvesting methods
- selecting the technique by crop type
- “pick your own” gardens.

Process/Skill Questions

- What factors should one consider when selecting a harvesting technique?

- What problems can be encountered when operating a “pick your own” garden?

Task Number 106

Evaluate fruits and vegetables for harvest.

Definition

Evaluation should include, but not be limited to

- ripeness of the produce
- freedom from defects.

Process/Skill Questions

- How are tomatoes removed from a plant?
 - What methods can be used to increase shelf life after harvest?
 - What time of day is best for harvesting fruits and vegetables?
-
-

Applying Principles of Food Safety

Task Number 107

Define *food safety*.

Definition

Definition should include

- identifying local, state, and federal food safety regulations
- following local, state, and federal agency expectations for food safety
- handling and storage based on local, state, and federal agency recommendations
- taking specific steps to ensure food safety for continued use or food access
- identifying safe sources of water and potential hazards of contamination.

Process/Skill Questions

- What local agency establishes food safety recommendations? What state agency? What federal agency?
- What determines the procedures for safely handling foods?
- What may result from improper handling of foods?

Task Number 108

Prepare food products for consumption or preservation.

Definition

Preparation should include

- determining the correct preparation method
- identifying equipment or resources needed
- conducting activities to ensure food safety (e.g., temperature monitoring during cooking, before serving).

Process/Skill Questions

- What determines the preparation method for food items to be consumed or preserved?
- What factors must be considered when cooking food items (e.g., time, temperature, product)?

Task Number 109

Describe techniques and procedures for the safe handling of food products.

Definition

Description should include the selecting, obtaining, inspecting, transporting, cleaning, and use of the food item, and the pre- and post-use activities to meet food quality and ServSafe safety standards. Description should include the use of all safety precautions and PPE.

Process/Skill Questions

- What hazards should one consider when handling food items?
- What preventive measures should one take to prevent food contamination?
- What criteria are used to establish proper handling of prepared foods?

Task Number 110

Describe storage of types of food products.

Definition

Description should include selecting a method to ensure food safety (e.g., refrigeration, freezing, room temperature) and a type of storage (e.g., freezer bags).

Process/Skill Questions

- What determines the type of storage method to be used?
- What determines the type of storage container to be used, if needed?
- What preventive measures should be taken to ensure product freshness?

Task Number 111

Describe food security issues.

Definition

Description should include a definition of food security and issues such as

- natural and manmade disasters
- cybersecurity
- agroterrorism
- accidents
- phytosanitation
- animal diseases
- zoonoses.

Process/Skill Questions

- What components of the food industry are especially vulnerable to cyber attacks?
- How can natural disasters affect food security?
- How can crop selection address the threats of climate change?

Processing Fruits and Vegetables

Task Number 112

Outline the procedure for processing fruits and vegetables.

Definition

Outlining will depend upon

- the types of fruits and vegetables chosen
- the type of process (e.g., whole, canned, sliced)
- the types of fruits and vegetables that are available locally.

Process/Skill Questions

- What are the different procedures for processing fruits?

- What are the different procedures for processing vegetables?
- What determines the procedure for processing a specific food item?

Task Number 113

Identify fruit and vegetable varieties.

Definition

Identification should include

- differentiating among physical characteristics
- stating the plant's common name
- determining the growing season
- stating the best use for the fruit or vegetable.

Process/Skill Questions

- What steps are used to identify fruits?
- What steps are used to identify vegetables?
- What are the differences between fruits and vegetables?

Task Number 114

Describe methods of preserving fruits and vegetables.

Definition

Description should include processes involving

- canning
- freezing
- drying
- salting
- fermenting
- pickling.

Process/Skill Questions

- What would cause spoilage of a fruit or vegetable?
- What determines the best preservation method?
- How is food preservation beneficial?

Task Number 115

Demonstrate a method of preservation.

Definition

Demonstration should include

- selecting a method
- obtaining required materials and equipment
- following safety procedures
- evaluating the preservation process.

Process/Skill Questions

- What are the proper safety procedures for preserving food?
 - How do we determine success or failure of the process used to preserve food?
 - What determines the correct method to be used?
-
-

Identifying and Processing Meats

Task Number 116

Identify major cuts of meat.

Definition

Identification should include

- describing primal and subprimal cuts (i.e., wholesale and retail)
- differentiating among species (i.e., beef, pork, lamb, veal, and poultry)
- locating retail subprimal cuts on the animal
- differentiating among cut types
- differentiating among cooking types.

Process/Skill Questions

- What are the primal cuts of meat?
- What are the subprimal cuts of meat?
- How would one tell the difference between primal and subprimal cuts?
- What are the characteristics of meat from each species?

Task Number 117

List specialized meat products.

Definition

List should include

- processed meats (i.e., hamburger, hot dogs, bologna, and sausage)
- variety meats (i.e., heart, liver, and tongue).

Process/Skill Questions

- What primal or subprimal cuts can be used to create specialty meats?
- How would the consumer determine which subprimal cuts and species of animal are used in specialty meats?
- What are common consumer objections to specialty meats (e.g., additives, mechanically separated meats)?

Task Number 118

Outline the procedure for animal slaughter.

Definition

Outline should include

- humane animal handling procedures
- Humane Methods of Livestock Slaughter Act of 1958/1978
- methods for stunning animals
- animal evisceration and draining of blood
- handling and disposal of offal
- methods of cutting animals into primal cuts
- hazard analysis and critical control points (HACCP)
- meat-aging techniques and procedures.

Process/Skill Questions

- How is humane slaughter defined?
- Who is responsible for ensuring that humane slaughter practices are followed at slaughterhouses?
- What are humane methods for stunning animals?
- What products can be created from offal?
- How are hazard analysis and critical control points implemented in slaughter facilities?
- How has technology and mechanization changed the process for slaughtering animals?
- What are the meat-aging processes for various animal species?

Inspecting, Grading, and Labeling Meats

Task Number 119

Explain the purposes of meat inspection.

Definition

Explanation should include

- describing food safety issues that may arise during processing
- identifying federal and state agencies that regulate meat inspection
- describing standards that must be met in the inspection process
- identifying federal regulations for meat inspection, including
 - Federal Meat Inspection Act
 - Wholesome Meat Act of 1967
 - Poultry Products Inspection Act
- identifying different levels of regulation, based on the size of a slaughter facility
- describing regulations that affect direct-to-consumer farm sales.

Process/Skill Questions

- Why are slaughter facilities subject to meat inspection?
- Who is in charge of overseeing the meat inspection process?
- What can happen to meat if proper procedures are not followed?
- How do regulations change, based on the size of the slaughter operation?

Task Number 120

Describe the types of meat inspection.

Definition

Description should include

- antemortem inspection practices
- postmortem inspection practices
- bovine spongiform encephalopathy (BSE) testing in cattle
- imported meat-product inspection practices.

Process/Skill Questions

- What factors would exclude an animal from slaughter for human consumption?
- What is involved in the postmortem inspection of animals?
- How does the inspection of imported products differ from domestic products?
- What causes BSE? Can BSE be transmitted to humans?

Task Number 121

Interpret a meat product label.

Definition

Interpretation should include

- identifying components of a meat product label
- describing implications of meat product ingredients
- describing country of origin labeling
- describing common additives to meat products and their effects
- identifying voluntary information on a meat label.

Process/Skill Questions

- What is included in a meat product label?
 - Why are additives included in meat products?
 - Why is it important to know the country of origin for meat products?
 - What voluntary information can be placed on a meat product label to add value?
-

Task Number 122

List factors to consider when selecting meats.

Definition

List should include

- the intended purpose for the meat (i.e., direct consumption, further processing)
- the consumer's preference
- quality grading
- price considerations
- serving size
- health benefits.

Process/Skill Questions

- What factors affect the quality of a cut of meat?
 - Which subprimal (retail) cuts would be best for grilling? For roasting? For baking? For slow cooking?
 - How do the current prices of meats compare on a per-pound basis?
-

Task Number 123

Rank cuts of meat according to quality grade.

Definition

Ranking of cuts should include

- maturity of the animal at slaughter
- meat marbling grades
- degree of marbling
- quality grades for each type of animal.

Process/Skill Questions

- How does animal maturity affect meat quality?
 - What is the difference between intramuscular fat (marbling) and intermuscular fat?
 - How does marbling affect meat quality and taste?
 - What are the different quality grades for each type of animal?
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Preserving Meats

Task Number 124

Describe methods for preserving meats.

Definition

Description should include

- salt-curing
- sugar-curing
- dehydrating
- canning
- freezing.

Process/Skill Questions

- What is the process for salt-curing meat?
- How are meats sugar-cured?

- How does dehydration affect meat quality?
- What sealing procedures can be used to preserve frozen meat?
- How would a consumer determine which method of meat preservation is most desirable?

Task Number 125

Demonstrate meat-preservation processes.

Definition

Demonstration should include

- visiting a meat processing facility, in person or virtually
- preserving meat using one of the following methods
 - salt cure
 - sugar cure
 - dehydration
 - canning
 - freezing.

Process/Skill Questions

- What are the ingredients of a salt or sugar cure?
 - What is the dehydrating temperature for different types of meat?
 - What are the differences in applying liquid and dry cures for meat?
-
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Performing Electrical Operations

Task Number 126

Explain common electrical terms.

Definition

Explanation should include defining the terms *watts*, *amps*, *volts*, and *ohms* in accordance with the National Electrical Code (NEC).

Explanation should also include describing

- atomic structure, as it relates to electricity

- the law of charges
- the differences among conductors, insulators, and semiconductors
- current, including its unit of measure and symbol
- voltage, including its unit of measure and symbol
- resistance, including its unit of measure and symbol
- the interrelationship of current, voltage, and resistance
- potential and electromotive forces
- Ohm's law.

Process/Skill Questions

- What are the differences between watts, amps, volts, and ohms?
- How are watts, amps, volts, and ohms calculated?
- Who is credited with discovering the law of charges?
- According to the law of charges, how should objects with similar charges behave with each other?
- What letter symbol is used to represent current? Voltage? Resistance?
- How does resistance affect the movement of free electrons?
- What are the mathematical relationships of Ohm's law?

Task Number 127

Identify safety rules associated with the use of electrical appliances and equipment.

Definition

Identification should include using precautions with electricity and maintaining safe and effective electrical fixtures. Identification should also include the following [safety rules from Electrical Engineering Portal](#):

- Avoid contact with energized electrical circuits.
- Treat all electrical devices as if they are live or energized.
- Disconnect the power source before servicing or repairing electrical equipment.
- Use only tools and equipment with non-conducting handles when working on electrical devices.
- Never use metallic pencils or rulers, or wear rings or metal watchbands when working with electrical equipment.
- When it is necessary to handle equipment that is plugged in, be sure hands are dry and, when possible, wear non-conductive gloves, protective clothes and shoes with insulated soles.
- If it is safe to do so, work with only one hand, keeping the other hand at your side or in your pocket, away from all conductive material. This precaution reduces the likelihood of accidents that result in current passing through the chest cavity.
- Minimize the use of electrical equipment in cold rooms or other areas where condensation is likely. If equipment must be used in such areas, mount the equipment on a wall or vertical panel.
- If water or a chemical is spilled onto equipment, shut off power at the main switch or circuit breaker and unplug the equipment.
- If an individual comes in contact with a live electrical conductor, do not touch the equipment, cord or person. Disconnect the power source from the circuit breaker or pull out the plug using a leather belt.
- Equipment producing a "tingle" should be disconnected and reported promptly for repair.

- Do not rely on grounding to mask a defective circuit nor attempt to correct a fault by insertion of another fuse or breaker, particularly one of larger capacity.
- Drain capacitors before working near them and keep the short circuit on the terminals during the work to prevent electrical shock.
- Never touch another person's equipment or electrical control devices unless instructed to do so.
- Enclose all electric contacts and conductors so that no one can accidentally come into contact with them.
- Never handle electrical equipment when hands, feet, or body are wet or perspiring, or when standing on a wet floor.
- Do not store highly flammable liquids near electrical equipment.
- Do not wear loose clothing, jewelry, or ties near electrical equipment.

Process/Skill Questions

- Where can one find safety rules and precautions for electrical appliances and equipment?
- What safety rules and considerations are critical to adhere to when working with electrical appliances and equipment?
- What is the danger of overloading an electrical circuit?

Task Number 128

Calculate cost of power consumption.

Definition

Calculation should include

- interpreting an electric meter
- accounting for the cost per kilowatt hour and the number of kilowatt hours used
- determining the increase/decrease in cost over time.

Process/Skill Questions

- Where is the electric meter located on your property?
- What factors are necessary for determining the cost of electricity used for your home?
- How can one reduce electricity costs?
- How would solar power affect electrical costs?

Task Number 129

Demonstrate electrical shock emergency procedures.

Definition

Demonstration should include

- recognizing symptoms
- following emergency procedures and first-aid steps for electrical shock

- preventing further shock or injuries
- evaluating the cause of initial shock.

Process/Skill Questions

- How would one determine whether a person has suffered an electrical shock?
 - Why should one disconnect the electrical power prior to administering first aid?
 - What are some causes of electrical shock?
-

Task Number 130

Identify electrical symbols.

Definition

Identification should include common electrical symbols found in the NEC for residential wiring.

Process/Skill Questions

- What is the purpose of an electrical symbol?
- How are electrical symbols used in schematic diagrams or blueprints?

Task Number 131

Identify series and parallel circuits.

Definition

Identification should include

- defining electrical symbols
- defining characteristics of a series circuit
- defining characteristics of a parallel circuit
- differentiating among the circuits, in accordance with the NEC.

Process/Skill Questions

- What function does series circuitry typically perform in an agricultural setting?
- Where would one use series circuits?
- Where would one use parallel circuits?

Task Number 132

Identify tools, equipment, and supplies used in the construction and repair of electrical circuits and equipment.

Definition

Identification should include the names, purposes, and terminology for tools, equipment, and supply items used for installation and repairs of fixtures and circuits.

Process/Skill Questions

- Why are tools used for electrical work insulated?
- What determines the electrical fixture selection for a given application?
- What is the difference between a common name and a brand name?

Task Number 133

Splice wires.

Definition

Splicing should include

- selecting the appropriate splicing method, in accordance with the NEC
- joining the wires as prescribed.

Process/Skill Questions

- What determines the method for wire splicing?
- How would one justify the method selected for splicing wire?
- What are the hazards related to wire splicing?

Task Number 134

Install an electrical fixture.

Definition

Installation should include

- selecting a fixture
- using installation tools and equipment
- connecting fixtures in accordance with the NEC and available wiring diagram(s)
- testing for proper installation and use.

Process/Skill Questions

- What precautions should be taken prior to the installation of an electrical fixture?
 - How does one determine the successful installation of an electrical fixture?
 - What factors affect the proper connection of electrical fixtures?
-

Task Number 135

Evaluate electrical problems.

Definition

Evaluation should include

- determining the cause of the problem using diagnostic tools and/or equipment
- isolating the cause
- taking necessary steps to ensure reduction or elimination of the chance of an electrical fire or other danger.

Process/Skill Questions

- What precautions should one take prior to beginning the troubleshooting process?
- How do we determine what diagnostic tool or equipment item to use for troubleshooting?

Performing Plumbing Operations

Task Number 136

Identify safety rules associated with the use of plumbing equipment.

Definition

Identification should include safety recommendations in the Uniform Plumbing Code (UPC) for residential plumbing.

Process/Skill Questions

- What determines the specific types of plumbing materials to be used?
 - What hazards should one consider when working with plumbing?
-

Task Number 137

Identify tools, equipment, and supplies used for the installation of plumbing fixtures.

Definition

Identification should include names, purposes, and terminology applicable to specific tools, equipment, and supply items used for the installation of plumbing fixtures.

Process/Skill Questions

- What determines the selection of tools to be used for a specific plumbing operation?
- How do we select materials needed for a particular plumbing task?

Task Number 138

Identify pipe and pipe fittings.

Definition

Identification should include names, purposes, and terminology applicable to the type of pipe and fittings needed for a given application.

Process/Skill Questions

- What are the differences among plumbing fittings?
- What determines the type of plumbing fixture or material used?

Task Number 139

Determine the length of pipe to be cut.

Definition

Determining the length should be based on specific plans and cutting requirements in the UPC.

Process/Skill Questions

- What factors should one consider prior to cutting pipe for a given application?
- How are tools and equipment for cutting pipe selected?

Task Number 140

Combine lengths of pipe.

Definition

Combining pipe should be done in accordance with the applications and methods recommended by the manufacturer.

Process/Skill Questions

- What factors should one consider prior to joining pipe?
 - What determines the type of material used to join pipe?
 - What tests are available to perform to ensure a proper plumbing joint?
-
-

Performing Woodworking Operations

Task Number 141

Demonstrate the safe use of woodworking equipment.

Definition

Demonstration should include the use of PPE and the operation of equipment in accordance with manufacturer's recommendations.

Process/Skill Questions

- What determines the type of equipment to be used for a given application?
 - What adjustments to the equipment may be necessary for completion of a woodworking task?
 - What PPE should be worn while using woodworking equipment?
-

Task Number 142

Identify tools, equipment, and materials used in woodworking.

Definition

Identification should include the names, purposes, and terminology for items used in basic woodworking.

Process/Skill Questions

- What determines the selection of tools to be used for a specific woodworking operation?
- How do we select materials needed for a particular woodworking task?

Task Number 143

Determine materials needed for a project.

Definition

Determination should include a sketch of the project, as well as a bill of materials and costs, according to project construction parameters and items needed.

Process/Skill Questions

- What factors influence the cost of a project?
 - How does one calculate board feet?
 - What are the items included for consideration in a bill of materials?
-

Task Number 144

Demonstrate layout procedures for a project.

Definition

Demonstration should include the safe use of layout tools to measure, mark, and prepare the wood for cutting and shaping.

Process/Skill Questions

- What tools and/or equipment are needed to lay out a given project?
 - What determines the procedure to be used for completing a project layout?
-

Task Number 145

Identify fasteners.

Definition

Identification should include the names, purposes, and terminology for specific types of fasteners used to join wood.

Process/Skill Questions

- What determines the type of fastener needed?
- What are the characteristics for the strength ratings of various fasteners?
- How are sizes of fasteners classified?

Task Number 146

Demonstrate fastening techniques.

Definition

Demonstration should include the use of glue and/or mechanical fasteners to join wood.

Process/Skill Questions

- What are factors to consider when selecting a method for fastening wood?
 - How can one avoid mistakes when joining wood?
-

Task Number 147

Construct a woodworking project.

Definition

Construction should include the planning, selection of materials, and assembly in accordance with prescribed or available plans.

Process/Skill Questions

- How are the processes for project construction selected?
 - What precautions should one take prior to assembling a project?
-

Task Number 148

Apply a finish to a woodworking project.

Definition

Application should include

- selecting a finish (e.g., stain, paint)

- preparing the surface
- applying the finish.

Process/Skill Questions

- What determines the type of finish to be applied to a project?
 - What determines the type of solvent used to clean or thin a specific finish?
 - What affects the final finish of a project?
-
-

Performing Metalworking Operations

Task Number 149

Demonstrate the safe use of metalworking equipment.

Definition

Demonstration should include the use of PPE and the use of metalworking equipment in accordance with manufacturer's recommendations.

Process/Skill Questions

- What factors influence the selection of the metalworking equipment to be used?
 - What hazards are possible while using metalworking equipment?
-

Task Number 150

Identify tools, equipment, and materials used in metalworking.

Definition

Identification should include the names, purposes, and terminology of tools, equipment, and supply items used for metal work.

Process/Skill Questions

- What determines the selection of metalworking items for a specific application?
- What determines the selection of tools to be used for metalworking processes?

Task Number 151

Demonstrate a metalworking process.

Definition

Demonstration should include

- selecting a process
- determining the tool and equipment needs
- completing a metalworking activity.

Process/Skill Questions

- What determines the process required for completing a metalworking activity?
 - What are the differences among various types of metalworking equipment and processes?
-

Task Number 152

Apply a finish to a metalworking project.

Definition

Application should include

- selecting a finish (e.g., sealant, paint)
- preparing the surface
- applying the finish.

Process/Skill Questions

- What determines the type of finish to be applied to a project?
 - What precautions should one consider prior to finishing a metal project?
-
-

Examining the Livestock and Poultry Industry

Task Number 153

Research the history of the domestication of farm animals.

Definition

Research should include

- defining domestication
- determining reasons for domesticating farm animals
- describing the introduction and history of various species.

Source: [Agricultural Animal Production and Management \(01.43200\)](#), Georgia Agricultural Education

Process/Skill Questions

- What are some examples of domestication of animals from early humankind?
- Why were animals domesticated in the United States?
- How does animal domestication benefit humans?

Task Number 154

Explain the function of livestock.

Definition

Explanation should include

- food
- clothing
- power
- recreation
- conservation
- by-products.

Source: [Agricultural Animal Production and Management \(01.43200\)](#), Georgia Agricultural Education

Process/Skill Questions

- What animals are used for power? For conservation?
- What are some examples of animal by-products marketed today?
- What are some examples of clothing provided by livestock?

Task Number 155

Describe the scope and importance of the livestock and poultry industry in the United States.

Definition

Description should include the economic importance and magnitude of the livestock and poultry industry as it relates to the economy.

Source: [Agricultural Animal Production and Management \(01.43200\)](#), Georgia Agricultural Education

Process/Skill Questions

- How many Virginians are employed in the livestock and poultry industry?
- Has the size of the industry changed over the past 50 years? Explain.

Task Number 156

Analyze commercially important livestock breeds in Virginia.

Definition

Analysis should include

- identifying commercially important livestock species raised in Virginia
- identifying regions of the state in which the species are raised
- explaining the economic importance of the livestock and the products obtained from the animals.

Process/Skill Questions

- What is the most common species of livestock raised in Virginia?
- What types of livestock species have been recently introduced on farms in Virginia?

Task Number 157

Describe issues related to animal welfare and animal rights.

Definition

Description should include

- definition of *animal welfare*
- definition of *animal rights*
- comparison of animal welfare and animal rights
- ethics in livestock production.

Process/Skill Questions

- In what ways do meat production operations address animal welfare?
- Who is responsible for enforcing animal welfare? Explain.

Task Number 158

Examine the role of show animals in the development of brood stock.

Definition

Examination should include

- superior genetic traits
- desirable phenotypes
- safe handling and care.

Process/Skill Questions

- What are some issues related to safe handling of animals? Brood stock?
- How long have farmers been raising show animals?

SOL Correlation by Task

39	Identify the role of supervised agricultural experiences (SAEs) in agricultural education.	English: 9.3, 9.5, 10.3, 10.5, 11.3, 11.5, 12.3, 12.5
40	Participate in an SAE.	English: 9.5, 9.8, 10.5, 10.8, 11.5, 11.8, 12.5, 12.8
41	Identify the benefits and responsibilities of FFA membership.	English: 9.5, 9.6, 9.7, 9.8, 10.5, 10.6, 10.7, 10.8, 11.5, 11.6, 11.7, 11.8, 12.5, 12.6, 12.7, 12.8
42	Describe leadership characteristics and opportunities as they relate to agriculture and FFA.	English: 9.5, 10.5, 11.5, 12.5 History and Social Science: VUS.8, VUS.9, VUS.10, VUS.11, WHII.8, WHII.10, WHII.11
43	Apply for an FFA degree and/or an agricultural proficiency award.	English: 9.5, 10.5, 11.5, 12.5
44	Explain the purposes and roles of federal agricultural agencies.	English: 9.5, 10.5, 11.5, 12.5 History and Social Science: GOVT.7, GOVT.9, GOVT.15
45	Explain the purposes and roles of state agricultural agencies.	English: 9.5, 9.8, 10.5, 10.8, 11.5, 11.8, 12.5 History and Social Science: GOVT.8, GOVT.9, GOVT.15
46	Identify non-governmental agricultural partners and their roles in advocacy in the community.	English: 9.5, 10.5, 11.5, 12.5 History and Social Science: GOVT.8, GOVT.9, GOVT.15
47	Identify marked safety areas.	English: 9.5, 10.5, 11.5, 12.5

		Science: CH.1
48	Identify the location and use of eyewash stations.	English: 9.5, 10.5, 11.5, 12.5 Science: CH.1
49	Identify the location of the posted evacuation routes.	English: 9.5, 10.5, 11.5, 12.5
50	Demonstrate knowledge of safety data sheets (SDS).	English: 9.5, 10.5, 11.5, 12.5 History and Social Science: GOVT.15 Science: CH.1
51	Explain the safe use of chemicals.	English: 9.5, 10.5, 11.5, 12.5 Science: CH.1
52	Demonstrate the safe use of standard and metric hand tools.	
53	Demonstrate the safe use of power tools.	
54	Demonstrate the safe use of precision standard and metric measuring tools.	
55	Demonstrate the safe use of protective clothing and equipment.	
56	Demonstrate the safe use of fire protection equipment.	
57	Demonstrate the safe use of equipment.	
58	Demonstrate safe practices in the agricultural mechanics lab/workshop.	
59	Identify parts of a soil profile.	English: 9.5, 10.5, 11.5, 12.5 Science: ES.8
60	Identify types of soil particles.	English: 9.5, 10.5, 11.5, 12.5 Science: ES.1, ES.8
61	Describe characteristics of different soil types.	English: 9.5, 10.5, 11.5, 12.5 Science: ES.1, ES.8
62	List the major soils found in Virginia.	English: 9.6, 9.7, 10.6, 10.7, 11.6, 11.7, 12.6, 12.7 Science: ES.8
63	Explain the purpose of testing soil fertility.	English: 9.5, 10.5, 11.5, 12.5
64	Conduct a soil test.	English: 9.5, 10.5, 11.5, 12.5
65	Interpret results of a soil test.	English: 9.5, 10.5, 11.5, 12.5
66	Explain the purposes for amending the soil.	English: 9.5, 10.5, 11.5, 12.5
67	Describe Virginia laws as they apply to fertilizer application on turf and pasture.	English: 9.5, 10.5, 11.5, 12.5
68	List types of soil erosion.	English: 9.6, 9.7, 10.6, 10.7, 11.6, 11.7, 12.6, 12.7 Science: ES.8
69	Explain the consequences of soil erosion.	English: 9.5, 10.5, 11.5, 12.5

		Science: ES.8
70	Identify methods of controlling erosion.	English: 9.5, 10.5, 11.5, 12.5 History and Social Science: WG.1, WG.2 Science: ES.8
71	Explain the use of erosion control techniques and methods used in agriculture.	English: 9.5, 10.5, 11.5, 12.5 History and Social Science: WG.7
72	Describe methods of seeding.	English: 9.5, 10.5, 11.5, 12.5
73	Prepare the seedbed for a lawn, pasture, or hayfield.	History and Social Science: WG.1, WG.2
74	Select seed.	English: 9.5, 10.5, 11.5, 12.5
75	Seed a seedbed.	English: 9.5, 10.5, 11.5, 12.5
76	Irrigate a new lawn seedbed.	English: 9.5, 10.5, 11.5, 12.5
77	Identify techniques for managing a lawn or pasture.	English: 9.5, 10.5, 11.5, 12.5
78	Describe service and maintenance of agricultural equipment.	English: 9.5, 10.5, 11.5, 12.5
79	Describe common problems in grass management.	English: 9.5, 10.5, 11.5, 12.5
80	Design a year-round grass management plan.	English: 9.1, 10.1, 11.1, 12.1
81	Identify common trees and shrubs.	English: 9.5, 10.5, 11.5, 12.5 Science: BIO.8
82	Explain the importance of pruning.	English: 9.5, 10.5, 11.5, 12.5
83	Identify pruning equipment, supplies, and best-management practices.	English: 9.1, 9.5, 10.1, 10.5, 11.1, 11.5, 12.1, 12.5
84	Plant a tree and a shrub.	English: 9.5, 10.5, 11.5, 12.5
85	Create a management plan for trees and shrubs.	English: 9.1, 10.1, 11.1, 12.1
86	Implement a management plan for trees and shrubs.	
87	Analyze the location of a garden plot.	English: 9.5, 10.5, 11.5, 12.5
88	Calculate food needs for a family.	
89	Estimate the yield of specific garden crops.	Mathematics: A.1
90	Determine the location of crops in the garden plot.	English: 9.5, 10.5, 11.5, 12.5
91	Select seed and plant varieties.	
92	Prepare the seedbed for a garden.	
93	Plant seeds and vegetable plugs.	English: 9.5, 10.5, 11.5, 12.5
94	Determine water and mulch needs for the garden.	
95	Select appropriate time and method to water the garden.	English: 9.5, 10.5, 11.5, 12.5
96	Manage vegetable and fruit plants in the garden.	
97	Identify common agricultural pests.	English: 9.5, 10.5, 11.5, 12.5 Science: BIO.8
98	Explain the life cycle of pests.	English: 9.5, 10.5, 11.5, 12.5 Science: BIO.8
99	Describe integrated pest management (IPM).	English: 9.5, 10.5, 11.5, 12.5 Science: BIO.8

100	Describe the major types of agricultural pesticides.	English: 9.5, 10.5, 11.5, 12.5
101	Interpret pesticide labels.	English: 9.5, 10.5, 11.5, 12.5 Science: CH.1
102	Manage agricultural pests using integrated pest management.	English: 9.5, 10.5, 11.5, 12.5
103	Identify characteristics of ripened vegetables and fruits.	English: 9.5, 10.5, 11.5, 12.5
104	List factors that affect the quality of vegetables and fruits.	English: 9.6, 9.7, 10.6, 10.7, 11.6, 11.7, 12.6, 12.7
105	Describe techniques for harvesting fruits and vegetables.	English: 9.5, 10.5, 11.5, 12.5
106	Evaluate fruits and vegetables for harvest.	
107	Define <i>food safety</i> .	English: 9.3, 10.3, 11.3, 12.3 History and Social Science: GOVT.9
108	Prepare food products for consumption or preservation.	English: 9.5, 10.5, 11.5, 12.5
109	Describe techniques and procedures for the safe handling of food products.	English: 9.5, 10.5, 11.5, 12.5
110	Describe storage of types of food products.	English: 9.5, 10.5, 11.5, 12.5
111	Describe food security issues.	English: 9.5, 10.5, 11.5, 12.5 History and Social Science: VUS.14, WHII.14
112	Outline the procedure for processing fruits and vegetables.	English: 9.6, 9.7, 10.6, 10.7, 11.6, 11.7, 12.6, 12.7
113	Identify fruit and vegetable varieties.	English: 9.5, 10.5, 11.5, 12.5
114	Describe methods of preserving fruits and vegetables.	English: 9.5, 10.5, 11.5, 12.5
115	Demonstrate a method of preservation.	
116	Identify major cuts of meat.	English: 9.5, 10.5, 11.5, 12.5
117	List specialized meat products.	English: 9.6, 9.7, 10.6, 10.7, 11.6, 11.7, 12.6, 12.7
118	Outline the procedure for animal slaughter.	History and Social Science: GOVT.9
119	Explain the purposes of meat inspection.	English: 9.5, 10.5, 11.5, 12.5 History and Social Science: GOVT.9, VUS.8
120	Describe the types of meat inspection.	English: 9.5, 10.5, 11.5, 12.5 History and Social Science: VUS.8
121	Interpret a meat product label.	
122	List factors to consider when selecting meats.	
123	Rank cuts of meat according to quality grade.	
124	Describe methods for preserving meats.	English: 9.5, 10.5, 11.5, 12.5
125	Demonstrate meat-preservation processes.	
126	Explain common electrical terms.	English: 9.5, 10.5, 11.5, 12.5 Science: PH.11
127	Identify safety rules associated with the use of electrical appliances and equipment.	English: 9.5, 10.5, 11.5, 12.5

128	Calculate cost of power consumption.	Mathematics: A.1
129	Demonstrate electrical shock emergency procedures.	
130	Identify electrical symbols.	Science: PH.11
131	Identify series and parallel circuits.	Science: PH.11
132	Identify tools, equipment, and supplies used in the construction and repair of electrical circuits and equipment.	English: 9.5, 10.5, 11.5, 12.5
133	Splice wires.	
134	Install an electrical fixture.	
135	Evaluate electrical problems.	English: 9.5, 10.5, 11.5, 12.5
136	Identify safety rules associated with the use of plumbing equipment.	
137	Identify tools, equipment, and supplies used for the installation of plumbing fixtures.	English: 9.5, 10.5, 11.5, 12.5
138	Identify pipe and pipe fittings.	English: 9.5, 10.5, 11.5, 12.5
139	Determine the length of pipe to be cut.	English: 9.5, 10.5, 11.5, 12.5
140	Combine lengths of pipe.	
141	Demonstrate the safe use of woodworking equipment.	
142	Identify tools, equipment, and materials used in woodworking.	English: 9.5, 10.5, 11.5, 12.5
143	Determine materials needed for a project.	
144	Demonstrate layout procedures for a project.	
145	Identify fasteners.	English: 9.5, 10.5, 11.5, 12.5
146	Demonstrate fastening techniques.	
147	Construct a woodworking project.	
148	Apply a finish to a woodworking project.	
149	Demonstrate the safe use of metalworking equipment.	
150	Identify tools, equipment, and materials used in metalworking.	English: 9.5, 10.5, 11.5, 12.5
151	Demonstrate a metalworking process.	
152	Apply a finish to a metalworking project.	
153	Research the history of the domestication of farm animals.	English: 9.8, 10.8, 11.8, 12.8
154	Explain the function of livestock.	English: 9.5, 10.5, 11.5, 12.5
155	Describe the scope and importance of the livestock and poultry industry in the United States.	English: 9.5, 10.5, 11.5, 12.5
156	Analyze commercially important livestock breeds in Virginia.	English: 9.5, 10.5, 11.5, 12.5
157	Describe issues related to animal welfare and animal rights.	English: 9.5, 10.5, 11.5, 12.5
158	Examine the role of show animals in the development of brood stock.	English: 9.5, 10.5, 11.5, 12.5

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](#).

Entrepreneurship Infusion Units

Entrepreneurship Infusion Units may be used to help students achieve additional, focused competencies and enhance the validated tasks/competencies related to identifying and starting a new business venture. Because the unit is a complement to certain designated courses and is not mandatory, all tasks/competencies are marked “optional.”

Appendix: Credentials, Course Sequences, and Career Cluster Information

Industry Credentials: Only apply to 36-week courses

- BASF Plant Science Certification Examination
- College and Work Readiness Assessment (CWRA+)
- Customer Service Specialist (CSS) Examination
- Food Safety & Science Certification Examination
- Meat Evaluation Certification Examination
- National Career Readiness Certificate Assessment
- Workplace Readiness Skills for the Commonwealth Examination

Concentration sequences: *A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.*

- Agricultural Fabrication and Emerging Technologies (8019/36 weeks)
- Agricultural Power Systems (8018/36 weeks)
- Agricultural Power Systems, Advanced (8020/36 weeks)
- Agricultural Production Technology (8010/36 weeks)
- Agricultural Structural Systems (8017/36 weeks)
- Applied Agricultural Concepts (8072/18 weeks)
- Biological Applications in Agriculture (8086/36 weeks)
- Biotechnology Applications in Agriculture (8087/36 weeks)
- Biotechnology Foundations in Agricultural and Environmental Science (8085/36 weeks)
- Biotechnology Foundations in Health and Medical Sciences (8344/36 weeks)
- Biotechnology Foundations in Technology Education (8468/36 weeks)
- Community Forestry and Tree Management (8048/36 weeks)
- Ecology and Environmental Management (8046/36 weeks)
- Ecology and Environmental Management (8045/18 weeks)
- Floriculture (8038/36 weeks)
- Food Science and Dietetics (8239/36 weeks)
- Forestry Management (8042/36 weeks)
- Forestry Management, Advanced (8044/36 weeks)
- Greenhouse Plant Production and Management (8035/36 weeks)
- Horticulture Sciences (8034/36 weeks)
- Introduction to Animal Systems (8008/36 weeks)
- Introduction to Natural Resources and Ecology Systems (8040/36 weeks)
- Introduction to Plant Systems (8007/36 weeks)
- Introduction to Power, Structural, and Technical Systems (8016/36 weeks)
- Landscaping I (8036/36 weeks)
- Landscaping II (8039/36 weeks)
- Livestock Production Management (8012/36 weeks)
- Operating the Farm Business (8014/36 weeks)
- Outdoor Recreation, Parks, and Tourism Systems Management (8043/36 weeks)
- Turfgrass Management (8051/36 weeks)
- Turfgrass Management, Advanced (8054/36 weeks)

Career Cluster: Agriculture, Food and Natural Resources	
Pathway	Occupations
Agribusiness Systems	Agricultural Commodity Broker Agricultural Products Sales Representative Farm, Ranch Manager Feed, Farm Supply Store Sales Manager
Animal Systems	Animal Breeder, Husbandry Animal Scientist Poultry Manager
Environmental Service Systems	Agricultural Products Sales Representative Environmental Compliance Inspector Water Conservationist
Food Products and Processing Systems	Biochemist Food Scientist
Natural Resources Systems	Fish and Game Officer Forest Technician Outdoor Recreation Guide Park Manager Park Technician Wildlife Manager
Plant Systems	Forest Geneticist Nursery and Greenhouse Manager Tree Surgeon
Power, Structural, and Technical Systems	Agricultural Equipment Operator Agricultural Equipment Parts Manager Agricultural Equipment Parts Salesperson