

Agricultural Education

8050 36 weeks (Preparation)

8053 36 weeks (Development)

Table of Contents

Acknowledgments.....	1
Course Description.....	2
Task Essentials Table.....	3
Curriculum Framework.....	7
SOL Correlation by Task.....	59
FFA Information.....	62
Appendix: Credentials and Career Cluster Information.....	64

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Course Description

Suggested Grade Level: 9 or 10 or 11 or 12

8050 Agricultural Education – Preparation

This course covers a wide variety of information about agriculture and related fields. The intent is to enable the instructor to customize instruction to meet the needs of the student enrolled in the agricultural education program. Content areas include agribusiness operations, animal science and care, ecology and natural resource management, plant science and landscaping, and woodworking and basic mechanics. Instructors should select the content areas that will prepare students for the pathways offered in the school. Competencies in this course should be included in an SAE.

The career pathway will be determined by other courses taken in conjunction with this course to build a concentration sequence.

Note: The class size shall be limited to an average of 15 students per instructor per class period with no class being more than 18. ([Refer to Superintendent's Memo #203-16 and 8VAC20-120-150.](#))

“Agricultural Education--Preparation” may be offered as a complement to an existing concentration sequence in any CTE program area. In some instances, where noted, it may be combined with specific courses to create concentration sequences.)

8053 Agricultural Education – Development

This course covers a wide variety of information about agriculture and related fields. The intent is to enable the instructor to customize instruction to meet the needs of the student enrolled in the agricultural education program. Content areas include agribusiness operations, animal science and care, ecology and natural resource management, plant science and landscaping, and woodworking and basic mechanics. Competencies in this course should be included in a supervised agricultural experience (SAE).

Note: For teachers creating individualized education programs (IEPs) for their students, it is recommended that instruction focus on one or more areas in the 8053 list to create comprehensive and challenging IEPs reflective of each student's ability.

The career pathway will be determined by other courses taken in conjunction with this course to build a concentration sequence.

Note: The class size shall be limited to an average of 10 students per instructor per class period with no class being more than 12 or up to an average of 12 students per class period with no class being more than 15 where an instructional aide is provided. (Refer to Superintendent’s Memo #203-16 and 8VAC20-120-150.)

“Agricultural Education--Development” may be offered as a complement to an existing concentration sequence in any CTE program area. In some instances, where noted, it may be combined with specific courses to create concentration sequences.)

Task Essentials Table

- Tasks/competencies designated by plus icons (⊕) in the left-hand column(s) are essential
- Tasks/competencies designated by empty-circle icons (○) are optional
- Tasks/competencies designated by minus icons (⊖) are omitted
- Tasks marked with an asterisk (*) are sensitive.

8050	8053	Tasks/Competencies
⊕	○	Identify the role of supervised agricultural experiences (SAEs) in agricultural education.
⊕	○	Participate in an SAE.
⊕	○	Identify the benefits and responsibilities of FFA membership.
⊕	○	Describe leadership characteristics and opportunities as they relate to agriculture and FFA.
○	○	Apply for an FFA degree and/or an agricultural proficiency award.
⊕	○	Define <i>agriculture</i> and related terms.
⊕	○	Maintain professional standards.
⊕	○	Demonstrate safety procedures for personal protection.
⊕	○	Identify resources and agencies related to agriculture issues.
⊕	○	Research career opportunities related to agriculture, food, and natural resources.
⊕	○	Identify classifications of plants.
⊕	○	Identify plant parts.
⊕	○	Identify requirements for plant growth.
⊕	○	Identify soil characteristics.
⊕	○	Demonstrate soil sampling and testing procedures.

<input checked="" type="radio"/>	<input type="radio"/>	Determine plant nutrition requirements.
<input checked="" type="radio"/>	<input type="radio"/>	Identify types and forms of fertilizers.
<input type="radio"/>	<input type="radio"/>	Apply soil amendments.
<input checked="" type="radio"/>	<input type="radio"/>	Define terms related to plant propagation.
<input checked="" type="radio"/>	<input type="radio"/>	Identify methods of plant reproduction.
<input checked="" type="radio"/>	<input type="radio"/>	Demonstrate asexual propagation methods.
<input checked="" type="radio"/>	<input type="radio"/>	Prepare media/substrate for plant growth.
<input checked="" type="radio"/>	<input type="radio"/>	Demonstrate plant care.
<input checked="" type="radio"/>	<input type="radio"/>	Identify pests and diseases.
<input type="radio"/>	<input type="radio"/>	Define terms related to pest management.
<input checked="" type="radio"/>	<input type="radio"/>	Demonstrate the process for planting seeds.
<input checked="" type="radio"/>	<input type="radio"/>	Use techniques, equipment, and supplies for greenhouse plant production.
<input checked="" type="radio"/>	<input type="radio"/>	Describe the differences in outdoor vs. greenhouse plant production.
<input checked="" type="radio"/>	<input type="radio"/>	Describe the differences in lawn grasses.
<input checked="" type="radio"/>	<input type="radio"/>	Select turf seed or sod based on site characteristics.
<input type="radio"/>	<input type="radio"/>	Seed lawns.
<input type="radio"/>	<input type="radio"/>	Transplant turf.
<input checked="" type="radio"/>	<input type="radio"/>	Describe safety requirements specific to lawn/turf care.
<input type="radio"/>	<input type="radio"/>	Mow the lawn.
<input checked="" type="radio"/>	<input type="radio"/>	Water the lawn.
<input checked="" type="radio"/>	<input type="radio"/>	Plan a garden.
<input checked="" type="radio"/>	<input type="radio"/>	Design container gardens.
<input checked="" type="radio"/>	<input type="radio"/>	Plant a garden.
<input checked="" type="radio"/>	<input type="radio"/>	Describe the value of a home garden.
<input checked="" type="radio"/>	<input type="radio"/>	Identify trees and shrubs.
<input checked="" type="radio"/>	<input type="radio"/>	Plant trees and shrubs.

<input type="radio"/>	<input type="radio"/>	Prune and shape trees and shrubs.
<input checked="" type="radio"/>	<input type="radio"/>	Identify cut flowers and foliage.
<input type="radio"/>	<input type="radio"/>	Process flowers.
<input checked="" type="radio"/>	<input type="radio"/>	Design or replicate floral arrangements.
<input type="radio"/>	<input type="radio"/>	Prepare plants for customers.
<input type="radio"/>	<input type="radio"/>	Design balloon bouquets.
<input type="radio"/>	<input type="radio"/>	Use floral supplies and accessories.
<input checked="" type="radio"/>	<input type="radio"/>	Create a sales ticket or invoice.
<input checked="" type="radio"/>	<input type="radio"/>	Interpret labels and signage.
<input checked="" type="radio"/>	<input type="radio"/>	Assist customers.
<input type="radio"/>	<input type="radio"/>	Unload products.
<input type="radio"/>	<input type="radio"/>	Store products.
<input type="radio"/>	<input type="radio"/>	Weigh products.
<input checked="" type="radio"/>	<input type="radio"/>	Mark prices on products.
<input checked="" type="radio"/>	<input type="radio"/>	Inventory products.
<input checked="" type="radio"/>	<input type="radio"/>	Market products.
<input checked="" type="radio"/>	<input type="radio"/>	Use tools, equipment, and materials.
<input checked="" type="radio"/>	<input type="radio"/>	Maintain tools.
<input type="radio"/>	<input type="radio"/>	Describe the types of power sources and lubricants associated with tools and equipment.
<input type="radio"/>	<input type="radio"/>	Lubricate a tractor or lawn mower.
<input checked="" type="radio"/>	<input type="radio"/>	Follow a woodworking project plan.
<input checked="" type="radio"/>	<input type="radio"/>	Estimate materials for a project.
<input checked="" type="radio"/>	<input type="radio"/>	Identify tools, equipment, and materials.
<input checked="" type="radio"/>	<input type="radio"/>	Measure lumber.
<input type="radio"/>	<input type="radio"/>	Make glue joints.
<input checked="" type="radio"/>	<input type="radio"/>	Use wood fasteners.

<input checked="" type="radio"/>	<input type="radio"/>	Construct a woodworking project.
<input type="radio"/>	<input type="radio"/>	Apply preservatives to wood surfaces.
<input checked="" type="radio"/>	<input type="radio"/>	Identify common species found in the small animal care industry.
<input checked="" type="radio"/>	<input type="radio"/>	Identify the role of companion animals.
<input checked="" type="radio"/>	<input type="radio"/>	Implement safety in small animal care.
<input checked="" type="radio"/>	<input type="radio"/>	Describe the responsibilities of pet ownership.
<input checked="" type="radio"/>	<input type="radio"/>	Explain the difference between animal rights and animal welfare.
<input type="radio"/>	<input type="radio"/>	Identify species of birds.
<input type="radio"/>	<input type="radio"/>	Identify breeds of dogs.
<input type="radio"/>	<input type="radio"/>	Identify breeds of cats.
<input type="radio"/>	<input type="radio"/>	Identify reptiles, amphibians, and other exotic species.
<input type="radio"/>	<input type="radio"/>	Identify various categories of fish suitable for home aquariums.
<input checked="" type="radio"/>	<input type="radio"/>	Identify safety procedures and protocols specific to animal husbandry.
<input checked="" type="radio"/>	<input type="radio"/>	Select tools and equipment necessary for animal care.
<input checked="" type="radio"/>	<input type="radio"/>	Measure feed.
<input checked="" type="radio"/>	<input type="radio"/>	Describe animal nutritional requirements.
<input checked="" type="radio"/>	<input type="radio"/>	Keep feed records.
<input checked="" type="radio"/>	<input type="radio"/>	Sanitize animal living areas.
<input checked="" type="radio"/>	<input type="radio"/>	Identify common bedding materials.
<input checked="" type="radio"/>	<input type="radio"/>	Identify signs of animal health and illness.
<input checked="" type="radio"/>	<input type="radio"/>	Explore treatments for pests and diseases.
<input checked="" type="radio"/>	<input type="radio"/>	Identify exercise requirements for specific animals.
<input checked="" type="radio"/>	<input type="radio"/>	Groom animals.
<input checked="" type="radio"/>	<input type="radio"/>	Demonstrate etiquette when handling animals.
<input checked="" type="radio"/>	<input type="radio"/>	Describe environmental conservation techniques.
<input checked="" type="radio"/>	<input type="radio"/>	Identify types of erosion.

<input checked="" type="radio"/>	<input type="radio"/>	Identify sources of water, air, and soil pollution.
<input checked="" type="radio"/>	<input type="radio"/>	Describe the value of forests.
<input checked="" type="radio"/>	<input type="radio"/>	Identify pests and diseases that damage forests.
<input type="radio"/>	<input type="radio"/>	Maintain a park or campground area.
<input type="radio"/>	<input type="radio"/>	Maintain trails.

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 Skills and FFA Membership

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?

Orienting the Student to Agricultural Science and Mathematics

Task Number 44

Define *agriculture* and related terms.

Definition

Definition should include, but should not be limited to, terms such as

- *agribusiness*
- *agriscience*
- *conservation*
- *ecology*
- *environment*
- *forestry*
- *horticulture*
 - *pomology*
 - *olericulture*
 - *floriculture*
 - *landscape*
 - *nursery*
- *natural resources*.

Process/Skill Questions

- Why does the term *agriculture* have multiple definitions?
- What are the major differences and similarities among agricultural fields?
- What role does agriculture serve in the community, state, country, and the world?
- What are major industries within agriculture?
- Why is agriculture Virginia's largest industry?
- How does agriscience relate to agriculture, agribusiness, and renewable natural resources?
- What are the four major divisions in horticulture?
- What role does the horticulture industry serve in the local community and the state?

Task Number 45

Maintain professional standards.

Definition

Maintenance should include

- identifying roles, responsibilities, and expectations
- identifying and following housekeeping procedures
- maintaining a clean, orderly, and safe working environment
- reviewing the importance of equipment, tools, and supplies/material storage.

Process/Skill Questions

- Why is it important to understand individual roles, responsibilities, and expectations?
- Why is it important to maintain housekeeping standards?
- How can one maintain a clean, orderly, and safe working environment?
- Why is it important to store items in their proper place?
- What are some daily housekeeping tasks?

Task Number 46

Demonstrate safety procedures for personal protection.

Definition

Demonstration should include

- laboratory safety procedures
- chemical safety procedures, including proper storage, as related to pesticides, fertilizers, paints, solvents, and other chemical agents in the agriculture lab
- safe operational procedures/practices for applicable agricultural equipment (e.g., stationary and portable hand/power tools, lawn care tools, mowers, sprayers, other related equipment)
- lab organization procedures.

Process/Skill Questions

- Why is safety important?
- Why are there safety procedures and guidelines for the agriculture industry?
- What are the proper operational and safety procedures for various agricultural equipment?
- Why is it important to know how to operate equipment in the horticulture industry?
- What are storage issues one might encounter in horticulture?
- Why is lab organization important?
- What is the daily routine for lab maintenance?
- What types of accidents could occur in the lab due to lack of organization?

Task Number 47

Identify resources and agencies related to agriculture issues.

Definition

Identification should include

- local (e.g., master gardeners, extension service, nurseries, florists, Farm Bureau)
- state (e.g., Virginia Cooperative Extension, Department of Forestry, Department of Soil and Water Conservation)
- federal (e.g., U.S. Department of Agriculture, Farm Service Agency).

Process/Skill Questions

- What are the benefits of using local, state, and federal resources?

Task Number 48

Research career opportunities related to agriculture, food, and natural resources.

Definition

Research should include

- benefits related to the career (e.g., economical, physical)
- educational requirements
- physical requirements
- entrepreneurship opportunities.

Teacher resources:

- [ONet](#)
- [Ag Explorer](#)

Process/Skill Questions

- What are the educational requirements for a selected career?
- What jobs have physical requirements?
- What are some examples of common benefits offered by employers?

Exploring Plant Propagation

Task Number 49

Identify classifications of plants.

Definition

Identification should include the classification of plants according to

- kingdom
- phylum
- class
- order
- family
- genus
- species.

Identification should also include species-specific traits, determined by drawing logical comparisons between plants or by using taxonomic keys to compare the parts of plants.

Process/Skill Questions

- What is a taxonomic key, and how is it used?
- What is the order of scientific classification?
- How are two common plants (e.g., pine tree and Boston fern) distinct in terms of their classification?
- What is the difference between the scientific and common names for plants?

Task Number 50

Identify plant parts.

Definition

Identification should include, but is not limited to,

- stem
- leaf
- bud
- root
- flower
- fruit
- seed.

Process/Skill Questions

- What is the purpose and function of each plant part?
- What are examples of leaf shapes?
- What are different types of root structures?
- What is a modified stem? Leaf? Root? Flower?

Task Number 51

Identify requirements for plant growth.

Definition

Identification should include, but is not limited to,

- light
- water
- air
- media/substrate
- nutrients
- temperature.

Process/Skill Questions

- What are the basic requirements for plant growth?
- How does the length of light exposure affect plant growth and appearance?
- How does one determine the amount of water a plant needs?
- What role does pH play in plant growth?
- What nutrients are needed by most plants?
- How does one adjust the nutrients to an optimal level to promote plant growth?
- What is an *ecosystem*, and how is it important to plant growth?
- What is an example of a different ecosystem or biome from the local area, and how would one compare the types of plants that can be cultivated in each?
- How does pollution affect plant growth?

Task Number 52

Identify soil characteristics.

Definition

Identification should include

- soil texture (i.e., sand, silt, clay)
- soil composition (i.e., mineral matter, water, air, organic matter)
- percentages of each component needed to create optimal growing conditions.

Teacher resource: [Virginia FFA Soils CDE](#)

Process/Skill Questions

- What creates soil texture?
- What are the components of soil?
- How does soil composition affect plant growth?
- How does geographic location affect plant growth?
- What is *organic matter*?
- How does organic matter affect the physical and chemical properties of soil?

Task Number 53

Demonstrate soil sampling and testing procedures.

Definition

Demonstration should include

- determining necessary supplies and equipment
- exploring the options for soil analysis
- explaining the steps involved in taking a representative soil sample
- identifying the soil-testing options available to homeowners and agricultural producers
- evaluating and amending the soil according to test results and crop nutrient requirements.

Process/Skill Questions

- What is the purpose of conducting a soil test?
- Why should a metal bucket not be used for collecting a soil sample?
- Where can a homeowner or producer send a soil sample for analysis and obtain soil-sampling information?
- What tests can be conducted on soil?
- Why should a soil sample be taken before adding amendments to the soil?

Task Number 54

Determine plant nutrition requirements.

Definition

Determination should include

- nitrogen
- phosphorous
- potassium
- calcium
- magnesium
- sulfur
- carbon

- hydrogen
- oxygen
- the eleven micronutrients.

Process/Skill Questions

- What are the nine elements or macronutrients essential for optimal plant growth?
 - What are the eleven elements or micronutrients essential for optimal plant growth?
 - What are the three macronutrients that are most likely imbalanced in malnourished plants?
 - How does one adjust the nutrients to an optimal level to promote plant growth?
 - What is the composition of a 20-10-20 fertilizer?
 - What are some different types of plant fertilizer?
 - Why are there different fertilizer mixes?
 - How would one determine which type of fertilizer to use for specific plants?
 - How does pH affect nutrient availability?
-

Task Number 55

Identify types and forms of fertilizers.

Definition

Identification should include

- fertilizer types (i.e., organic, inorganic, nitrogen, phosphate, potassium)
- fertilizer forms (i.e., granular, liquid, powder)
- application techniques.

Process/Skill Questions

- What are the differences between organic fertilizer and inorganic fertilizer?
- What is the difference between a complete fertilizer and a single-element fertilizer?
- What are the advantages and disadvantages of using water-soluble fertilizers vs. dry fertilizers?
- What are the advantages and disadvantages of various fertilizer application methods?

Task Number 56

Apply soil amendments.

Definition

Application should include a

- description of methods of fertilizing landscape plantings
- determination of when plants should be fertilized

- determination of proper concentrations when mixing fertilizer.

Process/Skill Questions

- What are the methods of fertilizing landscape plantings?
 - Why is it important to select the appropriate fertilizer for a plant?
 - What are the advantages and disadvantages of each type of fertilizer?
 - What are the various fertilizer application methods?
 - Why is spreader calibration important?
 - What should be done prior to applying fertilizers?
-

Task Number 57

Define terms related to plant propagation.

Definition

Definition should include

- *cuttings*
- *seeding*
- *grafting*
- *division*
- *budding*
- *layering*
- *tuber*
- *bulb*
- *corm*
- *rhizome*.

Process/Skill Questions

- What is *propagation*?
- What is the difference between asexual propagation and sexual propagation?
- What is *division*?
- How is division used?

Task Number 58

Identify methods of plant reproduction.

Definition

Identification should include

- sexual propagation
- asexual propagation.

Process/Skill Questions

- What is sexual propagation?
- What are some methods of asexual propagation?
- How are bees, insects, and other animals important to plant reproduction?
- How can one artificially propagate plants?
- How would one describe the cross-pollination process?
- What are some examples of self-pollinated plants?

Task Number 59

Demonstrate asexual propagation methods.

Definition

Demonstration could include one or more of the following:

- Cuttings (e.g., stem, tip, medial, cane, leaf)
- Grafting (e.g., cleft, bark, whip/tongue)
- Division
- Separation
- Budding (e.g., patch, chip, T-budding)
- Layering (e.g., simple, compound, air)
- Micropropagation

Process/Skill Questions

- Why are plant propagation techniques used?
- What type of cutting would one use on a hardwood plant?
- When would one graft a plant?
- What are the benefits of using cuttings?
- Why are there so many different ways of propagating plants?
- What are the advantages of asexual propagation?
- What are the advantages and disadvantages of using a rooting hormone?

Task Number 60

Prepare media/substrate for plant growth.

Definition

Preparation should include

- selecting germination media/substrate
- evaluating media/substrate components (e.g., peat moss, bark, coir, soil, vermiculite, perlite, sand, Styrofoam)
- combining media/substrate components or soilless mix with proper ratios of soil components and water
- identifying and using the tools, supplies, and equipment needed.

Process/Skill Questions

- What types of media/substrate can be used for germination?
- What types of media/substrate are used in the propagation of cuttings?
- How do the components of media/substrate influence plant growth?
- What is the importance of using sterilized media/substrate?

Task Number 61

Demonstrate plant care.

Definition

Demonstration could include

- watering plants
- transplanting plants
- providing appropriate lighting
- following nutrient-management practices
- managing pests
- managing plant media/substrate.

Process/Skill Questions

- Why is it important for a plant to receive the proper amount of light?
- What are some effects of inadequate light?
- How does one determine when and how much to water?
- What are the effects of improper watering?
- Why is it important to establish nutrient-management practices?

Task Number 62

Identify pests and diseases.

Definition

Identification should include

- citing common greenhouse and/or garden pests
- classifying pests (e.g., insects, mites, nematodes, gastropods, animals, plants, pathogenic agents)
- citing fungal diseases
- citing bacterial diseases
- citing viral diseases
- suggesting methods of control
- collecting and organizing photos of the pests and the damage they cause
- listing plants that attract particular pests.

Process/Skill Questions

- What pests may become established in the greenhouse?
- What are the major categories of plant pests?
- Why is species selection important in pest control?
- How are bacterial, fungal, and viral diseases transmitted?
- What is a *vector*?

Task Number 63

Define terms related to pest management.

Definition

Definition should include

- *integrated pest management (IPM)*
- biological, mechanical, cultural, physical, and chemical controls
 - *pesticide*
 - *herbicide*
 - *fungicide*
 - *rodenticide*
 - *molluscicide*
 - *insecticide*
 - *nematicide*.

Process/Skill Questions

- What are the differences among pest control methods?
- What are alternative pest control methods?
- What are some pest management techniques that can reduce the amount of pesticides used?
- What is an example of an IPM plan?
- What safety precautions should be observed when applying pesticides?
- What are the positive and negative effects of chemical pest control?

Task Number 64

Demonstrate the process for planting seeds.

Definition

Demonstration should include

- selecting seed
- preparing media/substrate
- preparing a seed label
- planting seed
- caring for the seed until germination (i.e., monitoring and adjusting light, humidity, water, and temperature as needed)
- caring for the seedling
- transplanting the seedling.

Demonstration could also include mechanical seeding methods.

Process/Skill Questions

- How can one identify quality seed? What factors should be considered?
- What is the benefit of labeling seeds?
- How would one describe the process for transplanting a seedling?
- How would one plant a seed to promote a high germination rate?
- How are germination rates calculated?
- When are mechanical seeding methods used?

Task Number 65

Use techniques, equipment, and supplies for greenhouse plant production.

Definition

Use should include

- sanitation practices
- benching systems (e.g., plastic tables, movable benches, self-watering tables)
- floor production practices (e.g., considering drainage, light, watering systems, heated floors, bench systems)
- preparing containers and growing supplies (e.g., hanging baskets, flats, inserts)
- labeling (e.g., hanging baskets, flats, inserts)
- watering supplies (e.g., hoses, end spray nozzles, irrigation system components).

Process/Skill Questions

- What factors should be considered when selecting a greenhouse?
- What factors should be considered when choosing a glazing material?
- What types of plants are well suited for benches?
- When are containers a good option?
- What is a *trellis*, and how is it used?

- What are the consequences of poor sanitation practices?

Task Number 66

Describe the differences in outdoor vs. greenhouse plant production.

Definition

Description should include differences in

- plant species
- watering requirements
- air
- temperature requirements
- growth
- fertility
- light requirements
- shade requirements.

Process/Skill Questions

- What plants species grow best in a greenhouse that could not typically grow outside the local area?
- How can one determine the light requirements of a plant?
- What are the advantages of growing a plant outside vs. in a greenhouse? What are the disadvantages?
- What is the hardening-off process, and why is it important to plant survival?

Investigating the Landscaping Industry

Task Number 67

Describe the differences in lawn grasses.

Definition

Description should include

- identifying the main types of lawn or turf grasses in Virginia (i.e., bluegrass, bentgrass, ryegrass, fescue, grama grass, and Bermuda)

- identifying the main features of grass (i.e., thickness, durability, water requirements, color, maintenance requirements, length of growing season, shade and drought tolerance, and vulnerability to weeds, insects, and pests).

Process/Skill Questions

- What are the benefits of maintaining a grass lawn?
- When did grass lawns become popular?
- What are the criticisms of grass lawns, from an environmental point of view?
- How are cutting/mowing requirements different for various types of lawn or turf grasses?

Task Number 68

Select turf seed or sod based on site characteristics.

Definition

Selection should be based on

- the planting site (e.g., soil quality, drainage, climate)
- the site's stress factors (e.g., presence of trees, level of traffic, use of turf)
- resistance to location-specific diseases
- desired level of maintenance
- aesthetic considerations (e.g., density, texture, color)
- budget.

Process/Skill Questions

- What are the different applications of turf?
- What are economical and durable turf options?
- What are more expensive turf options?
- What is a *cultivar*?
- When would sod be more beneficial than seeding?

Task Number 69

Seed lawns.

Definition

Seeding lawns could include

- preparing the site
- selecting warm- or cool-season grasses depending on the time of year, intended use, and environmental conditions
- sowing, using a spreader, covering the area two times at right angles
- covering seed with a thin layer of soil (e.g., 0.25 to 0.33 inch) or with topdressing

- rolling the surface
- watering/irrigating the area.

Process/Skill Questions

- What are the processes of hydroseeding and hydromulching?
 - When might one want to pre-germinate the seed?
 - How is a spreader seeder loaded and used?
 - Why would one seed in a crisscross pattern (i.e., at right angles)?
 - What are different seeding applications, and why is following proper establishment procedures critical in producing a healthy turf?
-

Task Number 70

Transplant turf.

Definition

Transplanting turf could include

- treating the site to receive the sod
- cutting the sod as thin as possible to minimize soil loss from the sod production area
- transplanting within 48 hours of cutting and removing from original site (within 24 hours in peak summer months)
- watering.

Process/Skill Questions

- How long does it take to produce sod?
 - What is washed sod and why would one wash sod?
 - How does muck soil differ from mineral soil?
 - Which is better for transplanting sod, muck soil, or mineral soil? Why?
-

Task Number 71

Describe safety requirements specific to lawn/turf care.

Definition

Description should include identifying all recommended safety procedures, guidelines, and industry-accepted safety practices for equipment used in the landscape and turfgrass industries, the National Safe Tractor and Machinery Operation Program (NSTMOP), and the Virginia FFA Association Tractor Operator Rules.

Teacher resources:

- [NSTMOP](#)

Process/Skill Questions

- What are possible consequences of not following safety requirements?
- How do safety requirements evolve?

Task Number 72

Mow the lawn.

Definition

Mowing should include

- following safety procedures according to NSTMOP and the Virginia FFA Association Tractor Operator Rules
- mowing regularly with a sharp blade at an even height
- not mowing when lawn is wet
- not removing more than 30 to 40 percent of the plant tissue
- alternating the direction of cut from previous mowing
- scarifying and raking to remove dead grass and prevent tufting.

Process/Skill Questions

- What happens when one mows the grass, passing in the same direction each time?
- What are the general safety features on a lawn mower?
- How does one adjust the blades on the lawn mower?
- What are common injuries associated with mowing the lawn, and how can one prevent them or minimize the risk?

Task Number 73

Water the lawn.

Definition

Watering the lawn should include

- using water efficiently (i.e., adhering to the prescribed application rate)
- determining the best time to water
- testing the turgor of the grass
- acquiring and using rainfall data

- watering the entire lawn with one inch of water per week and soaking the soil to a depth of 4 to 6 inches, allowing the water to reach deep into the root system.

Process/Skill Questions

- How can overwatering hurt a lawn?
 - What are the signs that a lawn needs to be watered?
 - What is *turgor pressure*?
 - How does one calculate the 1- to 1.5-inch watering rate, and why should rainfall amounts be considered?
 - What are the factors one should know in order to determine watering needs?
-

Task Number 74

Plan a garden.

Definition

Planning a garden should include

- preparing a budget
- evaluating the garden site (calculating area, volume)
- evaluating garden soil type
- evaluating soil amendment requirements
- selecting the plants available for the hardiness zone
- selecting tools, equipment, and materials needed to prepare a garden
- listing the steps in planning and planting the garden
- investigating the requirements for daily maintenance of the garden
- examining fertilizer and pest-control options.

Process/Skill Questions

- What is meant by the term *hardiness zone*?
- What plants grow best in the local region?
- What factors influence plant selection?
- What are the space requirements for various plants?
- What plants need to be separated because of cross-pollination?
- What are the steps necessary to ensure a harvest?
- When should fertilizer be applied? What determines the application rate?

Task Number 75

Design container gardens.

Definition

Design should include

- identifying types of container gardens
- identifying plants suited for container plantings
- selecting containers suitable for a plant's requirements
- selecting growing media/substrate
- determining light and water requirements of the plants selected
- identifying principles of design and color composition
- making the optimal use of available space
- interpreting a particular design strategy, based on wants and needs
- sketching the design prior to implementation.

Process/Skill Questions

- Why is knowledge of light and its measurements critical to the container plantscaper?
- What maintenance measures may be necessary for container plants?
- In what types of situations might a container garden be desirable?
- What types of materials are typically used to construct containers?

Task Number 76

Plant a garden.

Definition

Planting could include garden types such as

- container garden
- vegetable garden
- raised bed garden
- themed gardens (e.g., butterfly, pollinator, herbs for pizza, herbal tea)
- cut-flower garden
- herb garden
- water garden.

Process/Skill Questions

- How does the type of garden influence soil selection?
- How do maintenance requirements differ for each type of garden?

Task Number 77

Describe the value of a home garden.

Definition

Description should include

- benefits to the environment
- personal benefits to the gardener and proprietor
- benefits of fresh-grown fruits, vegetables, herbs, and spices
- value of grass, flowers, trees, and shrubs
- value to the community
- aesthetic value.

Process/Skill Questions

- What are the benefits of growing one's own produce?
- What are the drawbacks of gardening?
- What are some varieties of gardens?
- What is *organic gardening*?

Task Number 78

Identify trees and shrubs.

Definition

Identification should include common species of trees and shrubs in Virginia.

Teacher resources: [Nursery](#) and [Forestry](#) Career Development Events, Virginia FFA

Process/Skill Questions

- What is the state tree of Virginia?
- Why do some trees grow in Virginia but not in other states, such as Arizona?
- What is *dendrology*?
- What trees and shrubs are valuable in the landscape?

Task Number 79

Plant trees and shrubs.

Definition

Planting should include

- selecting and preparing the site for planting
- determining the necessary tools, equipment, and supplies required for the job
- determining the practices necessary for a viable landscape design
- interpreting and adhering to a landscape design plan.

Teacher resource: [Virginia Department of Forestry](#)

Process/Skill Questions

- What are the tools, equipment, and supplies needed for landscape installation?
- What is the importance of a landscape design plan when installing plant material?
- What are the benefits of mulching trees and shrubs?
- What are some local resources for equipment and supplies?

Task Number 80

Prune and shape trees and shrubs.

Definition

Pruning and shaping should include

- determining equipment and supplies needed
- describing proper, safe use of equipment and supplies
- identifying reasons for pruning
- identifying maintenance requirements of a given landscape area
- determining pruning times and procedures for specific landscape trees and shrubs.

Process/Skill Questions

- What safety precautions should be taken when using the required tools, equipment, and supplies?
- What is the importance of following correct pruning procedures?
- Why is it important to disinfect pruning tools and equipment?
- What is a common disinfectant one can use to sterilize pruning tools and equipment?

Investigating the Floriculture Industry

Task Number 81

Identify cut flowers and foliage.

Definition

Identification should include

- naming commercial cut flowers and foliage by common name when shown actual fresh examples or pictures (slides or photographs)
- distinguishing among mass, line, filler, and interest forms for cut flowers and foliage
- listing color availability for cut flowers and foliage.

Process/Skill Questions

- Where are cut flowers and foliage grown?
- Where are cut flowers and foliage purchased?

Task Number 82

Process flowers.

Definition

Processing should include

- identifying factors affecting the shelf life of cut materials
- outlining the steps to be followed in conditioning cut materials
- specifying pretreatments of cut materials
- identifying the correct stage of bloom at which to purchase cut flowers
- listing ethylene-sensitive cut flowers
- identifying preventive measures to control ethylene-induced disorders
- comparing floral preservatives and their formulations.

Process/Skill Questions

- What can be done to make fresh flowers last longer?
- What causes roses to never open?
- At what temperature should fresh flowers be stored?

Task Number 83

Design or replicate floral arrangements.

Definition

Design or replication could include

- bud vases
- centerpieces
- boutonnieres and simple corsages
- rose bowls
- large vase arrangements
- hand-tied bouquets
- mass symmetrical and asymmetrical design
- holiday arrangements.

Process/Skill Questions

- What is the difference between a bud-vase and a large vase arrangement?

- For what occasions would a large vase arrangement be appropriate?
 - How does one decide whether to use mixed-vase or single-bloom displays?
 - What types of flowers are best suited for boutonnieres and corsages?
 - What types of arrangements are used for various holidays?
-

Task Number 84

Prepare plants for customers.

Definition

Preparation should include

- identifying the packaging materials, supplies, and tools used in wrapping bouquets of loose-cut flowers and foliage
- outlining the steps to be followed in wrapping loose bouquets of loose-cut flowers and foliage with a variety of packaging material, including tissue paper, cellophane, and sleeves
- wrapping loose bouquets of cut flowers and foliage.

Process/Skill Questions

- What are the advantages of boxed flowers?
- What are the advantages of wrapped flowers?
- What types of paper are used to wrap flowers?

Task Number 85

Design balloon bouquets.

Definition

Design should include

- inflating Mylar and latex balloons to the correct size (**Note: Caution should be taken to document and address possible latex sensitivity.**)
- creating tiered and rounded balloon bouquets
- inserting glitter, stuffed animals, and other accessories into bouquets
- outlining the procedures for assembling floating and freestanding arches
- creating an arch of latex balloons.

Process/Skill Questions

- Where might one expect to find balloon bouquets and arches?
- Why do some balloons stay inflated longer than others?
- How are balloon arches constructed?

- What causes balloons to shrink when taken outside?
- Why is it important to be aware of latex sensitivity?

Task Number 86

Use floral supplies and accessories.

Definition

Use could include

- identifying the functions of basic floral tools and equipment
- identifying basic supplies used in completing floral arrangements
- describing the types and shapes of wettable, dry, and wet floral foam
- comparing applications of dry floral foam to those of wet floral foam
- identifying alternatives to foams for securing cut materials
- listing and comparing applications of adhesives
- identifying wire gauges used in floral applications
- comparing types and widths of ribbons used in floral applications
- identifying other accessory supplies used in floral design.

Process/Skill Questions

- What tools should be used to cut fresh materials?
- How are flowers and foliage held in place in an arrangement?
- Where can floral design supplies be purchased?
- What potential hazards exist if tools and equipment are not used safely?

Investigating Business Operations

Task Number 87

Create a sales ticket or invoice.

Definition

Creation should include

- differentiating between cash, credit, and store-credit purchases
- determining itemized products and prices
- calculating discounts and coupons
- determining tax amount, including local tax, state tax, and any additional tax that may be required

- determining total
- making change
- ensuring that the date and name of the business appear on the ticket
- ensuring that the name and address of the customer appear on the ticket
- determining whether the purchase will be taken immediately, picked up at a later date, or delivered
- explaining the various means of completing a credit transaction (e.g., phone, online, card swipe by salesclerk, card swipe by customer).

Teacher resource: [Agricultural Sales CDE](#)

Process/Skill Questions

- What is the tax rate for retail sales in Virginia?
- Why is the preparation of sales tickets crucial to running a retail business?
- How can product itemization be helpful to inventory adjustments?
- What are the differences among cash, credit, and store-credit purchases?
- What are the different ways that a credit transaction may take place?
- What information needs to be obtained for delivery purchases?
- Why is it important to have pertinent information on a sales ticket?
- What is a sales invoice and what information does it include?

Task Number 88

Interpret labels and signage.

Definition

Interpretation should include identifying the

- product type
- description
- price.

Process/Skill Questions

- What information is typically included on a retail plant label?
- What would a sign for an endcap special look like?
- What pricing methods are used for regular vs. sale items?

Task Number 89

Assist customers.

Definition

Assisting customers should include

- following the seven steps of sales transactions
- providing timely assistance to customers in the store, on the phone, and through electronic communications
- responding to requests for information in the store, on the phone, or through electronic means with correct information or supplying resources where that information may be obtained
- knowing the layout of the store to assist customers in locating products
- asking for coworker assistance, if necessary
- being courteous at all times
- adhering to professional behavior standards
- developing contracts for ongoing relationships with other business partners.

Process/Skill Questions

- What is the best way to handle customer conflicts?
- Why is it important to interact professionally with all customers?
- What are the benefits of practicing and providing excellent customer service?
- What are some examples of addressing customers professionally?
- What information should be obtained from a customer calling with a question?
- How should one direct a customer looking for a particular product?

Task Number 90

Unload products.

Definition

Unloading products should include

- using proper lifting techniques
- determining where products need to be placed for storage (e.g., storeroom, floor, outside area)
- asking for coworker assistance, when necessary.

Process/Skill Questions

- What are the rules for lifting?
- What are the injuries associated with improper lifting techniques?
- When should one ask for coworker assistance when loading or unloading merchandise?
- Why should one avoid assistance from the customer when loading or unloading heavy products?
- How does one determine where products should be stored?

Task Number 91

Store products.

Definition

Storage should include

- locating the proper environmental conditions for storing the product
- protecting stored items from contamination or damage
- preserving items from deterioration
- rotating products so that the oldest items are sold first
- evaluating weather concerns to determine if alternative storage or protection is required.

Process/Skill Questions

- Why should most storage areas be environmentally controlled and protected from weather?
 - Why should storage areas be dry and organized?
 - What authorities enforce storage area requirements in the workplace?
 - What are the chemical and hazardous materials concerns when storing agricultural products?
 - How would one protect stock from weather damage?
 - How are products marketed to ensure that the oldest products are sold first?
-

Task Number 92

Weigh products.

Definition

Weighing products should include

- using the appropriate scale for each item
- interpreting the output
- using standard and metric systems
- measuring large-volume items (e.g., mulch, soil)
- measuring small items (e.g., bulbs, pebbles).

Process/Skill Questions

- What types of scales are used for measuring greenhouse/retail items?
 - Why would product weight be a retail issue?
 - Why is it important to know both standard and metric systems?
 - How are large-volume materials, such as mulch and soil, measured for sale?
 - How specific are the measurements for small items, such as bulbs?
 - How would one illustrate standard and metric equivalents?
-

Task Number 93

Mark prices on products.

Definition

Marking product prices should include

- using a legible, easy-to-read format
- using a marker and a font that can be seen on the item
- presenting prices in a manner consistent with policy
- posting tags where they can be easily seen or located.

Process/Skill Questions

- How can marked prices affect marketing initiatives?
 - What are the laws associated with marked prices and advertising?
 - Why is it important that the product prices and labels be legible and clear?
 - What types of markers are waterproof/weatherproof?
 - What computer fonts are the easiest for people to read?
-

Task Number 94

Inventory products.

Definition

Inventory should include

- product names, prices, and quantities on hand
- quantities produced or received in a given period
- quantities removed or sold in a given period
- following the principle of first in, first out (FIFO) vs. last in, first out (LIFO).

Process/Skill Questions

- How can correct inventories affect bottom-line profit margins?
 - How can inventory records help managers capitalize on sales trends?
 - How can sales systems and databases influence the accuracy of inventory records?
 - How can inventory records be a deterrent against employee theft?
 - What information should be included when doing inventory?
 - How often should inventory be done?
 - Why would a company use LIFO instead of FIFO?
-

Task Number 95

Market products.

Definition

Marketing products should include satisfying customers' needs and wants by developing, promoting, and distributing products. Marketing channels could include

- local television and news media
- a website
- social media
- school newspapers and websites
- business connections/partners
- coupons
- special holiday sales.

Internal marketing tools could include

- signs
- endcap displays
- pamphlets.

Teacher resource: [Marketing Plan CDE](#)

Process/Skill Questions

- How can effective marketing techniques influence the overall success of the business?
- Why is it important for a businessperson to be aware of the competition's marketing strategies in relation to its own?
- Why is it critical for a business to identify its customer base?
- What might be included on a sign to advertise a Labor Day sale, and how might that look different for a sale held in the spring?

Investigating Agricultural Tools and Machinery

Task Number 96

Use tools, equipment, and materials.

Definition

Use should include

- identifying all parts of hand and/or power tools and other equipment
- following all safety guidelines, procedures, and manufacturer recommendations
- following daily maintenance procedures
- evaluating the condition of the tool or equipment before each use

- selecting the proper tool or machine for each job
- selecting materials specific to the job.

Process/Skill Questions

- What are the legal regulations governing safety issues in the workplace?
- Why should the use of modified or compromised tools or equipment be avoided?
- Why should one always follow personal protective equipment (PPE) guidelines?
- Why is it important to read the owner's manual prior to using tools and operating equipment?

Task Number 97

Maintain tools.

Definition

Maintaining tools should include

- inspecting tools regularly for signs of damage, wear, and corrosion
- cleaning tools
- protecting electrical cords
- lubricating tools, when necessary
- sharpening dull edges
- following manufacturer's maintenance guidelines for all tools
- alerting the appropriate authority of damaged or broken tools
- storing tools based on manufacturer's guidelines
- keeping the work area organized.

Process/Skill Questions

- What are the benefits of storing tools in the appropriate place?
- What are the benefits of preserving and caring for tools?
- What is the danger of neglecting tool maintenance?
- What is the procedure for reporting damaged or broken tools?
- Why is it important to establish a tool maintenance plan?
- Why is it important to perform preventative maintenance on power tools?

Task Number 98

Describe the types of power sources and lubricants associated with tools and equipment.

Definition

Description should include power sources such as

- gasoline (diesel and liquid petroleum [LP])

- electricity
- battery
- pneumatic.

Lubricants should include those of different weights and viscosity, as well as water.

Process/Skill Questions

- Why do power tools require lubrication?
- Why would one select battery-powered tools over electrical tools?

Task Number 99

Lubricate a tractor or lawn mower.

Definition

Lubrication should be performed according to manufacturer specifications and include

- selecting the most appropriate lubricant for the application
- applying lubricant to wheel bearings, steering components, brake and clutch linkages, three-point hitch pivot points, transmission, gear-boxes, and other linkages or bearings
- checking and changing engine oil and filter (if required) with proper grade of oil.

Process/Skill Questions

- What lubricants are commonly used for tractors?
 - What should be done with waste oil and lubricants?
 - What would happen if a tractor were not lubricated properly?
 - What are the advantages and disadvantages of using a synthetic lubricant?
-
-

Investigating Woodworking

Task Number 100

Follow a woodworking project plan.

Definition

Following project plans could include

- developing sketches
- designing models (e.g., using paper, scrap material)
- using pictorial views
- using evolution of design
- using thumbnails
- considering proportions
- using design notes (e.g., justification, philosophy, reasoning)
- calculating angles and dimensions for the project.

Process/Skill Questions

- Why is it important to follow directions?
- What are the steps for constructing a woodworking project?
- What are the tools required for the project? Why is it important to measure twice prior to cutting lumber?

Task Number 101

Estimate materials for a project.

Definition

Estimation should include

- examining the purpose of a bill of materials
- identifying the steps in computing a bill of materials
- determining the process for developing a bill of materials.

Process/Skill Questions

- How are estimates used?
- What happens if the builder underestimates a project?
- What materials should be included in the materials estimate?

Task Number 102

Identify tools, equipment, and materials.

Definition

Identification should include

- tool, equipment, and supply classification according to their uses
- woodworking tools and other equipment
- daily maintenance and safety procedures.

Process/Skill Questions

- Why is it important to use each tool or machine for its intended purpose?
 - Why should one avoid using broken tools?
 - What tools and equipment are commonly used by woodworkers or carpenters?
-

Task Number 103

Measure lumber.

Definition

Measuring should include

- identifying measuring tools needed
- measuring to 1/16 of an inch
- marking the lumber
- verifying measurement accuracy.

Process/Skill Questions

- Why is accuracy of measurement important?
 - What is a good method for verifying measurement accuracy?
 - How is a standard measuring tape read?
-

Task Number 104

Make glue joints.

Definition

Making glue joints should include

- gluing both sides of the contact pieces
- pressing the pieces flat
- wiping away excess glue
- binding the pieces together to dry with clamp, vise, or other binder
- ensuring stability.

Process/Skill Questions

- When would a glue joint be preferable to a joint that uses fasteners?
- What types of glue are used for wood? What types of glue are used for metal?
- What might affect the required length of drying time?
- What types of fasteners may be used to strengthen a glue joint without being visible?

Task Number 105

Use wood fasteners.

Definition

Use should include

- identifying available wood fasteners
- identifying the tools, equipment, and supplies needed when using wood fasteners
- exploring the intended use of each type of fastener
- selecting a fastener for the specific project .

Process/Skill Questions

- What types of wood fasteners are available?
- When should wood fasteners be used?
- What tools and supplies are needed when using wood fasteners?
- What are the advantages and disadvantages of using glue vs. wood fasteners?

Task Number 106

Construct a woodworking project.

Definition

Construction should include

- following all safety guidelines and procedures
- selecting a plan to follow for a project
- estimating a bill of materials
- identifying hand tools, supplies, and equipment.

Process/Skill Questions

- What are the steps in constructing a woodworking project?
- What hand tools can be used in a woodworking project?
- How is the estimated cost of a woodworking project determined?

Task Number 107

Apply preservatives to wood surfaces.

Definition

Application could include

- selecting and preparing the material to be preserved
- identifying available preservatives and their purposes
- using stains, paints, lacquer, wax, varnishes, and polyurethane
- repairing blemishes/touching up finishes
- coating as necessary, according to manufacturer specifications.

Process/Skill Questions

- What are the purposes of preservatives and finishes?
- What safety precautions are required when applying preservatives?
- What is the importance of a wet edge?
- What is the advantage of using polyurethane over other types of finishes?

Exploring the Small Animal Care Industry

Task Number 108

Identify common species found in the small animal care industry.

Definition

Identification should include

- dog
- cat
- rabbit
- bird
- guinea pig
- hamster
- gerbil
- rodent
- reptile
- amphibian
- fish.

Process/Skill Questions

- Why are animals used for pets?
- How has the relationship between people and animals evolved over time?

Task Number 109

Identify the role of companion animals.

Definition

Identification should include

- describing the history of companion animals
- examining the role of pets from a historical perspective
- identifying safety issues related to pet ownership
- explaining responsible pet ownership
- identifying laws associated with pet ownership.

Process/Skill Questions

- What is the human-animal bond?
- How are animals a part of human life?

Task Number 110

Implement safety in small animal care.

Definition

Implementation should include

- discussing the procedures for handling small animals
- explaining reasons that animals scratch and bite humans
- explaining how to treat bites and scratches from small animals
- describing health problems resulting from small animal bites and scratches.

Process/Skill Questions

- What are *zoonotic diseases*?

Task Number 111

Describe the responsibilities of pet ownership.

Definition

Description should include

- considering options for obtaining a pet
- explaining the feeding and water schedule for pets

- describing the emotional needs of pets
- explaining pet health care
- explaining the concept and responsibility of euthanasia
- discussing the benefits of spaying and neutering to prevent over-population.

Process/Skill Questions

- Where can one purchase a pet?
- What is the feeding and watering schedule for a dog? Cat? Bird? Reptile?
- Why is it important to take a pet to be evaluated by a veterinarian?
- When should a pet owner consider euthanasia?
- What is abuse and neglect?

Task Number 112

Explain the difference between animal rights and animal welfare.

Definition

Explanation should include

- defining terms associated with animal rights and welfare
- comparing issues concerning animal rights and welfare
- identifying important legislation associated with animal rights and welfare.

Process/Skill Questions

- What are some current animals rights issues?
- What are some important laws that protect animals from neglect and abuse?

Task Number 113

Identify species of birds.

Definition

Identification could include

- terms related to birds
- considerations involved in selecting a pet bird
- common species of pet birds (e.g., cockatiels, conures, lovebirds, parakeets, parrots, cockatoos, macaws, canaries, starlings, finches)
- markings and color
- nutritional requirements of pet birds
- housing and equipment requirements of pet birds
- how to care for a bird
- anatomical characteristics (e.g., size, weight, shape, length)

- behaviors and song
- reproductive traits and nesting habits
- feeding habits
- geographic origins.

Process/Skill Questions

- What is *ornithology*?
- What are some protected bird species, and why are they protected?

Task Number 114

Identify breeds of dogs.

Definition

Identification could include

- terms related to dogs
- considerations involved in selecting dogs for pets
- common breeds of dogs in the seven groups (e.g., herding, hound, toy, non-sporting, sporting, terrier, working)
- physical characteristics of dogs (e.g., markings and colors, anatomical characteristics such as size, weight, shape, length, ears)
- common canine behaviors
- canine reproductive traits
- feeding habits
- nutritional requirements based on breed
- housing and equipment requirements for dogs
- how to care for dogs.

Process/Skill Questions

- What is *cynology*?
- What are the similarities and differences among dog breeds?

Task Number 115

Identify breeds of cats.

Definition

Identification could include

- terms common to cats
- considerations involved in selecting cats for pets

- common breeds of cats in shorthair and longhair categories (e.g., American shorthair, European Burmese, Egyptian mau, Japanese bobtail, Maine coon cat, Scottish fold, Turkish Angora)
- physical characteristics of cats (e.g., markings and color, anatomical characteristics such as size, weight, shape, length, ears)
- common feline behaviors
- feline reproductive traits
- feeding habits
- nutritional requirements based on breed
- housing and equipment requirements for cats
- how to care for cats.

Process/Skill Questions

- What is *felinology*?
- What are the similarities and differences among cat breeds?

Task Number 116

Identify reptiles, amphibians, and other exotic species.

Definition

Identification could include

- terms common to reptiles and amphibians
- considerations involved in selecting pet reptiles or amphibians
- common species of pet reptiles and amphibians (e.g., chameleon, bearded dragon, iguana, frog, toad, salamander, snake, turtle)
- physical characteristics (e.g., markings and color, anatomical characteristics such as size, weight, shape, length)
- reptile and amphibian behaviors
- reproductive traits
- feeding habits
- natural habitats
- nutritional requirements
- housing and equipment requirements of pet reptiles and amphibians
- how to care for reptiles and amphibians.

Process/Skill Questions

- What are the similarities and differences between a reptile and an amphibian?
- What abiotic or biotic factors affect amphibian and reptile habitats?
- How are reptiles and birds similar?
- What indigenous reptiles and amphibians are found in Virginia?
- How is loss of habitat affecting reptile and amphibian populations?
- What is *herpetology*?
- What are the nutritional requirements for specific species of reptiles, amphibians, frogs, toads, salamanders, newts, and caecilians?

- What are the housing and equipment requirements for reptiles and amphibians?
- What are some protected reptile and amphibian species, and why are they protected?

Task Number 117

Identify various categories of fish suitable for home aquariums.

Definition

Identification should include

- terminology common to fish (e.g., dorsal, cranial, anterior, caudal, transverse, brille, fins, gills, scales, scutes)
- considerations involved in selecting pet fish (e.g., freshwater, tropical, marine)
- common species of fish (e.g., goldfish, swordtails, angelfish, tetras, guppies, koi, gourami, oscars)
- markings and color and anatomical characteristics such as size, weight, shape, length, and fin structure
- fish behaviors
- reproductive traits
- feeding habits
- nutritional requirements of pet fish
- housing and equipment requirements for pet fish
- natural habitats in which fish are found (e.g., lake, pond, river, ocean).

Process/Skill Questions

- Why is it important to know the characteristics of a fish before selecting it for a pet?
- What species of fish can be kept in a freshwater aquarium?
- What species of fish can be kept in a saltwater aquarium?
- What is *ichthyology*?
- What types of filtration systems are available for aquariums?
- What are some protected fish species, and why are they protected?

Investigating General Animal Care

Task Number 118

Identify safety procedures and protocols specific to animal husbandry.

Definition

Identification should include

- handling procedures
- zoonotic diseases
- first aid
- grooming.

Process/Skill Questions

- Why is it important to wash one's hands after handling animals?
- Why is it important to use PPE while handling animals?

Task Number 119

Select tools and equipment necessary for animal care.

Definition

Selection should be made based on the

- type of animal
- age and weight of the animal
- condition of the animal
- function of the tool or equipment.

Selection should also include basic first-aid items in relation to animals.

Process/Skill Questions

- When working with animals, what factors influence the selection of tools or equipment?
- What are some tools and equipment used when working with small animals?
- What are some tools and equipment used when working with livestock (e.g., horses, goats, sheep, cattle)?

Task Number 120

Measure feed.

Definition

Measurement should include

- identifying the nutrient needs of animals
- weighing feed, using an appropriate scale.

Process/Skill Questions

- What might happen if one regularly overfeeds an animal?
- What might happen if one regularly underfeeds an animal?
- What tools are used to weigh, measure, and administer animal feed?

Task Number 121

Describe animal nutritional requirements.

Definition

Description should include

- identifying daily nutritional requirements of animals
- interpreting a nutrition label
- establishing amount of food, weighed and measured by manufacturer conversion rates
- establishing a method for delivery
- selecting a trusted source of feed for animals
- identifying water requirements specific to animal species.

Process/Skill Questions

- What are the goals of a nutrition program?
- Why should the geographic location of the animals be considered in planning a nutrition program?
- What are feed additives?
- How long can animals live without water? Why is water so important to animals?
- What safety precautions for the animal are involved in water maintenance?
- What are safety precautions for the human caretaker?
- What are the symptoms of dehydration in an animal?
- What should be done if an animal shows signs of dehydration?

Task Number 122

Keep feed records.

Definition

Keeping feed records could include

- quantities fed
- quantities consumed (if possible)
- date and time of day
- age (i.e., birth date) of animal
- type of food
- information on any medications being taken by the animal or illnesses the animal may be experiencing.

Process/Skill Questions

- What are the purposes of feed records?
- How can feed records save money?
- Why is it critically important to record the eating habits of sick animals?

Task Number 123

Sanitize animal living areas.

Definition

Sanitation should include

- changing bedding
- disposing of waste
- disinfecting food- and water-related equipment, using approved cleaning supplies
- disinfecting animal living areas.

Process/Skill Questions

- How often should pens be cleaned?
 - How often should drinking water be changed?
 - How often should food- and water-related equipment be disinfected?
-

Task Number 124

Identify common bedding materials.

Definition

Identification of bedding materials should include

- wood (e.g., pine, cedar, aspen)
- paper
- corncob
- clay
- straw.

Process/Skill Questions

- How often should bedding be changed?
- How often should a stall or cage be cleaned?
- What bedding materials are most common for livestock and for small animals?
- What are the advantages and disadvantages to the various kinds of bedding materials?

- What materials should not be used as bedding?
-

Task Number 125

Identify signs of animal health and illness.

Definition

Identification should include

- typical behavior of healthy animals
- healthy body temperature and vital signs.

Process/Skill Questions

- How can one identify if an animal is behaving normally?
- What are normal behaviors of healthy animals?
- What is the relationship between malnutrition and disease?
- What are normal vital sign ranges for a given animal?

Task Number 126

Explore treatments for pests and diseases.

Definition

Exploration should include

- assessing the animal's condition
- providing preventative care for animals
- identifying symptoms
- contacting a veterinarian, when necessary
- adhering to the treatment plan.

Process/Skill Questions

- What professional typically diagnoses diseased animals?
- What methods can be used to administer medication to animals?
- What physical or behavioral conditions may indicate an animal is diseased?
- What signs or symptoms should one look for before contacting a veterinarian?

Task Number 127

Identify exercise requirements for specific animals.

Definition

Identification should include the intensity, frequency, and duration of exercise needed by particular animals.

Process/Skill Questions

- What is the link between exercise and health?
- What are the differences in exercise requirements based on age?
- Why is it important to choose a pet based on the resources (e.g., schedule, disposable income) at one's disposal?
- How would one's lifestyle directly affect pet selection?
- Why is it important to research the breed's exercise requirements prior to breed selection?

Task Number 128

Groom animals.

Definition

Grooming should include

- evaluating the animal's temperament prior to grooming
- using the appropriate tools for the animal's coat and season
- keeping the coat healthy and tangle-free
- searching the coat for skin problems or parasites
- clipping nails
- providing dental care.

Process/Skill Questions

- What sort of tool/brush should one use with short-haired dogs?
- What are a dog's grooming requirements based on breed in addition to brushing?
- What are a cat's grooming requirements based on breed?
- What grooming is needed for other small animals (e.g., rabbits, guinea pigs, ferrets)?
- Why is grooming important?
- What are the health benefits of brushing animals?

Task Number 129

Demonstrate etiquette when handling animals.

Definition

Demonstration should include

- using appropriate techniques to hold and restrain animals

- wearing appropriate PPE around animals
- greeting unfamiliar animals with caution
- applying safety measures for the human and animal.

Process/Skill Questions

- What types of PPE are appropriate for handling animals?
- How would one safely approach an unfamiliar dog?
- What is the technique for picking up and holding a rabbit, hamster, cat, or other animals?

Investigating Ecology and Environmental Management

Task Number 130

Describe environmental conservation techniques.

Definition

Description should include

- the definition of *natural resource*
- the identification of natural resources necessary for human existence
- an explanation of methods for natural resource conservation.

Process/Skill Questions

- What is a *natural resource*?
- What natural resources are essential for human life?
- What is the purpose of conservation?
- What measures are necessary to preserve or conserve natural resources?
- What methods are necessary to protect resources facing possible depletion?
- What is *water conservation*?
- Why is water conservation needed?

Task Number 131

Identify types of erosion.

Definition

Identification should include

- definition of the terms *soil* and *soil erosion*
- the factors affecting soil erosion
- the four main types of soil erosion
- soil conservation methods.

Process/Skill Questions

- What does soil erosion look like?
- How does soil erosion affect watersheds?
- What effect does soil erosion have on crop production?
- What are common conservation practices to prevent soil erosion?

Task Number 132

Identify sources of water, air, and soil pollution.

Definition

Identification should include

- wastewater
- sediment
- chemicals/excess nutrients (e.g., pesticides, fertilizers)
- storm water
- sources of air pollution (e.g., vehicles, industry)
- sources of soil contamination
- sources of groundwater contamination.

Process/Skill Questions

- What are the differences between point- and nonpoint-source pollution?
- What is *industrial pollution*?
- What governmental regulatory agency oversees water pollution?
- What are causes of water pollution?
- What is the effect of pollution on society?
- Where can one find information about the proper disposal procedures for chemicals?
- How can soil contamination affect crop production?
- How is food for humans and animals affected by soil contamination?
- What are the consequences of groundwater contamination?

Investigating Forestry

Task Number 133

Describe the value of forests.

Definition

Description should include the following:

- To provide timber as raw material for wood products
- To provide a source of fuel
- To act as a wildlife habitat
- To regulate natural water quality
- To provide recreation opportunities
- To provide landscape and community protection
- To provide employment opportunities
- To create aesthetically appealing landscapes
- To act as a drain for atmospheric carbon dioxide, by producing oxygen

Teacher resources:

- [Forestry Guide to Virginia](#)
- [FFA Forestry CDE](#)

Process/Skill Questions

- What role do forests play in global warming?
- How do forests promote clean water?
- What is *forestry*?
- What are ways to prevent deforestation?
- What is *clear-cutting*?
- What are the ecological benefits of forests?
- What is *silviculture*?

Task Number 134

Identify pests and diseases that damage forests.

Definition

Identification should include

- insects that inflict damage, such as the emerald ash borer, the long-horned beetle, the gypsy moth, and tent caterpillars
- diseases (e.g., sudden oak death, laurel wilt, white pine blister rust)
- invasive plants and exotic weeds, such as kudzu, garlic mustard, giant hogweed, medusahead.

Process/Skill Questions

- What is sudden oak death, and what causes it?
- How does one eradicate pests without affecting the ecosystem?

- What are the names of Virginia's two national forests?
- How do invasive species threaten biodiversity and ecological integrity in the forest ecosystem?

Investigating Parks and Natural Resource Management

Task Number 135

Maintain a park or campground area.

Definition

Maintenance should include

- practicing fire safety
- leaving sites as they were discovered
- placing garbage in appropriate containers or packing it
- properly storing items in the campground area.

Process/Skill Questions

- What should one do with garbage if a trash can is not available?
 - How should one interact with wildlife?
 - Where should all food items be stored?
 - What animals may visit a campground, and how might one protect both the animals and the people?
 - What are the steps to extinguish an open fire?
-

Task Number 136

Maintain trails.

Definition

Maintenance of trails should include

- using PPE
- removing litter
- removing invasive or poisonous plants
- removing obstacles

- reporting problems.

Process/Skill Questions

- Why is it important that trails be maintained?
- Why should invasive plants be removed?
- Why should poisonous plants either be labeled or removed from the trail?
- Why is littering against the law?
- Why is it your responsibility to clean up garbage or report it, even if it is not your own?
- What are trail issues one should report, and to whom should one report them?

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, WHIL.8, WHIL.10, WHIL.11
43	Apply for an FFA degree and/or an agricultural proficiency award.	English: 9.5, 10.5, 11.5, 12.5
44	Define <i>agriculture</i> and related terms.	English: 9.3, 9.5, 10.4, 11.4, 12.4 Science: BIO.8, ES.6
45	Maintain professional standards.	English: 9.3, 9.5, 10.4, 12.4
46	Demonstrate safety procedures for personal protection.	History and Social Science: VUS.8, WHIL.8 Science: CH.1
47	Identify resources and agencies related to agriculture issues.	English: 9.3, 9.5, 10.4, 11.4, 12.4 History and Social Science: GOVT.7, GOVT.8, GOVT.14, GOVT.15, VUS.8, VUS.13, VUS.14, WHIL.8
48	Research career opportunities related to agriculture, food, and natural resources.	English: 9.8, 10.8, 11.8, 12.8
49	Identify classifications of plants.	English: 9.5, 10.4, 11.4, 12.4 Science: BIO.4
50	Identify plant parts.	English: 9.5, 10.5, 11.4, 12.5 Science: BIO.4
51	Identify requirements for plant growth.	History and Social Science: WHI.2, WHI.3

		Science: BIO.2
52	Identify soil characteristics.	History and Social Science: WHI.2, WHI.3 Science: ES.8
53	Demonstrate soil sampling and testing procedures.	English: 9.5, 10.4, 11.4, 12.4
54	Determine plant nutrition requirements.	
55	Identify types and forms of fertilizers.	English: 9.5, 10.4, 11.4, 12.4
56	Apply soil amendments.	
57	Define terms related to plant propagation.	English: 9.3, 10.4, 11.4, 12.4
58	Identify methods of plant reproduction.	English: 9.5, 10.4, 11.4, 12.4
59	Demonstrate asexual propagation methods.	
60	Prepare media/substrate for plant growth.	English: 9.2, 9.5, 10.4, 11.4, 12.4
61	Demonstrate plant care.	
62	Identify pests and diseases.	English: 9.5, 10.4, 11.4, 12.4
63	Define terms related to pest management.	English: 9.5, 9.8, 10.4, 10.8, 11.4, 11.8, 12.4, 12.8
64	Demonstrate the process for planting seeds.	English: 9.2, 9.5, 10.4, 11.4, 12.4
65	Use techniques, equipment, and supplies for greenhouse plant production.	English: 9.5, 9.6, 9.7, 10.4, 10.7, 10.8, 11.4, 11.7, 12.4, 12.7
66	Describe the differences in outdoor vs. greenhouse plant production.	English: 9.5, 10.4, 11.4, 12.4
67	Describe the differences in lawn grasses.	English: 9.5, 10.4, 11.4, 12.4
68	Select turf seed or sod based on site characteristics.	English: 9.5, 10.4, 11.4, 12.4
69	Seed lawns.	
70	Transplant turf.	
71	Describe safety requirements specific to lawn/turf care.	English: 9.5, 10.4, 11.4, 12.4 History and Social Science: VUS.8, WHII.8
72	Mow the lawn.	History and Social Science: VUS.8, WHII.8
73	Water the lawn.	
74	Plan a garden.	English: 9.5, 10.4, 11.4, 12.4 Mathematics: G.9, G.13
75	Design container gardens.	English: 9.5, 10.4, 11.4, 12.4
76	Plant a garden.	
77	Describe the value of a home garden.	English: 9.5, 10.4, 11.4, 12.4
78	Identify trees and shrubs.	Science: BIO.8
79	Plant trees and shrubs.	English: 9.5, 10.4, 11.4, 12.4
80	Prune and shape trees and shrubs.	English: 9.5, 10.4, 11.4, 12.4
81	Identify cut flowers and foliage.	English: 9.5, 10.4, 11.4, 12.4
82	Process flowers.	English: 9.5, 9.6, 10.4, 10.8, 11.4, 11.7, 11.8, 12.4, 12.7, 12.8
83	Design or replicate floral arrangements.	
84	Prepare plants for customers.	English: 9.6, 9.7, 10.7, 10.8, 11.7, 11.8, 12.7
85	Design balloon bouquets.	English: 9.5, 9.6, 9.7, 10.4, 10.7, 10.8, 11.4, 11.7, 11.8, 12.4, 12.7
86	Use floral supplies and accessories.	English: 9.5, 10.4, 11.4, 12.4

87	Create a sales ticket or invoice.	English: 9.5, 10.4, 11.4, 12.4 Mathematics: A.1, A.4
88	Interpret labels and signage.	English: 9.5, 10.4, 11.4, 12.4
89	Assist customers.	English: 9.5, 9.6, 9.7, 10.4, 10.7, 10.8, 11.4, 11.7, 11.8, 12.4, 12.7
90	Unload products.	
91	Store products.	
92	Weigh products.	
93	Mark prices on products.	
94	Inventory products.	
95	Market products.	English: 9.2, 9.5, 10.4, 11.4, 12.4
96	Use tools, equipment, and materials.	English: 9.5, 10.4, 11.4, 12.4 History and Social Science: WHI.2, WHI.3
97	Maintain tools.	History and Social Science: WHI.2, WHI.3
98	Describe the types of power sources and lubricants associated with tools and equipment.	English: 9.5, 10.4, 11.4, 12.4
99	Lubricate a tractor or lawn mower.	
100	Follow a woodworking project plan.	English: 9.5, 10.4, 11.4, 12.4 Mathematics: G.3, G.5, G.8, G.14
101	Estimate materials for a project.	Mathematics: A.1, A.4
102	Identify tools, equipment, and materials.	
103	Measure lumber.	
104	Make glue joints.	
105	Use wood fasteners.	
106	Construct a woodworking project.	English: 9.5, 10.4, 11.4, 12.4
107	Apply preservatives to wood surfaces.	English: 9.5, 10.4, 11.4, 12.4
108	Identify common species found in the small animal care industry.	English: 9.5, 10.4, 11.4, 12.4 Science: BIO.8
109	Identify the role of companion animals.	English: 9.5, 10.4, 11.4, 12.4 Science: BIO.8
110	Implement safety in small animal care.	English: 9.5, 10.4, 11.4, 12.4 Science: BIO.8
111	Describe the responsibilities of pet ownership.	English: 9.5, 10.4, 11.4, 12.4 Science: BIO.8
112	Explain the difference between animal rights and animal welfare.	English: 9.5, 10.4, 11.4, 12.4 Science: BIO.8
113	Identify species of birds.	English: 9.5, 10.4, 11.4, 12.4 Science: BIO.8
114	Identify breeds of dogs.	English: 9.5, 10.4, 11.4, 12.4

		Science: BIO.8
115	Identify breeds of cats.	English: 9.5, 10.4, 11.4, 12.4 Science: BIO.8
116	Identify reptiles, amphibians, and other exotic species.	English: 9.5, 10.4, 11.4, 12.4 Science: BIO.8
117	Identify various categories of fish suitable for home aquariums.	English: 9.5, 10.4, 11.4, 12.4 Science: BIO.8
118	Identify safety procedures and protocols specific to animal husbandry.	English: 9.5, 10.4, 11.4, 12.4 History and Social Science: VUS.8, WHII.8
119	Select tools and equipment necessary for animal care.	English: 9.5, 10.4, 11.4, 12.4
120	Measure feed.	English: 9.5, 10.4, 11.4, 12.4
121	Describe animal nutritional requirements.	English: 9.5, 10.4, 11.4, 12.4 Mathematics: A.1, A.4
122	Keep feed records.	English: 9.5, 9.6, 9.7, 10.4, 10.7, 10.8, 11.4, 11.7, 11.8, 12.4, 12.7
123	Sanitize animal living areas.	
124	Identify common bedding materials.	
125	Identify signs of animal health and illness.	English: 9.5, 10.4, 11.4, 12.4
126	Explore treatments for pests and diseases.	English: 9.5, 10.4, 11.4, 12.4
127	Identify exercise requirements for specific animals.	English: 9.5, 10.4, 11.4, 12.4
128	Groom animals.	English: 9.5, 10.4, 11.4, 12.4
129	Demonstrate etiquette when handling animals.	English: 9.5, 10.4, 11.4, 12.4
130	Describe environmental conservation techniques.	English: 9.3, 9.5, 10.4, 11.4, 12.4 Science: BIO.8, ES.6
131	Identify types of erosion.	English: 9.3, 10.4, 11.4, 12.4 Science: ES.7
132	Identify sources of water, air, and soil pollution.	English: 9.3, 9.5, 9.8, 10.4, 10.8, 11.4, 11.8, 12.4, 12.8 Science: ES.6, ES.8
133	Describe the value of forests.	English: 9.3, 9.5, 9.8, 10.4, 10.8, 11.4, 11.8, 12.4, 12.8
134	Identify pests and diseases that damage forests.	English: 9.5, 10.4, 11.4, 12.4
135	Maintain a park or campground area.	
136	Maintain trails.	

FFA Information

The FFA is a national 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 at <http://www.ffa.org> and the Virginia FFA Web site at <http://www.vaffa.org>.

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 and Career Cluster Information

Industry Credentials: Only apply to 36-week courses

- College and Work Readiness Assessment (CWRA+)
- Customer Service Specialist (CSS) Examination
- National Career Readiness Certificate Assessment
- Workplace Readiness Skills for the Commonwealth Examination

Career Cluster: Agriculture, Food and Natural Resources	
Pathway	Occupations
Agribusiness Systems	Agricultural Commodity Broker Agricultural Economist Agricultural Loan Officer Agricultural Products Sales Representative Farm Products Purchasing Agent and Buyer Farm, Ranch Manager Farmer/Rancher Feed, Farm Supply Store Sales Manager Sales Manager
Animal Systems	Agricultural Products Sales Representative Animal Breeder, Husbandry Animal Geneticist Animal Nutritionist Animal Scientist Aquacultural Manager Poultry Manager Veterinarian Veterinary Technician
Environmental Service Systems	Agricultural Products Sales Representative Environmental Compliance Inspector Environmental Sampling and Analysis Technician Hazardous Materials Handler Recycling Coordinator Secondary School Teacher Toxicologist Turf Farmer Water Conservationist
Food Products and Processing Systems	Biochemist Food Scientist
Natural Resources Systems	Ecologist Fish and Game Officer Fisheries Technician Forest Manager, Forester Forest Technician Geological Technician Logging Equipment Operator Microbiologist

Career Cluster: Agriculture, Food and Natural Resources

Pathway	Occupations
	Outdoor Recreation Guide Park Manager Park Technician Range Technician Wildlife Manager
Plant Systems	Agricultural Products Sales Representative Botanist Certified Crop Advisor Crop Grower Custom Harvester Farm, Ranch Manager Farmer/Rancher Floral Designer Floral Shop Manager Forest Geneticist Golf Course Superintendent Machine Setter, Operator Nursery and Greenhouse Manager Ornamental Horticulturist Plant Breeder/ Geneticist Secondary School Teacher Soil and Plant Scientist Tree Surgeon Turf Farmer
Power, Structural, and Technical Systems	Agricultural Engineer Agricultural Equipment Operator Agricultural Equipment Parts Manager Agricultural Equipment Parts Salesperson Machinist Parts Manager Welder