



## **EXAM INFORMATION**

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**Items**

50

**Points**

50

**Prerequisites**

NONE

**Grade Level**

9-12

**Course Length**

ONE SEMESTER

**Career Cluster**

AGRICULTURE, FOOD AND NATURAL  
RESOURCES

**Performance Standards**

INCLUDED

**Certificate Available**

YES

## **DESCRIPTION**

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Students will demonstrate knowledge and skills in nursery operation and landscape management practices which will prepare them to select appropriate plant materials and to design, install, and maintain interior and exterior plantings and hardscapes. Equipment and facilities maintenance is also covered.

## **EXAM BLUEPRINT**

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<b>STANDARD</b>	<b>PERCENTAGE OF EXAM</b>
1- Student Organizations in Agricultural Education	4%
2- Agricultural Experience in Agricultural Education	2%
3- Landscape Design Components	24%
4- Landscape Plant Practices	30%
5- Integrated Pest Management	2%
6- Irrigation Systems	38%
7- Landscape Equipment (Optional)	



### **STANDARD 1**

#### **STUDENTS WILL DEVELOP PERSONAL, LEADERSHIP, AND CAREER SKILLS THROUGH STUDENT ORGANIZATION PARTICIPATION**

- Objective 1** Assess the role of student organization participation in developing personal and leadership skills.
1. Identify important personal skills and the strategies used in developing the skills.
  2. Identify important leadership skills and the role of student organization participation in developing the skills.
- Objective 2** Assess the role of student organization participation in developing career skills.
1. List and describe proficiency awards appropriate for horticulture
  2. List and describe career development events appropriate for horticulture.
  3. Relate the importance of supervised agricultural experience to student organization achievement.
  4. Utilize student organization and supervised agricultural experience participation to gain advanced degrees of student organization membership.

Standard 1 Performance Evaluation included below (Optional)

### **STANDARD 2**

#### **STUDENTS WILL EXPLAIN THE MAINTENANCE AND EXPANSION OF SUPERVISED AGRICULTURAL EXPERIENCE PROGRAMS**

- Objective 1** Maintain and use agricultural experience records.
1. Explain how agricultural experience records are maintained from year to year.
  2. Explain how to summarize and analyze agricultural experience records.
- Objective 2** Devise long-range plans for expanding agricultural experience programs.
1. Evaluate the overall quality of a current agricultural experience and determine how to make it more productive or profitable.
  2. Explain factors that should be considered in expanding an agricultural experience program.
  3. Explain how placement agricultural experience and ownership agricultural experience programs may be expanded.

Standard 2 Performance Evaluation included below (Optional)

### **STANDARD 3**

#### **STUDENTS WILL DEMONSTRATE AN UNDERSTANDING OF LANDSCAPE DESIGN COMPONENTS**

- Objective 1** Identify and categorize landscape plants.
1. Explain systems used to classify plants.
  2. Classify landscape plants according to the hierarchical classification system, life cycles, plant use, and status as monocotyledons or dicotyledons.
  3. Identify woody landscape plants.



4. Identify annuals, biennials, and herbaceous perennials used in the landscape.
5. Identify turfgrass species.
6. Explain the use of a USDA plant hardiness zone map and plant heat zone maps in the selection of landscaping plants.

Objective 2 Compile information in preparation for landscape design work.

1. Determine the client's needs and desires.
2. Analyze the site conditions and prepare a site analysis plan.
3. Identify drafting equipment and demonstrate its proper use.

Objective 3 Create a functional and aesthetically pleasing landscape plan.

1. Create a base plan to scale.
2. Identify and draw landscape symbols on the landscape plan.
3. Identify and design the major areas of a residential landscape (e.g., public, outdoor living, service).
4. Organize the location of activities within the landscape plan.
5. Apply the principles and elements of design to the landscape.
6. Select plant materials for the landscape.
7. Select hardscape materials for the landscape.
8. Plan for xeriscaping and soil erosion control.
9. Develop bed patterns for the landscape.
10. Locate trees in the landscape plan.
11. Label the landscape plan.

Objective 4 Explain landscape design business concepts.

1. Differentiate between an estimate and a bid.
2. Describe landscape specifications.
3. Calculate common landscape measurements.
4. Prepare a cost estimate for a landscape plan.
5. Prepare a bid for a landscape design and installation project.

Standard 3 Performance Evaluation included below (Optional)

## **STANDARD 4**

**STUDENTS WILL DEMONSTRATE LANDSCAPE PLANT INSTALLATION AND MAINTENANCE PRACTICES**

Objective 1 Install a landscape area based on a landscape design.

1. Read a landscape plan and locate plant and hardscape placement.
2. Plant seeds, bulbs, ground covers, annuals, perennials, and woody plants according to instructions.
3. Provide post-planting care, such as appropriate watering, bracing, and mulching.

Objective 2 Explain turfgrass installation and maintenance methods.

1. Identify methods of turfgrass establishment and the advantages and disadvantages of each method.



2. Interpret a seed label.
3. Explain proper turfgrass watering practices.
4. Identify and explain the use of equipment for installing and maintaining turfgrass.
5. Explain the reason for, and the process of, aerating turfgrass.
6. Describe mowing procedures.
7. Explain the purpose of and procedure for top dressing turfgrass.
8. Explain over seeding of turfgrass.
9. Interpret fertilizer bag labels.
10. Calculate the quantity of fertilizer needed for turfgrass.
11. Apply fertilizers as needed to maintain nutrient levels.

**Objective 3** Describe proper tree and shrub maintenance practices and procedures.

1. Identify symptoms of water stress in trees and shrubs.
2. Explain recommended watering practices for trees and shrubs.
3. Identify symptoms of nutrient deficiency in trees and shrubs.
4. Explain guidelines for fertilizing trees and shrubs.
5. Describe how to select and apply mulches to the landscape.
6. Identify tools used for pruning trees and shrubs.
7. Demonstrate various techniques for pruning trees and shrubs.

**Objective 4** Examine the physical and chemical properties of growing media in landscape applications.

1. Describe the components of growing media.
2. Describe the functions of growing media.
3. Determine desirable properties of growing media.
4. Evaluate the advantages and disadvantages of soilless media.
5. Demonstrate proper techniques for sampling growing media.
6. Test and determine pH level of various growing media.
7. Interpret pH test results of a growing medium sample.
8. Describe pH and how it is modified.

Standard 4 Performance Evaluation included below (Optional)

## **STANDARD 5**

### **STUDENTS WILL DESCRIBE INTEGRATED PEST MANAGEMENT**

**Objective 1** Describe the principles of integrated pest management.

1. Explain integrated pest management (IPM).
2. Identify benefits of IPM.
3. Describe pest control strategies associated with IPM.

**Objective 2** Identify plant pests and diseases and their causes.

1. Identify types of plant pests and disorders.
2. Identify weed, insect, rodent, and fungi pests.



- Objective 3
3. Identify infectious and noninfectious plant diseases.
- Explain procedures for the safe handling, use, and storage of pesticides.
1. Explain risks and benefits associated with the materials and methods used in plant pest management.
  2. Interpret pesticide labels.
  3. Explain procedures for mixing and storing pesticides.
  4. Describe types of pesticide controls and formulations.
  5. Explain the safety practices that should be followed when applying pesticides.
  6. Describe the proper disposal of surplus pesticides and empty containers.
  7. Evaluate environmental and consumer concerns regarding pest management strategies.

## STANDARD 6

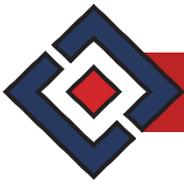
### STUDENTS WILL DEMONSTRATE THE INSTALLATION AND MAINTENANCE OF IRRIGATION SYSTEMS

- Objective 1
- Prepare for installation of a sprinkler system
1. Analyze site conditions.
  2. Calculate area coverage dimensions.
  3. Calculate water flow in gallons per minute (GPM).
  4. Identify components of irrigation systems, including pipes and joints.

- Objective 2
- Plan and install a sprinkler system.
1. Plan and illustrate a distribution system.
  2. Select components for the irrigation system.
  3. Calculate the number of heads, valves, and drains and the length of pipe needed.
  4. Calculate the cost of the parts, supplies, and labor for system installation.
  5. Identify factors involved in the bidding process.
  6. Cut, fit, and install PVC pipes and fittings.
  7. Install valves and faucets.
  8. Perform an irrigation system test.

- Objective 3
- Maintain a sprinkler system.
1. Check for leaks or broken heads.
  2. Replace or repair heads.
  3. Replace or repair pipe.
  4. Adjust sprinkler head height.

Standard 6 Performance Evaluation included below (Optional)



**STANDARD 7 (Optional)**

**STUDENTS WILL DEMONSTRATE LANDSCAPE EQUIPMENT MAINTENANCE AND OPERATION**

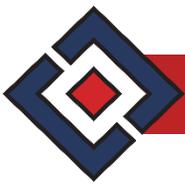
Objective 1 Demonstrate the use of equipment in landscape maintenance.

1. Identify common equipment and its use in landscape maintenance.
2. Explain the meaning and importance of the operator's manual.
3. Identify the location and use of controls on equipment.
4. Follow safe practices in the use of landscape maintenance equipment.

Objective 2 Properly maintain equipment used in landscape maintenance.

1. Complete basic tire inspections and perform maintenance for safe tire performance.
2. Check the oil level and add oil if necessary.
3. Check the fuel level and add fuel if necessary.
4. Service the air cleaner.

Standard 7 Performance Evaluation included below (Optional)



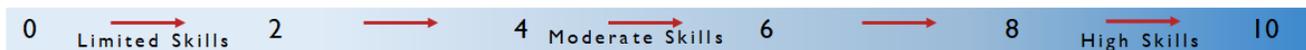
### Nursery Operation Performance Standards (Optional)

Performance assessments may be completed and evaluated at any time during the course. The following performance skills are to be used in connection with the associated standards and exam. To pass the performance standard the student must attain a performance standard average of **8 or higher** on the rating scale. Students may be encouraged to repeat the objectives until they average **8 or higher**.

Students Name \_\_\_\_\_

Class \_\_\_\_\_

#### PERFORMANCE RATING SCALE



#### STANDARD 1 Student Organization in Agricultural Education

Score:

- Students will attend a student organization meeting

#### STANDARD 2 Agricultural Experience in Agricultural Education

Score:

- Students will use the approved record book to record financial transactions and activities on an agricultural experience

#### STANDARD 3 Landscape Design Components

Score:

- Student will design a landscape area demonstrating landscape design components
- Develop leadership and personal development goals

#### STANDARD 4 Landscape Plant Practices

Score:

- Display proper tree, shrub, and turn maintenance practices and procedures

#### STANDARD 6 Irrigation Systems

Score:

- Properly install and maintain an irrigation system

#### STANDARD 7 Landscape Equipment Maintenance and Operation

Score:

- Demonstrate safe use of equipment
- Perform vehicle maintenance

#### PERFORMANCE STANDARD AVERAGE SCORE: