

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 10.0 Describe the horticulture industry.

**Benchmark:** 10.01 Describe the importance of horticulture to the American and global economies.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to information about horticulture and American and/or global economy.

### Stimulus Attributes:

Stimulus may identify the roles of the horticulture industry in American and/or global economies.

Stimulus may include a scenario, diagrams, and/or charts.

### Response Attributes:

Responses may address the economy and the relevance of horticulture in the economy.

Responses may be limited to aspects of horticulture or horticulture as a whole.

### Sample Item:

Horticultural exports from the United States annually accounts for over \$10 billion. What was the impact of the economic downturn from 2007 to 2010 on the horticulture industry?

- A. The horticulture industry in America as a whole has shrunk resulting in higher prices and less interest globally.
- B. The horticulture industry in America as a whole has been stagnant and the demand for exports globally has declined.
- \* C. The horticulture industry in America as a whole has remained strong, continuing to grow and has resulted in increased demand for exports.
- D. The horticulture industry in America as a whole has improved, but there have been less exports but higher profits for the growers.

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## Item Specifications

**Standard:** 10.0 Describe the horticulture industry.

**Benchmark:** 10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to career and educational requirements for careers in horticulture.

### Stimulus Attributes:

Stimulus may address career opportunities in horticulture and educational requirements.

Stimulus may identify horticulture careers.

Stimulus may address continuing education opportunities for horticulture careers.

Stimulus may include a scenario, diagram, and/or charts.

### Response Attributes:

Responses may list possible careers in the horticulture industry.

Responses may identify post-secondary requirements for entry into horticultural coursework.

### Sample Item:

Stacy is researching a college program for horticulture. When planning her high school elective courses, which courses would **BEST** prepare Stacy for a career in botany?

- A. Vegetable Production and Soil Science
- B. Soil Fertility and Soil Science
- \* C. Plant Nutrition and Principles of Plant Pathology
- D. Introduction to Permaculture and Postharvest Physiology

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## Item Specifications

**Standard:** 10.0 Describe the horticulture industry.

**Benchmark:** 10.03 Describe the importance of horticulture to the environment, including sustainability practices.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to the horticulture industry and environmental concerns.

### Stimulus Attributes:

Stimulus may describe the importance of horticulture to the environment.

Stimulus may describe the impact the horticulture industry has on the environment or the best practices for sustainability.

### Response Attributes:

Responses may involve horticulture practices or terminology.

Responses may involve sustainability requirements.

### Sample Item:

Environmental concerns carry over to the horticulture industry. Which practice focuses on water conservation and sustainability?

- \* A. Xeriscaping
- B. composting
- C. hydroponics
- D. Olericulture

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## **Item Specifications**

**Standard:** 10.0 Describe the horticulture industry.

**Benchmark:** 10.04 Identify professional organizations and certifications for the horticultural industry.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to professional organizations in the Florida horticulture industry.

### **Stimulus Attributes:**

Stimulus may identify professional organizations in the horticulture industry.

Stimulus may identify certifications that are appropriate in the horticulture industry.

Stimulus may include graphs, charts, and/or pictures.

### **Response Attributes:**

Responses may reflect professional organizations or certifications in the horticulture industry.

Responses should be plausible aspects of the horticulture industry.

### **Sample Item:**

After completing a high school horticultural science curriculum, what certification would students be eligible to receive?

- \* A. Florida Certified Horticultural Professional
- B. Agricultural Biotechnology Certification
- C. Agricultural Technology Certification
- D. Florida Nursery and Landscape Professional

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## Item Specifications

**Standard:** 11.0 Identify safety procedures in the workplace.

**Benchmark:** 11.01 Identify the common causes of accidents in the horticulture industry.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to common causes of accidents in the horticulture industry. Items may include accident prevention, but the treatment of accident injuries should not be included.

### Stimulus Attributes:

Stimulus may include types of accidents that occur in the horticulture industry.  
Stimulus may include workplace safety procedures and/or accident prevention.

### Response Attributes:

Responses may include types of common agricultural accidents.  
Responses may include prevention techniques or common causes of accidents.

### Sample Item:

Despite the relatively small percentage of the population that is employed in the horticulture industry, there are higher than average workplace fatalities. What are two of the most common causes of death in the horticulture industry?

- A. transportation mishaps and electrocution
- B. contact with machinery and asphyxiation/drowning
- C. falling from a height and electrocution
- \* D. transportation mishaps and being struck by moving or falling objects

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## Item Specifications

**Standard:** 11.0 Identify safety procedures in the workplace.

**Benchmark:** 11.02 Demonstrate proper safety precautions and use of personal protective equipment specific to the horticulture industry.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to personal protective equipment specific to the horticulture industry. Items should be limited to safety procedures or precautions commonly occurring in the horticulture industry.

### Stimulus Attributes:

Stimulus may include pictures or diagrams of safety hazards or equipment.

Stimulus may include processes for ensuring safety on the job.

Stimulus may include a demonstration of knowledge through the selection of correct behaviors or a performance of the required behaviors.

### Response Attributes:

Responses may include types of protective equipment.

Responses may include precautions for avoiding danger.

Responses should relate to aspects witnessed in the horticulture industry.

### Sample Item:

Miguel is getting ready to start work irrigating the soil where a garden will be planted. Before beginning work, Miguel's boss asks him to be safe. What is the best order to follow?

- \* A. put on safety boots, check the area for potential problems, and check the equipment
- B. check the area for potential problems, check the equipment, and put on safety boots
- C. check the area for potential problems, put on safety boots, and check the equipment
- D. put on safety boots, check the equipment, and check the area for potential problems

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## **Item Specifications**

**Standard:** 11.0 Identify safety procedures in the workplace.

**Benchmark:** 11.03 Explain, identify and utilize pertinent information from a container label and/or Material Safety Data Sheet (MSDS) according to Environmental Protection Agency (EPA), Worker Protection Standard and Occupational Safety and Health Agency (OSHA) regulations.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to information contained in the MSDS and/or on common containers utilized in the horticulture industry.

### **Stimulus Attributes:**

Stimulus may reference OSHA and/or EPA organizations.

Stimulus may refer to common placement of information contained on standardized labels.

Stimulus may include a scenario, diagram, or graphic.

Stimulus may include an explanation that includes written ideas or the selection of correct ideas.

### **Response Attributes:**

Responses may reference common materials used in horticulture.

Responses may include common acronyms and/or terminology used in horticulture.

### **Sample Item:**

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## Item Specifications

Chantelle has been asked to identify the best option to use for preventing chinch bugs. The main active ingredient to control chinch bugs is Bifenthrin.

# **Bifenthrin 7.9**

## **Termiticide/Insecticide**

### **Multi Use Insecticide**

•Controls a Wide Range of Insects and Mites on Trees, Shrubs, Flowering Plants, Non-Bearing Fruit and Nut Trees, and Flowers

•Controls Pests Indoors and Outdoors on Residential, Institutional, Public, Commercial, and Industrial Buildings, and Lawns, Ornamentals, Parks, Recreational Areas and Athletic Fields

•For Use in Interiorscapes including Hotels, Shopping Malls, and Office Buildings

•For Use in Outdoor Landscapes including Residential Dwellings, Parks, Institutional Buildings, Recreational Areas, Athletic Fields, and Home Lawns

•Prevents and Controls Termites In and Around Structures and Constructions

•Prevents and Controls Ticks (including ticks that may transmit Lyme Disease and Rocky Mountain Spotted Fever)

When used as a Termiticide, Individuals/ Firms must be licensed by the State to apply termiticide products. States may have more restrictive requirements regarding qualifications of persons using this product. Consult the pest control regulatory agency of your State prior to use of this product.

Active Ingredient:

By Wt.

Bifenthrin* .....	7.9%
Other Ingredients: .....	<u>92.1%</u>
Total .....	100.0%



## Item Specifications

### KEEP OUT OF REACH OF CHILDREN CAUTION

<b>FIRST AID</b>	
<b>If swallowed</b>	<ul style="list-style-type: none"> <li>• Call a poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told to do so by the poison control center or doctor.</li> <li>• Do not give anything by mouth to an unconscious person.</li> </ul>
<b>If inhaled</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth if possible.</li> <li>• Call a poison control center or doctor for further treatment advice.</li> </ul>
<b>If on skin or clothing</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If in eyes</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water 15-20 minutes.</li> <li>• Remove contact lenses, if present, after the first 5 minutes, then continuing rinsing eye.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<p>Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For a medical emergency involving this product, call 800-222-1222.</p>	
<p><b>Note to Physician</b> - This product is a pyrethroid. If large amounts have been ingested, the stomach and intestine should be evacuated. Treatment is symptomatic and supportive. Digestible fats, oils, or alcohol may increase absorption and so should be avoided.</p>	

### PRECAUTIONARY STATEMENTS

#### Hazards to Humans and Domestic Animals

**Caution** - Causes moderate eye irritation. Harmful if swallowed, inhaled, or absorbed through skin. Avoid contact with skin, eyes or clothing. Avoid breathing spray mist. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Remove contaminated clothing and wash before reuse.

All pesticide handlers (mixers, loaders, and applicators) must wear long-sleeved shirt and long pants, socks, shoes, and chemical-resistant gloves. After the product is diluted in accordance with label directions for use, and/or when mixing and loading using a closed spray tank transfer system, or an in-line injector system, shirt, pants, socks, shoes, and waterproof gloves are sufficient. In addition, all pesticide handlers must wear a respiratory protection device when working in a non-ventilated space (one of the following NIOSH approved respirator with any R, P or HE filter or a NIOSH approved respirator with an organic vapor (OV) cartridge or canister with any R,P or HE prefilter). All pesticide handlers must wear protective eyewear when working in non-ventilated space or when applying termiticide by rodding or sub-slab injection.

When treating adjacent to an existing structure, the applicator must check the area to be treated, and immediately adjacent areas of the structure, for visible and accessible cracks and holes to prevent any leaks or significant exposures to persons occupying the structure. People present or residing in the structure during application must be advised to remove their pets and themselves from the structure if they see any signs of leakage. After application, the applicator is required to check for leaks. All leaks resulting in the deposition of termiticide in locations other than those prescribed on this label must be cleaned up prior to leaving the application site. Do not allow people or pets to contact contaminated areas or to reoccupy contaminated areas of the structure until the clean-up is completed.

When applying the pesticide, some overspray got into Chantelle's eyes and on her clothes/skin. Using the information above what should she do?

- \*     A.     rinse her skin, rinse her eyes for 20 minutes, and call poison control  
        B.     discard her clothing, call 9-1-1, and rinse her eyes for 10 minutes  
        C.     induce vomiting, call 9-1-1, and take off her contaminated clothing  
        D.     sip a glass of water, move to fresh air, and rinse the skin where the spray hit

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## Item Specifications

**Standard:** 12.0 Identify and classify plants.

**Benchmark:** 12.01 Identify plants by scientific and common names.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to plants produced commercially in the Florida horticulture industry. Items should be limited to scientific or common names of plants.

### Stimulus Attributes:

Stimulus may use pictures or graphics.

Stimulus may use plant descriptors to identify plants by scientific and common names.

Stimulus may use plant parts to identify plants by scientific and common names.

### Response Attributes:

Responses may include scientific and common names for plants.

Responses may include identification techniques and/or common plant parts.

Responses may include detailed descriptions of plant appearances.

### Sample Item:



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What is the scientific and common name of the plant?

- A. Strelitzia reginae, bird of paradise
- \* B. Philodendron corodam, heartleaf philo
- C. Cycas revolute, king sago
- D. Codiaeum variegatum, croton

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## Item Specifications

**Standard:** 12.0 Identify and classify plants.

**Benchmark:** 12.02 Classify plants botanically.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to plants commercially grown in the Florida horticulture industry.

### Stimulus Attributes:

Stimulus may include pictures of specimen plants.

Stimulus may include plant descriptors for plant classification.

Stimulus may include information about the classification process.

### Response Attributes:

Responses may include botanical classification of plants.

Responses may include classification techniques used in classifying plants botanically.

### Sample Item:

When classifying plants botanically, it is important to identify them based on common characteristics. What is the correct classification order?

- A. Family, Order, Genius, Species
- B. Genius, Order, Family, Species
- \* C. Order, Family, Genius, Species
- D. Order, Genius, Family, Species

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## Item Specifications

**Standard:** 12.0 Identify and classify plants.

**Benchmark:** 12.03 Write scientific names for plants.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to plants commercially grown in the Florida horticulture industry. Items may include a written answer or the selection of a correct written response.

### Stimulus Attributes:

Stimulus may include pictures, charts, or common names of plants.

Stimulus may include classification ranking and/or classification referrals.

### Response Attributes:

Responses may include scientific names for plants.

Responses may include pictures of plants.

Responses may include classification rankings.

### Sample Item:

The scientific name for a Queen Palm is *Arecastrum romanzoffianum* (Cham.) Becc. What is the scientific name for the Family in which the Queen Palm is associated?

- A.     Arecidae
- B.     Arecales
- \* C.     Arecaceae
- D.     Areca

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## **Item Specifications**

**Standard:** 13.0 Propagate Plants.

**Benchmark:** 13.01 Identify propagating and growing facilities and structures.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to propagating and/or growing facilities commonly used in the Florida horticulture industry.

### **Stimulus Attributes:**

Stimulus may consist of pictures, diagrams, or models.

Stimulus may involve a scenario describing the propagating and growing facilities used in Florida.

Stimulus may include the identification of techniques or procedures.

### **Response Attributes:**

Responses may describe propagation facilities.

Responses may include names of common horticulture facilities or structures.

Responses may include terminology or acronyms used in the horticulture industry.

### **Sample Item:**

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### Item Specifications

What is the name of this structure used in the horticulture industry?



- \* A. greenhouse
- B. hothouse
- C. shade house
- D. lean to

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## Item Specifications

**Standard:** 13.0 Propagate plants.

**Benchmark:** 13.02 Prepare propagation media.

**Depth of Knowledge:** Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to propagation media for plants propagated in the Florida horticulture industry or the process of preparing said media. Items may require the student to prepare media or to select procedures when preparing propagation media.

### Stimulus Attributes:

Stimulus may include a scenario describing the ingredients used in media propagation for plant material.

Stimulus may include pictures of the ingredients used in media propagation.

Stimulus may include procedures to prepare propagation media.

### Response Attributes:

Responses may include moisture requirements.

Responses may describe the types of cuttings to be propagation.

Responses may include ingredients and/or procedures to prepare propagation media.

### Sample Item:

Angela is preparing propagation media and knows that the soil for her planting seeds must be well aerated. What is the most likely reason that she would aerate the soil?

- A. Seeds require moisture and aerating the soil facilitates moisture penetration.
- \* B. Seeds require oxygen and aerating the soil allows oxygen to circulate.
- C. Seeds require warmth when first planted and aerating the soil creates a heat barrier.
- D. Seeds require darkness and aerating the soil ensures that light will not reach the seeds.

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## Item Specifications

**Standard:** 13.0 Propagate plants.

**Benchmark:** 13.03 Select and collect propagation materials.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to the selection, collection, or process of selection/collection of propagation materials. Items may include the selection of materials or the identification of propagation materials.

### Stimulus Attributes:

Stimulus may use a scenario to describe propagation materials collected.

Stimulus may include propagation vocabulary (i.e. cutting, liner, hook and blade pruner, rootone).

Stimulus may include materials for different propagation methods.

### Response Attributes:

Responses may include but are not limited to describing the locale where material may be collected.

Responses may be pictures or graphs depicting where the material can be collected from or the process to identify it.

Responses may include the classification of propagation material.

### Sample Item:

Keyshawn is determining the best propagation material for asexual propagation of a plant. After determining the type of method to use, he needs to determine the best place to obtain the material. For asexual propagation, what is the method to use and from where can the material be collected?

- A. micro propagation; fungi is introduced to the plant
- B. striking; soil from a fertile field
- C. germination; empty seeds from another plant
- \* D. grafting; tissues from another plant



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## Item Specifications

**Standard:** 13.0 Propagate plants.

**Benchmark:** 13.04 Demonstrate propagation by sexual and asexual methods.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to the process and systems of propagation by sexual and asexual methods used in horticulture. Items may include a demonstration of knowledge by selecting correct behaviors or a performance of the required behaviors.

### Stimulus Attributes:

Stimulus may include charts, diagrams, and pictures.

Stimulus may be a description of the process of sexual and asexual propagation.

Stimulus may include live specimen of either sexual or asexual propagation.

### Response Attributes:

Responses may include the method by which sexual reproduction occurs.

Responses may be demonstrated using performance measures.

### Sample Item:

Sally is bud grafting a plant using asexual propagation. Which term or phrase describes the organism when fully grown?

- \* A. identical to parent
- B. genetically superior
- C. an embryo
- D. a virion

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## Item Specifications

**Standard:** 13.0 Propagate plants.

**Benchmark:** 13.05 Demonstrate environmental controls for propagation materials.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to environmental controls for propagation materials (i.e. scarification, stratification, separation, tissue culture, and callus) used in horticulture or control mechanisms or processes. Items may include a demonstration of knowledge by selecting correct behaviors or a performance of the required behaviors.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures related to horticulture.

Stimulus may address light and temperature on plant growth.

Stimulus may involve a scenario related to the horticulture industry.

### Response Attributes:

Responses may involve a scenario related to the horticulture industry and its environmental controls.

Responses may address light and temperature on plant growth.

### Sample Item:

Which example demonstrates an environmental control?

- A. reproducing plants from tissue culture
- B. growing plants in the forest
- C. pruning plants in the backyard
- \* D. irrigating plants with water

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## **Item Specifications**

**Standard:** 13.0 Propagate plants.

**Benchmark:** 13.06 Identify and select proper rooting hormones based on plant characteristics.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to rooting hormones and plant characteristics. Items may include the selection of correct information or performance.

### **Stimulus Attributes:**

Stimulus may include rooting hormones, techniques, and methods.

Stimulus may include pictures, diagrams, and/or models.

Stimulus may include a scenario of plant characteristics.

### **Response Attributes:**

Responses may include techniques used in horticulture.

Responses may use terminology associated with horticulture.

### **Sample Item:**

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### **Item Specifications**

Stimulus: A farmer is considering what rooting hormone should be used on his blackberry plants. In two to three paragraphs, discuss what needs to be considered when selecting a rooting hormone to use on plants. In your response, identify the rooting hormone that you would select in this case and describe at least two benefits the farmer would likely see from the proper rooting hormone selection.

Rubric:

- |          |  |
|----------|--|
| 4 Points | Response includes the correct rooting hormone. A description of what needs to be considered when selecting a rooting hormone is included. Response includes at least two correctly identified benefits for the farmer from the proper selection of rooting hormone.  |
| 3 Points | Response includes the correct rooting hormone. A partially correct description of what needs to be considered when selecting a rooting hormone is included. Response includes at least two correctly identified benefits for the farmer from the proper selection of rooting hormone.  |
| 2 Points | Response may not correctly identify the rooting hormone. Response includes the description of what needs to be considered when selecting a rooting hormone, however, it contains some flaws or improper considerations. Response includes at least one correctly identified benefit for the farmer from the proper selection of rooting hormone. |
| 1 Point  | Response may not correctly identify the rooting hormone. Response includes the description of what needs to be considered when selecting a rooting hormone, however, it contains major flaws or improper considerations. Response does not correctly identify any benefits for the farmer from the proper selection of rooting hormone.          |

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## Item Specifications

**Standard:** 14.0 Identify growing media and apply fertilizers.

**Benchmark:** 14.01 Identify soil and media materials.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to soil media and/or media materials. Items may be limited to soil media commonly found in the Florida horticulture industry.

### Stimulus Attributes:

Stimulus may include soil media.

Stimulus may include media materials.

Stimulus may include pictures, charts, graphs, and/or maps.

Stimulus may include the use of different soil media materials.

### Response Attributes:

Responses may be soil media or media materials.

Responses may include the benefits or use of different soil materials.

### Sample Item:

Which is the **BEST** soil media material you can add to a mixture to increase drainage?

- A. clay
- B. peat moss
- \* C. sand
- D. compost

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## Item Specifications

**Standard:** 14.0 Identify growing media and apply fertilizers.

**Benchmark:** 14.02 Identify nutritional needs of plants.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to plants produced in the Florida horticulture industry. Items should be limited to nutritional needs of plants.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures related to nutritional needs in plants.

Stimulus may address Best Management Practices.

Stimulus may involve a scenario related to the nutritional needs in plants.

### Response Attributes:

Responses may include micro and macronutrients.

Responses may include nutritional terminology or samples.

### Sample Item:

What are the three primary macronutrients needed by plants?

- A. Ca-Mg-S
- \* B. N-P-K
- C. N-P-S
- D. Zn-B-Cu

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## Item Specifications

**Standard:** 14.0 Identify growing media and apply fertilizers.

**Benchmark:** 14.03 Identify symptoms of nutritional deficiencies and toxicities of plants.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to plants grown in the Florida horticulture industry. Items should be limited to common nutritional deficiencies and/or toxicities of plants.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures related to nutritional needs in plants.

Stimulus may address Best Management Practices.

Stimulus may involve a scenario related to the toxicities found in plants.

### Response Attributes:

Responses may involve a scenario related to plant disorders.

Responses may include nutritional information and/or diseases of plants.

### Sample Item:

The tomatoes shown have small spots on their leaves. The spots have a yellow ring around the dark brown spot. The problem seems to be most common on the lower leaves of the plant. What is wrong with the tomato plant and what is the likely cause?



- A. Iron deficiency, caused by a lack of or abundance of one or more nutrients
- B. Summer Patch, caused by fungi
- C. White Rot, caused by poor pruning
- \* D. Early Blight, caused by an infected leaf or stem on or in the soil

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**Standard:** 14.0 Identify growing media and apply fertilizers.

**Benchmark:** 14.04 Identify types and kinds of fertilizers.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice

**Content Limits:** Items should be limited to fertilizers used in the Florida horticulture industry. Items should include all types of fertilizers.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures related to nutritional needs in plants.

Stimulus may address Best Management Practices.

Stimulus may involve a scenario related to the fertilizer needs found in plants.

### Response Attributes:

Responses may involve a scenario related to plant nutritional needs.

Responses may include nutritional requirements of plants.

Responses may include different types of fertilizers and their use.

### Sample Item:

What type of fertilizer can last over a period of several months and is available in a solid form?

- A. fast-release
- B. organic
- \* C. slow-release
- D. water-soluble



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## Item Specifications

**Standard:** 14.0 Identify growing media and apply fertilizers.

**Benchmark:** 14.05 Identify methods of distributing fertilizers.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to equipment used for both liquid and granular fertilizers in the horticulture industry. Items should be limited to methods or techniques associated with distributing fertilizers.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures related to distributing fertilizers.

Stimulus may address Best Management Practices.

Stimulus may involve a scenario related to distributing fertilizer.

### Response Attributes:

Responses may involve a scenario related to fertilizer distribution.

Responses may include types of fertilizer applicators.

### Sample Item:

Mr. White has a large yard and needs to fertilize his lawn. What fertilizer spreader equipment would be best utilized in performing the task of covering a large open area quickly?

- \* A. broadcast spreader
- B. rotary spreader
- C. hand spreader
- D. drop spreader

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 14.0 Identify growing media and apply fertilizers.

**Benchmark:** 14.06 Interpret information on a label of fertilizer used in Florida.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to information on a label of fertilizer used in the Florida horticulture industry.

### **Stimulus Attributes:**

Stimulus may include graphs, charts, diagrams, or pictures related to fertilizers.

Stimulus may involve a scenario related to different types of fertilizers.

### **Response Attributes:**

Responses may involve a scenario related to types of fertilizer.

Responses may include different analysis of fertilizers.

### **Sample Item:**

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

### Item Specifications

Stimulus: Review the picture of a lawn fertilizer bag. Identify the three nutrients indicated by the 12-3-10 and explain the quantities of each nutrient based on a 100 lb. bag. Discuss what the soil analysis would have shown to require this particular type of lawn fertilizer?



Rubric:

- |          |   |
|----------|---|
| 4 Points | Response includes the correct identification of all three nutrients. Response indicates the correct quantities for each of the nutrients. Response includes a comprehensive and thorough explanation of how a soil analysis dictates the correct fertilizer to be used.                                   |
| 3 Points | Response includes the correct identification of all three nutrients. Response indicates the correct quantities for two of the three nutrients. Response includes an explanation of how a soil analysis dictates the correct fertilizer to be used. There may be minor errors in the explanation.          |
| 2 Points | Response includes the correct identification of less than three nutrients. Response does not indicate the correct quantities for the nutrients. Response includes a brief explanation of how a soil analysis dictates the correct fertilizer to be used. There may be multiple errors in the explanation. |
| 1 Point  | Response correctly identifies less than three nutrients. Response does not indicate the correct quantities for the nutrients. Response does not include an understanding of how a soil analysis dictates the correct fertilizer to be used. There may be major errors in the explanation.                 |

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 15.0 Irrigate plants and turf.

**Benchmark:** 15.01 Identify water needs of plants.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to plants produced in the Florida horticulture industry. Items should be limited to water needs of plants.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures related to water needs in plants.

Stimulus may involve a scenario related to water needs found in plants.

Stimulus may include the water needs of different plants or environments.

### Response Attributes:

Responses may be a scenario related to water requirements in plants grown in Florida.

Responses may include different plant types with different requirements.

Responses may include different environmental conditions.

### Sample Item:

In which climate would a plant need the most water?

- \* A. dry, high temperatures
- B. dry, low temperatures
- C. humid, high temperatures
- D. humid, low temperatures

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 15.0 Irrigate plants and turf.

**Benchmark:** 15.02 Irrigate plants at recommended rates.

**Depth of Knowledge:** Low Complexity, Medium Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should focus on the irrigation needs of plants. Items should also include turf grass irrigation.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures related to the irrigation needs of plants in the horticulture industry.

Stimulus may address water requirements of plants and turf grasses.

Stimulus may involve a scenario related to the horticulture industry.

### Response Attributes:

Responses may include moisture requirements.

Responses may describe the types of irrigation methods.

Responses may include types of plants and/or turf grasses.

### Sample Item:

Which type of Florida grass has the highest irrigation needs?

- A. Bahia
- B. Bermuda
- \* C. St. Augustine
- D. Zoysia

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 15.0 Irrigate plants and turf.

**Benchmark:** 15.03 Identify the symptoms of excessive water and water stress in plants.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to plants and turf produced and used in the Florida horticulture industry.

### Stimulus Attributes:

Stimulus may address symptoms of excessive water in plants and turf grasses.

Stimulus may involve a scenario related to water stress in plants.

Stimulus may include graphs, charts, diagrams, or pictures related to irrigation needs of plants in the horticulture industry.

### Response Attributes:

Responses may include plant types.

Responses may describe methods of determining water stress in plants.

Responses may include symptoms of water stress.

### Sample Item:

There are several visual symptoms that appear in turf grass with water stress. What is commonly the **FIRST** symptom seen?

- A. turning bluish
- \* B. foot printing
- C. turning yellowish
- D. stunted roots

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 15.0 Irrigate plants and turf.

**Benchmark:** 15.04 Describe the basic irrigation systems and principles used in the landscape and nursery.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to irrigation systems that are common to Florida horticulture industry. Items may include written ideas or the selection of appropriate ideas.

### Stimulus Attributes:

Stimulus may address basic types of irrigation systems used in the landscape industry.

Stimulus may include graphs, charts, diagrams, or pictures related to irrigation needs of turf in the landscape.

### Response Attributes:

Responses may include irrigation systems for lawns or nurseries.

Responses may describe the types of supplies needed for irrigation systems.

### Sample Item:

Joan is designing an irrigation system for her new lawn. Her lawn has several varieties of trees and shrubs. What should Joan do before she begins the project?

- A. Determine what valves are necessary for water shut-offs.
- \* B. Measure the area to be irrigated.
- C. Find the water pressure that she receives from the source.
- D. Pick out sprinkler heads that will suit her needs.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 16.0 Describe Integrated Pest Management approaches.

**Benchmark:** 16.01 Identify common pests of plants.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to pests common to the Florida horticulture industry.

### **Stimulus Attributes:**

Stimulus may address common pests in the horticulture industry of Florida.

Stimulus may involve a scenario of harmful and beneficial pest to the horticulture industry.

Stimulus may include graphs, charts, diagrams, or pictures related to pest damage to plants in the horticulture industry.

### **Response Attributes:**

Responses may include harmful or beneficial pests that are common to Florida.

Responses may describe the types of damage to plants common to Florida horticulture industry.

### **Sample Item:**



### Item Specifications

Identify the insect that is beneficial to a plant.



A - grasshopper



B- Sawfly



C- Praying Mantis



D - aphids

- A. grasshopper
- B. Sawfly
- \* C. Praying Mantis
- D. aphids

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard** 16.0 Describe Integrated Pest Management approaches.

**Benchmark:** 16.02 Describe life cycles of common pests of plants.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to the life cycles of plant pests common to the plant industry in Florida. Items may include written ideas or the selection of appropriate ideas.

### Stimulus Attributes:

Stimulus may address common pests in the horticulture industry of Florida.

Stimulus may involve a scenario of the lifecycles of pest common to the horticulture industry.

Stimulus may include graphs, charts, diagrams, or pictures related to pest lifecycles.

### Response Attributes:

Responses may include the identification of pest life cycles.

Responses may include the name of pest life cycles.

### Sample Item:

Which picture shows the nymph phase of a pest?



A.



B.



C.



D.

- A. A
- B. B
- \* C. C
- D. D

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 16.0 Describe Integrated Pest Management approaches.

**Benchmark:** 16.03 Recognize signs of damage from pests.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to damage from pests common to plants in Florida horticulture industry.

### Stimulus Attributes:

Stimulus may address damage from pests in the horticulture industry of Florida.

Stimulus may involve a scenario of the damage created by pest common to the horticulture industry.

Stimulus may include graphs, charts, diagrams, or pictures related to pest damage.

### Response Attributes:

Responses may include signs of pest damage.

Responses may describe the types of damage done by plant pest(s).

Responses may include the cause of plant damage.

### Sample Item:

Mary is in her garden checking on her plants and notices a plant leaf with holes and missing parts of the leaf as shown in the picture.



What is the likely cause of this damage?

- A. birds
- B. fungus
- \* C. insects
- D. mites

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 17.0 Describe the principles and requirements of plant growth.

**Benchmark:** 17.01 Explain how the energy of sunlight is converted to chemical energy through the process of photosynthesis.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to one or more of the stages of photosynthesis. Items may include an explanation of written ideas or the selection of appropriate ideas.

### Stimulus Attributes:

Stimulus may address how energy from sunlight is converted to chemical energy.

Stimulus may involve a scenario of one or more stages of photosynthesis.

Stimulus may include graphs, charts, diagrams, or pictures related to photosynthesis.

### Response Attributes:

Responses may include requirements for plant growth.

Responses may describe the process of photosynthesis.

### Sample Item:

In the light reaction phase of photosynthesis, what does chlorophyll absorb?

- A. ATP and NADHP
- B. oxygen
- \* C. light energy
- D. 5-carbon sugar

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 17.0 Describe the principles and requirements of plant growth.

**Benchmark:** 17.02 Explain how photosynthesis in plants is directly affected by various environmental factors such as light and temperature.

**Depth of Knowledge:** Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to various environmental factors specific to plants in Florida horticulture industry. Items may include written ideas or the selection of appropriate ideas.

### Stimulus Attributes:

Stimulus may address the influence of environmental factors on photosynthesis.

Stimulus may include graphs, charts, diagrams, or pictures.

### Response Attributes:

Responses may reflect the influence of environmental factors on photosynthesis.

Responses may reflect the impact of light and/or temperature.

### Sample Item:

Photosynthesis occurs in two stages. These stages require environmental conditions that can affect the process. How would this process be impacted if Florida's climate became much colder and wetter?

- \* A. The process would be changed because of the temperature of the air.
- B. The process would be unchanged because of the abundance of the water.
- C. The process would be unchanged, as the amount of light remains the same.
- D. The process would be changed because of the temperature of the water.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 17.0 Describe the principles and requirements of plant growth.

**Benchmark:** 17.03 Explain the process of respiration and the flow of energy in plants.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to the process of respiration and the flow of energy in plants specific to Florida horticulture industry. Items may include written ideas or the selection of appropriate ideas.

### **Stimulus Attributes:**

Stimulus may address the respiration process and/or energy flow in plants.

Stimulus may include graphs, charts, diagrams, or pictures.

### **Response Attributes:**

Responses may address the process of respiration and/or the flow of energy in plants.

### **Sample Item:**

Which statement explains the actions of the plant in the process of respiration?

- \* A. Plants breathe in carbon dioxide and release oxygen.
- B. Plants use water to create carbon dioxide.
- C. Plants releases extra water to the air through evaporation.
- D. Plants give off carbon dioxide and oxygen during the entire day.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 17.0 Describe the principles and requirements of plant growth.

**Benchmark:** 17.04 Describe the influence of light and temperature on plant growth.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to the influence of light and temperature on plants grown in the Florida horticulture industry. Items may include written ideas or the selection of appropriate ideas.

### **Stimulus Attributes:**

Stimulus may address the influence of light and/or temperature on plant growth.

Stimulus may include graphs, charts, diagrams, or pictures.

### **Response Attributes:**

Responses may reflect the influence of light and/or temperature on plant growth in the stimulus.

### **Sample Item:**

What is the primary reason that plants can grow year round in Florida but not in New York?

- A. Soil in Florida requires less aeration and therefore is less likely to damage root systems.
- B. The sandy soil in Florida allows for a wide variety of plants to grow.
- C. The temperature in Florida is warmer and allows the plant pores to remain open.
- \* D. The warmer winter temperatures in Florida allow plants to grow in the winter months.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 18.0 Apply best management practices in the horticulture industry.

**Benchmark:** 18.01 Identify and apply Best Management Practices to reduce pollution and conserve water.

**Depth of Knowledge:** Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to Best Management Practices used to reduce pollution and conserve water in the Florida horticulture industry.

### Stimulus Attributes:

Stimulus may address Best Management Practices in relation to water pollution or conservation.  
Stimulus may include graphs, charts, diagrams, or pictures.

### Response Attributes:

Responses may reflect Best Management Practices in relation to water pollution or conservations.

### Sample Item:

John owns a new lawn care company and promises fast service for clients. John is out on a call and is asked to apply herbicide to the grass. After completing the task, he is asked to apply a fungicide to some infected parts of the same grass. John quickly empties his spreader of herbicide, rinses the spreader, and dumps the water into a stream. He then puts the fungicide in the spreader, and treats the infected grass. What was the **MOST** important thing John should have avoided?

- A. He should not have applied the fungicide on the same day.
- \* B. He should not have poured the water into a clean water source.
- C. He should not have wasted water rinsing the equipment off.
- D. He should not have applied fungicide after he applied the herbicide.



**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 18.0 Apply best management practices in the horticulture industry.

**Benchmark:** 18.02 Identify and apply Best Management Practices on fertilizer recommendations for Florida plants and turf.

**Depth of Knowledge:** Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to Best Management Practices on fertilizer recommendations for Florida plants and turf used in the horticulture industry.

### Stimulus Attributes:

Stimulus may address the Best Management Practices on fertilizer recommendations for Florida plants and turf.

Stimulus may include graphs, charts, diagrams, or pictures.

### Response Attributes:

Responses may reflect the Best Management Practices on fertilizer recommendations for Florida plants and turf.

### Sample Item:

Diana was asked to apply fertilizer to her neighbor's lawn while the neighbor was away. Diana had always been amazed at how well the lawn looked and how all the ornamentals had been maintained in pristine condition. Diana applied a turf grass fertilizer to the lawn using a broadcast spreader and everything looked great for a week. A week later when the neighbor returned home, they found their ornamentals were dead. What is the most likely cause of this?

- \* A. The fertilizer was absorbed in the roots of the ornamentals.
- B. The fertilizer used was too rich in nitrogen.
- C. Too much fertilizer was used to treat the lawn.
- D. Water from the irrigation carried the fertilizer into the water source.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 19.0 Identify principles of landscape design.

**Benchmark:** 19.01 Compare and contrast the use of line, form, texture, and color in designing landscapes.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to the use of line, form, texture, and color in designing landscapes in the Florida horticulture industry.

### Stimulus Attributes:

Stimulus may address the use of line, form, texture, and color in designing landscapes.  
Stimulus may include graphs, charts, diagrams, or pictures.

### Response Attributes:

Responses may reflect the use of line, form, texture, and color in designing landscapes.

### Sample Item:

ABC Landscape Company is designing a landscape for a luxury southern plantation style home. In consideration of line, form, texture, and color, which **BEST** describes the landscape?

- A. Use a concrete stamp to define the walkway and use red plant colors to evoke relaxation and peace.
- B. Use tall trees to bring attention to the home and use zigzag garden shapes to contrast the lines of the home.
- \* C. Use sweeping pathways to add boldness and use formal balance to keep both halves of the landscape equal.
- D. Use only green plants to create a textured approach while not drawing attention to one aspect and use a straight slate pathway for a grand approach.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 19.0 Identify principles of landscape design.

**Benchmark:** 19.02 Identify the principles of design (unity, repetition, balance, emphasis, and scale) as they apply to landscapes.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be constrained to principles of design as they apply to landscapes in the horticulture industry.

### Stimulus Attributes:

Stimulus may address the principles of design (unity, repetition, balance, emphasis, and scale) as they apply to landscapes.

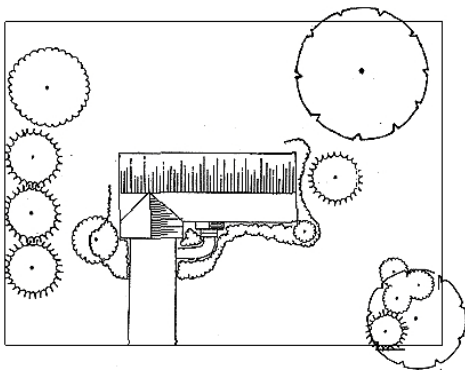
Stimulus may include graphs, charts, diagrams, or pictures.

### Response Attributes:

Responses may reflect the principles of design (unity, repetition, balance, emphasis, and scale) as they apply to landscapes.

### Sample Item:

Review the landscape plan for a new home. What landscape design principal is shown in the landscape plan?



- \* A. balance  
B. unity  
C. line  
D. repetition

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 19.0 Identify principles of landscape design.

**Benchmark:** 19.03 Identify points of emphasis and major design areas in the residential landscape.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be constrained to design areas in the residential landscape in the horticulture industry.

### Stimulus Attributes:

Stimulus should address the points of emphasis and major design areas in the residential landscape.

Stimulus may include graphs, charts, diagrams, or pictures.

### Response Attributes:

Responses may reflect the points of emphasis and major design areas in the residential landscape.

### Sample Item:

In the picture, what major element of design is the focus?



- A. color
- \* B. texture
- C. scale
- D. dominance

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 19.0 Identify principles of landscape design.

**Benchmark:** 19.04 Identify plant selection for a residential landscape using Florida Friendly Landscape Principles.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to Florida Friendly Landscape Principles. Items should be limited to plant selection from those commonly available in Florida.

### **Stimulus Attributes:**

Stimulus should address the plant selection for a residential landscape using Florida Friendly Landscape Principles.

Stimulus may include graphs, charts, diagrams, or pictures.





### **Response Attributes:**

Responses may reflect the plant selection for a residential landscape using Florida Friendly Landscape Principles.

### **Sample Item:**

### Item Specifications

A homeowner wants to select a few plants for the front of their house to accent the stucco walls and cover a 20 foot area with 12 plants. Identify which plant the homeowner would **MOST** likely to choose?

			
<i>Pyracantha coccinea</i> Firethorn	<i>Rosa</i> spp. Rose	<i>Russelia sarmentosa</i> Firecracker Plant	<i>Strelitzia reginae</i> Bird of Paradise
<b>N</b> <b>C</b> 8-9 No	<b>N</b> <b>C</b> <b>S</b> 8-11 Var.	<b>N</b> <b>C</b> <b>S</b> 8b-11 No	<b>S</b> 10-11 No
10-15↑ 8-12⇒	Fast 1-20↑ 2-8⇒	Fast 3-4↑ 2-4⇒	3-5↑ 2-4⇒
●●●○ Any	●●●● Any	○●●○ S/L	●●●○ Any
☹️☹️ Medium	☹️ Medium	☹️ Medium	☹️☹️ High
☀️☁️ L-N	☀️ M	☀️☁️ U	☀️☁️ L-N
	🐦	🦋🐦	
white, showy flowers; red/orange fall and winter fruit; works well as freestanding specimen plant; can be espaliered or trained onto a trellis; susceptible to pests and diseases	flowers vary; susceptible to pests and diseases	red, summer flowers; provides food for wildlife	large leathery leaves are held upright on stiff stalks; orange/blue striking flowers; susceptible to pests; tolerates occasionally wet soil

- \* A. Firethorn  
 B. Rose  
 C. Firecracker Plant  
 D. Bird of Paradise

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 19.0 Identify principles of landscape design.

**Benchmark:** 19.05 Read and interpret a landscape plan.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be constrained to a landscape plan used in horticulture.

### **Stimulus Attributes:**

Stimulus may address reading and interpreting a landscape plan.

Stimulus may include graphs, charts, diagrams, or pictures.

### **Response Attributes:**

Responses may reflect reading and interpreting a landscape plan.

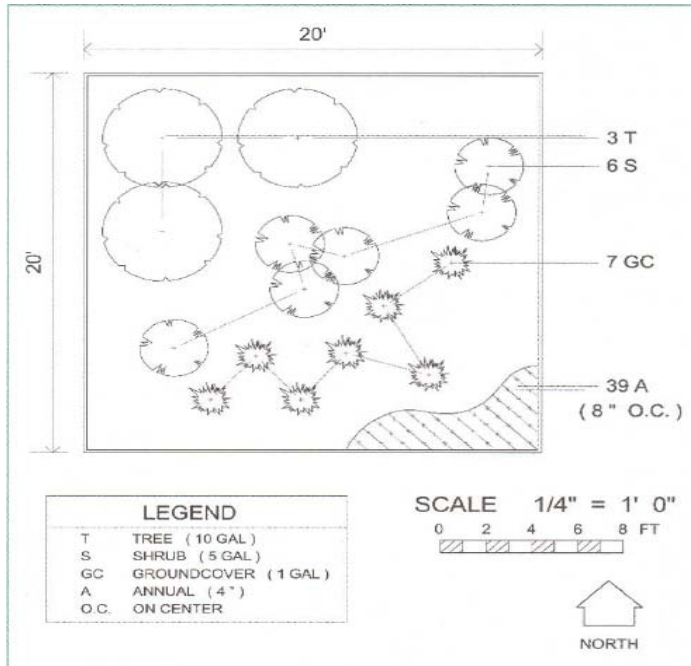
### **Sample Item:**

Course Name: Introduction to Horticulture 2

Course Number: 8121510

### Item Specifications

Using the landscape plan, how many 10 gallon, 5 gallon, 1 gallon, and annuals are needed?



- A. 7 ten gallon, 3 five gallon, 8 one gallon, 39 annuals
- B. 3 ten gallon, 7 five gallon, 39 one gallon, 6 annuals
- C. 6 ten gallon, 3 five gallon, 39 one gallon, 7 annuals
- \* D. 3 ten gallon, 6 five gallon, 7 one gallon, 39 annuals



**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 19.0 Identify principles of landscape design.

**Benchmark:** 19.06 Develop skills for drawing and identifying symbols.

**Depth of Knowledge:** Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be constrained to drawing and identifying symbols used commonly in horticulture.

### Stimulus Attributes:

Stimulus may address the skills for drawing and identifying symbols.

Stimulus may include graphs, charts, diagrams, or pictures.

### Response Attributes:

Responses may reflect the skills for drawing and identifying symbols.

### Sample Item:

Sam is trying to hone her skills for designing a landscape plan. She has traditionally struggled with scales for irregular shapes. What would be the **BEST** approach for her to use to develop her skills in this area?

- A. Use a metric scale and use grid paper for drawing irregular shapes.
- B. Use an engineer's scale and combine existing shapes to form the new shape.
- \* C. Use an architect's scale and divide the shape into smaller areas to measure.
- D. Clearly define the scale used and keep the irregular shape to a measurable portion of the scale.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 19.0 Identify principles of landscape design.

**Benchmark:** 19.07 Draw and design a landscape plan for a small garden.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to common terminology used in designing a small garden in the horticulture industry.

### **Stimulus Attributes:**

Stimulus may address drawing and design a landscape plan for a small garden.

Stimulus may include graphs, charts, diagrams, or pictures.

### **Response Attributes:**

Responses may reflect the drawing and design of a landscape plan for a small garden.

### **Sample Item:**

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

### **Item Specifications**

Task: Raphael is getting ready to design his Florida backyard garden. The garden is very small and receives a lot of light. On a blank sheet of paper, draw and design a landscape plan for Raphael's backyard garden. Focus should be paid to fundamental elements of design including plant selection and quantities.

Rubric:

- |          |   |
|----------|---|
| 4 Points | Response indicates a complete and comprehensive garden design. Response includes essential elements including, but not limited to: legend, scale, spacing of rows, spacing of plants, location of plants, and direction of rows. Response includes proper selection of plants for the geographical location in the state of Florida.              |
| 3 Points | Response indicates a complete and comprehensive garden design. Response includes most of the essential elements including, but not limited to: legend, scale, spacing of rows, spacing of plants, location of plants, and direction of rows. Response may include a few plant choices that may not be appropriate for the location.               |
| 2 Points | Response indicates a partially complete garden design. Response includes some of the essential elements including, but not limited to: legend, scale, spacing of rows, spacing of plants, location of plants, and direction of rows. Response includes many choices that are not appropriate for the geographic location in the state of Florida. |
| 1 Point  | Response indicates a partially complete garden design. Response includes some of the essential elements. Response includes the selection of plants that are mostly not appropriate for the geographic location of the garden.   |

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 19.0 Identify principles of landscape design.

**Benchmark:** 19.08 Construct a landscape display.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to common terminology used when constructing a landscape display in the horticulture industry. Items may include the selection of landscape display activities or performing the required behaviors.

### **Stimulus Attributes:**

Stimulus may address constructing a landscape display.  
Stimulus may include graphs, charts, diagrams, or pictures.

### **Response Attributes:**

Responses may reflect constructing a landscape display.

### **Sample Item:**

## Item Specifications



Natasha has created the design above. When constructing this display, which sequence of events is the most appropriate to follow?

- A. grade the site, develop the plan, install the plants, and install the hardscape
- B. install the plants, install the hardscape, develop the plans, and grade the site
- \* C. develop the plan, grade the site, install the hardscape, and install the plants
- D. develop the plan, install the hardscape, grade the site, and install the plants

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 20.0 Demonstrate leadership, employability, communications, and human relations skills.

**Benchmark:** 20.01 Conduct group meetings using parliamentary procedure and public speaking skills.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to running a horticulture group meeting using parliamentary procedure and basic motions presented in Robert's Rules of Order. Items may include a demonstration of correct behaviors or the selection of behaviors.

### Stimulus Attributes:

Stimulus may include copies of Robert's Rules of Order.

Stimulus may include a sample-meeting vignette.

Stimulus may include correct and incorrect media examples of group meetings.

### Response Attributes:

Responses may include copies of Robert's Rules of Order.

Responses may include sample-meeting vignette.

Responses may include correct and incorrect media examples of group meetings.

### Sample Item:

Christy had several people ask her to start a club to talk about horticulture. At the groups' initial meeting, there was very little structure or format and it turned into many discussions on various topics. Christy would like the next meeting to be more organized. What would be the **BEST** approach for Christy to follow?

- A. Charge a fee to allow interested people to join which will encourage serious participation.
- \* B. Create an agenda to follow that will structure the meeting.
- C. Enact procedures that only allow for her to speak unless she allows others to.
- D. Bring in a guest speaker that will mean others will listen rather than talk.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 21.0 Demonstrate language arts knowledge and skills.

**Benchmark:** 21.01 Locate, comprehend and evaluate key elements of oral and written information.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to written and oral communications specific to the horticulture industry.

### **Stimulus Attributes:**

Stimulus may include magazines and newsletters; including the Florida FFA newsletter at this link <http://www.flaffa.org/category/news/>.

Stimulus may include sample copies of student speeches.

Stimulus may include internet and web based research on trends in horticulture.

### **Response Attributes:**

Responses may involve a scenario related to the horticulture industry.

Responses may include magazines and newsletters; including the Florida FFA newsletter at this link <http://www.flaffa.org/catergory/news/>.

Responses may include sample copies of student speeches.

Responses may include internet and web based research on trends in horticulture.

### **Sample Item:**

## Item Specifications

### Global Economy

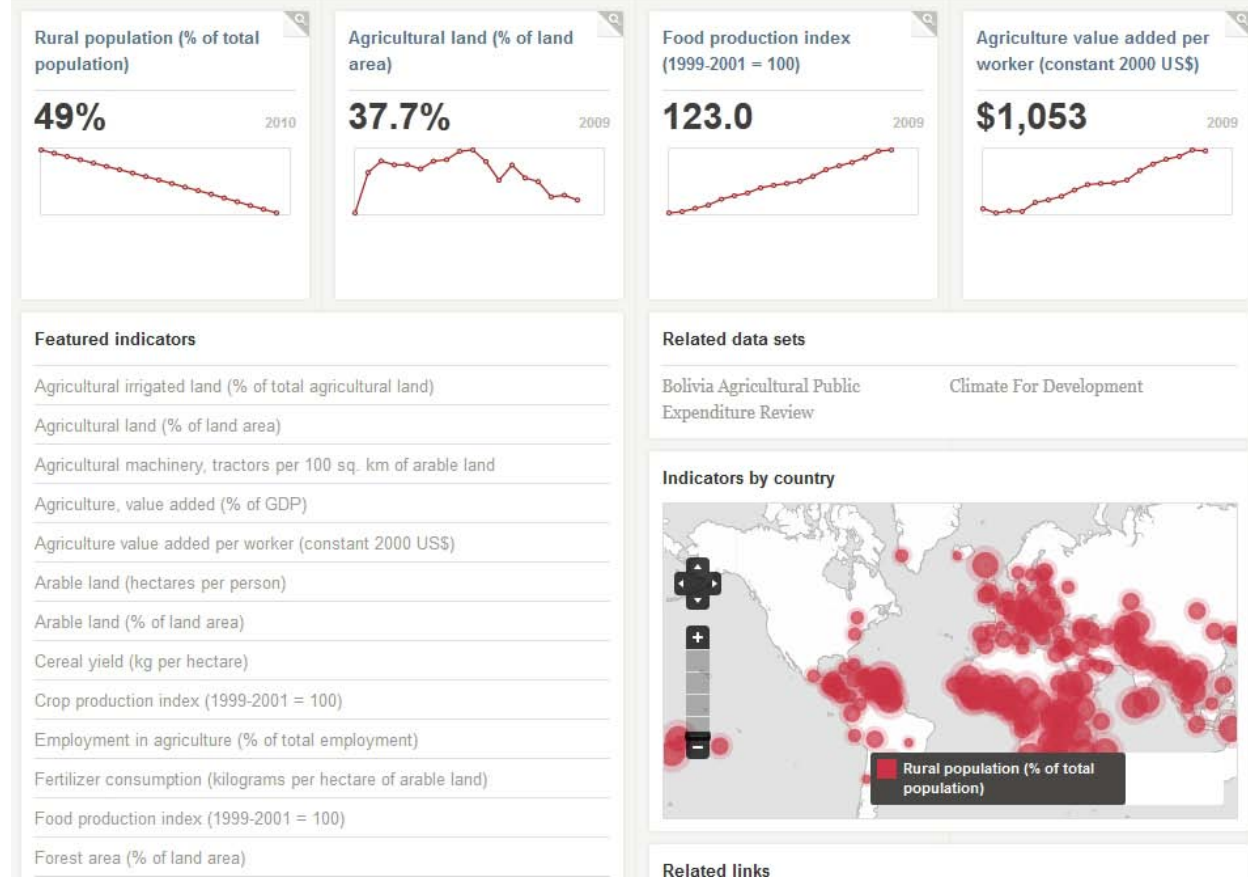
### Agriculture & Rural Development

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For the 70 percent of the world's poor who live in rural areas, agriculture is the main source of income and employment. But depletion and degradation of land and water pose serious challenges to producing enough food and other agricultural products to sustain livelihoods here and meet the needs of urban populations. Data presented here include measures of agricultural inputs, outputs, and productivity compiled by the UN's Food and Agriculture Organization.



### United States

#### Agricultural Land (% of land area)

Country name	2007	2008	2009
United States	43.9	44.2	44.1

#### Food production index

Country name	2007	2008	2009
United States	110.0	112.0	115.0

<http://data.worldbank.org/>



**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

### **Item Specifications**

The above information was produced by the World Bank and lists economic indicators for countries around the world. Evaluate the key elements of agricultural land and food production for the United States when compared to the numbers of the global economy. Which statement **BEST** summarizes the 2007-2009 information shared by World Bank.

- A. Food production is increasing in both the United States and the global economy while agricultural land percent is decreasing in both the United States and the global economy.
- B. There is very little agricultural land remaining in the United States which will continue to decrease the ability for the United States to produce enough food.
- C. Many former United States crops will need to be moved to other areas such as Africa due to the large number of rural areas available for crop growing in Africa.
- \* D. Food production in the United States is less than the global economy index, meaning agricultural land use in the U.S. is not as effective as the global economy .

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 22.0 Demonstrate mathematics knowledge and skills.

**Benchmark:** 22.01 Demonstrate knowledge of arithmetic operations.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to arithmetic operations commonly used in the horticulture industry. Items may include a demonstration of knowledge through the selection of correct information or performing the required behaviors.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures related to horticulture.

Stimulus may address the simple arithmetic operations.

Stimulus may address a scenario related to the horticulture industry.

Stimulus may include sample mathematic problems related to horticulture.

Stimulus may include sample word mathematic problems related to horticulture.

Stimulus may include internet and web based basic mathematic operations.

### Response Attributes:

Responses may address a scenario related to the horticulture industry.

Responses may include mathematical problems related to horticulture.

Responses may include a word based mathematic problems related to horticulture.

Responses may include internet and web based basic mathematic horticulture.

### Sample Item:

Mr. Harris has plans to build two greenhouses to grow liners for propagation with his citrus nursery. His plans call for the greenhouses with the following measurements:

#1. Length: 300 feet

Width: 50 feet

Height: 12 feet

#2. Length: 200 feet

Width: 55 feet

Height: 10 feet

What is the square footage of the floors of the combined greenhouses that Mr. Harris plans to build?

- A. 290,000 sq. ft.
- B. 52,500 sq. ft.
- \* C. 26,000 sq. ft.
- D. 672 sq. ft.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard** 22.0 Demonstrate mathematics knowledge and skills.

**Benchmark:** 22.02 Construct charts/tables/graphs using functions and data.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to charts/tables/graphs using functions and data commonly used in the horticulture industry. Items may include the selection of correct examples or the creation of a chart.

### **Stimulus Attributes:**

Stimulus may include graphs, charts, diagrams, or pictures related to horticulture.

Stimulus may include a scenario related to the horticulture industry.

Stimulus may include sample word mathematic problems related to horticulture.

Stimulus may include internet and web based basic mathematic operations.

Stimulus may include technology software, which utilizes data, charts, and graphs.

### **Response Attributes:**

Responses may include a scenario related to the horticulture industry.

Responses may include graphs, charts, diagrams, or pictures related to horticulture.

Responses may include sample word mathematic problems related to horticulture.

Responses may include internet and web based basic mathematic operations.

Responses may include technology software, which utilize data, charts, and graphs.

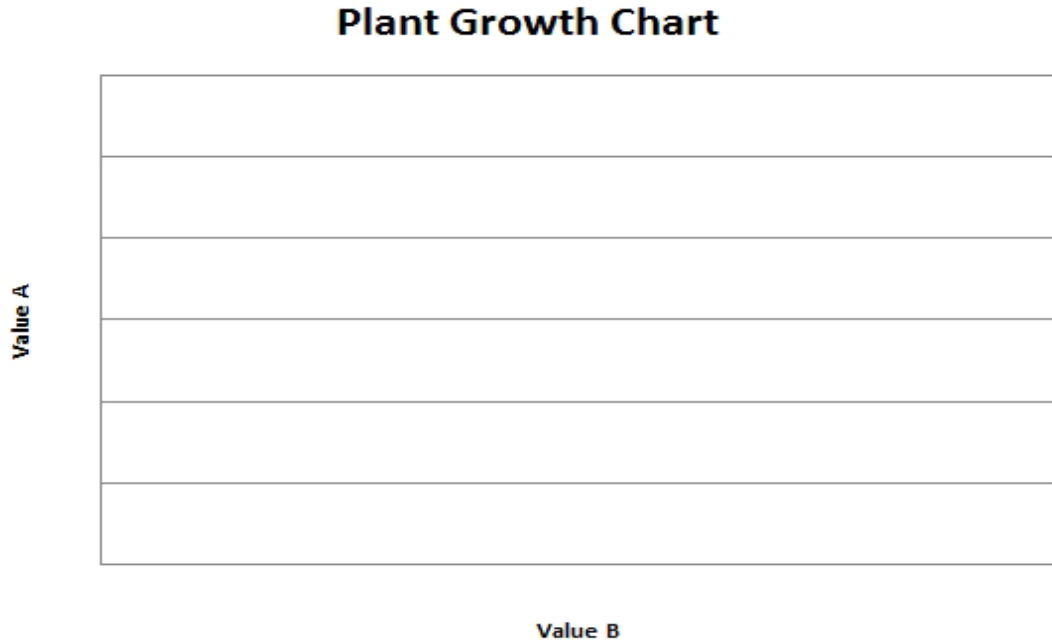
### **Sample Item:**

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

### Item Specifications

Steve inherited his plant nursery from his father, who recently retired. Steve wants to graph the growth of plants over a two-month span using a spreadsheet program and the chart below. What elements would Steve use in order to create an effective plant growth graph?



- \* A. Value A – height of each plant (in inches), Value B – period of time (in days)
- B. Value A – amount of water for each plant (in ounces), value B – amount of sunlight (in hours)
- C. Value A – expected plant growth (in inches), Value B – number of plants (in units)
- D. Value A – expected amount of sunlight (in hours), Value B – actual amount of sunlight (in hours)

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 23.0 Demonstrate science knowledge and skills.

**Benchmark:** 23.01 Discuss the role of creativity in constructing scientific questions, methods, and explanations.

**Depth of Knowledge:** Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to scientific method, hypothesis, analysis etc. in relation to horticulture and plant science. Items may include a discussion or the selection of written ideas.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures related to horticulture.

Stimulus may address the scientific method.

Stimulus may include sample descriptions of horticultural scientific events.

Stimulus may include vignettes about scientific explanations regarding horticulture.

Stimulus may include internet-based research regarding the role of science in horticulture.

Stimulus may include sample charts and pictures.

### Response Attributes:

Responses may include sample descriptions of horticultural scientific events.

Responses may include internet-based research regarding the role of science in horticulture.

Responses may include sample charts and pictures.

### Sample Item:

Which horticulture research question is the **MOST** creative?

- A. How much water does Bahia grass need to grow?
- B. What is the most effective pesticide to kill animals?
- \* C. What plants can be cross-bred to produce a flower that smells like chocolate chip cookies?
- D. What determinant tomato plant varieties can produce tomatoes in the Florida heat of summer?

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 24.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.

**Benchmark:** 24.01 Locate, organize and reference written information from various sources.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to written information specific to plant science and horticulture.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures related to horticulture.

Stimulus may include sample copies of student speeches.

Stimulus may include internet and web-based research on trends in horticulture.

### Response Attributes:

Responses may address what is the best way to solve the problem.

Responses may include sample copies of student speeches.

Responses may include internet and web based research on trends in horticulture.

### Sample Item:

Stimulus: Jessica is a horticulture student and is writing a report on planting a garden in her back yard. Locate three sources that Jessica can use for her report. Create a bibliography that properly lists the references.

Rubric:

4 Points	Response includes at least three sources of references that relate to the process of backyard gardening. Response includes a bibliography with three correctly formatted references.
3 Points	Response includes at least three sources of references that relate to the process of backyard gardening. Response includes a bibliography that may contain minor formatting errors.
2 Points	Response includes two or more sources of references that relate to the process of backyard gardening. Response includes a bibliography that may major formatting errors.
1 Point	Response does not include sources of references that relate to the process of backyard gardening. The bibliography may be missing or is generally incorrect.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 24.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.

**Benchmark:** 24.02 Interpret verbal and nonverbal cues/behaviors that enhance communication.

**Depth of Knowledge:** Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to verbal and nonverbal cues/behaviors that enhance communication when discussing plant science.

### **Stimulus Attributes:**

Stimulus may include graphs, charts, diagrams, or pictures related to horticulture.

Stimulus may address verbal/nonverbal cues.

Stimulus may include videos, audio broadcasts, audio magazines, and newsletters.

Stimulus may include sample copies of student presentation speeches.

Stimulus may include internet and web-based media research in horticulture.

Stimulus may include vignette about speeches in horticulture competitions.

### **Response Attributes:**

Responses may address verbal/nonverbal cues.

Responses may include videos, audio broadcasts, audio magazines, and newsletters.

Responses may include sample copies of student presentation speeches.

Responses may include internet and web-based media research in horticulture.

### **Sample Item:**

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

### **Item Specifications**

**Stimulus:** Observe the simulated interaction between a store clerk and an unhappy customer. The customer wants his/her money back because the plants died. Identify two verbal and two non-verbal cues in the customer that signifies his/her displeasure. Write a two-paragraph essay describing and interpreting the cues that enhance communication.

**Rubric:**

- |          |   |
|----------|---|
| 4 Points | Response includes a comprehensive and thorough description of the verbal and non-verbal cues. Response includes at least two verbal and two non-verbal behaviors witnessed in the scenario. The correct interpretation of the cues that enhance communication was identified and described in detail.                           |
| 3 Points | Response includes the description of two verbal and two non-verbal cues. The correct interpretation of the cues that enhance communication was identified, but the description was brief and may contain minor errors.  |
| 2 Points | Response includes the description of two verbal and two non-verbal cues. The incorrect interpretation of the cues that enhance communication was identified or the examples may be poor. The description of the cues may be limited or may contain multiple errors.   |
| 1 Point  | Response may include the description of less than two verbal and two non-verbal cues. The incorrect interpretation of the cues that enhance communication was identified or the examples are incorrect examples or the examples are missing altogether. The description of the cues may be missing or may contain major errors. |



**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 24.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.

**Benchmark:** 24.03 Apply active listening skills to obtain and clarify information.

**Depth of Knowledge:** Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to information pertaining to plant science and horticulture.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures related to horticulture.

Stimulus may address listening skills.

Stimulus may include books, magazines, and newsletters related to horticulture.

Stimulus may include sample copies of student presentation speeches.

Stimulus may include internet and web-based media research in horticulture.

Stimulus may include vignette about speeches in horticulture competitions.

### Response Attributes:

Responses may address listening skills.

Responses may include books, magazines, and newsletters related to horticulture.

Responses may include sample copies of student presentations speeches.

Responses may include internet and web-based media research in horticulture.

Responses may include vignette about speeches in horticulture competitions.

### Sample Item:

Ashley and Judy were talking to each other about planting a garden. Ashley had 12 tomato plants for the garden, and she asked Judy to go plant the tomato plants in the garden. Judy planted the tomato plants and called Ashley over to see the garden. Ashley got upset when she saw that only three plants were planted when she had wanted 12 planted. What aspect of active listening did Judy fail to use?

- A. gesture
- B. empathy
- C. demonstration
- \* D. clarifying

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 25.0 Solve problems using critical thinking skills, creativity, and innovation.

**Benchmark:** 25.01 Employ critical thinking skills independently and in teams to solve problems and make decisions.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to critical thinking skills used specifically for issues related to the horticulture industry.

### **Stimulus Attributes:**

- Stimulus may describe a problem related to the horticulture Industry.
- Stimulus may present a scenario where students are solving a horticulture problem.
- Stimulus may include graphs, charts, diagrams, or pictures related to horticulture.
- Stimulus may include print and non-print resources related to horticulture teamwork.
- Stimulus may include vignettes of various situations and issues with the horticulture industry.
- Stimulus may include research regarding attributes of effective critical thinking.
- Stimulus may include vignettes about horticulture problems involving individuals and groups.

### **Response Attributes:**

- Responses may address what is the best way to solve the problem.
- Responses may be decisions that relate to the problem.
- Responses may include print and non-print resources related to horticulture teamwork.
- Responses may include vignettes of various situations and issues with the horticulture industry.
- Responses may include research regarding attributes of effective critical thinking.
- Responses may include vignettes about horticulture problems involving individuals and groups.

### **Sample Item:**

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

### Item Specifications

Task: Form team of three to four classmates. Review the image of a Hibiscus and identify the plant's problem. As a team agree upon the problem and 2 potential solutions. Present your findings to the class. Describe how your team made their decisions.



Rubric:

- |          |  |
|----------|--|
| 4 Points | As a team the students discuss potential problems and agree on one problem. Students agree on two correct solutions. The presentation clearly describes the problem and solutions. All team members were involved in the process.  |
| 3 Points | As a team the students discuss potential problems and agree on one problem. The students agreed on solutions that may not be totally correct for the problem. The presentation describes the problem and solution but may have been somewhat unclear. The team members were generally involved in the decision making process.   |
| 2 Points | As a team the students discuss the problem but may not agree on one problem. The students identify solutions but may not agree on the selected solutions. The presentation describes the problem and solution but was somewhat unclear. All team members were not involved in the decision making process.                       |
| 1 Point  | As a team the students discuss the problem but may not agree on or may have included most of the members. The students may not identify solutions or may not agree on solutions. The presentation was unclear and may not describe the problem and solutions. All team members were not involved in the decision making process. |

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 25.0 Solve problems using critical thinking skills, creativity, and innovation.

**Benchmark:** 25.02 Employ critical thinking and interpersonal skills to resolve conflicts.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to critical thinking and interpersonal skills used to resolve conflicts that may occur within the horticulture industry.

### Stimulus Attributes:

Stimulus may address critical thinking or interpersonal skills.

Stimulus may address conflict resolution.

Stimulus may include a scenario where students have to use interpersonal skills and critical-thinking to resolve a conflict.

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include print and non-print resources related to horticulture teamwork.

Stimulus may include vignettes of various situations and issues with the horticulture industry.

Stimulus may include research regarding attributes of effective critical thinking.

Stimulus may include vignettes about horticultural problems involving individuals and groups.

### Response Attributes:

Responses may address critical thinking or interpersonal skills and/or conflict resolution.

Responses may include print and non-print resources related to horticulture teamwork.

Responses may include vignettes of various situations and issues with the horticulture industry.

Responses may include research regarding attributes of effective critical thinking.

Responses may include vignettes about horticultural problems involving individuals and groups.

### Sample Item:

Racquel is a valued employee at a plant nursery and is very knowledgeable about horticulture. Her supervisor, Jeff, has noted that she is frequently late. When asked why she is late, she stated that her bus arrives at 4:00, which is her start time and she is often unable to catch an earlier bus because of when the babysitter can get to her house. What should Jeff do to correct the problem?

- \* A. Change her schedule to start at 4:30, but advise her that she must start getting to work on time.
- B. Set a precedent by writing her up and then fire her if she is late to work one more time.
- C. Being late is unacceptable, so immediate termination is the only option since it has happened so often.
- D. Remind her that her performance evaluation is coming up and that part of it is based on her punctuality at work.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 26.0 Use information technology tools.

**Benchmark:** 26.01 Employ computer operations applications to access, create, manage, integrate, and store information.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to computer applications and programs consistent with use in a horticulture industry situation.

### Stimulus Attributes:

Stimulus may revolve around typical computer applications including Microsoft Word, Microsoft Excel Spreadsheet, Power point, and Microsoft Publisher.

Stimulus may involve a scenario where the student may have to use a computer application (as mentioned above) to solve a horticulture related problem.

Stimulus may describe a problem related to the horticulture industry.

Stimulus may include graphs, charts, diagrams, or pictures.

### Response Attributes:

Responses may involve a scenario where the student may have to use a computer application to realize answers.

Responses should address horticulture related topics.

### Sample Item:

Jackson owns a horticultural supply company. His company is quickly growing and he sees the need to integrate computer software to help increase efficiency. Which statement explains how creating a database system would be appropriate for ordering supplies?

- \* A. A database can track essential information that can be used to keep inventory at manageable levels.
- B. A database can track sales tax collected and ensure that you pay the government the correct amount.
- C. A database can track inventory turnover that can be used for accounting reporting.
- D. A database can track the hours worked for employees to determine the cost to produce each inventory item.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 26.0 Use information technology tools.

**Benchmark:** 26.02 Employ collaborative/groupware applications to facilitate group work.

**Depth of Knowledge:** Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to technologies used to facilitate group collaboration. Items should be limited to technologies commonly used in the horticulture industry.

### Stimulus Attributes:

Stimulus may revolve around collaborative/groupware computer applications (Net Meeting, Skype, Instant Messaging, Windows Live etc.).

Stimulus may describe a problem related to the horticulture industry.

Stimulus may include graphs, charts, diagrams, or pictures.

### Response Attributes:

Responses should address horticulture related topics.

Responses may address collaboration/groupware methods or applications.

### Sample Item:

A national company would like to get feedback from employees on their upcoming launch of a new product for irrigation. The company has looked at several options for getting feedback in a timely manner while allowing collaboration from different divisions of the company. The company finally decided to use a teleconference approach, but feel that it may be hard to ensure participation from all the groups. What would be the best way to establish the teleconference?

- \* A. Set up groups at each location and allow one speaker from each group to relay thoughts.
- B. Establish an order in which each division will be allowed to participate.
- C. Allow each person to use the 'question' feature on the teleconference to ask questions in an orderly fashion.
- D. Make all divisions aware that they can submit questions in advance and those questions will be covered in the teleconference.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 27.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.

**Benchmark:** 27.01 Explain the impact of the global economy on business organizations.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to economic impacts affecting the horticulture industry. Items should address the global economy.

### Stimulus Attributes:

Stimulus may involve fundamental economic principles and their effects on businesses.

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include historical text.

Stimulus may include a scenario where the student may have to use basic economic principles to realize an answer.

### Response Attributes:

Responses may address impacts to economy.

Responses may address economic terms.

### Sample Item:

On Valentine's Day, Daniel went to his local florist to buy a dozen roses for his girlfriend, Pearl. He notices that the roses cost 3 times as much as they did when he got Pearl a dozen for Christmas. What is the **BEST** explanation for the price increase?

- A. The supply of roses increases for Valentine's Day and therefore customers are required to pay more.
- B. Roses grown in the winter must be grown in a greenhouse, thus this extra expense increases the price.
- \* C. Supply of roses is constant while demand for roses during Valentine's Day increase dramatically, thus increasing the price.
- D. Growers cut the production of roses before Valentine's Day and therefore given the demand the prices charged can be higher.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 28.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.

**Benchmark:** 28.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to jobsite and/or personal safety rules and regulations. Items should be limited to work environments. Items may include a description of written ideas or the selection of appropriate ideas.

### Stimulus Attributes:

Stimulus should describe a problem related to the horticulture industry.

Stimulus may include a scenario where a student may have to apply jobsite safety rules or regulations to a worksite application.

Stimulus may include graphs, charts, diagrams, or pictures.

### Response Attributes:

Responses should address horticulture related topics.

### Sample Item:

The organization, OSHA, is primarily charged with workplace health and safety. When utilizing OSHA's four-point program, an employee, Sasha, discovered that the table saw in the Agriculture Shop was too close to the wall. Which of the 4 Focus Hazards would this directly relate to?

- A. falls
- \* B. caught in between
- C. struck by
- D. electrocution



**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 28.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.

**Benchmark:** 28.02 Explain emergency procedures to follow in response to workplace accidents.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to workplace accidents and/or incidents. Items should be limited to responses to emergencies or procedures in case of emergencies. Items may include an explanation of written ideas or the selection of appropriate ideas.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus should describe a problem related to the horticulture industry.

Stimulus may include a scenario that involves emergency procedures to follow regarding a workplace accident.

### Response Attributes:

Responses should address horticulture related topics.

Responses may involve a scenario where a student must implement emergency procedures regarding a workplace accident.

### Sample Item:

Shortly before noon the weather near ABC Ag Group became very dark and ominous. The weather spurred severe weather warnings which were followed by the touchdown of a tornado that ripped the roof off of ABC Ag Group. Following the accident, workers noticed that many electrical wires were exposed and the rain falling from the storm concerned them. What would be the appropriate emergency procedure for workers at ABC to follow?

- \* A. The workers should shut off the main power to the building and watch for any potential water hazards that may exist.
- B. The storm would have knocked out power, so the workers should begin clean up as they can't sell anything while the power is out.
- C. The workers should unplug all electrical wires until emergency services can check to ensure that everything is in working order.
- D. The workers should immediately find something to ground themselves from electrical shock and should cover any computers and/or paperwork from rain.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 28.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.

**Benchmark:** 28.03 Create a disaster and/or emergency response plan.

**Depth of Knowledge:** Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to disasters that occur in the state of Florida. Items should be limited to the creation of plans.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include a scenario involving a disaster and/or emergency response plan.

### Response Attributes:

Responses may include a scenario involving a disaster and/or emergency response plan.

### Sample Item:

Christopher is the newly appointed health and safety leader at his job. His first task is to create an emergency response plan in case of a fire. What would be **BEST** first step in addressing the need?

- A. Establish an evacuation and lock-down drills.
- B. Delegate roles and responsibilities to others.
- C. Conduct drills and trainings for employees.
- \* D. Construct a diagram of escape routes.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 29.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.

**Benchmark:** 29.01 Employ leadership skills to accomplish organizational goals and objectives.

**Depth of Knowledge:** Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to leadership roles, responsibilities, and/or traits. Items should be limited to the understanding and/or following of organizational goals and objectives.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include a scenario involving the student knowledge of leadership skills and using them to accomplish organizational goals.

Stimulus may include fundamental leadership skills in their relation to organizational goals and objectives.

### Response Attributes:

Responses may include fundamental leadership skills in their relation to organizational goals and objectives.

### Sample Item:

The Funny Farm Company just elected a new Chairman of the Board at a critical point in time when the economy is at a very low point. The new Chairman is experienced in the field, but is unsure what his first act of leadership should be. What should the Chairman do first to calm the members that were unsure of his appointment?

- A. Conduct a needs assessment of the company and determine how the company should best meet those needs in the near future.
- \* B. Meet with the board to create goals and objectives that meet the needs of the market place.
- C. Listen to the members of the board and ask each one what they would like to see from him and do the best to make sure all the needs are met.
- D. Admit to the company that some things may need to change because of the economy, but pledge his commitment to helping the company through.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 29.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.

**Benchmark:** 29.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to common practices surrounding working relationships and/or workplace dynamics.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include a scenario involving the student knowledge on working relationships and using them to accomplish goals and tasks.

Stimulus may include fundamental knowledge of working relationships and their relation to goals and tasks.

### Response Attributes:

Responses may include fundamental working relationships and their relation to goals and objectives.

### Sample Item:

May is new to her job working at Joe's landscaping company, but has 10 years of experience. The company was made up of Joe and his 4 male employees. May is now the first female working in the field for Joe. She is trying to establish working relationships with the other members of the team, but they do not tend to listen to anything that she has to say. How can May establish a better working relationship with her coworkers so that they will begin to listen to her?

- A. She should ask them to trust her a little bit at a time until they feel confident that she is correct in what she is saying and doing.
- B. She should ask them to let her do her aspect of the job. She will stand behind her work and everything will be fine.
- C. She should follow the instructions for completing the task as Joe requires. Refer the other workers to the technical assistance document.
- \* D. She should remain reliable in that she is consistently doing her job well and correct. The other will learn that she knows what she is doing.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 30.0 Describe the importance of professional ethics and legal responsibilities.

**Benchmark:** 30.01 Evaluate and justify decisions based on ethical reasoning.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to commonly made decisions in the horticulture industry. Items should be limited to ethical reasoning surrounding decision making.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include a scenario involving student knowledge on ethical reasoning.

Stimulus may include information on ethical reasoning.

### Response Attributes:

Responses may include fundamental knowledge concerning ethical reasoning.

### Sample Item:

Julie works at a local garden center. While she is working at the cash register, she notices an elderly man pull out his wallet and a \$20 bill fell to the ground. Julie chose not to tell the man and instead she let him walk away. After he left, she picked up the bill and put it beside the cash register. At the end of her shift, she told the manager she found the money. The manager said Julie could keep the money if it was not claimed in 7 days. Evaluate the decision Julie made to turn in the money.

- \* A. Turning it in is just as bad as taking it in the first place because she should have told the man that he lost it.
- B. Turning it in was the right thing to do as the person may return to the store when they find the money missing.
- C. The original act of not telling the man was not right, but it is balanced off with the fact that she turned the money in.
- D. She should go the extra mile to post a notice by the cash register letting people know that they should see her if they are missing any money.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 31.0 Explain the importance of employability skill and entrepreneurship skills.

**Benchmark:** 31.01 Identify and demonstrate positive work behaviors needed to be employable.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to common behaviors witnessed in the workplace. Items should be limited to identification of techniques commonly accepted in workplaces in the horticulture industry. Items may include the demonstration of knowledge with the selection of correct behaviors or the performance of the required behaviors.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include a scenario involving student knowledge of positive work behaviors.

Stimulus may include information on positive work behaviors.

Stimulus should address horticultural related topics.

### Response Attributes:

Responses may include fundamental knowledge concerning positive work behaviors.

Responses should address horticultural related topics.

### Sample Item:

In preparing for her interview as a cashier at Jack's nursery, Jackie reviewed her resume. She discovered that she did not list skills that may be desirable to the potential employer. To address this, Jackie brainstormed and decided that she should add the following: team player, reliable, honest, and loyal. She found that her resume would only support three of the four traits without going to another page. Which trait would be **BEST** choice for her to remove from her resume to demonstrate employable behaviors and keep her resume to one page?

- A. team player
- B. reliable
- C. honest
- \* D. loyal

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 31.0 Explain the importance of employability skill and entrepreneurship skills.

**Benchmark:** 31.02 Develop personal career plan that includes goals, objectives and strategies.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to career planning. Items should be limited to employment requirements, employment strategies, and/or career goal setting.

### **Stimulus Attributes:**

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include a scenario involving student knowledge on a personal career plan.

Stimulus may include information on a personal career plan.

Stimulus should address horticultural related topics.

### **Response Attributes:**

Responses may include fundamental knowledge of a personal career plan.

Responses should address horticultural related topics.

### **Sample Item:**

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

### **Item Specifications**

Stimulus: Identify a career plan in the horticulture industry. Identify and describe goals, objectives, and strategies for one, five, and ten-year time periods. The goals should be reachable in the time frame and be supported by realistic objectives and strategies. Response should utilize a poster paper, select pictures and/or drawings to represent each goal.

Rubric:

- |          |   |
|----------|---|
| 4 Points | Response includes a poster listing one year, five year, and ten year career goals.<br>Response includes pictures and/or graphics to depict all the selected goals. Response includes identified goals, objectives, and strategies for one year; five year; and ten year time periods that are achievable in the time frame. |
| 3 Points | Response includes a poster listing one year, five year, and ten year career goals.<br>Response includes pictures and/or graphics to depict all the selected goals. Response includes the identification of goals, objectives, and strategies that are mostly achievable in the time frame.                                  |
| 2 Points | Response includes a poster listing one year, five year, and ten year career goals.<br>Response includes pictures and/or graphics to depict most of the selected goals.<br>Response includes the identification of goals, objectives, and strategies that are mostly not reachable in the time frame.                        |
| 1 Point  | Response may not include a poster listing one year, five year, and ten year career goals.<br>Response may not include pictures or graphics to depict some of the selected goals.<br>Response may not identify goals, objectives, and strategies that are reachable in the time frame.                                       |



**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 31.0 Explain the importance of employability skill and entrepreneurship skills.

**Benchmark:** 31.03 Maintain a career portfolio to document knowledge, skills and experience.

**Depth of Knowledge:** Low Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to aspects commonly contained in career portfolios of those in the horticulture industry.

### **Stimulus Attributes:**

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include a scenario involving student knowledge on preparing and/or maintaining a career portfolio.

Stimulus may include information on preparing and/or maintaining a career portfolio.

### **Response Attributes:**

Responses may include fundamental knowledge concerning preparing and/or maintaining a career portfolio.

### **Sample Item:**

Career portfolios should contain all off the following elements **EXCEPT**

- A. personal awards and acknowledgements.
- \* B. personal demographic information.
- C. sample work.
- D. references from past employers.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 31.0 Explain the importance of employability skill and entrepreneurship skills.

**Benchmark:** 31.04 Evaluate and compare employment opportunities that match career goals.

**Depth of Knowledge:** Moderate Complexity, High Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to comparing and/or evaluating employment requirements and career goals in the agricultural industry.

### **Stimulus Attributes:**

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include a scenario involving student knowledge on employment opportunities and/or career goals.

Stimulus may include information on employment opportunities and/or career goals.

### **Response Attributes:**

Responses may include fundamental knowledge concerning employment opportunities and/or career.

### **Sample Item:**

Juan is trying to determine what aspect of horticulture to pursue when he goes to college. Juan knows that he likes to work outdoors, likes planting trees, but would like to work in an environment with limited contact with people. In comparing his desires to those required in the horticulture industry, what career may he want to pursue?

- \* A. arboriculturist
- B. botanist
- C. horticultural therapist
- D. viticulturist

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 31.0 Explain the importance of employability skill and entrepreneurship skills.

**Benchmark:** 31.05 Examine and describe entrepreneurship opportunities as a career planning option.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to requirements of entrepreneurship as it relates to the horticulture industry. Items may include written ideas or the selection of appropriate ideas.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include a scenario involving student knowledge of entrepreneurship and/or career planning.

Stimulus may include information on entrepreneurship and/or career planning.

### Response Attributes:

Responses may include fundamental knowledge concerning entrepreneurship and/or career planning.

### Sample Item:

Carlos is a high school student currently working for a small landscape company which he thoroughly enjoys. His family suggests he look at starting his own landscape business when he is done with high school. What would Carlos **MOST** want to consider before starting his own company?

- A. how many staff he will need
- B. where his office will be
- \* C. how much money is needed to start
- D. who he will use as his payroll company

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 32.0 Demonstrate personal money-management concepts, procedures, and strategies.

**Benchmark:** 32.01 Identify and describe the services and legal responsibilities of financial institutions.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to functions of financial institutions and/or responsibilities of financial institutions to their clients. Items may include a description of written ideas or the selection of appropriate ideas.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include a scenario involving student knowledge of financial institutions.

Stimulus should include information on financial institutions.

### Response Attributes:

Responses may include fundamental knowledge financial institutions.

### Sample Item:

Sam's Farms have been very profitable for years. They have built a substantial bank account with over half a million dollars at their small, FDIC insured local bank. The economy has fallen on hard times and many banks have been forced to close suddenly. Sam went to his bank Monday morning after hearing the news that they were closing. The bank had indeed gone under, and he began to wonder if he would ever see his money again. What will likely happen to the money in the account?

- A. If he insured the account with the FDIC, he will be fully covered.
- B. The money will remain in the account that is controlled by the government.
- C. The money will all be lost.
- \* D. Up to \$250,000 of the money will be covered.

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## Item Specifications

**Standard:** 32.0 Demonstrate personal money-management concepts, procedures, and strategies.

**Benchmark:** 32.02 Describe the effect of money management on personal and career goals.

**Depth of Knowledge:** Low Complexity, Moderate Complexity

**Item Types:** Multiple Choice, Constructed Response

**Content Limits:** Items should be limited to money management skills, career income expectancy, and/or usual horticulture career lifestyles. Items may include a description of written ideas or the selection of appropriate ideas.

### Stimulus Attributes:

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include a scenario involving student knowledge of money management.

Stimulus may include information on money management.

### Response Attributes:

Responses may include fundamental knowledge of money management.

### Sample Item:

Joel has owned a tree farm for 3 years and would like to retire in 30 years. He wants to travel but would also like to make sure that his family's needs are met after his death. What would be his **BEST** steps for accomplishing this goal?

- A. monitor bank account statements, invest in retirement savings, and set up a budget
- B. have paychecks split into multiple accounts, insure the home mortgage, and purchase a timeshare
- \* C. start a savings account, monitor expenses and income, and obtain a life insurance policy
- D. set up a budget, invest in a 401K, and establish a life insurance policy

**Course Name:** Introduction to Horticulture 2

**Course Number:** 8121510

## **Item Specifications**

**Standard:** 32.0 Demonstrate personal money-management concepts, procedures, and strategies.

**Benchmark:** 32.03 Develop a personal budget and financial goals.

**Depth of Knowledge:** Moderate Complexity

**Item Types:** Multiple Choice, Performance Task

**Content Limits:** Items should be limited to budgeting techniques and systems, goal setting, and/or monetary concepts as they relate to individuals in the horticulture industry.

### **Stimulus Attributes:**

Stimulus may include graphs, charts, diagrams, or pictures.

Stimulus may include a scenario involving student's personal budget and/or financial goals.

Stimulus may include information on a personal budget and/or financial goal.

### **Response Attributes:**

Responses may include fundamental knowledge of a personal budget and/or financial goals.

### **Sample Item:**

Course Name: Introduction to Horticulture 2

Course Number: 8121510

## Item Specifications

### Howard's Monthly Personal Budget

#### Income

Work paychecks	2800
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#### Expenses

Car Payment (\$12,000 @ 0% interest)	300
Mortgage (\$180,000 @ 4% interest)	1500
Utilities	125
Insurance	200
Misc. Expenses	200
Credit Card Debt (\$20,000 @ 12% interest)	300
Property Taxes	250
Total Expenses	2875

Monthly Budget	-75
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In reviewing Howard's personal budget, it is evident that he is not able to support his current expenses or continue operating in this fashion. Howard knows that his income will not soon change, but he wants to make sure that he saves at least \$200 a month. How should he use the \$3000 that he received on his tax return?

- A. pay down his car balance
- B. pay his property taxes
- C. pay ahead on his mortgage
- \* D. pay extra on his credit cards