

Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: L1400 FLORAL DESIGN

Number: L1400 Hours: 405.00

Dates: Spring 2025

Description/Objectives:

Student will know and be able to design a variety of floral arrangements including body flowers using the elements and principles of design, identify and describe characteristics and uses of cut flowers, foliage, fillers and floral mechanics, and complete all tasks using proper safety and operating techniques for floral design.

Tasks:

- L1401 - Describe and apply the principles and elements of floral design.
- L1402 - Order, receive, store, and rotate inventory of floral materials.
- L1403 - Demonstrate proper safety and operating techniques for floral design.
- L1404 - Identify and describe the characteristics and uses of cut flowers, foliage and fillers.
- L1405 - Identify and describe the use of floral mechanics.
- L1406 - Create corsages and other body flowers.
- L1407 - Create various types of free-standing floral arrangements using fresh and/or permanent materials.
- L1409 - Create special event designs.
- L1410 - Operate a POS.
- L1411 - Create various holiday centerpieces.
- L1412 - Create various holiday wreaths/door pieces.
- L1413 - Create various bridal bouquets.
- L1414 - Create various formal centerpieces.
- L1415 - Create a garland.
- L1416 - Create various pin-on corsages.
- L1417 - Create various wristlets.
- L1418 - Create various boutonnières.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.

CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.

Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.

INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other

sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.

RESEARCH GRADES 9-10-11-12

Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.

Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.

Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- Pennsylvania Core Standards for Mathematics Standard 2.0

Supporting Anchor/Standards:

NUMBERS AND OPERATIONS

Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.

Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

Instructional Activities:

Knowledge:

Participate in discussion and answer questions during lecture

Describe how to make a floral sale
 Describe supplies needed to create a corsage or boutonniere
 Describe corsage design mechanics and techniques
 Discuss proper placement and pinning of corsages and boutonnieres
 Explain basic geometric designs
 Describe floral arrangements for holidays
 Describe typical wedding needs
 Explain the process of designing a wedding
 Explain how to service a wedding
 Explain the importance of sympathy flowers
 Analyze the principles of floral design
 Examine the concept of proportion
 Explain how the concept of balance is applied to floral design
 Describe how rhythm is applied in floral work
 Explain how the principles of dominance and focal point are used in floral design
 Describe the major forms used in floral design
 Explain how space and depth enhance floral design
 Assess the importance of texture in floral design
 Analyze when and how to harvest everlasting flowers
 Explain the methods of preserving plant materials
 Describe designing with everlasting plant materials (dried and silk)
 Explain the importance of effective buying

Skill:

Demonstrate tool safety
 Demonstrate the proper use of tool for a specified task
 Identify the correct tools for the task and model the use of the tool
 Complete task sheet assigned
 Complete self evaluation using rubric
 Complete description sheet for each task
 Identify the qualities of a good salesperson
 Make bow
 Identify supplies needed to create a corsage or boutonniere
 Identify and describe styles of corsages and boutonnieres
 Identify supplies and tools needed in floral work
 Define naturalistic style design
 Design bud-vase arrangements
 Design vase arrangements
 Demonstrate how to design centerpieces
 Learn how to take a centerpiece order
 Identify the major holidays
 Identify and describe types of wedding bouquets
 Identify and describe typical sympathy pieces
 Evaluate the influences of color on floral work
 Construct dried and silk arrangements
 Determine the costs for floral arrangements
 Read reference material as needed
 Interpret and review the reference orally to the instructor
 Read assigned module
 Complete anticipation guide
 Complete reading strategy assignment
 Participate in group activity
 Complete assigned individual and group projects
 Present and review grading rubrics for projects
 Maintain a notebook
 Maintain a clean work area

Remediation:

Re-teach major concepts
 Review with teacher assistance

Worksheets

Individual tutoring

Group tutoring
 Peer tutoring
 Review games
 Create a chart
 Technology integration
 Computer assisted instruction
 Checklists

Enrichment:

Upon completion students will move to the next task/assignment
 Repeat tasks to enhance skill
 Model learning of concepts for others
 Teach concepts to peers
 Independent study for FFA competition
 FFA leadership related activities

Special Adaptations:

Extended Time (assignments and/or testing)
 Graphic Organizer
 Chunking of Assignments/Material
 Preferential Seating
 Directions/Comprehension Check (frequent checks for understanding)
 Study Guide
 Directions and/or Tests Read Aloud
 Adapted Tests and/or Assignments
 Use of Calculator
 Taking Tests in Alternate Setting (or if requested)
 Teacher Modeling
 Use of Computer (Access to)
 Positive Reinforcement
 Have Student Repeat Directions
 Wait Time
 Grading Rubric

Safety:

Student must:
 Handle material in a safe and workmanlike manner
 Use protective clothing and equipment
 Use hand tools in a safe manner
 Follow manufacturer's directions when using any product, tool, equipment, etc.
 Use proper safety precautions when using /operating hand tools
 Use tools and equipment in a professional work-like manner according to OSHA standards
 Know and follow the established safety rules at all times

Assessment:

Worksheets
 Anticipation Guides
 Pre/post test
 Video /DVD worksheets
 Student self assessment
 Student written description of task and proper tool's for task
 Safety sign off sheet
 Student checklist
 Grading rubrics for projects
 Notebook

Resources/Equipment:

Ingels, J. , , & , . (2004). Ornamental horticulture science, operations, and management. Delmar. (Ingels, , & , 2004) Griner, C. (2004). Floriculture designing & merchandising. Delmar. (Griner, 2004 Internet E-unit: Selling Floral Orders. Danville, IL: CAERT, Inc E-unit 030059: Designing Corsages and Boutonnieres. Danville, IL: CAERT, Inc. www.mycaert.com PowerPoint Presentation MDS 642: Floral Design 2: Principles and Practices. Urbana: University E-unit 030060: Designing Basic Floral Work. Danville, IL: CAERT, Inc. www.mycaert.com PowerPoint Presentation MDS 642: Floral Design 2: Principles and Practices. Urbana: University of Illinois Information Technology and Communication Services. E-unit 030061: Designing Vase Arrangements. Danville, IL: CAERT, Inc. www.mycaert.com PowerPoint Presentation MDS 642: Floral Design 2: Principles and Practices. Urbana: University of Illinois Information Technology and Communication Services. E-unit 030062: Designing Centerpieces. Danville, IL: CAERT, Inc. www.mycaert.com PowerPoint Presentation MDS 642: Floral Design 2: Principles and Practices. Urbana: University of Illinois Information Technology and Communication Services. E-unit 030063: Designing Holiday Arrangements. Danville, IL: CAERT, Inc. www.mycaert.com PowerPoint Presentation MDS 642: Floral Design 2: Principles and Practices. Urbana: University of Illinois Information Technology and Communication Services. E-unit 030064: Designing Wedding Pieces. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030065: Designing Sympathy Arrangements. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030057: Understanding the Principles of Floral Design. Danville, IL: CAERT, Inc. www.mycaert.com PowerPoint Presentation MDS 642: Floral Design 2: Principles and Practices. Urbana: University of Illinois Information Technology and Communication Services. E-unit 030058: Understanding the Design Elements. Danville, IL: CAERT, Inc. www.mycaert.com PowerPoint Presentation MDS 642: Floral Design 2: Principles and Practices. Urbana: University of Illinois Information Technology and Communication Services. E-unit: Advertising and Displaying Horticultural Products. Danville, IL: CAERT E-unit 030055: Caring for Fresh Cut Flowers and Foliage. Danville, IL: CAERT, Inc. www.mycaert.com PowerPoint Presentation MDS 641: Floral Design 1: Plant Material. Urbana: University of Illinois Information Technology and Communication Services. E-unit 030066: Using Everlasting Flowers. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030055: Caring for Fresh Cut Flowers and Foliage. Danville, IL: CAERT, Inc. www.mycaert.com PowerPoint Presentation MDS 641: Floral Design 1: Plant Material. Urbana: University of Illinois Information Technology and Communication Services. E-unit 030067: Pricing Floral Design Work. Danville, IL: CAERT, Inc. www.mycaert.com E-unit: Establishing a Horticultural Business. Danville, IL: CAERT, Inc. Reiley, H. Edward., and Carroll Shry L. Introductory Horticulture. Albany, NY: Delmar, 1997. Floriculture Designing & Merchandising Book Ornamental Horticulture Book Copies of newspapers/ Trade Magazines Writing surface Copies of sample test Visuals from accompanying masters Copies of student lab sheets Dried plant materials Cut flowers (carnations are ideal and inexpensive) Graduated cylinders Water Floral preservative in packets Clear soda pop Floral design tools and supplies Examples of floral designs (pictures or actual designs) Photos of floral arrangements Horticultural products (e.g., those in a greenhouse)Hyperlinks:

Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: L1500 LANDSCAPING TECHNOLOGY SKILLS

Number: L1500 **Hours:** 320.00

Dates: Spring 2025

Description/Objectives:

This hands-on, project-based course introduces students to the foundational knowledge and practical skills required in the modern landscaping and horticulture industry. Students will explore the principles of design, installation, and maintenance of sustainable and aesthetically pleasing outdoor spaces. The curriculum integrates plant science, soil management, safe operation of industry-standard tools and equipment, and the latest technologies in landscape design.

Tasks:

- L1501 - Demonstrate proper safety and operating techniques for landscape tools and equipment.
- L1502 - Find resources that describe specifications for landscape construction projects.
- L1503 - Describe and apply principles of landscape and hardscaping design.
- L1504 - Describe and apply principles of landscape management.
- L1505 - Calculate areas and volumes from information shown on a blueprint.
- L1506 - Estimate costs of landscape materials.
- L1507 - Explain the purpose of Pennsylvania "One Call" service.
- L1508 - Identify landscape site management issues.
- L1509 - Determine drainage/elevations using the appropriate layout and leveling devices.
- L1510 - Read and interpret blueprints, blueprint symbols and abbreviations.
- L1511 - Prepare and plant turf using seed or sod.
- L1512 - Install plants that are bare-root, containerized, balled and burlapped, boxed, or machine-moved.
- L1513 - Identify appropriate types of irrigation systems and installation methods.
- L1514 - Determine management schedules as appropriate for various turf and ornamental installations.
- L1515 - Explain methods for rough and fine grading.
- L1516 - Prune evergreen and deciduous trees and shrubs.
- L1517 - Install landscape structures.
- L1518 - Create landscape bed edges.
- L1519 - Describe the characteristics of lawn, recreation and sports turf.
- L1520 - Explain the characteristics of cool season and warm season grasses.
- L1521 - Select grasses and seed mixes/blends for particular turf purposes and areas.
- L1522 - Calculate quantities of turf grass for installation.
- L1523 - Plan the construction of a new turf area and install turf grass.
- L1524 - Develop a fertilizer program for turf grass and apply it in correct amounts.
- L1525 - Develop a mowing schedule.
- L1526 - Describe hydro-seeding techniques.
- L1527 - Demonstrate various methods and procedures for turf maintenance, including de-thatching.

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reporting quantities.

Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

Instructional Activities:

Knowledge:

- Explain the purpose of Pennsylvania 'One Call' service
- Explain how turf grasses are selected based on climate
- Describe how turf grass is established by seeding
- Describe how turf grass is established vegetatively
- Explain how turf can be renovated
- Describe fertilization practices for turf grass
- Explain proper mowing procedures
- Discuss water practices for turf grass
- Describe other maintenance practices for turf grass
- Discuss turf grass diseases and management practices
- Discuss turf grass management for golf courses
- Explain turf grass management for athletic fields
- Describe the turfgrasses used for golf courses and athletic fields
- Explain aspects of outdoor living area design
- Describe the functions of a service area
- Explain how to use annuals and perennials in the landscape
- Describe how to design a flower garden
- Explain why plant names are important
- Describe how to label a landscape plan
- Describe landscape specifications
- Describe skills needed to manage a landscape business
- Analyze the requirements of starting a landscape business
- Describe the basic management practices of a landscape company
- Discuss the use of computers in the landscape industry
- Interpret a landscape plan
- Discuss the preparation of the landscape site
- Determine irrigation requirements
- Determine water capacity and pressure
- Select sprinklers and establish spacing ranges
- Establish sprinkler circuits and install valves
- Locate controllers and size wiring
- Prepare the final irrigation plan
- Identify the different methods of harvesting plant materials
- Outline proper planting techniques
- Describe the methods of planting annuals, perennials, and ground covers
- Discuss post-planting care
- Compare the types of materials used in paving
- Explain how to select patio materials
- Describe how to install a walkway or patio
- Discuss proper deck installation procedures
- Explain the reasons for installing a fence or wall
- Identify the different parts of a fence
- Discuss how to properly install a fence
- Describe the different materials used to build a retaining wall
- Explain how to install a retaining wall
- Identify the major lighting techniques available for the garden
- Explain the difference between high and low voltage
- Describe the proper installation of low-voltage lighting systems
- Identify the different materials needed to create a water feature
- Describe the proper technique for creating a small pond
- Explain how to construct a waterfall feature
- Analyze the influence of woody plant biology on maintenance practices
- Explain recommended watering practices for woody landscape plants
- Explain guidelines for fertilizing woody landscape plants
- Describe how to select and apply mulches to the landscape

Explain why woody landscape plants are pruned
 Describe how to prune deciduous and evergreen trees and shrubs properly
 Describe various pruning techniques used with shrubs
 Describe how to estimate landscape maintenance costs
 Discuss some advantages and disadvantages of using computer spreadsheets in a landscape maintenance business
 Discuss the types of digging and grading hand tools and their uses
 Explain the major types of pruning and cutting hand tools and their uses
 Describe other types of hand tools used in horticulture
 Discuss common shop hand tools used in horticulture
 Explain how to maintain hand tools
 Discuss the proper maintenance of power tools and equipment

Skill:

Demonstrate proper safety and operating techniques for landscape tools and equipment.
 Identify major parts of turfgrass plants
 Identify characteristics of grass plants used for turfgrass purposes
 Examine site preparation for establishing turfgrass
 Identify turfgrass weeds and describe methods for managing weeds
 Identify turfgrass pests and pest management practices
 Identify hand tools used in the turfgrass industry.
 Identify power tools used in the turfgrass industry
 Identify heavy equipment used in the turfgrass industry
 Determine the client's needs and desires
 Demonstrate the proper use of drafting equipment
 Create a base plan
 Prepare a site analysis plan
 Distinguish the major areas of a residential landscape
 Assess design guidelines for the public area
 Organize landscape activities using goose egg plans
 Develop bed patterns for a landscape
 Locate trees in a landscape plan
 Distinguish between an annual and a perennial
 Evaluate the selection of plant materials for the landscape
 Demonstrate how to draw plants on a landscape plan
 Define the categories of landscape plants
 Illustrate how to render a landscape plan
 Differentiate between an estimate and a bid
 Prepare a cost estimate for a landscape plan
 Calculate common landscape measurements
 Examine the segments of the landscape industry
 Identify tools used in pruning woody landscape plants
 Identify the skills a landscape maintenance technician should master
 Identify and describe common types of turf maintenance equipment
 Identify and describe common landscape installation and maintenance tools and equipment
 Determine drainage/elevations using the appropriate layout and leveling devices.

Remediation:

Re-teach major concepts
 Review with teacher assistance
 Worksheets
 Individual tutoring
 Group tutoring
 Peer tutoring
 Review games
 Create a chart
 Technology integration
 Computer assisted instruction
 Checklists

Enrichment:

Upon completion students will move to the next task/assignment

Repeat tasks to enhance skill
 Model learning of concepts for others
 Teach concepts to peers
 Independent study for FFA competition
 FFA leadership related activities

Special Adaptations:

Extended Time (assignments and/or testing)
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 Chunking of Assignments/Material
 Preferential Seating
 Directions/Comprehension Check (frequent checks for understanding)
 Study Guide
 Directions and/or Tests Read Aloud
 Adapted Tests and/or Assignments
 Use of Calculator
 Taking Tests in Alternate Setting (or if requested)
 Teacher Modeling
 Use of Computer (Access to)
 Positive Reinforcement
 Have Student Repeat Directions
 Wait Time
 Grading Rubric

Safety:

Student must:
 Handle material in a safe and workmanlike manner
 Use protective clothing and equipment
 Use hand tools in a safe manner
 Follow manufacturer's directions when using any product, tool, equipment, etc.
 Use proper safety precautions when using /operating hand tools
 Use tools and equipment in a professional work-like manner according to OSHA standards
 Know and follow the established safety rules at all times

Assessment:

Worksheets
 Anticipation Guides
 Pre/post test
 Video /DVD worksheets
 Student self assessment
 Student written description of task and proper tool's for task
 Safety sign off sheet
 Student checklist
 Grading rubrics for projects
 Notebook

Resources/Equipment:

Writing surface Overhead projector Copies of sample test Visuals from accompanying masters Copies of student lab sheets Samples of grass seed, sprigs, plugs, and sod Bag of fertilizer Photos of new homes without landscaping Drafting supplies Catalogs of flowering plants Graph paper Several books on landscape plants T-square Landscape plans Circle template Scale Drawing pencils Tracing paper Triangle Colored pencils or markers Calculator Clip-on utility lights (sometimes known as clamp or "trouble" lights) or flashlights Samples of evergreen branches Pruning tools Hand tools Linseed oil Old paint brush Lubricating oil Rags Files Horticultural power tools Ingels, J, , , & , . (2004). Ornamental horticulture

science, operations, and management. Delmar. (Ingels, , & , 2004) Griner, C. (2004). Floriculture designing & merchandising. Delmar. (Griner, 2004 Internet E-unit 030006: Classifying Ornamental Plants. Danville, IL: CAERT, Inc. www.mycaert.com Subject Matter Unit U5038: Horticultural Plant Names. Urbana: University of Illinois Information Technology and Communication Services E-unit: Identifying, Classifying, and Selecting Turfgrass. Danville, IL: CAERT, Inc. . E-unit: Establishing and Growing Turfgrass. Danville, IL: CAERT, Inc. . E-unit: Managing Turfgrass. Danville, IL: CAERT, Inc. . E-unit: Managing Pests and Diseases in Turfgrass. Danville, IL: CAERT, Inc. . E-unit: Identifying Tools and Equipment Associated with Turfgrass. Danville, IL: . E-unit: Managing Athletic Fields and Golf Courses. Danville, IL: CAERT, Inc. E-unit 030075: Analyzing the Residential Landscape. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030076: Designing the Landscape Areas. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030077: Beginning the Design Process. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030079: Using Annuals and Perennials in the Landscape. Danville, IL: CAERT, Inc. www.mycaert.com E-unit: Choosing Plants for the Landscape. Danville, IL: CAERT, Inc. www.mycaert.com E-unit: Putting the Plan on Paper. Danville, IL: CAERT, Inc. www.mycaert.com E-unit: Pricing the Landscape Plan. Danville, IL: CAERT, Inc. www.mycaert.com E-unit: Managing the Landscape Business. Danville, IL: CAERT, Inc. www.mycaert.com E-unit: Preparing the Landscape Site. Danville, IL: CAERT, Inc. www.mycaert.com E-unit: Installing and Maintaining Irrigation Systems. Danville, IL: CAERT, Inc. www.mycaert.com E-unit: Installing Woody Landscape Plants, Groundcovers, Perennials, and Annuals. Danville, IL: CAERT, Inc. . E-unit: Installing Patios, Walks, and Decks. Danville, IL: CAERT, Inc. . E-unit: Installing Fences and Walls. Danville, IL: CAERT, Inc. . E-unit: Incorporating Lights into the Landscape. Danville, IL: CAERT, Inc. . E-unit: Incorporating Water Features into the Landscape. Danville, IL: CAERT, Inc. . E-unit: Watering, Fertilizing, and Mulching Woody Landscape Plants. Danville, IL: CAERT, Inc. . E-unit: Pruning Landscape Plants. Danville, IL: CAERT, Inc. . E-unit: Pricing Landscape Maintenance Work. Danville, IL: CAERT, Inc. . E-unit: Using Hand Tools in Landscaping. Danville, IL: CAERT, Inc. . E-unit: Using Power Tools and Small Landscape Maintenance Equipment. Danville, IL: CAERT, Inc. . Parker, R. O. Plant and Soil Science: Fundamentals and Applications. Clifton Park, NY: Delmar Cengage Learning, 2010. Emmons, Robert D. Turfgrass Science and Management. Albany, NY: Delmar, 1984. Sauter, David. Landscape Construction. Africa: Delmar Thomson Learning, 2000. Reiley, H. Edward., and Carroll Shry L. Introductory Horticulture. Albany, NY: Delmar, 1997. Hyperlinks:

Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: L1200 PLANT PRODUCTION (GREENHOUSE/NURSERY)

Number: L1200 **Hours:** 290.00

Dates: Spring 2025

Description/Objectives:

This practical, hands-on course explores the science and technology involved in propagating, growing, and marketing high-quality plants in controlled environments, such as greenhouses and nurseries. Students will manage and operate a working facility, learning key industry skills in horticultural science, plant health management, and business operations. The curriculum covers the lifecycle of various crops, including but not limited to annuals, perennials, herbs, and vegetables, preparing students for immediate entry into the green industry or for advanced study in horticulture and plant science.

Tasks:

- L1201 - Demonstrate proper safety and operating techniques for greenhouse/nursery tools and equipment.
- L1202 - Describe the characteristics and features of various types of growing structure.
- L1203 - Control and sanitize the growing environment and equipment.
- L1205 - Transplant various types of plant material.
- L1206 - Prune various types of plant material.
- L1209 - Prepare plant material for marketing or sales.
- L1210 - Recognize non-traditional growth and propagation of various plant materials. (examples may include but are not limited to: hydroponics, aquaponics, aeroponics, and tissue culture)
- L1211 - Recognize proper operation of the environmental control systems of a growing structure.
- L1212 - Receive, handle and grade standard plant material and containers.
- L1214 - Develop a growing schedule for a greenhouse or nursery crop.
- L1215 - Grow a greenhouse or nursery crop as per the growing schedule you created.
- L1216 - Market and sell the greenhouse or nursery crop you grew.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.

CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.

Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.

INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.

RESEARCH GRADES 9-10-11-12

Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.

Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.

Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- PA SCIENCE, TECHNOLOGY & ENGINEERING, AND ENVIRONMENTAL LITERACY & SUSTAINABILITY STANDARDS (STEELS)

Supporting Anchor/Standards:

3.5.9-12.A Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.H Evaluate ways that technology and engineering can impact individuals, society, and the environment.

3.5.9-12.I (ETS) Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

3.5.9-12.J Synthesize data and analyze trends to make decisions about technological products, systems, or processes.

3.5.9-12.K (ETS) Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

3.5.9-12.N Analyze and use relevant and appropriate design thinking processes to solve

technological and engineering problems.

3.5.9-12.P Apply a broad range of design skills to a design thinking process.

3.5.9-12.Y (ETS) Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.OO Use project management tools, strategies, and processes in planning, organizing, and controlling work.

3.5.9-12PP Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making

Instructional Activities:

Knowledge:

Describe the components of soil

Describe the functions of the growing media

Review considerations for greenhouse frameworks

Describe the functions of the head-house

Describe greenhouse bench options

Describe methods of heating greenhouse structures

Contrast major greenhouse cooling and ventilation systems

Discuss how energy curtains are used to maintain greenhouse temperatures

Analyze greenhouse climate controls

Discuss the advantages of automated systems

Assess automated systems involved in planting

Describe production practices for potted tulips

Explain how potted daffodils are forced

Describe techniques used to force hyacinths

Describe forcing techniques used for Asiatic and Oriental lilies

Discuss production practices for amaryllis

Describe the importance and scope of the foliage plant industry

Discuss production practices used in growing foliage plants in the greenhouse

Explain practices used in caring for foliage plants in the home or office

Describe the importance and scope of the bedding plant industry

Explain production practices used in growing bedding plants

Describe career opportunities associated with greenhouse management

Discuss the importance of sexual propagation of plants

Describe the process of seed germination

Describe the factors involved in planting seeds for transplanting

Explain how to successfully direct seed outdoors

Describe leaf and leaf-bud cuttings and how they are used to propagate plants

Discern the three types of stem cuttings

Explain how root cuttings are prepared for propagation

Examine factors that determine the success of rooting of cuttings

Explain separation and division

Describe layering and identify four common forms of layering

Describe how grafting is used to propagate plants

Explain how budding is used for plant propagation

Discuss the importance of tissue culture

Explain how to prepare a business plan

Explain how computers can be useful in a horticultural business

Explain the scope and history of the nursery industry

Explain the environmental factors involved in selecting a nursery site

Describe the process of lining out nursery stock

Describe the tools and equipment used in production

Describe how to ball-and-burlap stock properly.

Discuss the advantages and disadvantages of bare root, balled-and-burlapped, and containerized packaging

Describe the types of storage used for nursery stock

Describe the techniques used in the defoliation of plants before storage

Describe common tasks performed by nursery workers.

Describe the functions of nursery business management

Skill:

Appraise the components of a soilless mix

Evaluate the advantages and disadvantages of soilless medium

Determine desirable properties of growing media

Differentiate greenhouse designs

Define the types of growing media

Identify and describe greenhouse glazing materials

Identify automated systems involved in moving plants in the greenhouse

Compare automated systems involved in watering plants

Distinguish between bulbs, corms, tubers, and rhizomes

Compare forcing schedules for crocus, dwarf iris, and grape-hyacinth

Examine the factors involved in getting bedding plants started

Differentiate the types of greenhouse businesses

Recognize costs related to production

Identify skills a plant grower should master

Report on why plants are propagated asexually

Identify and explain the difference between three common methods of

Grafting

Demonstrate tissue culture techniques

Define entrepreneurship and explain how it relates to horticulture

Identify the three ways of doing business

Identify the five functions of business management

Compare the different types of nurseries

Examine the economic factors involved in selecting a nursery site

Contrast the different types of nursery facilities

Demonstrate how the plant-hardiness zone map and the plant heat-zone map are used

Determine proper nursery field practices

Examine the field practice schedules for different types of plants

Categorize the common pests and problems of field nursery stock

Demonstrate the proper staking of a tree in the field

Differentiate the three types of packaging of nursery crops.

List and describe the problems that might occur to plants in storage

Demonstrate the process of grading with a caliper

Appraise the desirable work traits of nursery employees

List and describe the occupations found in a nursery business

Express ways nurseries market their stock

Remediation:

Re-teach major concepts

Review with teacher assistance

Worksheets

Individual tutoring

Group tutoring

Peer tutoring

Review games

Create a chart

Technology integration

Computer assisted instruction

Checklists

Enrichment:

Upon completion students will move to the next task/assignment

Repeat tasks to enhance skill

Model learning of concepts for others

Teach concepts to peers

Independent study for FFA competition

FFA leadership related activities

Special Adaptations:

Extended Time (assignments and/or testing)
 Graphic Organizer
 Chunking of Assignments/Material
 Preferential Seating
 Directions/Comprehension Check (frequent checks for understanding)
 Study Guide
 Directions and/or Tests Read Aloud
 Adapted Tests and/or Assignments
 Use of Calculator
 Taking Tests in Alternate Setting (or if requested)
 Teacher Modeling
 Use of Computer (Access to)
 Positive Reinforcement
 Have Student Repeat Directions
 Wait Time
 Grading Rubric

Safety:

Student must:
 Handle material in a safe and workmanlike manner
 Use protective clothing and equipment
 Use hand tools in a safe manner
 Follow manufacturer's directions when using any product, tool, equipment, etc.
 Use proper safety precautions when using /operating hand tools
 Use tools and equipment in a professional work-like manner according to OSHA standards
 Know and follow the established safety rules at all times

Assessment:

Worksheets
 Anticipation Guides
 Pre/post test
 Video /DVD worksheets
 Student self assessment
 Student written description of task and proper tool's for task
 Safety sign off sheet
 Student checklist
 Grading rubrics for projects
 Notebook
 Outcome of student crops
 Calipers

Resources/Equipment:

E-unit 030042: Exploring Greenhouse Structures. Danville, IL: CAERT, Inc. www.mycaert.com E-unit
 030043: Controlling the Greenhouse Climate. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030044:
 Using Automated Systems in the Greenhouse. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030049:
 Growing and Forcing Spring Flowering Bulbs. Danville, IL: CAERT, Inc. www.mycaert.com Lesson:
 Growing and Forcing Bulbs, Corms, and Tubers E-unit 030050: Growing Foliage Plants. Danville, IL:
 CAERT, Inc. www.mycaert.com E-unit 030051: Growing Bedding Plants. Danville, IL: CAERT, Inc.
www.mycaert.com E-unit 030053: Managing the Greenhouse Business. Danville, IL: CAERT, Inc.
www.mycaert.com E-unit 030015: Propagating Plants Sexually. Danville, IL: CAERT, Inc.
www.mycaert.com E-unit 030016: Propagating Plants by Cuttings. Danville, IL: CAERT, Inc.
www.mycaert.com Subject Matter Unit U5006a: Producing Plants by Asexual Propagation. Urbana:
 University of Illinois Information Technology and Communication Services. E-unit 030017: Propagating

Plants by Division, Separation, and Layering. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030018: Propagating Plants by Grafting and Budding. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030019: Propagating Plants by Tissue Culture. Danville, IL: CAERT, Inc. www.mycaert.com E-unit: Establishing a Horticultural Business. Danville, IL: CAERT, Inc. Ingels, J., , & , . (2004). Ornamental horticulture science, operations, and management. Delmar. (Ingels, , & , 2004) Griner, C. (2004). Floriculture designing & merchandising. Delmar. (Griner, 2004 Internet E-unit 030006: Classifying Ornamental Plants. Danville, IL: CAERT, Inc. www.mycaert.com Subject Matter Unit U5038: Horticultural Plant Names. Urbana: University of Illinois Information Technology and Communication Services E-unit 030071: Understanding Nursery Production Facilities. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030072: Producing Nursery Crops. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030073: Packaging Nursery Crops. Danville, IL: CAERT, Inc. www.mycaert.com E-unit 030074: Managing the Nursery Business. Danville, IL: CAERT, Inc. www.mycaert.com Parker, R. O. Plant and Soil Science: Fundamentals and Applications. Clifton Park, NY: Delmar Cengage Learning, 2010. Emmons, Robert D. Turfgrass Science and Management. Albany, NY: Delmar, 1984. Sauter, David. Landscape Construction. Africa: Delmar Thomson Learning, 2000. Reiley, H. Edward., and Carroll Shry L. Introductory Horticulture. Albany, NY: Delmar, 1997. Writing surface
 Copies of sample test Visuals from accompanying masters Copies of student lab sheet Computer LCD projector Samples of greenhouse glazing materials Bulbs, corms, and tubers Foliage plants for identification Industry catalogs Live bedding plants Supplies and/or materials for student laboratory activities Plant and seed samples Seed catalogs Plant samples Apples or an apple tree seedling and pictures of mature apple trees African violet plant Graph paper Paper play money Nursery catalogs—both for equipment and for plant material Plant resource books CalipersHyperlinks:

Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: L1300 FFA

Number: L1300 Hours: 130.00

Dates: Spring 2025

Description/Objectives:

The FFA (Future Farmers of America) is a dynamic, student-led organization that develops premier leadership, personal growth, and career success through agricultural education. As a federally chartered student youth organization, FFA is an integral part of a high school's Agriculture, Food, and Natural Resources (AFNR) curriculum. The program operates through three interconnected components: classroom/laboratory instruction, supervised agricultural experience (SAE) projects, and local, state, and national FFA chapter activities. Students participate in competitive events, community service, and hands-on projects to develop skills in communication, teamwork, entrepreneurship, and technical agriculture.

Tasks:

1301- Leadership- a. Observe parliamentary procedures.

1302- Leadership- b. Participate in leadership contests.

1303- Leadership- c. Participate in Skill contests.

1304- Leadership- d. Complete an out-of-school project SOE in Horticulture.

1305- Job Search- a. Prepare a resume.

1306- Job Search- b. Write a letter of application.

1307- Job Search- c. Complete an application form for a job.

1308- Job Search- d. Write a follow-up letter after an interview.

1309- Job Search- e. Select examples of proper conduct during personal interview.

1310- Job Search- f. Select attitudes desired by employers during interviews.

1311- Job Search- g. Distinguish between employer and employee expectations.

1312- Job Search- h. Select information asked for on application forms.

1313- Determining purposes and procedures of SAE

1314- Planning and developing SAE programs.

1315- Understanding the history of the FFA

1316- Recognizing opportunities in FFA

1317- Developing leadership skills.

1318- Participating in community and government organizations.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.

CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among

concepts in a text, etc.

Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.

INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.

RESEARCH GRADES 9-10-11-12

Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.

Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.

Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- Career, Education and Work

Supporting Anchor/Standards:

Career, Education and Work

Standard Area – Career Awareness and Exploration

Standard - 13.1.9-12.A Analyze the relationship between career choices and career preparation opportunities to choose a path.

Standard - 13.1.9-12.B Analyze entrepreneurship and other self-employment opportunities as they relate to personal career goals and corporate opportunities.

Standard - 13.1.9-12.C Analyze external factors that impact employment opportunities, such as, but not limited to: • Competition • Global influences • Job growth • Job openings • Labor supply • Potential advancement • Potential earnings

Standard - 13.1.9-12.E Utilize school- and community-based opportunities for career awareness/preparation.

Instructional Activities:

Knowledge:

Explain how, when, and why the National FFA Organization was founded.

Describe the mission and strategies, colors, motto, parts of the emblem, and organizational structure of the National FFA Organization.

Explain the purpose of FFA's Program of Activities and describe its committee structure.

Describe how FFA develops leadership skills, personal growth, and career success.

Describe the four FFA degree areas.

Explain the various team and individual career development events.

Describe the duties and responsibilities of FFA chapter officers.

Explain the characteristics of a good FFA leader and the proper dress for all FFA members.

Explain how to plan a meeting and develop an order of business.

Describe how to set up a meeting room.

Explain the parliamentary procedure used in an FFA meeting.

Describe the various student clubs and organizations available in schools.

Explain the 4-H Youth Program.

Discuss the meaning and importance of community service.

Explain how FFA members can become involved in community improvement and development.

Skill:

Recite and explain the meaning of the FFA Creed.

Identify major state and national activities available to FFA members.

Identify the FFA proficiency awards

Identify and describe some community service organizations

Remediation:

Re-teach major concepts

Review with teacher assistance

Worksheets

Individual tutoring

Group tutoring

Peer tutoring

Review games

Create a chart

Technology integration

Computer assisted instruction

Checklists

Enrichment:

Upon completion students will move to the next task/assignment

Repeat tasks to enhance skill

Model learning of concepts for others

Teach concepts to peers

Independent study for FFA competition

FFA leadership related activities

Special Adaptations:

Extended Time (assignments and/or testing)
 Graphic Organizer
 Chunking of Assignments/Material
 Preferential Seating
 Directions/Comprehension Check (frequent checks for understanding)
 Study Guide
 Directions and/or Tests Read Aloud
 Adapted Tests and/or Assignments
 Use of Calculator
 Taking Tests in Alternate Setting (or if requested)
 Teacher Modeling
 Use of Computer (Access to)
 Positive Reinforcement
 Have Student Repeat Directions
 Wait Time
 Grading Rubric

Safety:

Student must:
 Handle material in a safe and workmanlike manner
 Use protective clothing and equipment
 Use hand tools in a safe manner
 Follow manufacturer's directions when using any product, tool, equipment, etc.
 Use proper safety precautions when using /operating hand tools
 Use tools and equipment in a professional work-like manner according to OSHA standards
 Know and follow the established safety rules at all times

Assessment:

Worksheets
 Anticipation Guides
 Pre/post test
 Video /DVD worksheets
 Student self assessment
 Student written description of task and proper tool's for task
 Student checklist
 Grading rubrics for projects
 Notebook
 Writing surface
 Overhead projector
 Copies of sample test
 Visuals from accompanying masters
 Copies of student lab sheet
 Meeting paraphernalia

Resources/Equipment:

E-unit: History of the National FFA Organization. Danville, IL: CAERT, Inc. www.mychaert.com
 E-unit: The Mission, Symbols, and Creed of the FFA Organization. Danville, IL: CAERT, Inc. www.mychaert.com
 E-unit: Developing the Chapter E-unit: Opportunities in the FFA. Danville, IL: CAERT, Inc. www.mychaert.com
 E-unit: Achievement in FFA. Danville, IL: CAERT, Inc. www.mychaert.com
 E-unit: Leading the FFA Chapter. Danville, IL: CAERT, Inc. www.mychaert.com
 E-unit: Developing School and Community Awareness. Danville, IL: CAERT, Inc. www.mychaert.com
 E-unit: Developing School and Community Awareness. Danville, IL: CAERT, Inc. www.mychaert.com
 E-unit: School and Community Awareness. Danville, IL: CAERT, Inc. www.mychaert.com
 Hyperlinks:

Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: 100 SAFETY

Number: 100 **Hours:** 75.00

Dates: Spring 2025

Description/Objectives:

Student will know and be able to identify and follow general, laboratory, and field-site safety. They will follow OSHA safety standards, procedures written in the MSDS information system, safe use of horticulture equipment, proper protective equipment and clothing, and basic first-aid practices and procedures in horticulture.

Tasks:

PA101 - Follow all general safety, laboratory safety and field-site safety practices and procedures in horticulture.

PA102 - Follow all OSHA safety standards for the horticulture services industry.

PA103 - Follow procedures written in the Safety Data Sheet (SDS) information system.

PA104 - Operate horticulture equipment.

PA105 - Select the proper protective clothing and equipment.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

GRADES 9-10

Standard PCS.3.5.9-10.A

Standard PCS.3.5.9-10.B

Standard PCS.3.5.9-10.C

GRADES 11-12

Standard PCS.3.5.11-12A

Standard PCS.3.5.11-12.B

Standard PCS.3.5.11-12.C

CRAFT AND STRUCTURE

GRADES 9-10

Standard PCS.3.5.9-10.D.

Standard PCS.3.5.9-10.E

Standard PCS.3.5.9-10.F

GRADES 11-12

Standard PCS.3.5.11-12.D

Standard PCS.3.5.11-12.E

Standard PCS.3.5.11-12.F

INTEGRATE

KNOWLEDGE/IDEAS

GRADES 9-10

Standard PCS.3.5.9-10.G

Standard PCS.3.5.9-10.H

Standard PCS.3.5.9-10.I

GRADES 9-12

Standard PCS.3.5.11-12.G

Standard PCS.3.5.11-12.H

Standard PCS.3.5.11-12.I

RANGE OF
READING/LEVEL OF
COMPLEX TEXTS
GRADES 9-10
Standard PCS.3.5.9-10.J
GRADES 11-12
Standard PCS.3.5.11-12.J

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES/
PURPOSE
GRADES 9-10
Standard PCS.3.6.9-10.A
Standard PCS.3.6.9-10.B
GRADES 11-12
Standard PCS.3.6.11-12.A
Standard PCS.3.6.11-12.B
PRODUCTION AND
DISTRIBUTION OF
WRITING
GRADES 9-10
Standard PCS.3.6.9-10.C
Standard PCS.3.6.9-10 D
Standard PCS.3.6.9-10.E
GRADES 11-12
Standard PCS.3.6.11-12 C
Standard.PCS.3.6.11-12.D
Standard PCS.3.6.11- 12
E
RESEARCH
GRADES 9-10
Standard PCS.3.6.9-10.F
Standard PCS.3.6.9-10.G
Standard PCS.3.6.9-10.H
GRADES 11-12
Standard PCS.3.6.11-12.F
Standard PCS.3.6.11-12.G
Standard PCS.3.6.11-12.H
RANGE OF WRITING
GRADES 9-10
Standard PCS.3.5.9-10.I
GRADES 11-12

Connecting Anchor/Standard:

- Pennsylvania Core Standards for Mathematics Standard 2.1

Supporting Anchor/Standards:

NUMBERS AND
OPERATIONS
Standard
PCS.2.1.HS.F.1
Standard
PCS.2.1.HS.F.2
Standard
PCS.2.1.HS.F.3
Standard
PCS.2.1.HS.F.4
Standard
PCS.2.1.HS.F.5
Standard

PCS.2.1.HS.F.6

Standard

PCS.2.1.HS.F.7

Instructional Activities:

Knowledge:

Explain the importance of safety in horticulture

Describe working conditions in the horticulture industry

Know where to find the MSDS information book

Skill:

Utilize step guides for instruction

Practice safety precautions necessary when handling, applying, and storing chemicals

Identify the rules of the Horticulture program

Identify the guidelines of the Horticulture program

Identify the Right To Know

Identify the MSDS information

Complete self evaluation using rubric

Participate in discussion and answer questions during lecture

Complete description sheet for each task

Read reference material as needed

Read assigned module

Define personal protective equipment and give examples

Demonstrate tool safety

Demonstrate the proper use of tool for a specified task

Identify tool and model the use of the tool

Complete task sheet assigned

Interpret and review the reference orally to the instructor

Complete anticipation guide

Complete reading strategy assignment

Participate in group activity

Complete assigned individual and group projects

Present and review grading rubrics for projects

Maintain a notebook

Maintain a clean work area

Write a research paper

Demonstrate the safe use of power tools

Demonstrate the safe use of power equipment

Demonstrate the safe use of landscape hand tools

Demonstrate the safe use of floral tools

Demonstrate the safe use of nursery tools

Demonstrate the rules of the Horticulture program

Demonstrate use of the MSDS information book

Demonstrate understanding of a MSDS data sheet

Remediation:

Re-teach major concepts

Review with teacher assistance

Worksheets

Individual tutoring

Group tutoring

Peer tutoring

Review games

Create a chart

Technology integration

Computer assisted instruction

Checklists

Enrichment:

Upon completion students will move to the next task/assignment
 Repeat tasks to enhance skill
 Model learning of concepts for others
 Teach concepts to peers
 Independent study for FFA competition
 FFA leadership related activities

Special Adaptations:

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- Use of Calculator
- Taking Tests in Alternate Setting (or if requested)
- Verbal/Gestural Redirection (prompts to remain on task)
- Drill and Practice (Repetition of Material)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
- Use of Daily Planner/Assignment Book (monitor use of)
- Teacher Modeling
- Use of Computer (Access to)
- Positive Reinforcement
- Have Student Repeat Directions
- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Positive Reinforcement
- Provide Frequent Feedback
- Provide Frequent Breaks
- Regular Notebook Check
- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Limited, Short Directions
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Provide Opportunities to Retest
- Books on Tape or CD
- Allow Oral Answers for Testing
- Provide Editing Assistance
- Copies of Text for Home
- Cue for Oral Response
- De-Escalation Opportunities
- Daily Classwork Check
- Encourage Student to Check Work Before Turning In
- Opportunities for Repeated Practice of MATH Skills
- Provide repetition During Initial Instruction
- Allow Pre-read of Questions Before Reading Written Passage
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Time out
- Monitor Speed/Accuracy in which Student Completes Assignment
- Encouragement to Participate in Positive Leadership Role
- Student Self-Evaluation for Behavior

Safety:

Student must:

Handle material in a safe and workmanlike manner

Use protective clothing and equipment

Use hand tools in a safe manner

Use adequate ventilation when working in enclosed area

Follow manufacturer's directions when using any product, tool, equipment, etc.

Use proper safety precautions when using /operating hand tools

Use tools and equipment in a professional work-like manner according to OSHA standards

Know and follow the established safety rules at all times

Assessment:

Worksheets

Anticipation Guides

Pre/post test

Video /DVD worksheets

Student self assessment

Student written description of task and proper tools for task

Safety sign off sheet

Student checklist

Grading rubrics for projects

Notebook

- FORMATIVE/SUMMATIVE EVALUATION

- Business and Industry Credentialing Tests

- Traditional Tests - multiple choice, matching, true/false, short answer completion

- Traditional Quizzes - multiple choice, matching, true/false, short answer completion

- Graded Homework

- Graded Writing assignments

- Graded Math practice assignments

- Graded Reading assignments

- Notebook checks

- Completed and Turned-in Make Up work

- Exit Slips

- Student Hand Held Response Systems

- Textbook Computer Generated Tests

- OBSERVATIONAL EVALUATION

- Class Oral Responses

- Scores on projects when they are completed

- Teacher observing and scoring each step of the process as a job is being completed

- Teacher observing and recording the quality of work being done on an assigned job

- Teacher checking and scoring as each part of an activity is being done correctly

- Teacher observing and scoring as a job is done within a timeframe

- Teacher checking and scoring that students use the appropriate terminology for particular jobs

- Teacher determining if the student has the skills to work independently on an assigned job

- Teacher evaluating if PA Program of Study tasks are being achieved as expected

- Teacher evaluating student class participation

- Teacher evaluating a student media presentation

- Peer evaluation of individual students

- Student self-assessment

- WORK ETHIC

- Determine if students follow the daily plan as laid out at the start of class

- Evaluate the student's ability to work within a team when teamwork is necessary

- Evaluate the student's responsibility to complete work logs as expected

- Determine and evaluate if students adhere to all safety procedures

- Evaluate if students work without hindering other students' progress

- Evaluate if students stay on task in accordance with the job expectation

- Account if students are prepared for class each day
- Account if students are wearing appropriate clothing when necessary
- Account if students make up missed assignments in the established time limit

- SPECIAL NEEDS ASSESSMENT ADAPTATIONS

- Study guides provided prior to tests
- Use of calculator
- Multiple Choice will include 3 choices instead of 4
- Matching with groups of no more than 10 (depends on IEP)
- Matching with groups of no more than 5
- Tests read aloud
- Word bank with no more than 10 options
- Word bank with no more than 5 options
- Extended time to complete the assessment
- Alternate assessment-project or presentation instead of written assessment

Resources/Equipment:

Tool: Various Hand tools Pruner Scissors Floral Knife Loppers Hedge Shears Drill Circular Saw Pump Sprayer Back Pack Sprayer Kabota Tractor Push Mower Weedwacker Roto Tiller Skid steer Wet Saw Variety of chemicals and fertilizers Examples of personal protective equipment Ingels, J, , , & , . (2004). Ornamental horticulture science, operations, and management. Delmar. (Ingels, , & , 2004) Griner, C. (2004). Floriculture designing & merchandising. Delmar. (Griner, 2004 Internet E-unit 030005: Practicing Horticulture Safety. Danville, IL: CAERT, Inc. www.mycaert.com Trade Magazines Parker, R. O. Plant and Soil Science: Fundamentals and Applications. Clifton Park, NY: Delmar Cengage Learning, 2010. Emmons, Robert D. Turf grass Science and Management. Albany, NY: Delmar, 1984. Sauter, David. Landscape Construction. Africa: Delmar Thomson Learning, 2000. Reiley, H. Edward., and Carroll Shry L. Introductory Horticulture. Albany, NY: Delmar, 1997. Hyperlinks:

Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: 200 SAFE AND PROPER PLANT HEALTH CARE PRACTICES

Number: 200 **Hours:** 50.00

Dates: Spring 2025

Description/Objectives:

These tasks will provide students with the critical knowledge and hands-on skills necessary to maintain the health and vitality of plants in urban, residential, and agricultural settings. The curriculum emphasizes safety, environmental responsibility, and the use of Integrated Pest Management (IPM) principles to diagnose, prevent, and treat plant problems. Students will learn how to identify common pests, diseases, and cultural issues, and apply environmentally sound solutions while adhering to all relevant safety and regulatory guidelines. This is an essential course for students pursuing careers in arboriculture, pest management, horticulture, and sustainable agriculture.

Tasks:

PA201 - Control weeds, insects, and plant diseases.

PA202 - Interpret horticulture product labels.

PA203 - Formulate quantities of horticultural products used in plant health care.

PA205 - Investigate the concept of plant health care, e.g., disease, nutrients.

PA206 - Distinguish the components of an integrated pest management program including the effects of chemicals and pesticides on the environment.

PA207 - Analyze various horticultural pests including their signs and symptoms.

PA209 - Prepare for PA Pesticide Certification.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS

GRADES 9-10

Standard PCS.3.5.9-10.A

Standard PCS.3.5.9-10.B

Standard PCS.3.5.9-10.C

GRADES 11-12

Standard PCS.3.5.11-12A

Standard PCS.3.5.11-12.B

Standard PCS.3.5.11-12.C

CRAFT AND STRUCTURE

GRADES 9-10

Standard PCS.3.5.9-10.D.

Standard PCS.3.5.9-10.E

Standard PCS.3.5.9-10.F

GRADES 11-12

Standard PCS.3.5.11-12.D

Standard PCS.3.5.11-12.E

Standard PCS.3.5.11-12.F

INTEGRATE

KNOWLEDGE/IDEAS

GRADES 9-10
 Standard PCS.3.5.9-10.G
 Standard PCS.3.5.9-10.H
 Standard PCS.3.5.9-10.I
 GRADES 9-12
 Standard PCS.3.5.11-12.G
 Standard PCS.3.5.11-12.H
 Standard PCS.3.5.11-12.I
 RANGE OF
 READING/LEVEL OF
 COMPLEX TEXTS
 GRADES 9-10
 Standard PCS.3.5.9-10.J
 GRADES 11-12
 Standard PCS.3.5.11-12.J

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES/ PURPOSE
 GRADES 9-10
 Standard PCS.3.6.9-10.A
 Standard PCS.3.6.9-10.B
 GRADES 11-12
 Standard PCS.3.6.11-12.A
 Standard PCS.3.6.11-12.B
 PRODUCTION AND
 DISTRIBUTION OF
 WRITING
 GRADES 9-10
 Standard PCS.3.6.9-10.C
 Standard PCS.3.6.9-10 D
 Standard PCS.3.6.9-10.E
 GRADES 11-12
 Standard PCS.3.6.11-12 C
 Standard.PCS.3.6.11-12.D
 Standard PCS.3.6.11- 12 E
 RESEARCH
 GRADES 9-10
 Standard PCS.3.6.9-10.F
 Standard PCS.3.6.9-10.G
 Standard PCS.3.6.9-10.H
 GRADES 11-12
 Standard PCS.3.6.11-12.F
 Standard PCS.3.6.11-12.G
 Standard PCS.3.6.11-12.H
 RANGE OF WRITING
 GRADES 9-10
 Standard PCS.3.5.9-10.I
 GRADES 11-12

Connecting Anchor/Standard:

- Pennsylvania Core Standards for Mathematics Standard 2.0

Supporting Anchor/Standards:

NUMBERS AND
 OPERATIONS
 Standard
 PCS.2.1.HS.F.1
 Standard
 PCS.2.1.HS.F.2
 Standard

PCS.2.1.HS.F.3

Standard

PCS.2.1.HS.F.4

Standard

PCS.2.1.HS.F.5

Standard

PCS.2.1.HS.F.6

Standard

PCS.2.1.HS.F.7

Instructional Activities:

Knowledge:

Explain orally or in writing what biological control means.

Explain orally or in writing what integrated pest management means.

Describe the seven ways in which insects are killed by insecticides and the type of insect against which each is most effective.

Explain the relationship between the life cycle of insects and timing of insecticide application.

Describe three ways in which herbicides destroy weeds.

Skill:

Utilize step guides for instruction

Outline a pest control program, explaining when biological control should be used and at what point chemicals must be used.

List at least three insects that have been effectively controlled without man-made chemicals.

List at least one plant disease controlled by biological means.

List at least one weed and the biological method used to control it.

Identify the three main routes by which pesticides enter the body.

Examine five pesticide labels and identify the type of each and its degree of toxicity.

Examine five pesticide labels and demonstrate the recommended precautions in the mixing and handling of each.

List first aid steps to be taken in case of poisoning by one pesticide from each of the three families of pesticides.

Identify common insect pests and select an effective control method for each.

List the names and characteristics of the three major groups of insecticides (according to their chemical makeup)

Compare the six ways in which insecticides are applied.

Identify the common biological controls of insects.

Identify fungus diseases on plants and set up a spray or dusting schedule for effective control.

Recognize at least two types of rodents and apply a rodenticide in a bait station.

Recognize slugs and snails on sight and develop a slug control program, including chemicals used in the bait station or as contact poisons.

Identify two nematocides and explain in writing their application to specific situations.

Identify a weed problem and select a herbicide to control the problem.

Define the difference between selective and nonselective herbicides.

Identify the common biological controls of insects.

Identify fungus diseases on plants and set up a spray or dusting schedule for effective control.

Recognize at least two types of rodents and apply a rodenticide in a bait station.

Recognize slugs and snails on sight and develop a slug control program, including chemicals used in the bait station or as contact poisons.

Identify two nematocides and explain in writing their application to specific situations.

Identify a weed problem and select a herbicide to control the problem.

Define the difference between selective and nonselective herbicides.

Outline in writing how a sprayer is calibrated.

List three possible reasons for failure of a herbicide to work properly.

Properly apply a herbicide.

Practice safety when controlling weeds, insects, and plant diseases.

Demonstrate knowledge of federal and state pesticide laws.

Define the concept of Plant health care.

Remediation:

Re-teach major concepts
 Review with teacher assistance
 Worksheets
 Individual tutoring
 Group tutoring
 Peer tutoring
 Review games
 Create a chart
 Technology integration
 Computer assisted instruction
 Checklists

Enrichment:

Upon completion students will move to the next task/assignment
 Repeat tasks to enhance skill
 Model learning of concepts for others
 Teach concepts to peers
 Independent study for FFA competition
 FFA leadership related activities

Special Adaptations:

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- Use of Calculator
- Taking Tests in Alternate Setting (or if requested)
- Verbal/Gestural Redirection (prompts to remain on task)
- Drill and Practice (Repetition of Material)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
- Use of Daily Planner/Assignment Book (monitor use of)
- Teacher Modeling
- Use of Computer (Access to)
- Positive Reinforcement
- Have Student Repeat Directions
- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Positive Reinforcement
- Provide Frequent Feedback
- Provide Frequent Breaks
- Regular Notebook Check
- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Limited, Short Directions
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Provide Opportunities to Retest
- Books on Tape or CD
- Allow Oral Answers for Testing
- Provide Editing Assistance
- Copies of Text for Home
- Cue for Oral Response
- De-Escalation Opportunities
- Daily Classwork Check

- Encourage Student to Check Work Before Turning In
- Opportunities for Repeated Practice of MATH Skills
- Provide repetition During Initial Instruction
- Allow Pre-read of Questions Before Reading Written Passage
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Time out
- Monitor Speed/Accuracy in which Student Completes Assignment
- Encouragement to Participate in Positive Leadership Role
- Student Self-Evaluation for Behavior

Safety:

Student must:

Handle material in a safe and workmanlike manner

Use protective clothing and equipment

Use hand tools in a safe manner

Follow manufacturer's directions when using any product, tool, equipment, etc.

Use proper safety precautions when using /operating hand tools

Use tools and equipment in a professional work-like manner according to OSHA standards

Know and follow the established safety rules at all times

Assessment:

Worksheets

Anticipation Guides

Pre/post test

Video /DVD worksheets

Student self assessment

Student written description of task and proper tool's for task

Safety sign off sheet

Student checklist

Grading rubrics for projects

Notebook

Outcome of student crops

- Business and Industry Credentialing Tests

- Traditional Tests - multiple choice, matching, true/false, short answer completion

- Traditional Quizzes - multiple choice, matching, true/false, short answer completion

- Graded Homework

- Graded Writing assignments

- Graded Math practice assignments

- Graded Reading assignments

- Notebook checks

- Completed and Turned-in Make Up work

- Exit Slips

- Student Hand Held Response Systems

- Textbook Computer Generated Tests

- OBSERVATIONAL EVALUATION

- Class Oral Responses

- Scores on projects when they are completed

- Teacher observing and scoring each step of the process as a job is being completed

- Teacher observing and recording the quality of work being done on an assigned job

- Teacher checking and scoring as each part of an activity is being done correctly

- Teacher observing and scoring as a job is done within a timeframe

- Teacher checking and scoring that students use the appropriate terminology for particular jobs

- Teacher determining if the student has the skills to work independently on an assigned job

- Teacher evaluating if PA Program of Study tasks are being achieved as expected

- Teacher evaluating student class participation

- Teacher evaluating a student media presentation

- Peer evaluation of individual students

- Student self-assessment
- WORK ETHIC
- Determine if students follow the daily plan as laid out at the start of class
- Evaluate the student's ability to work within a team when teamwork is necessary
- Evaluate the student's responsibility to complete work logs as expected
- Determine and evaluate if students adhere to all safety procedures
- Evaluate if students work without hindering other students' progress
- Evaluate if students stay on task in accordance with the job expectation
- Account if students are prepared for class each day
- Account if students are wearing appropriate clothing when necessary
- Account if students make up missed assignments in the established time limit
- SPECIAL NEEDS ASSESSMENT ADAPTATIONS
- Study guides provided prior to tests
- Use of calculator
- Multiple Choice will include 3 choices instead of 4
- Matching with groups of no more than 10 (depends on IEP)
- Matching with groups of no more than 5
- Tests read aloud
- Word bank with no more than 10 options
- Word bank with no more than 5 options
- Extended time to complete the assessment
- Alternate assessment-project or presentation instead of written assessment

Resources/Equipment:

Parker, R. O. Plant and Soil Science: Fundamentals and Applications. Clifton Park, NY: Delmar Cengage Learning, 2010. Emmons, Robert D. Turfgrass Science and Management. Albany, NY: Delmar, 1984. Sauter, David. Landscape Construction. Africa: Delmar Thomson Learning, 2000. Reiley, H. Edward., and Carroll Shry L. Introductory Horticulture. Albany, NY: Delmar, 1997. mycaert onlineHyperlinks:

Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: 300 BASIC BOTANY

Number: 300 **Hours:** 60.00

Dates: Spring 2025

Description/Objectives:

Students will be able to analyze and explain how the structure and function of plant organs (roots, stems, leaves, flowers, and seeds) support growth, reproduction, and adaptation to different environments.

Tasks:

PA301 - Describe the process of photosynthesis, respiration, translocation, and transpiration.

PA302 - Compare plant cell structure, organization, and function.

PA303 - Compare plant structures and explain their functions.

PA304 - Analyze conditions essential for seed germination.

PA305 - Explain the environmental factors that affect the growth and development of a plant.

PA306 - Distinguish between sexual and asexual plant reproduction.

PA307 - Analyze plant nutrient requirements.

PA308 - Describe the nutrient cycles.

PA309 - Classify plants and use appropriate binomial taxonomic terminology.

PA310 - Describe techniques used to control environmental factors.

PA311 - Describe how weather and climate impact growing conditions and plant selection.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS

GRADES 9-10

Standard PCS.3.5.9-10.A

Standard PCS.3.5.9-10.B

Standard PCS.3.5.9-10.C

GRADES 11-12

Standard PCS.3.5.11-12A

Standard PCS.3.5.11-12.B

Standard PCS.3.5.11-12.C

CRAFT AND STRUCTURE

GRADES 9-10

Standard PCS.3.5.9-10.D.

Standard PCS.3.5.9-10.E

Standard PCS.3.5.9-10.F

GRADES 11-12

Standard PCS.3.5.11-12.D

Standard PCS.3.5.11-12.E

Standard PCS.3.5.11-12.F

INTEGRATE
 KNOWLEDGE/IDEAS
 GRADES 9-10
 Standard PCS.3.5.9-10.G
 Standard PCS.3.5.9-10.H
 Standard PCS.3.5.9-10.I
 GRADES 9-12
 Standard PCS.3.5.11-12.G
 Standard PCS.3.5.11-12.H
 Standard PCS.3.5.11-12.I
 RANGE OF
 READING/LEVEL OF
 COMPLEX TEXTS
 GRADES 9-10
 Standard PCS.3.5.9-10.J
 GRADES 11-12
 Standard PCS.3.5.11-12.J

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES/ PURPOSE
 GRADES 9-10
 Standard PCS.3.6.9-10.A
 Standard PCS.3.6.9-10.B
 GRADES 11-12
 Standard PCS.3.6.11-12.A
 Standard PCS.3.6.11-12.B
 PRODUCTION AND
 DISTRIBUTION OF
 WRITING
 GRADES 9-10
 Standard PCS.3.6.9-10.C
 Standard PCS.3.6.9-10 D
 Standard PCS.3.6.9-10.E
 GRADES 11-12
 Standard PCS.3.6.11-12 C
 Standard.PCS.3.6.11-12.D
 Standard PCS.3.6.11- 12 E
 RANGE OF WRITING
 GRADES 9-10
 Standard PCS.3.5.9-10.I
 GRADES 11-12

Connecting Anchor/Standard:

- PA SCIENCE, TECHNOLOGY & ENGINEERING, AND ENVIRONMENTAL LITERACY & SUSTAINABILITY STANDARDS (STEELS)

Supporting Anchor/Standards:

3.5.9-12.A Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.
 3.5.9-12.H Evaluate ways that technology and engineering can impact individuals, society, and the environment.
 3.5.9-12.I (ETS) Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.
 3.5.9-12.J Synthesize data and analyze trends to make decisions about technological products, systems, or processes.
 3.5.9-12.K (ETS) Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

3.5.9-12.N Analyze and use relevant and appropriate design thinking processes to solve technological and engineering problems.

3.5.9-12.P Apply a broad range of design skills to a design thinking process.

3.5.9-12.Y (ETS) Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.OO Use project management tools, strategies, and processes in planning, organizing, and controlling work.

3.5.9-12PP Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making

Instructional Activities:

Knowledge:

Explain why scientific plant names are used.

Explain the difference between genus, species, and variety.

Explain the process of photosynthesis.

Explain the process of respiration.

Describe the process of translocation.

Describe the process of transpiration.

Explain the major structural difference between dicot and monocot stems and how the stems grow.

Describe the process of pollination.

Describe the differences between clay, sand, and loamy soils and identify a sample of each.

Explain three ways to improve soil drainage and two ways to increase moisture retention in soil.

Explain what is meant by the Ph value of soil.

Describe the nutrient cycles.

Skill:

Note two contributions of plants to the life cycle on earth.

List and describe the purpose of the four main parts of a plants.

List four factors that affect the roots of a plant.

Compose a balance fertilizer for one plant that is grown commercially in the area.

List four above ground requirements for good plant growth.

List the three major plant food elements and two functions of each.

Identify the parts of a seed and the function of each.

Differentiate between indirect and direct seeding methods.

Prepare a medium for seeds, sow seeds, and provide the proper conditions for germination.

Water, fertilize, and harden off seedlings before transplanting.

Transplant seedlings into flats or pots.

Distinguish between sexual and asexual plant reproduction.

Remediation:

Re-teach major concepts

Review with teacher assistance

Worksheets

Individual tutoring

Group tutoring

Peer tutoring

Review games

Create a chart

Technology integration

Computer assisted instruction

Checklists

Enrichment:

Upon completion students will move to the next task/assignment

Repeat tasks to enhance skill

Model learning of concepts for others

Teach concepts to peers

Independent study for FFA competition
FFA leadership related activities

Safety:

Student must:

Handle material in a safe and workmanlike manner

Use protective clothing and equipment

Use hand tools in a safe manner

Follow manufacturer's directions when using any product, tool, equipment, etc.

Use proper safety precautions when using /operating hand tools

Use tools and equipment in a professional work-like manner according to OSHA standards

Know and follow the established safety rules at all times

Assessment:

Worksheets

Anticipation Guides

Pre/post test

Video /DVD worksheets

Student self assessment

Student written description of task and proper tool's for task

Safety sign off sheet

Student checklist

Grading rubrics for projects

Notebook

Outcome of student crops

Resources/Equipment:

Student must: Parker, R. O. Plant and Soil Science: Fundamentals and Applications. Clifton Park, NY: Delmar Cengage Learning, 2010. Emmons, Robert D. Turfgrass Science and Management. Albany, NY: Delmar, 1984. Sauter, David. Landscape Construction. Africa: Delmar Thomson Learning, 2000. Reiley, H. Edward., and Carroll Shry L. Introductory Horticulture. Albany, NY: Delmar, 1997. Handle material in a safe and workmanlike manner Use protective clothing and equipment Use hand tools in a safe manner Follow manufacturer's directions when using any product, tool, equipment, etc. Use proper safety precautions when using /operating hand tools Use tools and equipment in a professional work-like manner according to OSHA standards Know and follow the established safety rules at all timesHyperlinks:

Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: 400 HORTICULTURE BUSINESS OPERATIONS

Number: 400 **Hours:** 30.00

Dates: Spring 2025

Description/Objectives:

Students will be able to analyze and apply principles of business management, marketing, and production planning within the horticulture industry to develop and evaluate a basic business plan for a horticultural enterprise (such as a greenhouse, nursery, or landscaping service).

Tasks:

PA403 - Develop a horticultural business plan.

PA404 - Analyze pricing and mark-up techniques.

PA406 - Research vendors to obtain product information.

PA407 - Perform appropriate customer and client relationship attributes.

PA409 - Analyze record keeping system to determine best management practices.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS

GRADES 9-10

Standard PCS.3.5.9-10.A

Standard PCS.3.5.9-10.B

Standard PCS.3.5.9-10.C

GRADES 11-12

Standard PCS.3.5.11-12A

Standard PCS.3.5.11-12.B

Standard PCS.3.5.11-12.C

CRAFT AND STRUCTURE

GRADES 9-10

Standard PCS.3.5.9-10.D.

Standard PCS.3.5.9-10.E

Standard PCS.3.5.9-10.F

GRADES 11-12

Standard PCS.3.5.11-12.D

Standard PCS.3.5.11-12.E

Standard PCS.3.5.11-12.F

INTEGRATE

KNOWLEDGE/IDEAS

GRADES 9-10

Standard PCS.3.5.9-10.G

Standard PCS.3.5.9-10.H

Standard PCS.3.5.9-10.I

GRADES 9-12

Standard PCS.3.5.11-12.G

Standard PCS.3.5.11-12.H

Standard PCS.3.5.11-12.I

RANGE OF
 READING/LEVEL OF
 COMPLEX TEXTS
 GRADES 9-10
 Standard PCS.3.5.9-10.J
 GRADES 11-12
 Standard PCS.3.5.11-12.J

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES/ PURPOSE
 GRADES 9-10

Standard PCS.3.6.9-10.A

Standard PCS.3.6.9-10.B

GRADES 11-12

Standard PCS.3.6.11-12.A

Standard PCS.3.6.11-12.B

PRODUCTION AND
 DISTRIBUTION OF
 WRITING

GRADES 9-10

Standard PCS.3.6.9-10.C

Standard PCS.3.6.9-10 D

Standard PCS.3.6.9-10.E

GRADES 11-12

Standard PCS.3.6.11-12 C

Standard.PCS.3.6.11-12.D

Standard PCS.3.6.11- 12 E

RESEARCH

GRADES 9-10

Standard PCS.3.6.9-10.F

Standard PCS.3.6.9-10.G

Standard PCS.3.6.9-10.H

GRADES 11-12

Standard PCS.3.6.11-12.F

Standard PCS.3.6.11-12.G

Standard PCS.3.6.11-12.H

RANGE OF WRITING

GRADES 9-10

Standard PCS.3.5.9-10.I

GRADES 11-12

Connecting Anchor/Standard:

- Career Education and Work Academic Standards
 13.3. Career Retention and Advancement

Supporting Anchor/Standards:

13.3.11 A. Evaluate personal attitudes and work habits that support career retention and advancement.

13.3.11 E. Evaluate time management strategies and their application to both personal and work situations.

13.3.11 F. Evaluate strategies for career retention and advancement in response to the changing global workplace.

Instructional Activities:

Knowledge:

Describe and compare three legal forms of business operation.

Explain the value of a market survey.

Describe the methods, values, and limitations of advertising.
 Describe steps in planning a business venture.
 Identify and develop various horticulture record keeping systems.

Skill:

Utilize step guides for instruction
 List sources of capital for new and established businesses.
 List factors to be considered in choosing a business site.
 Draw up a physical plant layout plan and a staff organization chart.
 Outline the major laws and regulations that affect horticulturalists.
 List the characteristics of effective advertising.
 List the characteristics of effective displays.
 State five basic functions performed in the operation of a small business.
 Select a product or service for a personal or group enterprise.
 Determine the basic functions performed by small-business managers.
 Analyze the outcome of a business venture.
 Use small-business financial records.
 Analyze the benefits of self-employment versus other types of employment.
 Select and explain the reason for the most appropriate form of communication for specific business needs.
 Compose a correct and effective business letter.
 Place a business telephone call correctly.
 Answer a business call correctly.
 Determine criteria for selecting a site for a horticulture business.
 Research state and local requirements for horticulture businesses.
 Develop a horticultural business plan.
 Analyze pricing and mark-up techniques.
 Determine human resource needs in a horticulture business.
 Research vendors to obtain product information.
 Demonstrate appropriate customer/client relationship attributes.
 Analyze record keeping system to determine best management practices.
 Analyze business ethics.

Remediation:

Re-teach major concepts
 Review with teacher assistance
 Worksheets
 Individual tutoring
 Group tutoring
 Peer tutoring
 Review games
 Create a chart
 Technology integration
 Computer assisted instruction
 Checklists

Enrichment:

Upon completion students will move to the next task/assignment
 Repeat tasks to enhance skill
 Model learning of concepts for others
 Teach concepts to peers
 Independent study for FFA competition
 FFA leadership related activities

Special Adaptations:

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide

- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- Use of Calculator
- Taking Tests in Alternate Setting (or if requested)
- Verbal/Gestural Redirection (prompts to remain on task)
- Drill and Practice (Repetition of Material)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
- Use of Daily Planner/Assignment Book (monitor use of)
- Teacher Modeling
- Use of Computer (Access to)
- Positive Reinforcement
- Have Student Repeat Directions
- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Positive Reinforcement
- Provide Frequent Feedback
- Provide Frequent Breaks
- Regular Notebook Check
- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Limited, Short Directions
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Provide Opportunities to Retest
- Books on Tape or CD
- Allow Oral Answers for Testing
- Provide Editing Assistance
- Copies of Text for Home
- Cue for Oral Response
- De-Escalation Opportunities
- Daily Classwork Check
- Encourage Student to Check Work Before Turning In
- Opportunities for Repeated Practice of MATH Skills
- Provide repetition During Initial Instruction
- Allow Pre-read of Questions Before Reading Written Passage
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Time out
- Monitor Speed/Accuracy in which Student Completes Assignment
- Encouragement to Participate in Positive Leadership Role
- Student Self-Evaluation for Behavior

Safety:

Student must:

Handle material in a safe and workmanlike manner

Use protective clothing and equipment

Use hand tools in a safe manner

Follow manufacturer's directions when using any product, tool, equipment, etc.

Use proper safety precautions when using /operating hand tools

Use tools and equipment in a professional work-like manner according to OSHA standards

Know and follow the established safety rules at all times

Assessment:

Worksheets

Anticipation Guides

Pre/post test

- Video /DVD worksheets
- Student self assessment
- Student written description of task and proper tool's for task
- Student checklist
- Grading rubrics for projects
- Notebook
- Writing surface
- Overhead projector
- Copies of sample test
- Visuals from accompanying masters
- Copies of student lab sheet
- Meeting paraphernalia
- Business and Industry Credentialing Tests
- Traditional Tests - multiple choice, matching, true/false, short answer completion
- Traditional Quizzes - multiple choice, matching, true/false, short answer completion
- Graded Homework
- Graded Writing assignments
- Graded Math practice assignments
- Graded Reading assignments
- Notebook checks
- Completed and Turned-in Make Up work
- Exit Slips
- Student Hand Held Response Systems
- Textbook Computer Generated Tests
- OBSERVATIONAL EVALUATION
- Class Oral Responses
- Scores on projects when they are completed
- Teacher observing and scoring each step of the process as a job is being completed
- Teacher observing and recording the quality of work being done on an assigned job
- Teacher checking and scoring as each part of an activity is being done correctly
- Teacher observing and scoring as a job is done within a timeframe
- Teacher checking and scoring that students use the appropriate terminology for particular jobs
- Teacher determining if the student has the skills to work independently on an assigned job
- Teacher evaluating if PA Program of Study tasks are being achieved as expected
- Teacher evaluating student class participation
- Teacher evaluating a student media presentation
- Peer evaluation of individual students
- Student self-assessment
- WORK ETHIC
- Determine if students follow the daily plan as laid out at the start of class
- Evaluate the student's ability to work within a team when teamwork is necessary
- Evaluate the student's responsibility to complete work logs as expected
- Determine and evaluate if students adhere to all safety procedures
- Evaluate if students work without hindering other students' progress
- Evaluate if students stay on task in accordance with the job expectation
- Account if students are prepared for class each day
- Account if students are wearing appropriate clothing when necessary
- Account if students make up missed assignments in the established time limit
- SPECIAL NEEDS ASSESSMENT ADAPTATIONS
- Study guides provided prior to tests
- Use of calculator
- Multiple Choice will include 3 choices instead of 4
- Matching with groups of no more than 10 (depends on IEP)
- Matching with groups of no more than 5
- Tests read aloud
- Word bank with no more than 10 options
- Word bank with no more than 5 options
- Extended time to complete the assessment
- Alternate assessment-project or presentation instead of written assessment

Resources/Equipment:

Parker, R. O. Plant and Soil Science: Fundamentals and Applications. Clifton Park, NY: Delmar Cengage Learning, 2010. Emmons, Robert D. Turfgrass Science and Management. Albany, NY: Delmar, 1984. Sauter, David. Landscape Construction. Africa: Delmar Thomson Learning, 2000. Reiley, H. Edward., and Carroll Shry L. Introductory Horticulture. Albany, NY: Delmar, 1997. Hyperlinks:

Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: 500 SOILS AND FERTILIZER

Number: 500 **Hours:** 45.00

Dates: Spring 2025

Description/Objectives:

Students will be able to analyze the physical, chemical, and biological properties of soil and apply soil and fertilizer management practices to promote sustainable plant growth and environmental stewardship.

Tasks:

PA501 - Compare soil/media characteristics.

PA502 - Analyze soil and/or plant nutrients.

PA503 - Conduct soil management techniques.

PA504 - Conduct proper soil sampling techniques.

PA505 - Test soil for pH, texture, macronutrients and soluble salts.

PA506 - Interpret commercial soil test reports.

PA507 - Describe criteria for selecting fertilizers and soil amendments.

PA508 - Describe factors influencing fertilizer application.

PA509 - RESERVED

PA510 - RESERVED

PA511 - RESERVED

PA512 - Compare current issues regarding plant and soil management that impacts agronomic and horticultural practices.

513 - Analyze microbial life and its effects on soil.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.

CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.

Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author's purpose in providing an

explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.

INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.

RESEARCH GRADES 9-10-11-12

Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.

Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.

Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- Pennsylvania Core Standards for Mathematics Standard 2.0

Supporting Anchor/Standards:

NUMBERS AND OPERATIONS

Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.

Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when

reporting quantities.

Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

Instructional Activities:

Knowledge:

Discuss what soil is and where it comes from.

Describe soil layers and how they differ.

Describe how plants depend on soils for growth.

Describe how soils develop.

Describe the horizons of the soil profile.

Discuss the different definitions of soil.

Discuss what creates soil texture.

Discuss how the physical and chemical properties of soil affect plant growth.

Describe soil particle sizes.

Discuss how iron and organic matter influence the color of some soil.

Describe sodic and saline soils.

Discuss the effect of organic material in a soil.

Explain cation exchange capacity.

Explain how plant nutrients behave in soil.

Describe soil testing for determining plant nutrient needs and fertilizer sources.

Discuss how plant nutrients behave in the soil.

Discuss what soil pH is and how it is managed.

Describe the effect organic matter has on soil fertility.

Describe how soil pH influences the availability of the nutrients.

Describe the deficiency signs of five elements.

Describe how many pounds of nitrogen, phosphate, and potash are in a bag of fertilizer.

Discuss the process of soil erosion, its importance and prevention.

Describe soil management techniques.

Describe techniques used to control environmental factors.

Describe how weather and climate impact growing conditions and plant selection.

Skill:

Utilize step guides for instruction

Define a soil body.

List examples of the five soil-forming factors.

List soil components.

List the basic physical properties of soils.

Identify the chemical properties of soil.

Use the soil texture triangle to name soil.

Calculate bulk density of soil.

Identify the pH of neutral, acidic, and alkaline soil.

Name three ways soils are classified.

Name the essential plant nutrients and describe their role in plant growth.

List plant nutrients and fertilizer materials that are compatible with environment.

Name the 16 essential elements for plant growth.

Use conversion factors when working with fertilizers. List five types and sources of fertilizers

Conduct proper soil sampling techniques.

Test soil for pH, texture, macronutrients and soluble salts.

Interpret commercial soil test reports.

Identify environmental factors that affect plant growth.

Remediation:

Re-teach major concepts

Review with teacher assistance

Worksheets

Individual tutoring

Group tutoring

Peer tutoring

Review games

Create a chart

Technology integration
 Computer assisted instruction
 Checklists

Enrichment:

Upon completion students will move to the next task/assignment
 Repeat tasks to enhance skill
 Model learning of concepts for others
 Teach concepts to peers
 Independent study for FFA competition
 FFA leadership related activities

Special Adaptations:

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- Use of Calculator
- Taking Tests in Alternate Setting (or if requested)
- Verbal/Gestural Redirection (prompts to remain on task)
- Drill and Practice (Repetition of Material)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
- Use of Daily Planner/Assignment Book (monitor use of)
- Teacher Modeling
- Use of Computer (Access to)
- Positive Reinforcement
- Have Student Repeat Directions
- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Positive Reinforcement
- Provide Frequent Feedback
- Provide Frequent Breaks
- Regular Notebook Check
- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Limited, Short Directions
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Provide Opportunities to Retest
- Books on Tape or CD
- Allow Oral Answers for Testing
- Provide Editing Assistance
- Copies of Text for Home
- Cue for Oral Response
- De-Escalation Opportunities
- Daily Classwork Check
- Encourage Student to Check Work Before Turning In
- Opportunities for Repeated Practice of MATH Skills
- Provide repetition During Initial Instruction
- Allow Pre-read of Questions Before Reading Written Passage
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Time out

- Monitor Speed/Accuracy in which Student Completes Assignment
- Encouragement to Participate in Positive Leadership Role
- Student Self-Evaluation for Behavior

Safety:

Student must:

- Handle material in a safe and workmanlike manner
- Use protective clothing and equipment
- Use hand tools in a safe manner
- Follow manufacturer's directions when using any product, tool, equipment, etc.
- Use proper safety precautions when using /operating hand tools
- Use tools and equipment in a professional work-like manner according to OSHA standards
- Know and follow the established safety rules at all times

Assessment:

- Worksheets
- Anticipation Guides
- Pre/post test
- Video /DVD worksheets
- Student self assessment
- Student written description of task and proper tool's for task
- Safety sign off sheet
- Student checklist
- Grading rubrics for projects
- Notebook
- Outcome of student crops
- Extended Time (assignments and/or testing)
- Graphic Organizer
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- De-Escalation Opportunities
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- Provide repetition During Initial Instruction
- Allow Pre-read of Questions Before Reading Written Passage
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Time out
- Monitor Speed/Accuracy in which Student Completes Assignment
- Encouragement to Participate in Positive Leadership Role
- Student Self-Evaluation for Behavior

Resources/Equipment:

Parker, R. O. Plant and Soil Science: Fundamentals and Applications. Clifton Park, NY: Delmar Cengage Learning, 2010. Emmons, Robert D. Turfgrass Science and Management. Albany, NY: Delmar, 1984. Sauter, David. Landscape Construction. Africa: Delmar Thomson Learning, 2000. Reiley, H. Edward., and Carroll Shry L. Introductory Horticulture. Albany, NY: Delmar, 1997. Hyperlinks:

Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: 600 SUSTAINABLE HORTICULTURE

Number: 600 **Hours:** 50.00

Dates: Spring 2025

Description/Objectives:

Students will be able to evaluate and apply sustainable horticultural practices—including resource conservation, integrated pest management (IPM), and environmentally responsible production methods—to design and justify a sustainable growing system that balances economic viability with ecological health.

Tasks:

PA601 - Investigate different methods of sustainable horticulture.

PA602 - Compare sustainable watering and fertilizing techniques to conventional techniques.

PA603 - Compare sustainable plant material selection to conventional plant material.

PA604 - Recycle horticultural waste.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.

CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.

Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.

INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.

RESEARCH GRADES 9-10-11-12

Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.

Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.

Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- Pennsylvania Core Standards for Mathematics Standard 2.0

Supporting Anchor/Standards:

NUMBERS AND OPERATIONS

Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.

Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

Instructional Activities:

Knowledge:

Compare sustainable watering and fertilizing techniques to conventional techniques.

Compare sustainable plant material selection to conventional plant material.

Compare the efficiency of current energy sources with future energy sources in horticulture.

Skill:

Utilize step guides for instruction

Identify different methods of sustainable horticulture.

Recycle horticultural waste.

Remediation:

Re-teach major concepts

Review with teacher assistance

Worksheets

Individual tutoring
 Group tutoring
 Peer tutoring
 Review games
 Create a chart
 Technology integration
 Computer assisted instruction
 Checklists

Enrichment:

Upon completion students will move to the next task/assignment
 Repeat tasks to enhance skill
 Model learning of concepts for others
 Teach concepts to peers
 Independent study for FFA competition
 FFA leadership related activities

Special Adaptations:

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- Use of Calculator
- Taking Tests in Alternate Setting (or if requested)
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- Drill and Practice (Repetition of Material)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
- Use of Daily Planner/Assignment Book (monitor use of)
- Teacher Modeling
- Use of Computer (Access to)
- Positive Reinforcement
- Have Student Repeat Directions
- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Positive Reinforcement
- Provide Frequent Feedback
- Provide Frequent Breaks
- Regular Notebook Check
- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Limited, Short Directions
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Provide Opportunities to Retest
- Books on Tape or CD
- Allow Oral Answers for Testing
- Provide Editing Assistance
- Copies of Text for Home
- Cue for Oral Response
- De-Escalation Opportunities
- Daily Classwork Check
- Encourage Student to Check Work Before Turning In
- Opportunities for Repeated Practice of MATH Skills
- Provide repetition During Initial Instruction

- Allow Pre-read of Questions Before Reading Written Passage
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Time out
- Monitor Speed/Accuracy in which Student Completes Assignment
- Encouragement to Participate in Positive Leadership Role
- Student Self-Evaluation for Behavior

Safety:

Student must:

Handle material in a safe and workmanlike manner

Use protective clothing and equipment

Use hand tools in a safe manner

Follow manufacturer's directions when using any product, tool, equipment, etc.

Use proper safety precautions when using /operating hand tools

Use tools and equipment in a professional work-like manner according to OSHA standards

Know and follow the established safety rules at all times

Assessment:

Worksheets

Anticipation Guides

Pre/post test

Video /DVD worksheets

Student self assessment

Student written description of task and proper tool's for task

Student checklist

Grading rubrics for projects

Notebook

Writing surface

Overhead projector

Copies of sample test

Visuals from accompanying masters

Copies of student lab sheet

Meeting paraphernalia

- Business and Industry Credentialing Tests

- Traditional Tests - multiple choice, matching, true/false, short answer completion

- Traditional Quizzes - multiple choice, matching, true/false, short answer completion

- Graded Homework

- Graded Writing assignments

- Graded Math practice assignments

- Graded Reading assignments

- Notebook checks

- Completed and Turned-in Make Up work

- Exit Slips

- Student Hand Held Response Systems

- Textbook Computer Generated Tests

- OBSERVATIONAL EVALUATION

- Class Oral Responses

- Scores on projects when they are completed

- Teacher observing and scoring each step of the process as a job is being completed

- Teacher observing and recording the quality of work being done on an assigned job

- Teacher checking and scoring as each part of an activity is being done correctly

- Teacher observing and scoring as a job is done within a timeframe

- Teacher checking and scoring that students use the appropriate terminology for particular jobs

- Teacher determining if the student has the skills to work independently on an assigned job

- Teacher evaluating if PA Program of Study tasks are being achieved as expected

- Teacher evaluating student class participation

- Teacher evaluating a student media presentation

- Peer evaluation of individual students
- Student self-assessment
- WORK ETHIC
- Determine if students follow the daily plan as laid out at the start of class
- Evaluate the student's ability to work within a team when teamwork is necessary
- Evaluate the student's responsibility to complete work logs as expected
- Determine and evaluate if students adhere to all safety procedures
- Evaluate if students work without hindering other students' progress
- Evaluate if students stay on task in accordance with the job expectation
- Account if students are prepared for class each day
- Account if students are wearing appropriate clothing when necessary
- Account if students make up missed assignments in the established time limit
- SPECIAL NEEDS ASSESSMENT ADAPTATIONS
- Study guides provided prior to tests
- Use of calculator
- Multiple Choice will include 3 choices instead of 4
- Matching with groups of no more than 10 (depends on IEP)
- Matching with groups of no more than 5
- Tests read aloud
- Word bank with no more than 10 options
- Word bank with no more than 5 options
- Extended time to complete the assessment
- Alternate assessment-project or presentation instead of written assessment

Resources/Equipment:

Parker, R. O. Plant and Soil Science: Fundamentals and Applications. Clifton Park, NY: Delmar Cengage Learning, 2010. Emmons, Robert D. Turfgrass Science and Management. Albany, NY: Delmar, 1984. Sauter, David. Landscape Construction. Africa: Delmar Thomson Learning, 2000. Reiley, H. Edward., and Carroll Shry L. Introductory Horticulture. Albany, NY: Delmar, 1997. Hyperlinks:

Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: 700 HORTICULTURE TECHNOLOGY

Number: 700 **Hours:** 45.00

Dates: Spring 2023

Description/Objectives:

Tasks:

PA701 - Explain the uses of technologically altered plants.

PA704 - Research advanced and emerging technologies in horticulture.

PA705 - Perform a point of a sale (POS) transaction.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

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CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.

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INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.

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INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

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RESEARCH GRADES 9-10-11-12

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RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- PA SCIENCE, TECHNOLOGY & ENGINEERING, AND ENVIRONMENTAL LITERACY & SUSTAINABILITY STANDARDS (STEELS)

Supporting Anchor/Standards:

3.5.9-12.A Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.H Evaluate ways that technology and engineering can impact individuals, society, and the environment.

3.5.9-12.I (ETS) Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

3.5.9-12.J Synthesize data and analyze trends to make decisions about technological products, systems, or processes.

3.5.9-12.K (ETS) Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

3.5.9-12.N Analyze and use relevant and appropriate design thinking processes to solve technological and engineering problems.

3.5.9-12.P Apply a broad range of design skills to a design thinking process.

3.5.9-12.Y (ETS) Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.OO Use project management tools, strategies, and processes in planning, organizing, and controlling work.

3.5.9-12PP Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making

Instructional Activities:

Knowledge:

Discuss the benefits and limitations of modern technology in the green industry.

Explain the major types of computer programs currently popular in the industry.

Explain other technological advances that now serve the industry.

Project future benefits of technology to the industry.
 Explain the uses of technologically altered plants.
 Describe the use of different methods of plant tissue culture.

Skill:

Utilize step guides for instruction
 Research advanced technologies in horticulture equipment.
 Research new and emerging technologies in horticulture.

Remediation:

Re-teach major concepts
 Review with teacher assistance
 Worksheets
 Individual tutoring
 Group tutoring
 Peer tutoring
 Review games
 Create a chart
 Technology integration
 Computer assisted instruction
 Checklists

Enrichment:

Upon completion students will move to the next task/assignment
 Repeat tasks to enhance skill
 Model learning of concepts for others
 Teach concepts to peers
 Independent study for FFA competition
 FFA leadership related activities

Special Adaptations:

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- Use of Calculator
- Taking Tests in Alternate Setting (or if requested)
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- Use of Highlighter/Highlighted Text
- Positive Reinforcement
- Provide Frequent Feedback
- Provide Frequent Breaks
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- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Limited, Short Directions

- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Provide Opportunities to Retest
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- Provide Editing Assistance
- Copies of Text for Home
- Cue for Oral Response
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- Encourage Student to Check Work Before Turning In
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- Provide repetition During Initial Instruction
- Allow Pre-read of Questions Before Reading Written Passage
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Time out
- Monitor Speed/Accuracy in which Student Completes Assignment
- Encouragement to Participate in Positive Leadership Role
- Student Self-Evaluation for Behavior

Safety:

Student must:

Handle material in a safe and workmanlike manner

Use protective clothing and equipment

Use hand tools in a safe manner

Follow manufacturer's directions when using any product, tool, equipment, etc.

Use proper safety precautions when using /operating hand tools

Use tools and equipment in a professional work-like manner according to OSHA standards

Know and follow the established safety rules at all times

Assessment:

Worksheets

Anticipation Guides

Pre/post test

Video /DVD worksheets

Student self assessment

Student written description of task and proper tool's for task

Student checklist

Grading rubrics for projects

Notebook

Writing surface

Overhead projector

Copies of sample test

Visuals from accompanying masters

Copies of student lab sheet

Meeting paraphernalia

- Business and Industry Credentialing Tests

- Traditional Tests - multiple choice, matching, true/false, short answer completion

- Traditional Quizzes - multiple choice, matching, true/false, short answer completion

- Graded Homework

- Graded Writing assignments

- Graded Math practice assignments

- Graded Reading assignments

- Notebook checks

- Completed and Turned-in Make Up work

- Exit Slips

- Student Hand Held Response Systems

- Textbook Computer Generated Tests
- OBSERVATIONAL EVALUATION
- Class Oral Responses
- Scores on projects when they are completed
- Teacher observing and scoring each step of the process as a job is being completed
- Teacher observing and recording the quality of work being done on an assigned job
- Teacher checking and scoring as each part of an activity is being done correctly
- Teacher observing and scoring as a job is done within a timeframe
- Teacher checking and scoring that students use the appropriate terminology for particular jobs
- Teacher determining if the student has the skills to work independently on an assigned job
- Teacher evaluating if PA Program of Study tasks are being achieved as expected
- Teacher evaluating student class participation
- Teacher evaluating a student media presentation
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- WORK ETHIC
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- Evaluate the student's ability to work within a team when teamwork is necessary
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- Study guides provided prior to tests
- Use of calculator
- Multiple Choice will include 3 choices instead of 4
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- Matching with groups of no more than 5
- Tests read aloud
- Word bank with no more than 10 options
- Word bank with no more than 5 options
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Resources/Equipment:

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Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: 800 HISTORY AND CURRENT STATUS OF HORTICULTURE

Number: 800 **Hours:** 20.00

Dates: Spring 2025

Description/Objectives:

Students will be able to trace the historical development of horticulture from early agricultural practices to modern innovations and analyze current trends, technologies, and career opportunities shaping the horticulture industry today.

Tasks:

PA801 - Describe major historical developments in the field of horticulture.

PA802 - Compare/contrast the effect human beings have had on various plant species.

PA803 - Determine how development of certain plant species has affected cultural development.

PA804 - Describe the role horticulture plays in the economy of the state and nation.

PA 806 - Critique the impact that botanical gardens, public parks, and plants have on people in society.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

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Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

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Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.

INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.

RESEARCH GRADES 9-10-11-12

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Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.

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RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- Pennsylvania Core Standards for Mathematics Standard 2.0

Supporting Anchor/Standards:

NUMBERS AND OPERATIONS

Standard 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

Standard 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.

Standard 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Standard 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers

Instructional Activities:

Knowledge:

Describe major historical developments in the field of horticulture.

Describe the role horticulture plays in the economy of the state and nation.

Explain the psychological impact of botanical gardens, public parks, trees, flowers and plants have on people in a society.

Skill:

Utilize step guides for instruction

Compare/contrast

the effect human beings have had on various plant species.

Determine how development of certain plant species has affected cultural development.

Identify current issues regarding plant and soil management that impacts agronomic and horticultural practices.

Remediation:

Re-teach major concepts

Review with teacher assistance

Worksheets

Individual tutoring

Group tutoring

Peer tutoring

Review games

Create a chart

Technology integration

Computer assisted instruction

Checklists

Enrichment:

Upon completion students will move to the next task/assignment

Repeat tasks to enhance skill

Model learning of concepts for others

Teach concepts to peers

Independent study for FFA competition

FFA leadership related activities

Special Adaptations:

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
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- Copy of Teacher/Student Notes/Skeleton Notes
- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
- Use of Daily Planner/Assignment Book (monitor use of)
- Teacher Modeling
- Use of Computer (Access to)
- Positive Reinforcement
- Have Student Repeat Directions
- Wait Time
- Access to School Counselor
- Use of Highlighter/Highlighted Text
- Positive Reinforcement
- Provide Frequent Feedback
- Provide Frequent Breaks
- Regular Notebook Check
- Use of Assistive Device (i.e. notepad, laptop, ect.)
- Limited, Short Directions
- Communication Regarding Behavior & Consequences (PBS)
- Clear Language for Directions
- Provide Opportunities to Retest
- Books on Tape or CD

- Allow Oral Answers for Testing
- Provide Editing Assistance
- Copies of Text for Home
- Cue for Oral Response
- De-Escalation Opportunities
- Daily Classwork Check
- Encourage Student to Check Work Before Turning In
- Opportunities for Repeated Practice of MATH Skills
- Provide repetition During Initial Instruction
- Allow Pre-read of Questions Before Reading Written Passage
- Provide Verbal and Written Directions
- All Vocabulary to be Defined Before Testing
- Testing - Allow Dictation of Lengthy Answers
- Time out
- Monitor Speed/Accuracy in which Student Completes Assignment
- Encouragement to Participate in Positive Leadership Role
- Student Self-Evaluation for Behavior

Safety:

Student must:

Handle material in a safe and workmanlike manner

Use protective clothing and equipment

Use hand tools in a safe manner

Follow manufacturer's directions when using any product, tool, equipment, etc.

Use proper safety precautions when using /operating hand tools

Use tools and equipment in a professional work-like manner according to OSHA standards

Know and follow the established safety rules at all times

Assessment:

Worksheets

Anticipation Guides

Pre/post test

Video /DVD worksheets

Student self assessment

Student written description of task and proper tool's for task

Student checklist

Grading rubrics for projects

Notebook

Writing surface

Overhead projector

Copies of sample test

Visuals from accompanying masters

Copies of student lab sheet

Meeting paraphernalia

- Business and Industry Credentialing Tests

- Traditional Tests - multiple choice, matching, true/false, short answer completion

- Traditional Quizzes - multiple choice, matching, true/false, short answer completion

- Graded Homework

- Graded Writing assignments

- Graded Math practice assignments

- Graded Reading assignments

- Notebook checks

- Completed and Turned-in Make Up work

- Exit Slips

- Student Hand Held Response Systems

- Textbook Computer Generated Tests

- OBSERVATIONAL EVALUATION

- Class Oral Responses

- Scores on projects when they are completed

- Teacher observing and scoring each step of the process as a job is being completed
- Teacher observing and recording the quality of work being done on an assigned job
- Teacher checking and scoring as each part of an activity is being done correctly
- Teacher observing and scoring as a job is done within a timeframe
- Teacher checking and scoring that students use the appropriate terminology for particular jobs
- Teacher determining if the student has the skills to work independently on an assigned job
- Teacher evaluating if PA Program of Study tasks are being achieved as expected
- Teacher evaluating student class participation
- Teacher evaluating a student media presentation
- Peer evaluation of individual students
- Student self-assessment
- WORK ETHIC
- Determine if students follow the daily plan as laid out at the start of class
- Evaluate the student's ability to work within a team when teamwork is necessary
- Evaluate the student's responsibility to complete work logs as expected
- Determine and evaluate if students adhere to all safety procedures
- Evaluate if students work without hindering other students' progress
- Evaluate if students stay on task in accordance with the job expectation
- Account if students are prepared for class each day
- Account if students are wearing appropriate clothing when necessary
- Account if students make up missed assignments in the established time limit
- SPECIAL NEEDS ASSESSMENT ADAPTATIONS
- Study guides provided prior to tests
- Use of calculator
- Multiple Choice will include 3 choices instead of 4
- Matching with groups of no more than 10 (depends on IEP)
- Matching with groups of no more than 5
- Tests read aloud
- Word bank with no more than 10 options
- Word bank with no more than 5 options
- Extended time to complete the assessment
- Alternate assessment-project or presentation instead of written assessment

Resources/Equipment:

Parker, R. O. Plant and Soil Science: Fundamentals and Applications. Clifton Park, NY: Delmar Cengage Learning, 2010. Emmons, Robert D. Turfgrass Science and Management. Albany, NY: Delmar, 1984. Sauter, David. Landscape Construction. Africa: Delmar Thomson Learning, 2000. Reiley, H. Edward., and Carroll Shry L. Introductory Horticulture. Albany, NY: Delmar, 1997. Hyperlinks:

Monroe Career & Technical Institute

Course: Horticulture - Floriculture and Landscaping

Unit Name: 900 PLANT IDENTIFICATION

Number: 900 **Hours:** 20.00

Dates: Spring 2025

Description/Objectives:

Students will be able to identify, classify, and describe common ornamental, crop, and native plants using scientific names, physical characteristics, and classification systems, and explain how accurate plant identification supports horticultural and environmental practices.

Tasks:

PA901 - Outline the proper use of plant material in various segments of the horticulture industry.

PA902 - Determine the impact of environmental factors on plant materials.

PA903 - Analyze characteristics of various plant categories including woody and herbaceous plants in the horticulture industry.

PA904 - Identify 100 plants used in horticulture industry by horticultural reference/botanical reference. (70 to be deciduous, evergreen, annuals, perennials, and house plants)

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.

CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.

Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.

INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.

RESEARCH GRADES 9-10-11-12

Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.

Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.

Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- PA SCIENCE, TECHNOLOGY & ENGINEERING, AND ENVIRONMENTAL LITERACY & SUSTAINABILITY STANDARDS (STEELS)

Supporting Anchor/Standards:

3.5.9-12.A Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.H Evaluate ways that technology and engineering can impact individuals, society, and the environment.

3.5.9-12.I (ETS) Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

3.5.9-12.J Synthesize data and analyze trends to make decisions about technological products, systems, or processes.

3.5.9-12.K (ETS) Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

3.5.9-12.N Analyze and use relevant and appropriate design thinking processes to solve technological and engineering problems.

3.5.9-12.P Apply a broad range of design skills to a design thinking process.

3.5.9-12.Y (ETS) Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.OO Use project management tools, strategies, and processes in planning, organizing, and controlling work.

3.5.9-12PP Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making

Instructional Activities:

Knowledge:

Outline the proper use of plant material in various segments of the horticulture industry.

Identify 100 plants used in horticulture industry by horticultural reference/botanical reference. (65 need to be woody trees & shrubs and herbaceous annuals and perennials)

List the identifying characteristics of various plant categories associated with plants in the horticulture industry.

Skill:

Utilize step guides for instruction

Determine the impact of environmental factors on plant materials.

Identify 100 plants used in horticulture industry by horticultural reference/botanical reference. (65 need to be woody trees & shrubs and herbaceous annuals and perennials)

Remediation:

Re-teach major concepts

Review with teacher assistance

Worksheets

Individual tutoring

Group tutoring

Peer tutoring

Review games

Create a chart

Technology integration

Computer assisted instruction

Checklists

Enrichment:

Upon completion students will move to the next task/assignment

Repeat tasks to enhance skill

Model learning of concepts for others

Teach concepts to peers

Independent study for FFA competition

FFA leadership related activities

Special Adaptations:

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- Use of Calculator
- Taking Tests in Alternate Setting (or if requested)
- Verbal/Gestural Redirection (prompts to remain on task)
- Drill and Practice (Repetition of Material)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Provide Visual Model to Accompany Verbal Directions (Written/Oral Directions)
- Use of Daily Planner/Assignment Book (monitor use of)
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[Plant Diversity](#)

[Leaf Type and Arrangement](#)

[Conifer Leaves](#)

[Woody Plant Identification Video](#)

[Herbaceous Plant Identification](#)

[Plant Morphology - Fruit](#)