

**FREEHOLD REGIONAL HIGH SCHOOL DISTRICT**

**OFFICE OF CURRICULUM AND INSTRUCTION**

**ANIMAL AND BOTANICAL SCIENCES**

# **FLORAL & LANDSCAPE DESIGN**

Grade Level: 10

Credits: 5

**BOARD OF EDUCATION ADOPTION DATE:**

**AUGUST 26, 2013**

[SUPPORTING RESOURCES AVAILABLE IN DISTRICT RESOURCE SHARING](#)

APPENDIX A: ACCOMMODATIONS AND MODIFICATIONS

APPENDIX B: ASSESSMENT EVIDENCE

APPENDIX C: INTERDISCIPLINARY CONNECTIONS

# **FREEHOLD REGIONAL HIGH SCHOOL DISTRICT**

## **Board of Education**

Mr. Heshy Moses, President  
Mrs. Jennifer Sutera, Vice President

Mr. Carl Accettola  
Mr. William Bruno  
Mrs. Elizabeth Canario  
Mrs. Kathie Lavin  
Mr. Ronald G. Lawson  
Mr. Michael Messinger  
Ms. Maryanne Tomazic

Mr. Charles Sampson, Superintendent  
Mr. Jeffrey Moore, Director of Curriculum and Instruction

## **Curriculum Writing Committee**

Mr. Brian Ducey

## **Supervisors**

Mr. Thomas Gallahue

# Floral Landscape & Design

## Course Philosophy

Floral and Landscape Design is the second course in the Animal and Botanical Sciences Academy. It is an introductory career exploration course that integrates and applies biological science principals to specific agricultural food and natural resource sectors. Second year students are introduced to technical skills and business management fundamentals. They are challenged to apply these newly fostered skills to their individual supervised learning experiences, local and state design competitions and in our greenhouse laboratory production facility.

## Course Description

The course presents the fundamental principles of horticulture with a focus on ornamental horticulture. Career exploration, safety and technical skills make up the backbone of the course and spiral through subsequent units. Floral design, landscape design, greenhouse and nursery production, pest management, and supervised learning experiences are the more nuanced and focused units that are introduced and explored. Use of the greenhouse and classroom laboratory facilities allows students genuine hands on learning experiences that reinforce classroom instruction.

## Course Map

CCSS	Enduring Understandings	Essential Questions	Common Assessments
9.1.12.B3 9.1.12.F.2 9.4.12.A.(1).4 9-10.RST.4, 5 9-10.WHST.2, 4	Safety plans, procedures, and reviews can make a workplace and workforce safe and more productive.	What are the procedures that must be followed to ensure a safe environment?	<a href="#">ABS Academy Safety Objective Test</a> <a href="#">Safety Practicum</a>
		What are ways the personal protective equipment can be used to ensure the safety of the workforce?	
		What are the procedures used to review a workplace for risks and hazards?	
9.3.4.A.1-6 9.3.12.C.1-10 9.4.12.A.(2).1, 2, 3 9-10.RST.4 9-10.WHST. 6, 7, 10	Careers in horticulture are diverse and play a large role in our local, national, and international economies.	What are the local, state-wide, national and international career opportunities available in horticulture and specifically in the floral and ornamental industry?	<a href="#">AFNR Job Postings &amp; Resumes</a> <a href="#">AFNR Career Earning Project</a>
		What personal traits and career skills are required for success in the varied aspects of horticulture?	
9.4.12.A.(2).1, 2, 3 9.4.12.A.(7).2,3,4,5,6 9-10.RST.4 9-10.WHST.6	Business, management, financial, sales and marketing skills are just as important to success in the horticultural industry as biological knowledge.	What are the business skills and management procedures needed to sell horticultural products?	<a href="#">AFNR Job Postings &amp; Resumes</a> <a href="#">AFNR Career Earning Project</a> <a href="#">Plant Sale Business Management</a> <a href="#">Online Business Management</a>
		What are the marketing, production, and sales aspects of the floral and landscape industries?	
		What sales and marketing processes can be implemented to increase sales and marketing results?	
		What are the pricing strategies commonly used to price horticultural products?	

## Course Map

CCSS	Enduring Understandings	Essential Questions	Common Assessments
9.3.12.C.6 9.4.12.A.(2).1, 2, 3, 4 9.4.12.A.(7).4 9-10.RST.3,4,5,7 9-10.WHST.2, 4	Knowledge of plant anatomy and physiology is integral to successful horticultural decision making and problem solving.	What are the aesthetic features of plants that make them useful in floral design?	<a href="#">Floriculture Plant Material Test</a> <a href="#">Seasonal Floral Arrangement</a> <a href="#">Seed-to-Sale Project</a> <a href="#">Greenhouse Design</a> <a href="#">Landscape Designer Portfolio</a> <a href="#">FFA Scenario Presentation</a>
		What are the procedures used in the floral industry to extend the life of cut flowers?	
		What are the six categories of landscape plants and how can they be used successfully?	
		What are the anatomical structures that need to be identified for plant propagation?	
9.4.12.A.(2).1, 2, 4 9-10.RST.3, 4, 5, 7 9-10.WHST.2	The use of design principles can add aesthetic and monetary value to landscape and floral design.	What are the classifications of horticultural plants that directly relate to their application in a landscape setting?	<a href="#">Floriculture Plant Material Test</a> <a href="#">Seasonal Floral Arrangement</a> <a href="#">Landscape Designer Portfolio</a> <a href="#">FFA Scenario Presentation</a>
		How are the design principles applied to floral design?	
		What are the physical, physiological, and classification distinctions we use to relate plants to their appropriate use?	
9.4.12.A.(2).4 9.4.12.A.7 9-10.RST.3,5	Successful use of plant and nonliving material is highly dependent on environmental conditions and intended use.	What are the physical, physiological and classification distinctions we use to relate plants to their appropriate use?	<a href="#">Landscape Designer Portfolio</a> <a href="#">FFA Scenario Presentation</a>
		What are the physical properties of non-living materials that affect their successful use in the landscape and floral designs?	
9.3.12.C.6 9.4.12.A.(2).1,2,3,4 9.4.12.A.(7).4 9.4.12.A.7 9-10.RST.3,5 9-10.WHST.4	Biology fundamentals are integral to the successful management of horticultural operations.	What are the micro and macro climate characteristics that impact success in landscape installations?	<a href="#">Seed-to-Sale Project</a> <a href="#">Greenhouse Design</a> <a href="#">Landscape Designer Portfolio</a> <a href="#">FFA Scenario Presentation</a>
		What are sexual and asexual practices that are responsible for the reproduction of landscape and floriculture plants?	
		What are dynamics in a greenhouse that can be controlled to encourage successful production?	
9.4.12.A.(2).1,2,3 9-10.WHST.4, 6	Integrated pest management is a holistic approach to managing problems that takes into account costs, environment, and pest life cycles.	What aspects of biology are integral to understanding how to manage pests?	<a href="#">Extension Service Fact Sheet</a>
		What are the types of tolerances, thresholds, and economic metrics used in an IPM plan?	
		What physical, mechanical, biological and chemical tools are available to an IPM plan?	

## Enduring Understandings & Pacing

Unit Title	Unit Understandings	Recommended Duration
<a href="#">1: Safety in Horticulture</a>	Safety plans, procedures, and reviews can make a workplace and workforce safe and more productive.	1 week
<a href="#">2: Horticultural Careers</a>	Careers in horticulture are diverse and play a large role in our local, national, and international economies. Business, management, financial, sales and marketing skills are just as important to success in the horticultural industry as biological knowledge.	3 weeks
<a href="#">3: Floral Design</a>	The use of design principals can add aesthetic and monetary value to landscape and floral design. Knowledge of plant anatomy and physiology is integral to successful horticultural decision making and problem solving.	7 weeks
<a href="#">4: Landscape Design</a>	The use of design principals can add aesthetic and monetary value to landscape and floral design. Successful use of plant and nonliving material is highly dependent on environmental conditions and intended use. Biology fundamentals are integral to the successful management of horticultural operations. Knowledge of plant anatomy and physiology is integral to successful horticultural decision making and problem solving.	6 weeks
<a href="#">5: Greenhouse Management</a>	Biology fundamentals are integral to the successful management of horticultural operations. Knowledge of plant anatomy and physiology is integral to successful horticultural decision making and problem solving.	5 weeks
<a href="#">6: Pest Control &amp; IPM</a>	Integrated pest management is a holistic approach to managing problems that takes into account costs, environment, and pest life cycles.	4 weeks
<a href="#">7: Business Management</a>	Business, management, financial, sales and marketing skills are just as important to success in the horticultural industry as biological knowledge.	5 weeks
<a href="#">8: Supervised Learning Experience</a>	Careers in horticulture are diverse and play a large role in our national, international and local economies.	3 weeks

**LANDSCAPE AND FLORAL DESIGN  
UNIT 1: SAFETY IN HORTICULTURE**

**SUGGESTED DURATION: 1 WEEK**

**UNIT OVERVIEW**

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Safety plans, procedures, and reviews can make a workplace and workforce safe and more productive.	What are the procedures that must be followed to ensure a safe environment?
	What are ways the personal protective equipment can be used to ensure the safety of the workforce?
	What are the procedures used to review a workplace for risks and hazards?

**LEARNING TARGETS**

NJCCCS/CCSS	COMMON ASSESSMENT	LEARNING GOALS
9.1.12.B3 9.1.12.F.2 9.4.12.A.(1).4 9-10.RST.4, 5 9-10.WHST.2, 4	Animal and Botanical Science Academy Safety Objective Test	The proficient student will: <ul style="list-style-type: none"> <li>demonstrate mastery of safety procedures in the classroom and laboratory;</li> <li>produce clear writing in which the development is appropriate to task, purpose, and audience (narrative response to a classroom safety incident).</li> </ul>
	Safety Practicum: student demonstrates correct use of tool and safety equipment as well as ability to read pesticide and chemical labels.	The proficient student will: <ul style="list-style-type: none"> <li>create a document or demonstration that uses visual and written modes of communication to demonstrate understanding of the information contained in the MSDS sheets, product labels, and tool procedures.</li> </ul>

SUGGESTED STRATEGIES		
ACTIVITIES	DECLARATIVE KNOWLEDGE	PROCEDURAL KNOWLEDGE
Students are provided a content-specific informational text outlining OSHA and PEOSH regulations. They will create a procedure manual for the greenhouse and classroom laboratory. Students will analyze how informational text is structured to make identifying key information quick and easy especially in an emergency. Students exchange projects and peer critique.	Material Safety Data Sheet (MSDS) Blood borne pathogens Personal protective equipment (PPE) Caution, Warning , Danger LD 50	<ul style="list-style-type: none"> <li>Identify the standard format of labels so as to quickly identify information.</li> <li>Recall the location of MSDS book in classroom and FRHSD.</li> <li>Students correctly introduce and use content specific vocabulary in an informational text.</li> <li>Demonstrate safe and appropriate use of PPE.</li> </ul>
Students read chemical labels and MSDS sheets, and create informational posters with written and visual prompts.	Reactive Corrosive Flammability Eyewash  PEOSH OESHA CDC Contamination Cross contamination	<ul style="list-style-type: none"> <li>Identify potential hazards to carrying out any classroom or laboratory procedures.</li> <li>Integrate multiple sources of information presented in diverse formats and media in order to address a question or solve a problem</li> <li>Translate quantitative or technical information expressed in words from a text into visual form</li> </ul>
Students are paired or grouped up to create a skit based on a hazardous situation.		<ul style="list-style-type: none"> <li>Follow protocols for safe use of tools, equipment and chemicals.</li> </ul>

SUGGESTED MODIFICATIONS	
TECHNOLOGY INTEGRATION	
<b>Activity Alternatives</b> <ul style="list-style-type: none"> <li>Students can create a collaborative cloud document or presentation of safety procedures or handling a dangerous situation, instead of poster of text.</li> <li>Students utilize web-based platforms, including but not limited to Prezi, Glogster or YouTube, to create a multi-media safety advertisement. Instead of text or poster.</li> </ul>	<b>Student Monitoring</b> <ul style="list-style-type: none"> <li>Teacher/student-generated review quizzes utilizing Socrative, Quizlet, or SMART Responders</li> </ul>
DIFFERENTIATION	
<ul style="list-style-type: none"> <li>Choice of learning stations may be offered to students to review safety procedures.</li> <li>Choice may be given to students to integrate more technology or remain with manipulative handmade posters or kinetic demonstrations.</li> </ul>	

**LANDSCAPE AND FLORAL DESIGN**  
**UNIT 2: HORTICULTURAL CAREERS**

**SUGGESTED DURATION: 3 WEEKS**

**UNIT OVERVIEW**

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Careers in horticulture are diverse and play a large role in our local, national, and international economies.	What are the local, state-wide, national and international career opportunities available in horticulture and specifically in the floral and ornamental industry?
Business, management, financial, sales and marketing skills are just as important to success in the horticultural industry as biological knowledge.	What are the business skills and management procedures needed to produce horticultural products?
	What personal traits and career skills are required for success in the varied aspects of horticulture?
	What are the marketing, production, and sales aspects of the floral and landscape industries?

**LEARNING TARGETS**

NJCCCS/CCSS	COMMON ASSESSMENT	LEARNING GOALS
9.4.12.A.(2).1, 2, 3 9-10.RST.4 9-10.WHST. 6	Students must be able to identify the Seven AFNR (Agriculture, Food and Natural Resources) Career Clusters and match specific careers to the sectors by creating job postings and resumes for each.	The proficient student will: <ul style="list-style-type: none"> <li>describe the structure of the horticultural industry and the skills and aptitudes that are requisite for a career in each of the segments of the industry;</li> <li>Identify qualifications, salaries and market demand for careers by writing mini resumes for career clusters.</li> </ul>
9.4.12.A.(2).1, 2, 3 9-10.RST.4 9-10.WHST.6	Students use FFA Career Explorer to identify the earning potential of careers each of the seven AFNR Career Clusters.	The proficient student will: <ul style="list-style-type: none"> <li>compare careers in the horticulture industry and evaluate the economic value that the country places in the industry.</li> </ul>

SUGGESTED STRATEGIES		
ACTIVITIES	DECLARATIVE KNOWLEDGE	PROCEDURAL KNOWLEDGE
<p>Student research horticultural career options and focus of salaries, degrees, certifications and quality of life, industry demand. They create a profile for the career and present to their peers.</p>	Landscape technician Landscape architect Nurserymen Irrigation technician Production greenhouse Wholesaler Retailer Consumer	<ul style="list-style-type: none"> <li>• Research, identify and contrast careers in the horticulture industry.</li> <li>• Identify the requisite skills, abilities, and certifications need for the potential career opportunities.</li> </ul>
<p>Students create an individual learning plan for themselves and document the plan on <a href="#">The Agricultural Experience Tracker</a>. The students continue to add journal evidence as proof of their progress toward their career goals.</p>		<ul style="list-style-type: none"> <li>• Student will use web and SMS messages to create journal entries.</li> <li>• Record and reflect on progress towards individual SAE goals</li> </ul>

SUGGESTED MODIFICATIONS	
TECHNOLOGY INTEGRATION	
<p><b>Activity Alternatives</b></p> <ul style="list-style-type: none"> <li>• Students can conduct online interviews (Skype, Google Hangout) of industry members or volunteer to job shadow someone in a particular field</li> <li>• Students utilize career search sites such as Monster, Career Builder, or LinkedIn.</li> </ul>	<p><b>Student Monitoring</b></p> <ul style="list-style-type: none"> <li>• Student journal entries in the <a href="#">AET</a></li> <li>• Student career interest monitored with web-based Google surveys</li> </ul>
DIFFERENTIATION	
<ul style="list-style-type: none"> <li>• Choice of career exploration formats or modalities for research such as written, multimedia, or a poster display.</li> <li>• Choice may be given to students to integrate more technology, conduct interviews of industry members in related fields.</li> </ul>	

**LANDSCAPE AND FLORAL DESIGN**  
**UNIT 3: FLORAL DESIGN**

**SUGGESTED DURATION: 7 WEEKS**

**UNIT OVERVIEW**

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
The use of design principals can add aesthetic and monetary value to floral designs.	What are the aesthetic features of plants that make them useful in floral design?
	How are the design principals applied to floral designs?
	What are the physical, physiological and classification distinctions we use to relate plants to their appropriate use.
Knowledge of plant anatomy and physiology is integral to successful horticultural decision making and problem solving.	What are the aesthetic features of plants that make them useful in floral design?
	What are the procedures used in the floral industry to extend the life of cut flowers?

**LEARNING TARGETS**

NJCCCS/CCSS	COMMON ASSESSMENT	LEARNING GOALS
9.4.12.A.(2).1, 2, 4 9-10.RST.4, 7 9-10.WHST.2	Floriculture Plant Material Identification Test	<p>The proficient student will:</p> <ul style="list-style-type: none"> <li>• create a multimedia study guide for the plant materials and tools using Quizlet, study blue or similar;</li> <li>• identify and recall the most common and important plants in the floriculture industry.</li> </ul>
	Create seasonal floral arrangements that demonstrate design principals related to a particular theme.	<p>The proficient student will:</p> <ul style="list-style-type: none"> <li>• recall the elements of design and use them to create floral arrangements;</li> <li>• create a critique of peer arrangements;</li> <li>• calculate the cost of a floral design.</li> </ul>

SUGGESTED STRATEGIES		
ACTIVITIES	DECLARATIVE KNOWLEDGE	PROCEDURAL KNOWLEDGE
Students research floral design recipes and apply them to their Horticultural Exposition project following State FFA rubrics.	Form Filler Focal point Ratio mark-up Floriculture identification list Bypass pruners Wire cutters Floral tape Design principals Proportion Scale Negative space Rhythm Balance Unity Floral foam Floral preparation and conditioning	<ul style="list-style-type: none"> <li>• Create a floral design recalling the safety procedures.</li> <li>• Students will use permanent flowers to practice and reinforce specific domain concepts.</li> </ul>
Students write a procedure for preparing and conditioning flowers then create a training video outlining the procedures.	Antitranspirants Floral-life Bactericide Fungicide Nutrient solution	<ul style="list-style-type: none"> <li>• Identify key procedural steps.</li> <li>• Write a training guide, maintaining proper style and form for intended audience and purpose.</li> </ul>

SUGGESTED MODIFICATIONS	
TECHNOLOGY INTEGRATION	
<b>Activity Alternatives</b> <ul style="list-style-type: none"> <li>• Students utilize web-based platforms including but not limited to Quizlet, Study Blue, etc.</li> </ul>	<b>Student Monitoring</b> <ul style="list-style-type: none"> <li>• Teacher/student-generated identification review quizzes utilizing Socrative, Quizlet, SMART Responders, etc.</li> </ul>
DIFFERENTIATION	
<ul style="list-style-type: none"> <li>• Choice of procedure formats or modalities for conditioning flowers such as written, multimedia or a poster display</li> <li>• Choice of design category is offered to students.</li> </ul>	

**LANDSCAPE AND FLORAL DESIGN**  
**UNIT 4: LANDSCAPE DESIGN**

**SUGGESTED DURATION: 6 WEEKS**

**UNIT OVERVIEW**

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
The use of design principals can add aesthetic and monetary value to landscape and floral design.	What are the classifications of horticultural plants that directly relate to their application in a landscape setting?
Successful use of plant and nonliving material is highly dependent on environmental conditions and intended use.	What are the physical, physiological and classification distinctions we use to relate plants to their appropriate use?
	What are the physical properties of non-living materials that affect their successful use in the landscape and floral designs?
Biology fundamentals are integral to the successful management of horticultural operations.	What are the micro and macro climate characteristics that impact success in landscape instillations
Knowledge of plant anatomy and physiology is integral to successful horticultural decision making and problem solving.	What are the six categories of landscape plants and how can they be used successfully?

**LEARNING TARGETS**

NJCCCS/CCSS	COMMON ASSESSMENT	LEARNING GOALS
9.4.12.A.(2).4 9.4.12.A.7 9-10.RST.3,5	Landscape Designer Portfolio, including goose egg drawings, base plans, hardscape pattern samples, family inventory surveys, and plant symbols for each of the categories of landscape plants.	The proficient student will: <ul style="list-style-type: none"> <li>• be able to create a base plan;</li> <li>• conduct a family inventory survey;</li> <li>• Conduct a site analysis identifying living and non-living variables, micro and macroclimates at the site that impact the design.</li> </ul>
9.4.12.A.(2).4 9-10.RST.4	Complete a landscape design and write a presentation based on NJ FFA annual scenario.	The proficient student will: <ul style="list-style-type: none"> <li>• present designs to prospective clients highlighting the deliberate choices made in materials based on horticultural distinctions and appropriate use;</li> <li>• use each of the six categories of landscape plants in the design;</li> <li>• execute the concepts of outdoor rooms within a design.</li> </ul>

SUGGESTED STRATEGIES		
ACTIVITIES	DECLARATIVE KNOWLEDGE	PROCEDURAL KNOWLEDGE
Students complete drawings that sample several hardscape patterns and letter techniques.	Micro and macro climate Zone hardiness map Raised beds Bedding patterns Hardscapes T- square Compass Drawing board Triangles Erasure shields Stencils Outdoor Rooms	<ul style="list-style-type: none"> <li>• Correctly use drafting tools.</li> <li>• Application of design principals to landscape designs.</li> </ul>
Students will role play customer and designer, acting out the design consultation process.	Family inventory survey Base plan Site assessment	<ul style="list-style-type: none"> <li>• Identify clients' needs using appropriate assessments.</li> </ul>
Students create "Extension Service" style fact sheets outlining favorable plants that are native, deer resistant, low water requirement, or salt tolerant.	Annual/Biennial/Perennial Woody/Herbaceous Dicot/monocot Warm Season/Cool Season Native /Exotic/Invasive Zones and climates	<ul style="list-style-type: none"> <li>• Identify species of plant material as it pertains to specific use and function.</li> <li>• Describe and differentiate the qualities of the plant that make it ideally suited for specific use.</li> </ul>

SUGGESTED MODIFICATIONS	
TECHNOLOGY INTEGRATION	
<b>Activity Alternatives</b> <ul style="list-style-type: none"> <li>• Students can use Google SketchUp to create a 3-D model of their design</li> <li>• Students may use CAD programs to complete designs.</li> </ul>	<b>Student Monitoring</b> <ul style="list-style-type: none"> <li>• Student-created AET portfolios of student work.</li> </ul>
DIFFERENTIATION	
<ul style="list-style-type: none"> <li>• Students may use advanced CAD or Google SketchUp as an advanced skill.</li> <li>• Choice of level of drawing detail may be given.</li> </ul>	

**LANDSCAPE AND FLORAL DESIGN**  
**UNIT 5: GREENHOUSE MANAGEMENT**

**SUGGESTED DURATION: 3 WEEKS**

**UNIT OVERVIEW**

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Biology fundamentals are integral to the successful management of horticultural operations.	What are sexual and asexual practices that are responsible for the reproduction of landscape and floriculture plants?
	What are dynamics in a greenhouse that can be controlled to encourage successful production?
Knowledge of plant anatomy and physiology is integral to successful horticultural decision making and problem solving.	What are the anatomical structures that need to be identified for plant propagation?

**LEARNING TARGETS**

NJCCCS/CCSS	COMMON ASSESSMENT	LEARNING GOALS
9.3.12.C.6 9.4.12.A.(2).1,2,3 9.4.12.A.(7).4 9-10.WHST.4	Students are given seeds and mother plants to create product for our plant sale. Students must successfully propagate and raise ornamental plants.	The proficient student will: <ul style="list-style-type: none"> <li>grow a set of flats or pots of floriculture or landscape plants using sexual and asexual reproductive practices;</li> <li>create journal entries recording plant growth and cultural practices applied through greenhouse dynamics.</li> </ul>
	Students create a mini greenhouse and a sales brochure highlighting the benefits of their chosen greenhouse style.	The proficient student will: <ul style="list-style-type: none"> <li>identify construction materials and be able to compare and contrast the advantages and disadvantages as they pertain to growing dynamics and costs.</li> </ul>

SUGGESTED STRATEGIES		
ACTIVITIES	DECLARATIVE KNOWLEDGE	PROCEDURAL KNOWLEDGE
Students use Google maps and street view to identify types of commercial greenhouses structures that are local, national and international.	Framing Glazing Heating systems Ventilation Irrigation	<ul style="list-style-type: none"> <li>Use web resources to identify addresses of greenhouse producers.</li> <li>Assess construction styles based on location and use.</li> </ul>
Students create collaborative greenhouse production plan using growth predictions from seed suppliers. Dynamics for growth are outlined and schedules for student monitoring are agreed upon.	Even-span Lean to Gothic arch Fan and Pad Growing Media Fertigation systems Syphonject Heat requirement Day length Growing media Nodes Rooting hormone Grafting Layering Asexual reproduction Sexual reproduction	<ul style="list-style-type: none"> <li>Apply researched date to maturity to production calendar.</li> </ul>

SUGGESTED MODIFICATIONS	
TECHNOLOGY INTEGRATION	
<b>Activity Alternatives</b> <ul style="list-style-type: none"> <li>Students can create an animation or YouTube video of specified propagation.</li> <li>Students utilize Google SketchUp to model greenhouses.</li> </ul>	<b>Student Monitoring</b> <ul style="list-style-type: none"> <li>Journal entries in the AET (web-based Agricultural Experience Tracker).</li> </ul>
DIFFERENTIATION	
<ul style="list-style-type: none"> <li>Choice of career exploration formats or modalities for research such as written, multimedia or a poster display.</li> <li>Choice may be given to students to integrate more technology, conduct interviews of industry members in related fields.</li> </ul>	

**LANDSCAPE AND FLORAL DESIGN**  
**UNIT 6: PEST CONTROL AND IPM**

**SUGGESTED DURATION: 2 WEEKS**

**UNIT OVERVIEW**

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Integrated pest management is a holistic approach to managing problems that takes into account costs, environment, and pest life cycles.	What aspects of biology are integral to understanding how to manage pests?
	What are the types of tolerances, thresholds, and economic metrics used in an IPM plan?
	What physical, mechanical, biological and chemical tools are available to an IPM plan?

**LEARNING TARGETS**

NJCCCS/CCSS	COMMON ASSESSMENT	LEARNING GOALS
9.4.12.A.(2).1,2,3 9-10.WHST.4, 6	Students create an Extension Service fact sheet on a particular pest.	<p>The proficient student will:</p> <ul style="list-style-type: none"> <li>• identify all key parts of the pests life cycle;</li> <li>• identify any known biological, chemical or mechanical controls for this pest;</li> <li>• include any threshold for action (economic damage or aesthetic tolerances).</li> </ul>

**SUGGESTED STRATEGIES**

ACTIVITIES	DECLARATIVE KNOWLEDGE	PROCEDURAL KNOWLEDGE
Students create “most wanted signs” for pests that are likely seen in the greenhouse. Include management strategies for each pest.	Biological Control Mechanical Control Chemical Controls Scouting Beneficial Insects Endophytes Growth regulators Action Threshold	<ul style="list-style-type: none"> <li>• Identity target pests for specific crops.</li> <li>• Identify signs vs. symptoms of a pest outbreak.</li> <li>• Identify thresholds for each of the most wanted pests.</li> </ul>
Students read “mock pesticide” label and apply to area of turf.	Herbicide, fungicide, Insecticide Life cycle Phenology	<ul style="list-style-type: none"> <li>• Read and carryout a complex procedure according to the pesticide label.</li> </ul>

## SUGGESTED MODIFICATIONS

### TECHNOLOGY INTEGRATION

#### Activity Alternatives

- Students can create a collaborative cloud document or presentation of the identification list of landscape nursery, floriculture or turf grass species pests.

#### Student Monitoring

- Teacher/student generated identification review quizzes utilizing Socrative, Quizlet, or SMART Responders.

### DIFFERENTIATION

- Choice of pest wanted sign formats or modalities such as written, multimedia, or a poster display.
- Students may complete TIC-TAC-TOE boards of life cycle, pest, and crops.

**LANDSCAPE AND FLORAL DESIGN**  
**UNIT 7: HORTICULTURAL BUSINESS MANAGEMENT**

**SUGGESTED DURATION: 2 WEEKS**

**UNIT OVERVIEW**

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Business, management, financial and marketing skills are just as important to success in the horticultural industry as is biological knowledge.	What are the business skills and management procedures needed to sell horticultural products?
	What sales and marketing processes can be implemented to increase sales and marketing results?
	What are the pricing strategies commonly used to price horticultural products?

**LEARNING TARGETS**

NJCCCS/CCSS	COMMON ASSESSMENT	LEARNING GOALS
9.4.12.A(7).2,3,4,5,6 9-10.WHST.6	Students will be able to create a cloud-based interactive order form and balance sheet for the greenhouse plant sales and floral sales.	The proficient student will: <ul style="list-style-type: none"> <li>• will be able to identify assets and liabilities in a balance sheet;</li> <li>• will be able to record profits and losses;</li> <li>• will be able to identify the needs of a customer and match them with a product;</li> <li>• create advertisements that promote products to a target audience.</li> </ul>

SUGGESTED STRATEGIES		
ACTIVITIES	DECLARATIVE KNOWLEDGE	PROCEDURAL KNOWLEDGE
Students calculate materials needed to maximize production of floriculture crops and nursery crops in out laboratory greenhouse.	Business Plan Expenses Corporation Risk Capital Point of purchase Fixed costs	<ul style="list-style-type: none"> <li>Analyze area and volume calculations of media and greenhouse.</li> </ul>
Students conduct comparative analysis of different growing media and conduct a cost benefit analysis of the products.	Variable costs Balance sheet Management Sales steps Net worth Price promotions	<ul style="list-style-type: none"> <li>Conduct a cost benefit analysis.</li> </ul>

SUGGESTED MODIFICATIONS	
TECHNOLOGY INTEGRATION	
<b>Activity Alternatives</b> <ul style="list-style-type: none"> <li>Students may use TitanPad, Google Drive, or similar to collaborate on business plans, and planting schedules.</li> <li>Students utilize Sparks probes to measure growth parameters in different media</li> </ul>	<b>Student Monitoring</b> <ul style="list-style-type: none"> <li>Journal entries in the AET</li> </ul>
DIFFERENTIATION	
<ul style="list-style-type: none"> <li>Students may create excel spreadsheets to record sales and growth data.</li> <li>Choice may be given to students to market research large scale horticultural producers on the NYSE.</li> </ul>	

**LANDSCAPE AND FLORAL DESIGN**  
**UNIT 8: SUPERVISED LEARNING EXPERIENCES**

**SUGGESTED DURATION: 2 WEEKS**

**UNIT OVERVIEW**

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Careers in horticulture are diverse and play a large role in our national, international and local economies.	What personal traits and career skills are required for success in the varied aspects of horticulture?
	What are the local, state wide, national and international career opportunities available in horticulture and specifically in the floral and ornamental industry?

**LEARNING TARGETS**

NJCCCS/CCSS	COMMON ASSESSMENT	LEARNING GOALS
9.3.4.A.1-6 9.3.12.C.1-10 9-10.WHST.6,7,10	Students create a Supervised Agricultural Experience plan outlining learning goals and outcomes. This plan is individualized and designed based on student’s career interest. Students will share their SAE progress in AET.	<p>The proficient student will:</p> <ul style="list-style-type: none"> <li>• have an SAE plan that outlines goals, skills and traits needed as they align to a particular career cluster and their personal career goals;</li> <li>• create a series of journal entries that document progress in their SAE that meet or exceed the Animal and Botanical Academy Requirements while exploring the local and statewide opportunities in AFNR.</li> </ul>

**SUGGESTED STRATEGIES**

ACTIVITIES	DECLARATIVE KNOWLEDGE	PROCEDURAL KNOWLEDGE
Students create presentations about their individual progress toward their SAE.	SAE Exploratory Placement Research Entrepreneurial Improvement FFA proficiency	<ul style="list-style-type: none"> <li>• Students will create individual plans for SAE’s.</li> <li>• Use public speaking and presentation techniques effectively.</li> </ul>
Students create a demonstration of a particular skill learned or refined during the supervised agricultural experience.		

## SUGGESTED MODIFICATIONS

### TECHNOLOGY INTEGRATION

#### Activity Alternatives

- Students are able to use other media platforms to keep current with journal entries such as but not limited to Twitter, Google Plus, Tumblr, etc.

#### Student Monitoring

- Journal entries on the AET (Agricultural Experience Tracker).

### DIFFERENTIATION

- Choice of presentation formats such as multimedia or a poster display.
- Choice may be given to students to use journal entries to apply for star recognition or agriscience awards.