



Pine Grove Area

SCHOOL DISTRICT

Science

General Horticulture

September 18, 2008

I. PHILOSOPHY

The General Horticulture course of the Pine Grove Area School District has been structured to introduce, systematically and thematically, the basic principles of the horticulture industry. Students will acquire a basic level of understanding in many areas of the horticulture industry, greenhouse management, plant science, and landscape design. These principles will be addressed using many applications and opportunities for hands-on learning. The course will allow for the accommodation of many learning styles, motivational levels, and academic abilities.

II. CORE CONCEPTS

1. The Horticulture Industry - Identify key components of the horticulture industry
2. Greenhouse Management - Demonstrate key methods for effective greenhouse management.
3. Plant Science – Identify and describe plant parts, plant functions, and plant systems.
4. Plant Propagation - Discuss different methods of plant propagation.
5. Landscape Design - Demonstrate basic design techniques used in landscaping.

III. COURSE OF STUDY

A. Course Name: General Horticulture

B. Grade Level: 10-12

C. Length of Course: One Semester

1. Frequency: Daily

2. Duration: 43 minutes

D. Academic Level: Career Technology, Post-Secondary, College Prep

E. Credits: 0.5 Credits

F. Prerequisites: None

G. Course Description:

This course is designed to make students more aware of the latest concepts in horticulture. Topics to be covered include the horticulture industry, plant science, plant propagation, greenhouse management, pest management, landscaping, and vegetable and small fruit gardening.

IV. CONTENT: Introduction to Horticulture

CORE CONCEPT 1: The Horticulture Industry

MAJOR OBJECTIVE: Identify key components of the horticulture industry

CURRICULUM STANDARD:			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.4.12.A Analyze the management practices in the agriculture business.</p> <p>Identify the diversity in crop production and analyze the advantages and disadvantages of such diversity.</p> <p>Analyze the effects of agricultural practices on the economy.</p>	<p>Teacher will guide students to:</p> <p>Identify the four areas of the horticulture industry</p> <p>Examine various career opportunities in the field of horticulture</p> <p>Select and describe a horticulture career</p> <p>Discuss the role of the horticulture industry in agriculture</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Introduction to Horticulture

CORE CONCEPT 2: Greenhouse Management

MAJOR OBJECTIVE: Demonstrate key methods for effective greenhouse management.

CURRICULUM STANDARD:			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.7.12.A Apply advanced tools, materials and techniques to answer complex questions.</p> <p>Demonstrate the safe use of complex tools and machines within their specifications.</p> <p>Select and safely apply appropriate tools, materials and processes necessary to solve complex problems that could result in more than one solution.</p> <p>Evaluate and use technological resources to solve complex multistep problems.</p>	<p>Teacher will guide students to:</p> <p>Demonstrate safe use of appropriate greenhouse tools.</p> <p>Identify and describe various greenhouse tools.</p> <p>Describe the different types of greenhouse structures and their use.</p> <p>Utilize various greenhouse tools and resources to solve a complex multi-step problem</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Introduction to Horticulture

CORE CONCEPT 2: Greenhouse Management

MAJOR OBJECTIVE: Demonstrate key methods for effective greenhouse management.

CURRICULUM STANDARD:			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.7.12.B Evaluate appropriate instruments and apparatus to accurately measure materials and processes.</p> <p>Evaluate the appropriate use of different measurement scales (macro and micro).</p>	<p>Teacher will guide students to:</p> <p>Demonstrate appropriate methods of measurement that are commonly used in the horticulture industry.</p> <p>Describe and evaluate various methods of measurement used in the horticulture industry.</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Introduction to Horticulture

CORE CONCEPT 2: Greenhouse Management

MAJOR OBJECTIVE: Demonstrate key methods for effective greenhouse management.

CURRICULUM STANDARD:			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.7.12.C Evaluate computer operations and concepts as to their effectiveness to solve specific problems.</p> <p>Analyze and solve hardware and advanced software problems.</p>	<p>Teacher will guide students to:</p> <p>Evaluate the use of technology in a greenhouse.</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Introduction to Horticulture

CORE CONCEPT 2: Greenhouse Management

MAJOR OBJECTIVE: Demonstrate key methods for effective greenhouse management.

CURRICULUM STANDARD:			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.4.12.B Describe how agricultural science has influenced biotechnology.</p> <p>Investigate how bio-engineered crops may influence the food supply.</p> <p>Analyze the use of specific bacteria for the control of agricultural pests.</p>	<p>Teacher will guide students to:</p> <p>Identify different methods of pest control in the greenhouse.</p> <p>Describe the importance of pest control in a greenhouse.</p> <p>Compare and contrast various uses of bacteria for the control of agricultural pests</p> <p>Compare and contrast bio-engineered crops versus natural growing crops</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Introduction to Horticulture

CORE CONCEPT 2: Greenhouse Management

MAJOR OBJECTIVE: Demonstrate key methods for effective greenhouse management.

CURRICULUM STANDARD:			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.4.12.C Analyze and research the social, political and economic factors that affect agricultural systems.</p> <p>Analyze the costs and benefits associated with agriculture practices and how they affect economic and human needs.</p> <p>Analyze the costs and benefits of agriculture research practices in society.</p>	<p>Teacher will guide students to:</p> <p>Design a greenhouse management plan</p> <p>Discuss and analyze the economic importance of greenhouses.</p> <p>Explain how research practices benefit greenhouse use in the horticulture industry.</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Introduction to Horticulture

CORE CONCEPT 2: Greenhouse Management

MAJOR OBJECTIVE: Demonstrate key methods for effective greenhouse management.

CURRICULUM STANDARD:			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.4.12.D Analyze research and development activities as they relate to agriculture.</p> <p>Research and analyze energy sources used and/or generated by producing, processing and marketing agricultural products.</p>	<p>Teacher will guide students to:</p> <p>Evaluate the different sources of energy used in a greenhouse.</p> <p>Analyze various research and development activities related to the agricultural industry.</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Introduction to Horticulture

CORE CONCEPT 3: Plant Science

MAJOR OBJECTIVE: Identify and describe plant parts, plant functions, and plant systems.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.3.12.A Explain the relationship between structure and function at all levels of organization.</p> <p>Identify and explain interactions among organisms (e.g., mutually beneficial, harmful relationships).</p> <p>Explain and analyze the relationship between structure and function at the molecular, cellular and organ-system level.</p> <p>Describe and explain structural and functional relationships in each of the five (or six) kingdoms.</p> <p>Explain significant biological diversity found in each of the biomes.</p>	<p>Teacher will guide students to:</p> <p>Identify the different external structures of a plant.</p> <p>Compare/contrast interactions among organisms (e.g., mutually beneficial, harmful relationships).</p> <p>Discuss the function of various external plant structures.</p> <p>Explain the classification of different plant species.</p> <p>Discuss the importance of biological diversity in the plant kingdom.</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Introduction to Horticulture

CORE CONCEPT 3: Plant Science

MAJOR OBJECTIVE: Identify and describe plant parts, plant functions, and plant systems.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.3.12.B Analyze the chemical and structural basis of living organisms.</p> <p>Identify and describe factors affecting metabolic function (e.g., temperature, acidity, hormones).</p> <p>Evaluate relationships between structure and functions of different anatomical parts given their structure.</p> <p>Describe potential impact of genome research on the biochemistry and physiology of life.</p>	<p>Teacher will guide students to:</p> <p>Identify the internal structures of plants.</p> <p>Explain the functions of internal plant structures.</p> <p>Discuss how genetic engineering has impacted plant science.</p> <p>Explain the role plant structures have in various plant functions.</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Introduction to Horticulture

CORE CONCEPT 4: Plant Propagation

MAJOR OBJECTIVE: Discuss different methods of plant propagation.

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.6.12.B Analyze the impact of cycles on the ecosystem.</p> <p>Evaluate the materials necessary for natural cycles.</p> <p>Explain the processes involved in the natural cycles.</p>	<p>Teacher will guide students to:</p> <p>Evaluate the impact of life cycles on the ecosystem.</p> <p>Identify the elemental cycles that are necessary for plant growth.</p> <p>Explain how the elemental cycles are involved in plant growth.</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Introduction to Horticulture

CORE CONCEPT 4: Plant Propagation

MAJOR OBJECTIVE: Discuss different methods of plant propagation.

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.3.12.B Analyze the chemical and structural basis of living organisms.</p> <p>Evaluate relationships between structure and functions of different anatomical parts given their structure.</p> <p>Describe potential impact of genome research on the biochemistry and physiology of life.</p>	<p>Teacher will guide students to:</p> <p>Identify plant structures that are necessary for propagation.</p> <p>Discuss the roles different plant structures play in propagation.</p> <p>Compare and contrast the natural and artificial propagation in plants.</p> <p>Explain the impact of genetic engineering on plant propagation.</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Introduction to Horticulture

CORE CONCEPT 5: Landscape Design

MAJOR OBJECTIVE: Demonstrate basic design techniques used in landscaping.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.4.12.A Analyze the management practices in the agriculture business.</p> <p>Define the components of an agriculture system that would result in a minimal waste of resources.</p> <p>Identify the diversity in crop production and analyze the advantages and disadvantages of such diversity.</p> <p>Analyze the effects of agricultural practices on the economy.</p> <p>Analyze the impact of nutrient management laws on Pennsylvania agriculture.</p>	<p>Teacher will guide students to:</p> <p>Identify and analyze key components and techniques used in landscaping.</p> <p>Discuss the importance of plant diversity in landscaping.</p> <p>Examine landscaping techniques that are beneficial to the surrounding environment.</p> <p>Discuss the importance of landscaping in the horticulture industry.</p> <p>Describe the effect PA's nutrient management laws have on landscaping.</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Introduction to Horticulture

CORE CONCEPT 5: Landscape Design

MAJOR OBJECTIVE: Demonstrate basic design techniques used in landscaping.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.4.12.B Describe how agricultural science has influenced biotechnology.</p> <p>Investigate how bio-engineered crops may influence the food supply.</p> <p>Analyze the use of specific bacteria for the control of agricultural pests.</p>	<p>Teacher will guide students to:</p> <p>Identify and describe bio-engineered plants that are being used in landscaping.</p> <p>Discuss the benefits of using biotechnology in landscaping.</p> <p>Identify various methods of pest control in landscaping.</p>	<p>Teacher evaluation of:</p> <p>Student performance</p> <p>Partner projects</p> <p>Individuals during small group work</p> <p>Individuals during whole group discussion</p> <p>Oral question and answer</p> <p>Independent activities</p> <p>Cooperative group projects</p> <p>Note-taking</p> <p>Class participation</p> <p>Tests and quizzes</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

V. EXPECTED LEVELS OF ACHIEVEMENT

A. Students are expected to reach the proficient level of achievement, including all of the skills noted in the specific content area of this curriculum.

B. Grading system for General Horticulture is as follows:

Grading Scale	
A	90-100
B	80-89
C	70-79
D	60-69
F	0-59

C. Each student's grade will be determined at the conclusion of each marking period. Progress notes will be issued half-way throughout each marking period for students who are performing below 70%.