



Pine Grove Area

SCHOOL DISTRICT

Science

Forestry

September 18, 2008

I. PHILOSOPHY

The Forestry course of the Pine Grove Area School District has been structured to introduce, systematically and thematically, the basic principles of the animal industry. Students will acquire a basic level of understanding in many areas of the forest industry, forest regions, tree species, forest management, dendrology, forest technologies, and forest products. 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 Forestry Industry: Identify key components of the forestry industry.
2. Forest Regions/Species Identification: Identify the major forest regions and dominant tree species in those regions.
3. Forest Management: Identify and describe various methods of forest management.
4. Dendrology: Identify and describe the relationships between plan structure, plan systems and plant function.
5. Forest Technologies: Identify and discuss the importance of various uses of technology in the forestry industry.
6. Forest Products: Identify various forest products and by-products.

III. COURSE OF STUDY

A. Course Name: Forestry

B. Grade Level: 10-12

C. Length of Course: one semester

1. Frequency: Daily

2. Duration: 42 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 forestry science. Topics to be covered include forest regions, tree species, forest management, dendrology, forest technologies, and forest products.

IV. CONTENT: Forestry

CORE CONCEPT 1: The Forestry Industry

MAJOR OBJECTIVE: Identify key components of the forestry industry

CURRICULUM STANDARD:			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.4.12 A:</p> <p>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>Teacher will guide students to:</p> <p>Identify the major areas of the forestry industry.</p> <p>Examine various career opportunities in the field of forestry.</p> <p>Select and describe a forestry career.</p> <p>Discuss the role of the forestry industry in agriculture.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Partner/group projects • Individuals during small group work • Individuals during whole group discussion • Oral question and answer • Independent activities • Class participation • Tests and quizzes 	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry

CORE CONCEPT 2: Forest Regions/Species Identification

MAJOR OBJECTIVE: Identify the major forest regions and dominant tree species in those regions.

CURRICULUM STANDARD:

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.12 B:</p> <p>Analyze the availability, location and extraction of earth resources.</p> <p>Describe how the location of earth's major resources has affected a country's strategic decisions.</p> <p>Compare locations of earth features and country boundaries.</p> <p>Analyze the impact of resources (e.g., coal deposits, rivers) on the life of Pennsylvania's settlements and cities.</p>	<p>Teacher will guide students to:</p> <p>Identify the major forest regions in the US.</p> <p>Identify the dominant tree species in each forest region.</p> <p>Discuss the importance of various tree species in each forest region as they relate to other organisms in the ecosystem.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry

CORE CONCEPT 3: Forest Management

MAJOR OBJECTIVE: Identify and describe various methods of forest management.

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.2.12 A:</p> <p>Analyze the use of renewable and nonrenewable resources.</p> <p>Explain the effects on the environment and sustainability through the use of nonrenewable resources.</p> <p>Evaluate the advantages and disadvantages of reusing our natural resources.</p>	<p>Teacher will guide students to:</p> <p>Discuss the importance of the forest industry.</p> <p>Assess how using forest resources affects the environment and sustainability.</p> <p>Evaluate the importance of replenishing forest resources.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>
<p>PA Standard 4.2.12 B:</p> <p>Analyze factors affecting the availability of renewable and nonrenewable resources.</p> <p>Evaluate the use of natural resources and offer approaches for using them while diminishing waste.</p> <p>Compare the economics of different areas based on the availability and accessibility of the natural resources.</p>	<p>Teacher will guide students to:</p> <p>Discuss the importance of proper management of forest resources.</p> <p>Compare forest resources used in different areas based on resource accessibility and local economy.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry**CORE CONCEPT 3: Forest Management****MAJOR OBJECTIVE: Identify and describe various methods of forest management.**

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.2.12 C:</p> <p>Analyze factors that influence the availability of natural resources.</p> <p>Compare the use of natural resources in different countries.</p> <p>Determine how delivery systems influence the availability of resources at the local, regional and national level.</p>	<p>Teacher will guide students to:</p> <p>Compare and contrast the use of forest resources to other natural resources in the US.</p> <p>Discuss how distribution influences the use and availability of forest resources at different levels.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Partner/group projects • Individuals during small group work • Individuals during whole group discussion • Oral question and answer • Independent activities • Class participation • Tests and quizzes 	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>
<p>PA Standard 4.2.12 D:</p> <p>Evaluate solid waste management practices</p> <p>Examine and explain the path of a recyclable material from collection to waste, reuse or recycling identifying the market forces.</p> <p>Research new technologies in the use, reuse or recycling of materials.</p>	<p>Teacher will guide students to:</p> <p>Discuss the importance of recycling and how it impacts the forest industry.</p> <p>Examine new technologies that use, reuse, or recycle forest resources.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Partner/group projects • Individuals during small group work • Individuals during whole group discussion • Oral question and answer • Independent activities • Class participation • Tests and quizzes 	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry

CORE CONCEPT 3: Forest Management

MAJOR OBJECTIVE: Identify and describe various methods of forest management.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.3.12 B:</p> <p>Analyze the local, regional and national impacts of environmental health.</p> <p>Analyze the cost of natural disasters in both dollars and loss of natural habitat.</p> <p>Research and analyze the local, state and national laws that deal with point and nonpoint source pollution; evaluate the costs and benefits of these laws.</p> <p>Explain industry's initiatives to meet state and federal mandates on clean air and water.</p> <p>Describe the impacts of point and nonpoint source pollution on the Chesapeake Bay.</p>	<p>Teacher will guide students to:</p> <p>Identify and examine various natural disasters and their effect on the forest industry.</p> <p>Discuss the impact of point and nonpoint source pollution on forests.</p> <p>Explain the role forests play in the Chesapeake Bay watershed.</p> <p>Identify initiatives in the forest industry to meet mandates on minimizing pollution.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry

CORE CONCEPT 3: Forest Management

MAJOR OBJECTIVE: Identify and describe various methods of forest management.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.9.12 A:</p> <p>Analyze environmental laws and regulations as they relate to environmental issues.</p> <p>Analyze and explain how issues lead to environmental law or regulation (e.g., underground storage tanks, regulation of water discharges, hazardous, solid and liquid industrial waste, endangered species).</p> <p>Compare and contrast environmental laws and regulations that may have a positive or negative impact on the environment and the economy.</p> <p>Research and describe the effects of an environmental law or regulation and how it has impacted the environment.</p>	<p>Teacher will guide students to:</p> <p>Examine various laws and regulations that impact the forest industry.</p> <p>Identify and analyze environmental issues that have led to the implementation of environmental laws and regulations.</p> <p>Compare and contrast the effects of various environmental laws and regulations.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry

CORE CONCEPT 4: Dendrology

MAJOR OBJECTIVE: Identify and describe the relationships between plant structure, plant systems and plant function.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.3.12 A:</p> <p>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>Teacher will guide students to:</p> <p>Identify the different external structures of a plant.</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> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry

CORE CONCEPT 4: Dendrology

MAJOR OBJECTIVE: Identify and describe the relationships between plant structure, plant systems and plant function.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.3.12 B:</p> <p>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 forest science.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry

CORE CONCEPT 4: Dendrology

MAJOR OBJECTIVE: Identify and describe the relationships between plant structure, plant systems and plant function.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.1.12 C:</p> <p>Analyze the parameters of a watershed.</p> <p>Apply appropriate techniques in the analysis of a watershed (e.g., water quality, biological diversity, erosion, sedimentation).</p>	<p>Teacher will guide students to:</p> <p>Identify the role of a forest within a watershed.</p> <p>Discuss the importance of forests within watersheds.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>
<p>PA Standard 4.2.12 A:</p> <p>Analyze the use of renewable and nonrenewable resources.</p> <p>Explain the effects on the environment and sustainability through the use of nonrenewable resources.</p> <p>Evaluate the advantages and disadvantages of reusing our natural resources.</p>	<p>Teacher will guide students to:</p> <p>Discuss the importance of multiple uses in a forest ecosystem.</p> <p>Identify various uses of a forested area that can be utilized in a multiple use program.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry

CORE CONCEPT 4: Dendrology

MAJOR OBJECTIVE: Identify and describe the relationships between plant structure, plant systems and plant function.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.3.12.C Analyze the need for a healthy environment</p> <p>Research the relationship of some chronic diseases to an environmental pollutant.</p> <p>Explain how man-made system may affect the environment</p> <p>Course Standard: Describe how natural cycles function to prevent pollution and to renew the environment.</p> <p>Explain the relationship between soil erosion and pollution of surface water.</p> <p>Distinguish among the three soil orders that are of significance to forestry in North America.</p> <p>Describe the similarities and differences among food chains, food webs, and food pyramids.</p>	<p>Teacher will guide students to:</p> <p>Describe the various components in a forest ecosystem.</p> <p>Discuss the importance of species diversity in a forest ecosystem.</p> <p>Compare and contrast the significant forest soil orders in North America.</p> <p>Differentiate between food chains, food webs, and food pyramids.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry

CORE CONCEPT 4: Dendrology

MAJOR OBJECTIVE: Identify and describe the relationships between plant structure, plant systems and plant function.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.5.12 A:</p> <p>Research integrated pest management systems.</p> <p>Analyze the threshold limits of pests and the need for intervention in a managed environment.</p> <p>Research the types of germicides and analyze their effects on homes industry, hospitals and institutions.</p> <p>Design and explain an integrated pest management plan that uses a range of pest controls.</p>	<p>Teacher will guide students to:</p> <p>Identify the components of an integrated pest management system.</p> <p>Identify various forest diseases and pests.</p> <p>Discuss the affects forest diseases and pests.</p> <p>Create a pest management plan.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry**CORE CONCEPT 5: Forest Technologies****MAJOR OBJECTIVE:** Identify and discuss the importance of various uses of technology in the forestry industry.

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.7.12 A:</p> <p>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>Teacher will guide students to:</p> <p>Identify various tools used in the forest industry.</p> <p>Apply advanced tools, materials and techniques to answer complex questions.</p> <p>Demonstrate safe use of selected tools used in the forest industry.</p> <p>Identify safety precautions that are taken in the forest industry.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Partner/group projects • Individuals during small group work • Individuals during whole group discussion • Oral question and answer • Independent activities • Class participation • Tests and quizzes 	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>
<p>PA Standard 3.7.12 B:</p> <p>Evaluate appropriate instruments and apparatus to accurately measure materials and processes.</p> <p>Apply and evaluate the use of appropriate instruments to accurately measure scientific and technologic phenomena within the error limits of the equipment.</p>	<p>Teacher will guide students to:</p> <p>Identify various tools and procedures used to measure materials in the forest industry.</p> <p>Demonstrate the ability to measure various materials in a forested area.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none"> • Partner/group projects • Individuals during small group work • Individuals during whole group discussion • Oral question and answer • Independent activities • Class participation • Tests and quizzes 	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry

CORE CONCEPT 5: Forest Technologies

MAJOR OBJECTIVE: Identify and discuss the importance of various uses of technology in the forestry industry.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.7.12 C:</p> <p>Evaluate computer operations and concepts as to their effectiveness to solve specific problems.</p> <p>Describe and demonstrate atypical software installation.</p>	<p>Teacher will guide students to:</p> <p>Identify the use of different technologies in the forest industry.</p> <p>Discuss the importance of the use of technology in the forest industry.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>
<p>PA Standard 3.7.12 D:</p> <p>Evaluate the effectiveness of computer software to solve specific problems.</p> <p>Evaluate the effectiveness of software to produce an output and demonstrate the process.</p> <p>Analyze, select and apply the appropriate software to solve complex problems.</p> <p>Evaluate the effectiveness of the computer as a presentation tool.</p>	<p>Teacher will guide students to:</p> <p>Describe various programs used in the forest industry.</p> <p>Produce maps by using GPS software.</p> <p>Create a forest use presentation.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry

CORE CONCEPT 5: Forest Technologies

MAJOR OBJECTIVE: Identify and discuss the importance of various uses of technology in the forestry industry.

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.4.12 D:</p> <p>Analyze research and development activities as they relate to agriculture.</p> <p>Analyze the role of research, development and technology as it relates to the food and fiber system.</p>	<p>Teacher will guide students to:</p> <p>Discuss the importance of research technologies in the forest industry.</p> <p>Analyze research and development activities as they relate to agriculture and the food and fiber industry.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Notebook</p> <p>Supplemental materials</p>

CONTENT: Forestry

CORE CONCEPT 6: Forest Products

MAJOR OBJECTIVE: Identify various forest products and by-products.

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>Course Standards:</p> <p>Distinguish between processed woods of the hardwood and softwood varieties</p> <p>Identify distinguishing characteristics useful in identifying woods of different species.</p> <p>Describe the general process by which logs are processed into lumber.</p> <p>Explain the source and methods of processing wood veneers.</p>	<p>Teacher will guide students to:</p> <p>Identify various types of products and by-products produced in the forest industry.</p> <p>Discuss the importance of each product and by-product of the forest industry.</p> <p>Identify methods of processing logs into the lumber.</p> <p>Discuss the processing methods of wood veneers.</p>	<p>Teacher evaluation of:</p> <ul style="list-style-type: none">• Partner/group projects• Individuals during small group work• Individuals during whole group discussion• Oral question and answer• Independent activities• Class participation• Tests and quizzes	<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 (D or above) of achievement, including all of the skills noted in the specific content area of this curriculum.

B. Grading system for Forestry 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%.