



Pine Grove Area

SCHOOL DISTRICT

Science

Natural Resource Management

September 18, 2008

I. PHILOSOPHY

The Natural Resource Management course of the Pine Grove Area School District has been structured to introduce, systematically and thematically, the basic principles of resource management. Students will acquire a basic level of understanding in many areas of natural resource identification, resource conservation and management, soil resources, water resources, and energy resources. 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. Natural Resource Identification: Identify various types of natural resources.
2. Resource Conservation and Management: Identify and examine a variety of methods used for conservation and management of natural resources.
3. Soil Resources: Identify various types of soil resources and examine the importance and value of each.
4. Water Resources: Identify various types of water resources and examine the importance and value of each.
5. Energy Resources: Identify various types of alternative energy resources and examine the importance and value of each

III. COURSE OF STUDY

A. Course Name: Natural Resource Management

B. Grade Level: 9-10

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 need for conservation of our natural resources. Topics to be covered include natural resources identification, resource conservation and management, soil resources, water resources, energy resources, and agriculture.

IV. CONTENT: Natural Resource Management

CORE CONCEPT 1: Natural Resource Identification

MAJOR OBJECTIVE: Identify various types of natural resources

CURRICULUM STANDARD:			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.2.10 A:</p> <p>Explain that renewable and nonrenewable resources supply energy and materials.</p> <p>Identify alternative sources of energy.</p> <p>Compare and contrast the cycles of various natural resources.</p> <p>Explain food and fiber as renewable resources.</p>	<p>Teacher will guide students to:</p> <p>Identify major natural resources.</p> <p>Compare and contrast renewable and nonrenewable resources.</p> <p>Identify alternative sources of energy and how it's used.</p> <p>Explain the cycles of various natural resources.</p> <p>Describe how food and fiber is considered a renewable resource.</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: Natural Resource Management

CORE CONCEPT 1: Natural Resource Identification

MAJOR OBJECTIVE: Identify various types of natural resources

CURRICULUM STANDARD:

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.2.10 B:</p> <p>Evaluate factors affecting availability of natural resources.</p> <p>Describe natural occurrences that may affect the natural resources.</p> <p>Analyze technologies that affect the use of our natural resources.</p> <p>Evaluate the effect of consumer desires on various natural resources</p>	<p>Teacher will guide students to:</p> <p>Identify and evaluate factors that affect the availability of natural resources.</p> <p>Explain how technology impacts the use of natural resources.</p> <p>Describe how consumer demands control the availability of natural 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: Natural Resource Management

CORE CONCEPT 1: Natural Resource Identification

MAJOR OBJECTIVE: Identify various types of natural resources

CURRICULUM STANDARD:

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.6.10 A:</p> <p>Explain the biotic and abiotic components of an ecosystem and their interaction.</p> <p>Compare and contrast the interactions of biotic and abiotic components in an ecosystem.</p> <p>Analyze the effects of abiotic factors on specific ecosystems.</p> <p>Describe how the availability of resources affects organisms in an ecosystem.</p> <p>Explain energy flow in a food chain through an energy pyramid.</p> <p>Evaluate the efficiency of energy flow in a food chain.</p>	<p>Teacher will guide students to:</p> <p>Describe the relationship between abiotic and biotic natural resources.</p> <p>Examine the role abiotic resources have in an ecosystem.</p> <p>Explain how resource availability affects an ecosystem.</p> <p>Describe the flow of energy through a food chain and food pyramid.</p> <p>Discuss the efficiency of energy flow in food chains.</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: Natural Resource Management

CORE CONCEPT 1: Natural Resource Identification

MAJOR OBJECTIVE: Identify various types of natural resources

CURRICULUM STANDARD:

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.6.10 B:</p> <p>Explain how cycles affect the balance in an ecosystem.</p> <p>Describe an element cycle and its role in an ecosystem.</p> <p>Explain the consequences of interrupting natural cycles.</p>	<p>Teacher will guide students to:</p> <p>Identify various element cycles in an ecosystem.</p> <p>Discuss the effects of interrupting resource cycles in an 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>
<p>PA Standard 4.6.10 C:</p> <p>Analyze how ecosystems change over time.</p> <p>Identify and explain the succession stages in an ecosystem.</p> <p>Identify causes of succession.</p> <p>Analyze consequences of interrupting natural cycles.</p>	<p>Teacher will guide students to:</p> <p>Identify various ways in which ecosystems change over time.</p> <p>Describe the stages of succession.</p> <p>Identify various causes of succession.</p> <p>Compare and contrast consequences of interrupting various natural cycles.</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: Natural Resource Management

CORE CONCEPT 2: Resource Conservation & Management

MAJOR OBJECTIVE: Identify and examine a variety of methods used for conservation and management of natural resources.

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.2.10 C:</p> <p>Analyze how man-made systems have impacted the management and distribution of natural resources.</p> <p>Analyze energy uses and energy conservation in different regions.</p> <p>Examine conservation practices in different countries.</p> <p>Analyze the costs and benefits of different man-made systems and how they use renewable and nonrenewable natural resources.</p> <p>Analyze the impact of information systems on management and distribution of natural resources.</p>	<p>Teacher will guide students to:</p> <p>Identify various uses of energy resources.</p> <p>Identify different methods of resource conservation.</p> <p>Compare and contrast conservation practices in different areas of the United States.</p> <p>Discuss the use of information systems in the management of natural 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: Natural Resource Management

CORE CONCEPT 2: Resource Conservation & Management

MAJOR OBJECTIVE: Identify and examine a variety of methods used for conservation and management of natural resources.

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.3.10 B:</p> <p>Explain how multiple variables determine the effects of pollution on environmental health, natural processes and human practices.</p> <p>Explain how human practices affect the quality of the water and soil</p> <p>Identify evidence of natural events around the world and their effects on environmental health (e.g., Yellowstone National Park fires).</p> <p>Identify local and state environmental regulations and their impact on environmental health.</p> <p>Analyze data and explain how point source pollution can be detected and eliminated.</p> <p>Identify and explain ways of detecting pollution by using state-of-the-art technologies.</p>	<p>Teacher will guide students to:</p> <p>Identify activities that affect the quality of natural resources.</p> <p>Examine natural events that effect environmental health.</p> <p>Examine various environmental regulations and their impact on the environment.</p> <p>Compare and contrast various types of point and non-point source pollution.</p> <p>Explain how technology is used to identify sources of pollution.</p> <p>Identify various types of technology used to identify pollution sources.</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: Natural Resource Management

CORE CONCEPT 2: Resource Conservation & Management

MAJOR OBJECTIVE: Identify and examine a variety of methods used for conservation and management of natural resources.

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.8.10 A:</p> <p>Analyze how society’s needs relate to the sustainability of natural resources.</p> <p>Explain why some societies have been unable to meet their natural resource needs.</p> <p>Compare and contrast the use of natural resources and the environmental conditions in several countries.</p> <p>Describe how uses of natural resources impact sustainability</p>	<p>Teacher will guide students to:</p> <p>Examine the use of natural resources in various areas of the United States.</p> <p>Explain how the use of natural resources impacts sustainability.</p> <p>Examine factors that keep some society from meeting their natural resource needs.</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 4.8.10 B:</p> <p>Analyze the relationship between the use of natural resources and sustaining our society.</p> <p>Explain the role of natural resources in sustaining society.</p> <p>Analyze the effects of a natural resource’s availability on a community or region</p>	<p>Teacher will guide students to:</p> <p>Discuss the importance of natural resources in a sustainable society.</p> <p>Discuss the impact of resource availability on an 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: Natural Resource Management

CORE CONCEPT 2: Resource Conservation & Management

MAJOR OBJECTIVE: Identify and examine a variety of methods used for conservation and management of natural resources.

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.8.10 C:</p> <p>Analyze how human activities may cause changes in an ecosystem.</p> <p>Analyze and evaluate changes in the environment that are the result of human activities.</p> <p>Compare and contrast the environmental effects of different industrial strategies (e.g., energy generation, transportation, logging, mining, agriculture).</p>	<p>Teacher will guide students to:</p> <p>Evaluate human activities that effect changes in natural resource availability.</p> <p>Discuss how various industry contribute to environmental conditions.</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: Natural Resource Management

CORE CONCEPT 2: Resource Conservation & Management

MAJOR OBJECTIVE: Identify and examine a variety of methods used for conservation and management of natural resources.

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.8.10 D:</p> <p>Explain how the concept of supply and demand affects the environment.</p> <p>Identify natural resources for which societal demands have been increasing.</p> <p>Identify specific resources for which human consumption has resulted in scarcity of supply (e.g., buffalo, lobsters).</p> <p>Describe the relationship between population density and resource use and management.</p>	<p>Teacher will guide students to:</p> <p>Identify natural resources that are in high demand and increasing.</p> <p>Discuss the reason why consumption of resources has increased.</p> <p>Discuss how supply and demand control the use of natural resources.</p> <p>Analyze the relationship between population density and resource management.</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: Natural Resource Management

CORE CONCEPT 2: Resource Conservation & Management

MAJOR OBJECTIVE: Identify and examine a variety of methods used for conservation and management of natural resources.

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.9.10 A:</p> <p>Explain why environmental laws and regulations are developed and enacted.</p> <p>Explain the positive and negative impacts associated with passing environmental laws and regulations.</p> <p>Analyze the roles that local, state and federal governments play in the development and enforcement of environmental laws.</p> <p>Identify local and state environmental regulations and their impact on environmental health.</p> <p>Explain the positive and negative impacts of the Endangered Species Act.</p>	<p>Teacher will guide students to:</p> <p>Discuss positive and negative impacts associated with environmental laws and regulations.</p> <p>Describe and analyze the roles that government has in the development of environmental laws.</p> <p>Identify various environmental laws and the impact they have on environmental health.</p> <p>Compare and contrast the impacts of the Endangered Species Act.</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: Natural Resource Management

CORE CONCEPT 3: Soil Resources

MAJOR OBJECTIVE: Identify various types of soil resources and examine the importance and value of each

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.10 A:</p> <p>Relate earth features and processes that change the earth.</p> <p>Interpret topographic maps to identify and describe significant geologic history/structures in Pennsylvania.</p> <p>Explain several methods of dating earth materials and structures.</p>	<p>Teacher will guide students to:</p> <p>Examine and interpret topographic maps.</p> <p>Identify various geologic structures on topographic maps.</p> <p>Describe the process of identifying soils.</p> <p>Identify various types of rocks and minerals.</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: Natural Resource Management

CORE CONCEPT 3: Soil Resources

MAJOR OBJECTIVE: Identify various types of soil resources and examine the importance and value of each

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.4.10 A:</p> <p>Describe the importance of agriculture to society.</p> <p>Identify the major cash crops of Pennsylvania.</p> <p>Compare and contrast the influence of agriculture on a nation's culture, standard of living and foreign trade.</p> <p>Identify laws that affect conservation and management of food and fiber production in the local area and analyze their impact.</p>	<p>Teacher will guide students to:</p> <p>Describe the influence that agriculture has on different soil structures.</p> <p>Identify agricultural soils and discuss their importance in the production of crops.</p> <p>Discuss laws that affect soil conservation and management.</p> <p>Examine the importance of laws that affect soil conservation and management.</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: Natural Resource Management

CORE CONCEPT 3: Soil Resources

MAJOR OBJECTIVE: Identify various types of soil resources and examine the importance and value of each

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.4.10 B:</p> <p>Assess the influence of agricultural science on farming practices.</p> <p>Compare the practices of no-till farming to traditional soil preparation (e.g., plow, disc).</p> <p>Analyze and explain the various practices of nutrient management on the farm.</p>	<p>Teacher will guide students to:</p> <p>Identify agricultural processes that promote soil conservation.</p> <p>Compare and contrast various methods of soil preparation and their effect on the environment.</p> <p>Identify the major components of a nutrient 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>
<p>PA Standard 4.4.10 C:</p> <p>Explain the functions of the components of the food and fiber system.</p> <p>Compare and analyze growing conditions in the United States to determine which plants and animals are most suitable to each region.</p>	<p>Teacher will guide students to:</p> <p>Identify and describe necessary soil conditions for growing different crops</p> <p>Discuss ideal soil conditions for producing crops in the US.</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: Natural Resource Management

CORE CONCEPT 4: Water Resources

MAJOR OBJECTIVE: Identify various types of water resources and examine the importance and value of each

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.10 D:</p> <p>Assess the value of water as a resource.</p> <p>Compare specific sources of potable water (e.g., wells, public systems, rivers) used by people in Pennsylvania.</p> <p>Relate aquatic life to water conditions (e.g., turbidity, temperature, salinity, dissolved oxygen, nitrogen levels, pressure).</p> <p>Compare commercially important aquatic species in or near Pennsylvania.</p> <p>Assess the natural and man-made factors that affect the availability of clean water (e.g., rock and mineral deposits, man-made pollution).</p>	<p>Teacher will guide students to:</p> <p>Compare and contrast different sources of potable water.</p> <p>Compare water conditions to various forms of aquatic life.</p> <p>Examine different factors that affect the availability of clean water.</p> <p>Identify beneficial aquatic organisms found in Pennsylvania waterways.</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: Natural Resource Management

CORE CONCEPT 4: Water Resources

MAJOR OBJECTIVE: Identify various types of water resources and examine the importance and value of each

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.1.10 A:</p> <p>Describe changes that occur from a stream's origin to its final outflow.</p> <p>Identify Pennsylvania's major watersheds and their related river systems.</p>	<p>Teacher will guide students to:</p> <p>Identify major watersheds in Pennsylvania.</p> <p>Discuss changes that occur along a stream from origin to outflow.</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: Natural Resource Management

CORE CONCEPT 4: Water Resources

MAJOR OBJECTIVE: Identify various types of water resources and examine the importance and value of each

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.1.10 B:</p> <p>Explain the relationship among landforms, vegetation and the amount and speed of water.</p> <p>Describe how topography influences streams.</p> <p>Explain the influence of mountains on precipitation.</p> <p>Explain how vegetation affects storm water runoff.</p> <p>Delineate the boundaries of a watershed.</p> <p>Describe factors that affect the quality of groundwater.</p> <p>Explain how the speed of water and vegetation cover relates to erosion.</p>	<p>Teacher will guide students to:</p> <p>Discuss the importance of vegetation along bodies of water.</p> <p>Describe the importance of topography on precipitation.</p> <p>Identify factors that affect water runoff.</p> <p>Identify the boundaries of watersheds.</p> <p>Discuss factors that affect groundwater quality.</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: Natural Resource Management

CORE CONCEPT 4: Water Resources

MAJOR OBJECTIVE: Identify various types of water resources and examine the importance and value of each

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.1.10 C:</p> <p>Describe the physical characteristics of a stream and determine the types of organisms found in aquatic environments.</p> <p>Describe and explain the physical factors that affect a stream and the organisms living there.</p> <p>Identify terrestrial and aquatic organisms that live in a watershed.</p> <p>Explain the habitat needs of specific aquatic organisms.</p>	<p>Teacher will guide students to:</p> <p>Identify a stream's physical characteristics.</p> <p>Describe physical characteristics that influence aquatic life in a stream.</p> <p>Identify various aquatic organisms that live in a watershed.</p> <p>Describe the role of aquatic organisms in 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>

CONTENT: Natural Resource Management

CORE CONCEPT 4: Water Resources

MAJOR OBJECTIVE: Identify various types of water resources and examine the importance and value of each

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.1.10 D:</p> <p>Describe the multiple functions of wetlands.</p> <p>Describe wetlands in terms of their effects (e.g., habitat, flood, buffer zones, prevention areas, nurseries, food production areas).</p> <p>Explain how a wetland influences water quality, wildlife and water retention.</p> <p>Analyze wetlands through their indicators (e.g., soils, plants, hydrology).</p>	<p>Teacher will guide students to:</p> <p>Discuss characteristics of wetlands.</p> <p>Analyze how wetlands influence water quality.</p> <p>Identify wetland indicators.</p> <p>Describe the importance of various wetland indicators.</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: Natural Resource Management

CORE CONCEPT 4: Water Resources

MAJOR OBJECTIVE: Identify various types of water resources and examine the importance and value of each

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.1.10 E:</p> <p>Identify and describe natural and human events on watersheds and wetlands.</p> <p>Describe how natural events affect a watershed (e.g., drought, floods).</p> <p>Identify the effects of humans and human events on watersheds.</p>	<p>Teacher will guide students to:</p> <p>Explain how natural events affect watersheds.</p> <p>Describe how humans affect 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>

CONTENT: Natural Resource Management

CORE CONCEPT 5: Energy Resources

MAJOR OBJECTIVE: Identify various types of alternative energy resources and examine the importance and value of each

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
PA Standard 3.4.10 B: Analyze energy sources and transfers of heat.	Teacher will guide students to: Identify sources of alternative energy.	Teacher evaluation of: <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	Textbook resources Computer programs/web sites Notebook Supplemental materials

CONTENT: Natural Resource Management

CORE CONCEPT 5: Energy Resources

MAJOR OBJECTIVE: Identify various types of alternative energy resources and examine the importance and value of each

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.5.10 B:</p> <p>Explain sources and uses of earth resources.</p> <p>Compare the locations of strategic minerals and earth resources in the world with their geologic history using maps and global information systems.</p> <p>Demonstrate the effects of sedimentation and erosion before and after a conservation plan is implemented.</p> <p>Evaluate land use (e.g., agricultural, recreational, residential, commercial) in Pennsylvania based upon soil characteristics.</p>	<p>Teacher will guide students to:</p> <p>Compare and contrast effects of erosion before and after a conservation plan is implemented.</p> <p>Evaluate the various forms of land use.</p> <p>Explain how resource use affects the type of energy used in that location.</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: Natural Resource Management

CORE CONCEPT 5: Energy Resources

MAJOR OBJECTIVE: Identify various types of alternative energy resources and examine the importance and value of each

CURRICULUM STANDARD:			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 3.6.10 A:</p> <p>Apply biotechnologies that relate to propagating, growing, maintaining, adapting, treating and converting.</p> <p>Apply knowledge of plant and animal production processes in designing and improvement to existing processes.</p> <p>Describe specific examples that reflect the impact that agricultural science has had on biotechnology.</p>	<p>Teacher will guide students to:</p> <p>Identify various technologies that can be used to generate a source of energy.</p> <p>Identify related agricultural energy sources.</p> <p>Discuss the importance of related agricultural energy sources.</p> <p>Investigate the use of plant and animal production in the development of alternative energies.</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: Natural Resource Management

CORE CONCEPT 5: Energy Resources

MAJOR OBJECTIVE: Identify various types of alternative energy resources and examine the importance and value of each

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 4.4.10 D:</p> <p>Analyze the efforts of increased efficiency in agriculture through technology.</p> <p>Compare various technological advancements and analyze each for its contribution toward labor and cost efficiency.</p> <p>Compare the current market value of both natural and alternative energy sources involved in the production of food and fiber.</p>	<p>Teacher will guide students to:</p> <p>Discuss the use of technology in developing alternative energy sources.</p> <p>Compare natural and alternative energy sources.</p> <p>Discuss the benefits of alternative energy sources.</p> <p>Compare and contrast environmental impacts of various alternative energy sources.</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 Natural Resource Management 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%.