

FORESTRY AND PLANTS CURRICULUM

Course 18093

Forestry and Plants is designed to teach students about Pennsylvania's forest. Students will learn about the history of Pennsylvania forests, current forest management techniques and trends, tools used in forestry, how trees and plants grow, forest invasive plants and insect pests, the scientific names of Pennsylvania's trees and how to identify trees using several techniques (bark, fruits, flowers, and leaves). Students will also be constructing a tree collection guide while completing this course.

FORESTRY AND PLANTS OUTLINE:

Goals	Skills	Summative Assessments	Time Frame	Main Resources
<ul style="list-style-type: none">• Understand how humans have changed the forest of Pennsylvania throughout history.• Explain some of the common forestry terminology.• Describe the steps involved in taking a tree from the forest and turning it into furniture.• Describe the parts of a leaf, stem, root, flower and the functions of each part.• Understand the importance of being able to identify the trees of Pennsylvania or of any state that they may eventually live in.	<ul style="list-style-type: none">• Identify various trees of the Pennsylvania forest by their bark, leaves, and/or flowers.	End of Chapter Tests	1/2-year	

FORESTRY AND PLANTS MAP:

TIME FRAME	BIG IDEAS	CONCEPTS	ESSENTIAL QUESTIONS	STANDARDS	OBJECTIVES	DIFFERENTIATION	ASSESSMENT
Unit 1: History of PA Forest (Weeks 1-3)	<ul style="list-style-type: none"> The history of Pennsylvania's forest is an amazing story of trial and error. Pennsylvania's forest have supplied and still supply many useful products. 	<ol style="list-style-type: none"> Understanding how Pennsylvania's forest has changed throughout history. Understanding the many uses that Pennsylvania's forest have offered people throughout history. 	<ul style="list-style-type: none"> Describe what Pennsylvania's forest looked like during the different times periods throughout history. Explain some of the problems associated with how Pennsylvania's forest changed throughout history. Explain the role of the CCC in Pennsylvania's forest history. 	<p>4.1.10.B Explain the consequences of interrupting natural cycles.</p> <p>4.1.10.E Analyze how humans influence the pattern of natural changes (e.g. primary / secondary succession and desertification) in ecosystems over time.</p> <p>4.1.12.C Research how humans affect energy flow within an ecosystem.</p> <p>Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem</p>	<ul style="list-style-type: none"> Understand how humans have changed the forest of Pennsylvania throughout history. Understand who owns most of Pennsylvania's forest today. Identify some of the things that the CCC did to correct mistakes in Pennsylvania's forest. 	<p>Students will be given the following: Preferential seating when applicable</p> <p>Study guides</p> <p>Guided notes when applicable</p> <p>Extended time for assignments when needed</p> <p>Separate testing environment when applicable</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities (They will construct a leaf collection.)</p>
Unit 2: Silviculture (Weeks 4-7)	<ul style="list-style-type: none"> Timber harvesting is a big industry in Pennsylvania. Proper management of our natural resources is essential for the survival of all organisms. 	<ol style="list-style-type: none"> Understanding the many silviculture techniques available to you as a land owner. Understanding the timber harvesting process, from forest to furniture. Understanding how to use the forestry equipment. 	<ul style="list-style-type: none"> Compare and contrast the different silviculture techniques and determine which ones are more beneficial to the environment. Describe the difference between an even-aged and uneven-aged stand of timber. Explain the use of all the forestry equipment. 	<p>4.1.10.A Examine the effects of limiting factors on population dynamics.</p> <p>Analyze possible causes of population fluctuations.</p> <p>Explain the concept of carrying capacity in an ecosystem.</p> <p>Describe how organisms become classified as threatened or endangered.</p> <p>Describe how limiting factors cause organisms to become extinct.</p> <p>4.1.10.B Explain the consequences of interrupting natural cycles.</p> <p>4.1.10.D Research practices that impact biodiversity in specific ecosystems.</p>	<ul style="list-style-type: none"> Understand the different silviculture techniques and be able to explain which ones are more beneficial to a forest. Explain how to use certain forestry equipment. Explain some of the common forestry terminology and how to calculate things like board footage and cords. Differentiate the steps involved in taking a tree from the forest and turning it into furniture 	<p>Students will be given the following: Preferential seating when applicable</p> <p>Study guides</p> <p>Guided notes when applicable</p> <p>Extended time for assignments when needed</p> <p>Separate testing environment when applicable</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities (They will construct a leaf collection.)</p>

Analyze the relationship between habitat changes to plant and animal population fluctuations.

4.1.10.E

Analyze how humans influence the pattern of natural changes (e.g. primary / secondary succession and desertification) in ecosystems over time.

4.1.10.F

Compare and contrast scientific theories.

Know that both direct and indirect observations are used by scientists to study the natural world and universe.

Identify questions and concepts that guide scientific investigations.

Formulate and revise explanations and models using logic and evidence.

Recognize and analyze alternative explanations and models.

4.1.12.A

Analyze the significance of biological diversity in an ecosystem.

Explain how species adapt to limiting factors in an ecosystem.

Analyze the differences between natural causes and human causes of extinction.

Research wildlife management laws and their effects on biodiversity.

4.1.12.C

Research how humans affect energy flow within an ecosystem.

				Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem 4.1.12.E Research solutions addressing human impacts on ecosystems over time.			
Unit 3: Plant Structure and Function (Weeks 8-9)	<ul style="list-style-type: none"> The structure and function of plants is important to all organisms. Plants supply both food and oxygen to all living organisms. 	<ol style="list-style-type: none"> Understanding the many silviculture techniques available to you as a land owner. Understanding the timber harvesting process, from forest to furniture. Understanding how to use the forestry equipment. 	<ul style="list-style-type: none"> Compare and contrast the different silviculture techniques and determine which ones are more beneficial to the environment. Describe the difference between an even-aged and uneven-aged stand of timber. Explain the use of all the forestry equipment. 	<p>4.1.10.A Examine the effects of limiting factors on population dynamics.</p> <p>Analyze possible causes of population fluctuations.</p> <p>Explain the concept of carrying capacity in an ecosystem.</p> <p>Describe how organisms become classified as threatened or endangered.</p> <p>Describe how limiting factors cause organisms to become extinct.</p> <p>4.1.10.B Explain the consequences of interrupting natural cycles.</p> <p>4.1.10.D Research practices that impact biodiversity in specific ecosystems.</p> <p>Analyze the relationship between habitat changes to plant and animal population fluctuations.</p> <p>4.1.10.E Analyze how humans influence the pattern of natural changes (e.g. primary / secondary succession and desertification) in ecosystems over time.</p> <p>4.1.10.F Compare and contrast scientific theories.</p> <p>Know that both direct and indirect observations are used by scientists to study the natural world and universe.</p>	<ul style="list-style-type: none"> Understand the different silviculture techniques and be able to explain which ones are more beneficial to a forest. Explain how to use certain forestry equipment. Explain some of the common forestry terminology and how to calculate things like board footage and cords. Differentiate the steps involved in taking a tree from the forest and turning it into furniture. 	<p>Students will be given the following: Preferential seating when applicable</p> <p>Study guides</p> <p>Guided notes when applicable</p> <p>Extended time for assignments when needed</p> <p>Separate testing environment when applicable</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities (They will construct a leaf collection.)</p>

				<p>Identify questions and concepts that guide scientific investigations.</p> <p>Formulate and revise explanations and models using logic and evidence.</p> <p>Recognize and analyze alternative explanations and models.</p> <p>4.1.12.A Analyze the significance of biological diversity in an ecosystem.</p> <p>Explain how species adapt to limiting factors in an ecosystem.</p> <p>Analyze the differences between natural causes and human causes of extinction.</p> <p>Research wildlife management laws and their effects on biodiversity.</p> <p>4.1.12.C Research how humans affect energy flow within an ecosystem.</p> <p>Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem</p> <p>4.1.12.E Research solutions addressing human impacts on ecosystems over time.</p>			
<p>Unit 4: Pennsylvania Tree Identification (Weeks 10-13)</p>	<ul style="list-style-type: none"> • Pennsylvania has a diverse number of tree species, each with its own identification features. • Using a dichotomous key is important in 	<ol style="list-style-type: none"> 1. Understanding how plants work. 2. Understanding the structure of all parts of a plant, both herbaceous and woody plants. 	<ul style="list-style-type: none"> • Describe the parts of a woody and herbaceous stem. • Explain the involvement of a leaf in producing food and oxygen through 	<p>3.1.10.A8 Investigate the spatial relationships of organisms' anatomical features using specimens, models, or computer programs.</p> <p>3.1.12.A2 Evaluate how organisms must derive energy from their environment or their food in order to survive.</p>	<ul style="list-style-type: none"> • Understand the different parts of a plant, leaf, stem, roots, and flowers. • Explain the function of all the parts of a plant, leaf, stem, roots, and flowers. • Identify the different parts of 	<p>Students will be given the following: Preferential seating when applicable</p> <p>Study guides</p> <p>Guided notes when applicable</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities (They will construct a leaf collection.)</p>

	the environmental sciences.		photosynthesis <ul style="list-style-type: none"> Describe the parts of a flower and how pollination and fertilization occur. 		each plant part, leaf, stem, roots, and flowers.	Extended time for assignments when needed Separate testing environment when applicable	
Unit 5: Forest Levels and Tree Shade Tolerances (Weeks 14-15)	<ul style="list-style-type: none"> All trees have a special place within the forest. All trees require different materials for growth and success. 	<ol style="list-style-type: none"> Describing the vertical levels of a forest. Explaining the crown classes of trees within a forest. Distinguishing tree shade tolerances. 	<ul style="list-style-type: none"> Describe the vertical levels within a forest. Give the crown classes of trees and define what they mean. Explain shade tolerance. 	<p>4.3.10.A Evaluate factors affecting the use of natural resources.</p> <p>Evaluate the effect of consumer demands on the use of natural resources.</p> <p>Analyze how technologies such as modern mining, harvesting, and transportation equipment affect the use of our natural resources.</p> <p>Describe how local and state agencies manage natural resources.</p> <p>4.3.12.A Evaluate the advantages and disadvantages of using renewable and nonrenewable resources.</p> <p>Explain how consumption rate affects the sustainability of resource use.</p> <p>Evaluate the advantages and disadvantages of using renewable resources such as solar power, wind power, and biofuels.</p>	<ul style="list-style-type: none"> Distinguish the vertical levels of a forest. Explain what shade tolerance of a tree is and distinguish which of PA's trees are tolerant, intermediate, and intolerant of shade. Distinguish the crown classes of trees in a forest based on how much sunlight they are exposed to. 	<p>Students will be given the following: Preferential seating when applicable</p> <p>Study guides</p> <p>Guided notes when applicable</p> <p>Extended time for assignments when needed</p> <p>Separate testing environment when applicable</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities (They will construct a leaf collection.)</p>
Unit 6: Leaf Collection (Weeks 16-18)	<ul style="list-style-type: none"> Students should be able to identify the trees of Pennsylvania because they will eventually be land owners themselves. 	<ol style="list-style-type: none"> Pennsylvania's forest are predominantly privately owned, so the management of Pennsylvania's forest is put into the hands of our future land owners. 	<ul style="list-style-type: none"> Explain why it is important to know what tree species you are dealing with. Explain what you role will become if you are a land owner in Pennsylvania. 	<p>4.1.10.B Explain the consequences of interrupting natural cycles.</p> <p>4.1.10.E Analyze how humans influence the pattern of natural changes (e.g. primary / secondary succession and desertification) in ecosystems over time.</p> <p>4.1.12.A</p>	<ul style="list-style-type: none"> Understand the importance of being able to identify the trees of Pennsylvania or of any state that they may eventually live in. Understand the consequences of not being able to identify the trees. 	<p>Students will be given the following: Preferential seating when applicable</p> <p>Study guides</p> <p>Guided notes when applicable</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities (They will construct a leaf collection.)</p>

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