WETLANDS AND AQUATICS CURRICULUM

Course 18092

Wetlands and Aquatics will introduce students to the different types of wetlands and aquatic ecosystems. The students will also look at the aquatic life (Fish, Reptiles, Amphibians, and Macroinvertebrates) and how to preserve wetlands. They will also test water and learn how to make a stream more beneficial for living organisms.

WETLANDS AND AQUATICS OUTLINE:

Goals	Skills	Summative Assessments	Time Frame	Main Resources
• Know the vocabulary and terminology associated with wetland and aquatic biology. • Explain some of the major pollutants of Pennsylvania's waters and how we can reclaim our streams. • Describe common PA fish and watersheds they are found in along with factors that affect their distribution. • Explain the sensitivity to environmental factors for each macro-invertebrate and how this can help determine water quality. • Distinguish the factors that affect the salamanders of Pennsylvania. • Distinguish the factors that affect the fish of Pennsylvania.	• Identify the major species of fish, frogs, toads, salamanders, reptiles, and aquatic insects of Pennsylvania.	End of Chapter Tests	1/2-year	

WETLANDS AND AQUATICS MAP:

TIME FRAME	BIG IDEAS	CONCEPTS	ESSENTIAL QUESTIONS	STANDARDS	OBJECTIVES	DIFFERENTIATION	ASSESSMENT
Unit 1: Wetlands, Watershed, Stream Order, Water Cycle, and Pollution (Weeks 1-3)	• Wetlands play a crucial role in maintaining a healthy planet. • Clean water is important to all living organisms.	1. Wetlands supply use with many opportunities and services. 2. Water is an important resource to all living things. 3. Maintaining clean water is important. 4. Understanding where our water comes from is crucial to protecting this important resource.	• Explain what a wetland is and compare and contrast the different types. • Describe what a watershed is. • Discuss the importance of maintaining a clean water source.	4.1.10.A Examine the effects of limiting factors on population dynamics. Analyze possible causes of population fluctuations. Explain the concept of carrying capacity in an ecosystem. Describe how organisms become classified as threatened or endangered. Describe how limiting factors cause organisms to become extinct. 4.1.12.F Examine the status of existing theories. Evaluate experimental information for relevance and adherence to science processes. Judge that conclusions are consistent and logical with experimental conditions. Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution. Communicate and defend a scientific argument. 4.2.10.A Examine the interactions between abiotic and biotic factors within a watershed. Describe how topography influences the flow of water in a watershed.	• Define what a wetland is and explain the different types of wetlands. • Define what a watershed is and identify the six major watersheds in PA. • Understand how to determine the order of a stream. • Explain some of the major pollutants of Pennsylvania's waters and how we can reclaim our streams.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

				Describe how vegetation affects water runoff. Investigate and analyze the effects of land use on the quality of water in a watershed. 4.2.10.B Examine how human interactions impact wetlands and their surrounding environments. Describe how land use decisions affect wetlands 4.2.10.C Explain the relationship between water quality and the diversity of life in a freshwater ecosystem. Explain how limiting factors affect the growth and reproduction of freshwater organisms. 4.2.10.D 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. 4.2.12.D Examine the status of existing theories. Evaluate experimental information for relevance and adherence to science processes.			

				Judge that conclusions are consistent and logical with experimental conditions. Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution. Communicate and defend a scientific argument.			
Unit 2: Fish of Pennsylvania (Weeks 4-6)	• Pennsylvania has a diverse number of fish species. • Each fish species has a particular habitat that it can survive in.	1. The watersheds of Pennsylvania offer each fish species what it needs for survival. 2. All fish live in a certain range for water quality (pH, dissolved oxygen, and temperature).	• Explain why Pennsylvania has so many different fish species. • Describe some of the factors that affect where you find a fish species in Pennsylvania.	4.1.10.D Research practices that impact biodiversity in specific ecosystems. Analyze the relationship between habitat changes to plant and animal population fluctuations. 4.2.10.C Explain the relationship between water quality and the diversity of life in a freshwater ecosystem. Explain how limiting factors affect the growth and reproduction of freshwater organisms.	• Distinguish the external parts of a fish. • Identify the fish of Pennsylvania. • Distinguish the factors that affect the fish of Pennsylvania. • Explain what watersheds they will find each fish in Pennsylvania. • Explain which species are endangered and which are invasive.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities
Unit 3: Macro-Invertebrates (Weeks 7-10)	• Pennsylvania has a diverse number of macro-invertebrates. • Each macro-invertebrate species has a particular habitat that it can survive in.	1. The watersheds of Pennsylvania offer each macro-invertebrate species what it needs for survival. 2. All macro-invertebrates live in a certain range for water quality (pH, dissolved oxygen, and temperature), they are a good indicator as to	• Explain why Pennsylvania has so many different macro-invertebrate species. • Describe some of the factors that affect where you find a macro-invertebrate species in Pennsylvania.	4.1.10.D Research practices that impact biodiversity in specific ecosystems. Analyze the relationship between habitat changes to plant and animal population fluctuations. 4.2.10.C Explain the relationship between water quality and the diversity of life in a freshwater ecosystem. Explain how limiting factors affect the growth and reproduction of freshwater organisms.	• Identify the macro-invertebrates of Pennsylvania. • Distinguish the factors that affect the macro-invertebrates of Pennsylvania. • Explain the sensitivity to environmental factors for each macro-invertebrate and how this can help determine water quality. • Explain which species are	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

		the quality of the water.			endangered and which are invasive.		
Unit 4: Frogs and Toads (Weeks 11-12)	• Pennsylvania has a diverse number of frogs and toads. • Each frog and toad species has a particular habitat that it can survive in.	1. The watersheds of Pennsylvania offer each frog and toad species what it needs for survival. 2. All frogs and toads live in a certain range for water quality (pH, dissolved oxygen, and temperature).	• Explain why Pennsylvania has so many different frog and toad species. • Describe some of the factors that affect where you find a frog or toad species in Pennsylvania.	4.1.10.D Research practices that impact biodiversity in specific ecosystems. Analyze the relationship between habitat changes to plant and animal population fluctuations. 4.2.10.C Explain the relationship between water quality and the diversity of life in a freshwater ecosystem. Explain how limiting factors affect the growth and reproduction of freshwater organisms.	• Identify the frogs and toads of Pennsylvania. • Distinguish the factors that affect the frogs and toads of Pennsylvania. • Explain which species are endangered and which are invasive.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities
Unit 5: Salamanders (Weeks 13-14)	• Pennsylvania has a diverse number of salamanders. • Each salamander species has a particular habitat that it can survive in.	1. The watersheds of Pennsylvania offer each salamander species what it needs for survival. 2. All salamanders live in a certain range for water quality (pH, dissolved oxygen, and temperature).	• Explain why Pennsylvania has so many different salamander species. • Describe some of the factors that affect where you find a salamander species in Pennsylvania.	4.1.10.D Research practices that impact biodiversity in specific ecosystems. Analyze the relationship between habitat changes to plant and animal population fluctuations. 4.2.10.C Explain the relationship between water quality and the diversity of life in a freshwater ecosystem. Explain how limiting factors affect the growth and reproduction of freshwater organisms.	• Identify the salamanders of Pennsylvania. • Distinguish the factors that affect the salamanders of Pennsylvania. • Explain which species are endangered and which are invasive	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities
Unit 6: Turtles (Weeks 15-16)	• Pennsylvania has a diverse number of turtles. • Each turtle species has a particular habitat that it can survive in.	1. The watersheds of Pennsylvania offer each turtle species what it needs for survival. 2. All turtles live in a certain range for water quality (pH, dissolved	• Explain why Pennsylvania has so many different turtle species. • Describe some of the factors that affect where you find a turtle species	4.1.10.D Research practices that impact biodiversity in specific ecosystems. Analyze the relationship between habitat changes to plant and animal population fluctuations. 4.2.10.C	• Distinguish the parts of a turtle shell. • Identify the turtles of Pennsylvania. • Distinguish the factors that affect the turtles of Pennsylvania. • Explain which species are	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable,	Daily assignments. End of the Chapter Test. Labs and Classroom Activities

		oxygen, and temperature).	in Pennsylvania.	Explain the relationship between water quality and the diversity of life in a freshwater ecosystem. Explain how limiting factors affect the growth and reproduction of freshwater organisms.	endangered and which are invasive.	Extended time for assignments when needed. Separate testing environment when applicable.	
Unit 7: Snakes and Lizards (Weeks 17-18)	• Pennsylvania has a diverse number of snakes and lizards. • Each snake and lizard species has a particular habitat that it can survive in.	1. The watersheds of Pennsylvania offer each snake and lizard species what it needs for survival. 2. All snakes and lizards live in a certain range for water quality (pH, dissolved oxygen, and temperature).	• Explain why Pennsylvania has so many different snake and lizard species. • Describe some of the factors that affect where you find a snake and lizard species in Pennsylvania.	4.1.10.D Research practices that impact biodiversity in specific ecosystems. Analyze the relationship between habitat changes to plant and animal population fluctuations. 4.2.10.C Explain the relationship between water quality and the diversity of life in a freshwater ecosystem. Explain how limiting factors affect the growth and reproduction of freshwater organisms.	• Identify the snakes and lizards of Pennsylvania. • Distinguish the factors that affect the snakes and lizards of Pennsylvania. • Explain which species are endangered and which are invasive.	Students will be given the following: Preferential seating when applicable. Study guides. Guided notes when applicable, Extended time for assignments when needed. Separate testing environment when applicable.	Daily assignments. End of the Chapter Test. Labs and Classroom Activities