Middle School Envirothon

Aquatics Station

# **Pennsylvania Fish & Boat Commission**

## Essential Topics:

I. Aquatic Ecosystems

a. Abiotic

1. Physical and chemical properties of water

2. Water cycle

3. Watersheds

 b. Biotic

1. Types of aquatic habitats

2. Aquatic organisms

c. Community

1. Basic ecological relationships

 2. Food chains

II. Aquatic Resource Issues

a. Pollution

b. Biodiversity

c. Migratory fish

c. Threatened and endangered species

d. Aquatic nuisance species

c. Benefits of watersheds and wetlands to humans and wildlife.

III. Aquatic Resource Protection

a. Laws and regulations

b. Resource management, protection and enhancement

##### Learning Objectives

Students at the Junior Envirothon level should be able to:

1. Aquatic Ecosystems

 a. Abiotic

1. Label at least three parts of the water cycle and explain their role within a watershed (4.1.7 A)\*.

2. Define *watershed* and explain how water enters a watershed (4.1.7 B).

3. Identify Pennsylvania’s six watersheds and explain the factors that determine their boundaries (4.1.7 B).

b. Biotic

1. Give one example of an herbivore, carnivore, omnivore and scavenger and explain its role in an aquatic ecosystem (4.6.7 A).

2. Identify three different aquatic animals and briefly describe their life cycle and adaptations (4.1.7 C, 4.7.7 A & B).

c. Community

1. Give one example of an aquatic food chain and explain how energy flows from organism to organism (4.6.7 A).

2. Give an example of how two different aquatic ecosystems are interconnected (4.6.7 A).

3. List three different abiotic factors and explain how they influence the type of animals that will be found in a particular aquatic habitat (4.1.7 C, 4.6.7A).

2. Aquatic Resource Issues

a. List three different types of water pollution, describe their sources and explain their effects on a watershed (4.1.7 B, 4.3.7 A & B).

b. Define aquatic nuisance, introduced, invasive, and native species and describe the affect of each on the biodiversity of aquatic ecosystems (4.3.7 C, 4.7.7 A).

c. Give two examples of an introduced aquatic nuisance species and explain their affect on other organisms (4.3.7 C, 4.7.7 A).

d. Explain the difference between threatened, endangered and extinct (4.7.7 C).

e. Give two examples of an endangered fish, amphibian or reptile and explain a cause for their status (4.7.7 B & C).

f. Identify one migratory fish and identify a barrier to its life cycle (4.3.7 C, 4.8.7 C & D).

g. Give two examples of how watersheds and wetlands benefit humans and wildlife (4.1.7 B & E)

3. Aquatic Resource Protection

a. Identify the agency that is responsible for fishing and boating opportunities and give two examples of how it protects and manages aquatic resources (4.9.7 A).

b. Identify one fishing regulation and explain how it protects animals and aquatic habitats (4.9.7 A).

c. Give one example of how you can prevent the spread of aquatic nuisance species (4.8.7 D).

d. Discuss three ways that you can protect aquatic resources at home and at school (4.3.7 B, 4.8.7 C & D).

## \* Related Environment and Ecology Standards from the Department of Education follow in parenthesis. These references do not imply that a particular standard is met by completion of an objective or activity. The objectives were structured to “follow” the standards. The select activities will help prepare students to meet the Jr. Envirothon objectives. No single objective or activity can meet any one standard.

##

### Reference Materials

Stop Pointless Personal Pollution

PLAY: Six Ways to the Sea

PLAY: Aquatic Leaf Eater

PLAY: Why Fish Need Trees

##### Wetlands: Why Do Fish Need Them?

PLAY: April Showers Bring May Flowers

PLAY: Kitchen Table Experiment: Garbage Bag Watershed

PLAY: PA’s Least Wanted

On the Road to Extinction

## Additional Activities (to reinforce reference materials)

PLAY: What Do You Know About Water the Cycle?

PLAY: Read the Water

PLAY: The Nuisance Species Game

PLAY: How Much Water Do You Use?

PLAY: Critter Collectors

Pond and Stream Study Guide