**Lentic and Lotic Ecosystems**

We all depend on water for our survival. Pennsylvania is home to thousands of kinds of organisms that depend on freshwater ecosystems for their survival, too. The freshwater aquatic biome contains both lentic ecosystems and lotic ecosystems. There are many examples of both in Pennsylvania.

**Lentic Ecosystems: Standing Water**

Some examples of lentic ecosystems are lakes, ponds, swamps, marshes, and vernal pools. Lentic ecosystems take many forms, from small, temporary pools to large lakes. Some lentic ecosystems are fresh water with low salt content, and others have a higher salt content (Example: The Great Salt Lake in Utah). Lentic ecosystems such as lakes can be formed by glaciers, volcanoes, and shifting of tectonic plates, and some are man-made. Some, such as vernal pools, are only temporary during a rainy or wet season. Lentic ecosystems have layers from top to bottom that support different organisms, depending on factors such as the amount of light and temperature. Algae and aquatic plants produce food for other organisms in the ecosystem. Many tiny invertebrates, called zooplankton, live in lentic waters. They feed on algae and plants and provide food for other organisms such as snails and insects like water striders. The kinds of fish and other vertebrates depends on many factors, such as the salt content, amount of light, and depth of the water. There are many species of lentic vertebrates, including salamanders, frogs, alligators, and many kinds of birds.

**Lotic Ecosystems: Flowing Water**

Examples of lotic ecosystems are rivers, streams, creeks, brooks, and springs. Pennsylvania has about 45,000 miles of flowing water. Lotic ecosystems can have many forms, from a tiny spring to a wide, rushing river. A spring is a place where water flows from underground to above ground. They do have some common characteristics. They always flow in one direction. They often begin in the mountains, formed by snowmelt and rain, and they flow downward over the land. They tend to last hundreds of thousands of years, but some smaller ecosystems such as creeks may dry up each year as the seasons change. The types of organisms that live in lotic ecosystems depend on how fast the water is flowing, the amount of light, and the temperature. Organisms in lotic systems must be adapted to handle the high oxygen content, which is caused by the flowing water. Lotic systems have a low salt content. Animals must be able to prevent excess water from building up in their bodies. Algae and plants provide energy for animals in lotic ecosystems. Many invertebrates, such as insects, snails, and crayfish, depend on the flowing water to bring them oxygen and nutrients. Fish that live in lotic ecosystems must be adapted to survive in flowing water. Many lotic systems connect to each other and form a path to the ocean (example: spring → stream → river → ocean), so some fish species spend part of their lives in freshwater and part in the ocean. Other vertebrates spend part of the time on land and part in the water, such as species of amphibians, reptiles, mammals, and birds. Specific examples include: frogs, salamanders, snakes, turtles, beavers, and river otters.

**Source:** [**http://www.mrsoshouse.com/water/wintro.html**](http://www.mrsoshouse.com/water/wintro.html)

**Lentic and Lotic Ecosystems**

**Part 1: T-Chart**

**Directions:** Describe features of lotic and lentic ecosystems in the t-chart below.

|  |  |
| --- | --- |
| **Lotic Ecosystems** | **Lentic Ecosystems** |
|  |  |

**Part 2: Abiotic and Biotic Factors**

**Directions:** List at least three examples each of biotic factors and abiotic factors in lotic and lentic ecosystems. Some of the factors may be the same for lentic and lotic ecosystems.

**Lentic Ecosystems**

Biotic Factors:

Abiotic Factors:

**Lotic Ecosystems**

Biotic Factors:

Abiotic Factors:

**Lentic and Lotic Ecosystems KEY**

**Part 1: T-Chart**

**Directions:** Describe features of lotic and lentic ecosystems in the t-chart below.

|  |  |
| --- | --- |
| **Lotic Ecosystems** | **Lentic Ecosystems** |
| * Running water * Examples: Rivers, streams, creeks * Fresh water * Can last many thousands of years * Higher percentage of dissolved oxygen in water, due to water flowing * Animals must be adapted to survive in high oxygen content * Lower salt content * Fed by melting snow and rain * Animals must prevent excess water in bodies. * Fish must be able to survive in flowing water. | * Standing water * Examples: Lakes, ponds, swamps * Fresh water * Usually only last from a few hundred to a few thousand years * Lower percentage of dissolved oxygen, especially in deeper water * Higher salt content as water evaporates over time * Animals must prevent excess water in bodies. |

**Part 2: Abiotic and Biotic Factors**

**Directions:** List at least three examples each of biotic factors and abiotic factors in lotic and lentic ecosystems. Some of the factors may be the same for lentic and lotic ecosystems.

**Lentic Ecosystems**

Biotic Factors: zooplankton, frogs, algae, insects

Abiotic Factors: low salt content, low oxygen content

**Lotic Ecosystems**

Biotic Factors: fish, birds, snakes, insects

Abiotic Factors: low salt content, high oxygen content