

# Pond Life



## Goals:

Students will research freshwater biomes of ponds and lakes and conduct experiments to understand pond life, food webs and the impact of human influences on ponds.

## Objectives:

- Understand freshwater biomes (three different types).
- Understand food webs for lake and pond biomes.
- Conduct experiments and citizen science activities to explore the wildlife aspects of lake and pond biomes.
- Investigate the impact of human influences on a pond and devise an action plan for repairing freshwater biomes.

**Grade Level:** 9-12

## Subject Areas:

science, technology, math, English, civics

## Background

Freshwater biomes are defined as containing less than 1% salt concentration. In general, freshwater biomes are dividing into three categories: ponds and lakes, streams and rivers and wetlands. For the purpose of this lesson the focus will be on ponds and lakes.

Ponds and lakes are bodies of freshwater that are found in all types of environments and on all continents. Generally the center of a pond reaches depths of about 10 feet with little emergent vegetation and the edges are shallow with emergent grasses and sedges. Ponds and lakes support animals living in that area with fresh drinking water and therefore are a vital system to support wildlife. Rivers and streams may run into or out of the pond eventually merging with other bodies of water.

Pond food webs, as with all food webs, interlink consumers and producers. Example of a pond food web may include:

1. Aquatic invertebrates and minnow eat algae
2. Minnows and perch eat aquatic invertebrates
3. Perch and bass eat minnows
4. Great blue herons and bass eat perch
5. Great blue herons eat perch

## Procedure

Students will create an experiment—building a hypothesis to test, conducting the experiment, analyzing the results and presenting their findings about ponds. Some sample experiments may include:

1. Devise a citizen science project or participate in an existing citizen science program (such as Frogwatch USA) monitoring pond wildlife for a month, recording observations.
2. Conduct pollution experiments by testing samples of pond water containing aquatic organisms to observe reactions to foreign containments such as fertilizers, oil, gasoline, and other common sources of pollution.
3. Build a pond model in an aquarium using smaller pond wildlife such as snails and monitor what occurs to the water quality, number of species and other factors over a month.
4. Conduct water quality sampling at local ponds (including man-made vs. natural ponds and vernal pools).
5. Conduct sampling experiments of the microbiology of a pond by collecting samples from two different sources, examining, drawing and identifying the microscopic life.
6. Conduct temperature and light exposure experiments on pond

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samples over a week or more to identify the impact of each as independent factors or correlating factors.

## Citizen Science Projects

Citizen monitoring program information (PDF), <http://www.cfc.umt.edu/wi/Documents/citizen%20science/Citizen%20Monitoring%20Programs.pdf>

## Civic Responsibility (Take Action)

After the experiments, work with the class to identify an action project which classmates could participate in to follow through with their discoveries. For instance, organize a watershed or pond clean up working with a local soil and water conservation district, watershed non-profit or other.

## Resources:

- **Fresh Water Biomes:**  
<http://www.buzzle.com/articles/fresh-water-biomes.html>
- **Freshwater biome information from Colorado State University:**  
[http://lib.colostate.edu/wildlife/freshwater\\_biome.html](http://lib.colostate.edu/wildlife/freshwater_biome.html)
- **Freshwater regions information from the University of California:**  
<http://www.ucmp.berkeley.edu/exhibits/biomes/aquatic.php#fresh>
- **Pond food web information:**  
<http://www.eduweb.com/portfolio/earthsystems/food/foodweb3.html>
- **Freshwater ecosystem information:**  
<http://www.mbgnet.net/fresh/index.htm>