

CLASS 6
INTRODUCTION AND LIST OF RESOURCES

I. Introduction

The sixth class teaches the students about watersheds, water pollution, acid rain's effects, and regulation of water pollution. The class also introduces concepts that are used in the field trip. The class has two experiments/demonstrations; one demonstrates pH and the effects of Acid Rain, and the other involves using a topographic map to illustrate the concept of a watershed.

The first experiment teaches the students about measuring the pH of a substance. It involves placing acid sensitive strips into different substances (vinegar, lemon juice and baking soda). Kits of materials for the experiment can be purchased on the web (we have purchased ours at <http://www.learningresources.com/Index.pasp>). The class should be divided into groups, with each group given a set of materials to run its own experiment. A firm member should supervise each group to ensure that they are performing the experiment correctly. The experiment is also a good vehicle for discussing acid rain and giving the students a reference point for just how acidic such rain is. It also describes in detail how much acidity certain creatures can withstand.

The second activity involves the use of topographic maps to show the students where in the local watershed their school is located. Firm leaders explain the concept of a watershed and use a large map to show where the local watershed is (in our case we have illustrated the entire Chesapeake watershed, and then also indicated the Potomac and Anacostia watersheds). Every student is given a color copy of a topographic map of the local area. Then, each student determines where/how water flows from the school to the nearest waterbody (the students generally need help finding their school on the maps). Be aware that many of the students have a hard time understanding the maps, so try and explain carefully how they work and then work patiently with the students to help them understand. Firm members can assist the students individually.

This class has tied in nicely with our field trip at the end of the course, which is a boat trip on the Potomac and Anacostia Rivers in Washington, D.C. It provides a platform for discussing some of the issues affecting the rivers and the Chesapeake Bay and introducing vocabulary that will be useful on the excursion.

Tips:

- Remember to order the specialized materials for the experiments at least three weeks ahead of time, and gather all the materials together before the day of the class.
- Obtain a good map of the local watershed ahead of time. An internet search, visiting the website of the state environmental agency or the USGS link below should all easily locate a good map for sale.
- pH is the negative logarithm of the hydrogen ion (H⁺) concentration and therefore inversely related to the amount of hydrogen ion in the water. Lower pH waters have more hydrogen ions and are more acidic than higher pH waters.

II. Resources

If you are not familiar with all or some of the concepts, simply would like a refresher, or desire plenty of ammunition for responding to questions, below are some good internet resources. Additionally, some of the resources for the other classes overlap with Class 6's topics. Likewise, see the Resources section of the Introduction to the Class Series for general resources and teaching materials.

pH Paper

A pH Test kit can be purchased online. The kit costs roughly \$3 and contains 100 strips and a color chart. We have purchased our kit from Learning Resources, which is on the web at <http://www.learningresources.com/Index.pasp>.

Topographic Maps

The USGS has a page with information and links for purchasing topographic maps - http://topomaps.usgs.gov/ordering_maps.html

EPA

Water - <http://www.epa.gov/water/>
Kids Page - <http://www.epa.gov/kids/>
Acid Rain - <http://www.epa.gov/ebtpages/airairpolacidrain.html>
Kids Page - http://www.epa.gov/acidrain/site_students/index.html

Wisconsin DNR

Lakes and Acid Rain - <http://www.dnr.state.wi.us/org/water/fhp/lakes/under/acidity.htm>

Chesapeake Bay Foundation

Homepage - http://www.cbf.org/site/PageServer?pagename=cbf_homepage

NRDC

Water - <http://www.nrdc.org/water/pollution/default.asp>

Miscellaneous

Miami Science Museum - pH - <http://www.miamisci.org/ph/>
The pH Scale - <http://www.ga.usgs.gov/edu/phdiagram.html>