



Teacher's Time

Acid Rain:

Don't let these rain drops keep fallin' on your head!

Rationale

Over the past ten years, acid rain has attracted much attention. That is because we are starting to visually witness the effects of acid rain on our environment. However, some regions are less exposed to the effects, and thus less concerned about the issue. This type of attitude has resulted in the high level of acidic conditions that currently exist in our world. This activity is designed to demonstrate to students the effects of acidic conditions (specifically on aquatic life), regardless of where they live, or their knowledge about acidic contamination.

Outcomes

Students will have:

- generated and tested hypotheses concerning effects of acid precipitation;
- described the effects of acid rain on plant life;
- made inferences about the potential effects of acid precipitation on aquatic life.

Resources

- *The State of Canada's Environment Report - 1996*, "Acidic Deposition," subsection of Chapter 10; [Figure 10.6](#)
- SOE Fact Sheet No. 94-1, *The Inuit economy - sustaining a way of life*, "Arctic contaminants" diagram.
- See accompanying "pH Ranges," and "pH Ranges That Support Aquatic Life" Charts
- 250 milliliters of vinegar; three spray bottles; any type of pH testing device (litmus or hydrion paper, or a pH testing kit for a backyard pool); three trays of plant sprouts

Strategies

- Intro: Pour vinegar onto five paper towels and place around the classroom before students come in. Note their reaction to the odour when they enter the class. Ask students to describe what they think the odour is. Tell the students what you did, and explain to them that you wanted them to experience the discomfort of a pollutant in their environment. Transition the class' thoughts to what it would be like for aquatic life in a pond or lake with increasing acid levels.
- Use Chapter 10's "Acidic Deposition" subsection, explain the origins of acid rain pollution.
- Using a pH test, measure a sample of vinegar for its acidity - you may wish to involve students or develop this activity into classroom centres.
- Now test a sample of tap water.
- If you live in one of the regions where acid rain deposition is high, (see [Figure 10.6](#)), test local rain or pond water too.
- Next, place the plant sprouts in three trays; fill one spray bottle with vinegar, one with tap water, and one with acid rain or pond water. Label each bottle, and tray according to which bottle you will use to spray it, and locate an observational chart near each tray as well.
- Spray and water the plants with their respective solution once every other day for two weeks, or until noticeable differences appear between the three plants.
- Describe the plants' colour, texture, structure on the observational charts. Using litmus paper, measure the pH of the soil, and determine which soil is most acidic. Include diagrams.
- Have students write a report describing each of the sprout's conditions after one week.
- Conclude with a class discussion concerning the effects of acid rain. Review the causes of acid rain, and how they can be reduced and eliminated.

Evaluation: Teacher observation, Participation, Assignment

Timing: 2 periods, and a brief time each day for about a week to spray and record observations (1 period = 1 hour)

Extensions

- Extend the lesson by studying the global effects of air pollution. Refer to Fact Sheet diagram to explain that acid rain does not necessarily fall where it is created. This concept lends to further studies of ecosystems.
- Examine the effects of acid rain on buildings, human health, lakes, etc.
- Visit the [Monitoring Acid Rain Youth Program](#).

This activity was adapted from "Deadly Skies," *Project WILD Activity Guide*, Canadian Wildlife Federation, 1994.



Student's Turn

Acid Rain:
Don't let these rain drops keep fallin' on your head!

pH Ranges

MOST ACID					NEUTRAL					MOST ALKALINE			
1	2	3	4	5	6	7	8	9	10	11	12	13	14

pH Ranges That Support Aquatic Life

Bacteria	1.0	_____	13.0
Plants (algae, rooted, etc.)	6.5	_____	13.0
Carp, suckers, catfish, some insects	6.0	_____	9.0
Bass, crappie	6.5	_____	9.0
Snails, clams, mussels	7.0	_____	9.0
Largest variety of animals (trout, mayfly, stonefly, caddisfly)	6.5	_____	7.5

These charts were adapted from "pH Ranges That Support Aquatic Life." Project WILD Activity Guide, Canadian Wildlife Federation, 1994.

