

# Acid Rain Experiment

A good way to learn about acid rain is to perform the following experiment. The following explain materials to gather, steps to perform, observations to make, and further explorations to do.

## Purpose

The purpose of this experiment is to demonstrate to students how acid rain is formed. For background, see the [definition of acid rain](#).

## Materials

To get started, you'll need to gather the following:

- some means of measuring pH
- water
- straw

## Procedures

Here's what to do:

1. Place a small sample of water (approximately 20ml) in a container. Test for and record pH.
2. Place straw in water sample and have student exhale gently into water for several breaths—at least a minute.
3. Measure pH of sample again and compare with previous reading.
4. Have students try and explain what happened and why.

This demonstration works particularly well if you are using a test method that requires you to add a chemical to the water and compare color produced with known pH samples. In such cases, the color will change right in front of students. In most cases, students can lower pH by 2 units (from 7 to 5 for instance) which is actually, of course, a 100-fold increase in acidity.

**Note:** Once students see how easily water can absorb the carbon dioxide from their breath they begin to grasp why sulfur and nitrogen compounds in air can have such an impact.

## Further Exploration

If you have a pH meter and some students with a feel for chemistry, you may want to demonstrate how buffers reduce damage from acid rain. The amount of naturally occurring buffers varies in different regions. Without buffers, addition of acids results in a rather steady decrease in pH. When buffers are present, addition of acids creates little or no change in pH until buffers are used up and then pH

changes dramatically. Here are some ideas for other experiments:

- Use a larger sample of water and have students design some means of having a steady air flow into the sample (try placing an aquarium pump in an empty aquarium with a burning candle).
- Run test with distilled water, plotting changes of pH against time.
- Run test with buffered water, plotting changes of pH against time and compare results.

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