

## Creating Acid Rain



*Essential Question: Compare your results in this lab to what happens to power plant emissions in the atmosphere.*

### Overview

In the last several lessons, you have learned about the products of coal combustion. You have learned the way that ash and other particulates find their way into water supplies and ecosystems.  $\text{SO}_2$  and  $\text{NO}_x$  affect the environment in very different ways. They chemically react with compounds in the atmosphere. Both  $\text{SO}_2$  and  $\text{NO}_x$  are oxidized.  $\text{SO}_2$  forms sulfuric acid and  $\text{NO}_x$  forms nitric acid when oxidized and mixed with water. When this happens in the atmosphere, the precipitation that results is known as acid rain. In this activity, you will observe the change in pH when water is exposed to combustion products. You will then compare this to what occurs in the atmosphere.

### Materials

For the class:

- 1 roll of paper towels
- 1 gallon of bleach
- 1 gallon of distilled water
- 2 100-mL bottles of universal indicator solution
- 1 15-oz bottle of lemon juice
- 1 box of kitchen matches
- access to water

For each group:

- 1 100-mL graduated cylinder
- 2 self-sealing plastic bags (sandwich size)
- 10 10-oz plastic cups
- 10 3-mL pipettes

### Safety

Wear your goggles and lab apron. Follow standard safety rules for using glassware or working with matches. Tie back long hair, and tie back or remove any article of clothing or jewelry that can hang down and touch chemicals or flames.

### Procedure

1. First, test your indicator solution with known substances that are acidic, neutral, and basic. Complete the following chart by testing lemon juice, distilled water, and bleach with the indicator solution.