**The information in this lesson plan is current as of July 28, 2004**

# Acid Rain: An Air Pollutant

## Purpose

To demonstrate the effect of acid on statues and buildings

## Grade Level

- 5th grade

## Science TEKS

- 5.1 a, b
- 5.2 b, c, d
- 5.11 a

## Objective

Students will learn how acid rain is an air pollution problem.

## Focus

Show a picture of a defaced statue.

## Materials

- chalk
- vinegar
- glasses for each group

## Background

Acid rain is more acidic than normal rain and forms through a complex process of chemical reactions involving air pollution. The two most important pollutants that contribute to the formation of acid rain are oxides of nitrogen and sulfur dioxide, which react with moisture in the atmosphere to form nitric and sulfuric acid. The sulfur and nitrogen compound that contribute to acid rain primarily come from manmade sources, such as industries and utilities. Emissions also come from automobiles and other forms of transportation and industrial processes, such as

smelting.

Acid rain can harm forests and crops, damage bodies of water, and contribute to the damage of statues and buildings. Researchers are considering the possible effects of acid rain on human heath. These acidic pollutants can be deposited through rain, snow, fog, dew, or sleet. Large quantities can also be deposited in a dry form through dust.

Pollutants that contribute to acid rain may be carried hundreds of miles before being deposited on the earth. Because of this, it is sometimes difficult to determine the specific sources of these acid rain pollutants.

**Procedure**

- Explain that acids react chemically with limestone.
- Explain that the vinegar is an acid and chalk is limestone.
- Fill a glass 1/3 full with vinegar for each group.
- Add a piece of chalk to the glass.
- Have the students write what they see happening.
- Discuss their observations and inferences.
- Add corrected notes to a notebook.
- Discuss the slow deterioration of statues and buildings due to the weak acid rain that falls on some statues and buildings. If the stone is limestone or has limestone in it, the deterioration is more rapid.

**Extensions**

- Gather pictures of examples of acid rain (chemical weathering).
- Research effects of acid rain on great art works.
- Research causes of acid rain.
- Suggest solutions to the problem of acid rain.

**Acknowledgment**

Lois Richardson,  Stephen F. Austin University Nacogdoches TES Course, 1994