

The Effects of Acid Rain

Adapted from “The Effects of Acid Rain” by TeachEngineering.org.

Grade Level: 7th grade

Time Required:

TN Science Standards:

7.PS1: Matter and Its Interactions

5) Use the periodic table as a model to analyze and interpret evidence relating to physical and chemical properties to identify a sample of matter.

7.ESS3: Earth and Human Activity

2) Engage in a scientific argument through graphing and translating data regarding human activity and climate.

Summary

Students explore the effect of chemical erosion on statues and monuments. They use chalk to see what happens when limestone is placed in liquids with different pH values. They also learn several engineering approaches to reduce the effects of acid rain.

Objectives

- Give examples of common acids and bases.
- Describe acid rain and chemical erosion and how they affect the environment.
- List things engineers do to reduce acid rain and its effects.

Materials

- Lemon juice
- White vinegar
- White chalk
- Small cups
- Litmus paper
- Worksheet
- Tap water

Procedure

1. Prepare the materials before the students arrive. Pour the lemon juice, vinegar, and water into cups and lay out the chalk, nails, and litmus paper for the students to use. *You may want to hand the students the materials, especially the nail, after giving directions.*
2. Introduce acid rain to the students by following along with the PowerPoint.
3. Hand out the worksheet (optional) while reviewing the directions.
4. The students will carve a design on their piece of chalk using a nail. They will then draw their chalk art on their worksheet.
5. The students, working in groups of 3, will place their chalk into one of the cups and allow the reaction to occur for 10 minutes.
6. While the students wait, have them write down their observations and take the pH of each cup using the litmus paper. Then, have the students graph their pH on their worksheet.
7. After 10 minutes, have the students remove the chalk and draw their observations on their worksheet.
8. Discuss with the students the important work HPUD does to keep their water clean and to protect the environment.
9. Clean up!