

Wind Erosion

Introduction

Why is there so much dirt in the air after a farmer harvests a crop? This is the result of wind erosion.



Concepts

- Chemical weathering
- Erosion
- Mechanical weathering

Background

Weathering is a breakdown of the materials that form the Earth's crust, i.e., the breaking down of rocks into smaller and smaller particles. The two primary types of weathering are chemical and mechanical. Chemical weathering generally occurs when the Earth's crust is exposed to acidic water in the form of groundwater or rain. Mechanical weathering, on the other hand, involves physical forces such as freezing and thawing, the movement of water, prying by roots, abrasion, or wind. The movement of these particles by water, wind, ice, or gravity is called erosion.

The Dust Bowl that affected the American Plains States in the 1930s is one of the greatest examples of wind erosion in history. A prolonged dry spell that lasted about a decade resulted in dust storms and soil destruction of disastrous proportions. Farmlands became unusable, crops died, and the people suffered great hardships. This problem did not end when the Dust Bowl ended. It still plagues many parts of the world today, including the United States. Wind erosion typically removes the least dense materials, which are the most fertile parts of the soil, and thus threatens potential soil productivity and harms plant life.

Materials

Pie pan or container

Sand, white, 200 g to 250 g

Rocks or pebbles, small

Straw, drinking

Safety Precautions

Although the materials in this activity are considered nonhazardous, please observe all normal laboratory safety precautions. Wash hands thoroughly after performing laboratory experiments.

Procedure

1. Place the sand in a pile in the center of the pie pan or container.
2. Gently blow through the drinking straw and observe the movement of the sand.
3. Place small rocks or pebbles on top of the sand.
4. Repeat step 2 with the rocks or pebbles in place.
5. Record results in a data table.

Disposal

Please consult your current Flinn Scientific Catalog/Reference Manual for general guidelines and specific procedures, and review all federal, state and local regulations that may apply, before proceeding. The materials in this activity may be placed in the trash according to Flinn Suggested Disposal Method #26a.

Tips

- Blow gently to avoid spillage. Experiment with distances from the surface to find the most effective "wind."
- A container with a higher wall such as a shoebox or plastic container may work better to keep the sand contained.
- Blowing through the straw may cause moisture to accumulate and drip onto the sand causing clumping. Replace with a dry straw before too much moisture accumulates.

- Compare the effect of blowing through the straw with the effects of actual wind on sand dunes by finding pictures on the Internet.
- Constant blowing may cause lightheadedness. Take a break and, when the feeling diminishes, continue the activity.

Discussion

Blowing on the sand will show students the damaging effects of wind erosion, as well as provide a great visual for the concept itself. Students are able to see, firsthand, how wind moves particles in the process of erosion. Adding stones or pebbles simulates covering or increasing the roughness of soil to help prevent wind erosion.

Connecting to the National Standards

This laboratory activity relates to the following National Science Education Standards (1996):

Unifying Concepts and Processes: Grades K–12

Evidence, models, and explanation

Constancy, change, and measurement

Content Standards: Grades 5–8

Content Standard D: Earth Science, structure of the Earth system, Earth's history.

Content Standards: Grades 9–12

Content Standard D: Earth and Space Science, energy in the Earth system, origin and evolution of Earth system.

Materials for *Wind Erosion* are available from Flinn Scientific, Inc.

Catalog No.	Description
AP6025	Straws, Plastic, Wrapped, Pkg/500
S0003	Sand, Fine, White, 500 g
AP4974	Sandstone, Siliceous, Pkg/10

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.