

Erosion Tray Experiment

Week 24 — Wednesday | Testing How Wind and Water Change Land

Reading Time

Today you are going to build a model of how weathering and erosion change the land. Scientists call this kind of model an **erosion tray**. By creating a small version of a hillside, you can watch what happens when water and wind act on soil. This experiment will help you understand how real landscapes are shaped over millions of years.

In nature, **vegetation** (plants and grass) plays a very important role in preventing erosion. Plant roots hold the soil together like a net, making it much harder for water and wind to carry the soil away. Areas without plants, like bare dirt after a forest fire, are much more vulnerable to erosion. This is why deforestation can lead to landslides and why farmers plant cover crops to protect their soil.

During this experiment, you will test different conditions: bare soil versus soil with plants, gentle water versus fast water, and no wind versus strong wind. By comparing the results, you will see which conditions cause the most erosion and which ones protect the soil. This is the same kind of experiment that environmental scientists use to design better ways to protect our land and waterways.

Reading Questions

1. What does **vegetation** do to help prevent erosion?

2. Why are areas without plants more vulnerable to erosion?

3. What three conditions will you test in the erosion tray experiment?

4. Explain why understanding erosion is important for farmers and environmental scientists.

Vocabulary Grid

Write a definition or draw a picture for each word.

 **Vegetation**

 **Hypothesis**

 **Experiment**

 **Observation**

 **Data**

 **Conclusion**

 Your Erosion Tray Experiment

Materials: A shallow tray or baking pan, dirt or sand, water, a spray bottle or watering can, small twigs or grass clippings, a fan (optional), paper towels for cleanup.

Setup: Build a small hill in one half of the tray. Leave the other half flat to collect eroded material. Cover part of the hill with twigs or grass to represent vegetation. Leave part bare.

Before you start: Write your hypothesis. What do you predict will happen when you pour water on bare soil versus soil with vegetation?

 Experiment: Water Erosion

Test	What You Did	What Happened to the Soil?	How Much Erosion?
Light rain on bare soil	Spray water gently		
Heavy rain on bare soil	Pour water quickly		
Light rain with vegetation	Spray water gently on planted area		
Heavy rain with vegetation	Pour water quickly on planted area		

 Draw Your Results

Draw your erosion tray before and after the experiment. Show what happened to the soil and where sediment collected.

Before the experiment:

After the experiment:



Experiment Data Analysis

1. Which test caused the most erosion? Why do you think so?

2. Which test caused the least erosion? Why do you think so?

3. Was your hypothesis correct? Explain your reasoning.

4. How does this experiment show what happens to real hillsides during heavy rain?



True or False — Circle Your Answer

- ☐ 1. Vegetation helps hold soil in place and prevent erosion.
- ☐ 2. Fast-moving water causes less erosion than slow water.
- ☐ 3. Bare soil erodes more easily than soil with plants.
- ☐ 4. An erosion tray is a model that shows how the land changes.
- ☐ 5. A hypothesis is a guess made after the experiment is finished.
- ☐ 6. Sediment is material that gets carried by erosion.
- ☐ 7. Deforestation (cutting down trees) increases erosion.
- ☐ 8. Farmers use cover crops to protect soil from erosion.



Fill in the Blanks

Word Bank: weathering erosion vegetation sediment deforestation hypothesis observation conclusion

- 1. The movement of soil and rock by wind or water is called _____.
- 2. Plants and grass that cover the ground are called _____.
- 3. Small pieces of rock and soil carried by erosion are _____.
- 4. Cutting down all the trees in an area is called _____.
- 5. A prediction made before an experiment is a _____.
- 6. Information collected during an experiment is an _____.
- 7. The final explanation after an experiment is a _____.
- 8. The breaking down of rocks into smaller pieces is _____.



Think About It

After a large forest fire, all the trees and plants are gone. What do you think happens to the soil on the hillsides during the next heavy rain? Why?