

# Erosion Experiment

**Objective:** Students learn about the effect of different land use on soil erosion.

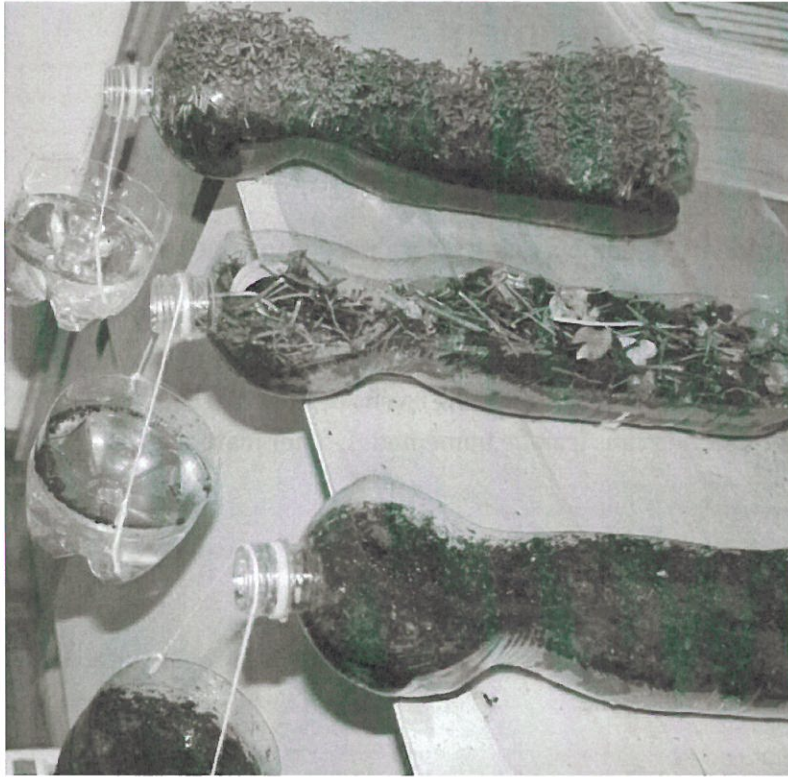
**Age:** 8+

**Time:** 1 hour for prep (with or without students, or combination), time for seeds to grow, 20-30 minutes for activity

**Materials:** 3 large soda bottles (or other containers), board or surface to secure bottles to, way to secure bottles (hot glue, weights, string), soil, seeds, sting, collecting basins (bottoms of soda bottles, plastic cups, etc.), measuring cups, small watering cans (can be homemade), other materials for variations (optional)

## **Directions:**

1. Cut 3 2L soda bottles in half lengthwise, leaving the mouth of the bottle whole.
2. Secure bottles to surface at a slight incline, open side up and mouth extending over surface.
3. Measure the same amount of soil into each bottle.
4. Leave one bottle with just soil.
5. Add leaf/natural litter to the second bottle (any materials collected from nearest natural space).
6. In the third bottle, plant fast growing seeds. To aid the seeds in growing you may want to place another half a bottle over the soil to create a mini greenhouse. Keep an eye on the seeds, watering (or wetting with spray bottle) as needed.
  - a. To accelerate the experiment, you can transplant already grown plants into the third bottle. It would still be best to allow the roots some time to grow if possible.
7. Using string, hang a clear collecting basin from the mouth of each bottle. These can be plastic cups or bottoms cut from soda bottles. Collecting basins must be large enough to hold the amount of water being added to each system. (see below for completed set up)
8. When the seeds are sufficiently developed to cover the soil, explain that each bottle is going to experience the same exact 'rain storm'. Have students hypothesize what differences or similarities they expect to see from each system. Try not to lead students too much in their reasoning. Hypotheses can range from how much water will come out of each system, to the rate of flow or the quality of water outflow.
9. Measure the same amount of water into watering cans. At the same time, water should be carefully sprinkled over each bottle towards the far end from the opening. Try to spread water in the same place of each bottle and at the same rate.
10. Carefully observe the bottles and record any observations.
11. After water seems to be ceasing to flow from the bottles, discuss the results.
12. Which bottle yielded the most water? Which one yielded the cleanest/clearest water? Which bottle had the fastest/slowest flow?



#### Variations:

1. Try using different types of soil such as sand, clay, potting soil, etc.
2. Include a layer over the soil that imitates paved/impervious surfaces (aluminum foil, etc).
3. Add a drop of food coloring on the soil before initiating a 'rain' storm. The dye represents a pollutant. (May be especially interesting combined with an impervious layer).
4. Have students brainstorm other ways to imitate actual watersheds.

#### Discussion Questions:

1. If these bottles were large watersheds, how would the differences in flow affect the people/environment?
2. What are some of the effects of quick flow from a rain storm?
3. What are some of the effects of erosion?
4. What implications does this have for managing watersheds?
5. What kind of landcover does each bottle simulate? What other types of landcover might you find in a watershed? What kind of outflow would you expect from each after a rain storm?
6. Think about where you live. Which bottle do you think is most similar to your local environment? How would this impact runoff/erosion?

#### Sources:

Photo: <http://www.lapappadolce.net/62-esperimenti-scientifici-limportanza-del-verde/>