

Experiment: Demonstrating Wind Erosion

Learning Objective:

Wind erosion can be reduced by putting a protective vegetative cover on the surface of the soil.

Discussion:

- During Dust Bowl events, wind acted as an agent for erosion. The soil loss is greater for soil that is bare than for the soil that has vegetative cover. This is demonstrated in the experiment.
- In the experiment, the reduced wind erosion with crop residue simulates a farmer's field using crop residue as a conservation practice. A bare (fallow) field will lose more soil than a field with crop residue covering the soil surface.

Materials Needed:

- Disposable cups with Lids (8 oz. size is fine) – *Two cups and lids for each group of students.*
- Drinking straws – *Two per group of students. Each group will have two cups and two straws*
- Samples of soil – *Enough soil to fill two cups per group. Soil in each group of cups should be the same soil type and texture. It needs to be dried out (so it will easily be blown).*
- Straw or other crop residue (grass clippings) or “craft moss” – *Use enough to cover the surface of the soil in one cup in each group of students. The “cover” should fit inside the cup on top of the soil.*
- Small Scale – *digital preferred.*
- Scissors
- Clean up supplies – *Paper towels or wet wipes, broom, etc.*
- Print outs of attached worksheet



Procedure: Preparation time approximately: 10 minutes; Class time approximately 15 minutes

Tips: Put the students into groups of 4 or less. Before the experiment, assign each student “a job” such as blower, recorder, weigher, speaker, etc. It saves class time to mostly prepare the cups in advance. It is effective to have the students compare the two samples, then, one of them put the cover on the sample.



STEP 1: Cut the lid with a semi-circle opening.

Note: Some lids fit better than others. Try to obtain a lid that fits well. Otherwise, might need tape to hold the lid onto the cup tightly.

STEP 2: Fill two cups about 1/3 full of soil each.
Each group will have two cups.



STEP 3: Make a hole in the bottom of each cup.

- The hole should be big enough for a straw to be inserted. A pencil works well to poke the hole.
- Make the hole near the rim.



STEP 4:

One cup will have bare soil only.

The other cup will have straw covering the bare soil.

Place the straw or cover in one of the cups, just enough to fully cover the soil surface and not hanging outside the cup.



STEP 5:

Weigh each cup individually and record the initial weight. Record the data onto the worksheet (Wind Erosion Demonstration Worksheet). The worksheet is included in the packet.



STEP 6:

Insert the tip of the drinking straws into the hole in the bottom of each cup.

Instructor: “dramatize” the experiment using students imagination about life on a “Dust Bowl” farm with an approaching wind storm.



STEP 7: While holding the cup horizontally with the hole to the top and the drinking straw directed toward the soil, exhale fairly strongly to blow out soil in a given time. Blow just enough for the students to see the effect. *Note: Remind students NOT to INHALE when the straw is near the soil. This part of the activity could be performed outside to minimize the mess. However, if performed inside, the effect is much more noticeable. If demonstrating inside a classroom, have students blow over their desk to reduce floor mess. After weighing, they can also “scoop” the soil back into the cup.*



STEP 8: Have the students observe the amount of soil blown out of the cup. Discuss differences in amounts lost between the covered soil cup and bare soil cup.

Other group members can start cleaning up the mess...



STEP 9: Weigh the cups individually and record the final weight on the worksheet. Have the students find the amount of soil loss from the initial sample to the final sample.

Clean up the mess.