



ROOTS TO THE RESCUE!

Grade Level

3-6

Length of Lesson

45 minutes

Objective:

By the end of this lesson, students will be able to explain how cover crops help farmers prevent soil erosion and protect farmland.

Materials:

- Photos showing farmland erosion and fields with cover crops
- 2 paint trays
- potting soil
- microgreens growing in 1 tray, bare soil in the other
- Measuring cup
- water
- tray for runoff
- video of experiment (see resources)

Standards

NGSS:

3-LS4-4; 4-ESS2-1;

5-ESS3-1; MS-ESS2-2

Lesson Summary

In this lesson, students will observe and compare erosion on bare soil versus soil protected by plant roots.

Suggested Sequence of Events:

1. Set Up: Have pictures of farmland from Teacher Resources printed out. Have microgreens already grown in tray “b”.
2. Read the books “A Handful of Dirt” by Raymond Bial or “The Soil in Jackie’s Garden” by Peggy Thomas to capture student interest.

3. Complete the activity following the procedures:

Engage: Show students photographs or slides of 1.) bare farmland after a heavy rain showing runoff and rills and 2.) farmland with cover crops growing between the seasons. Ask students what they notice about the two fields. Which field looks like it lost more soil? Where do you think the soil went? Why do farmers need to keep the soil in their fields?

Explain: When rain falls on bare soil, it can wash the soil away. This is called erosion. Farmers use cover crops to help keep soil where it belongs.

Activity:

- a. Have students fill tray “a” with bare potting soil. Show them the next tray containing the microgreens (we prefer daikon radish). Have them place an equal number of books under the edge of each paint tray and place an empty container under the bottom of each.
- b. Have students predict which tray will lose more soil after pouring water on each tray. Why?
- c. Slowly pour water (1 cup) over the top of the bare soil tray. Have students observe the soil movement, the muddy runoff and the water color as it enters the container. Record observations.
- d. Have students repeat step c with the microgreen tray.
- e. Encourage students to share their findings from their observations. Discuss why the microgreen seedlings prevented the soil erosion and how the process is similar in a real farm field. (The roots acted like anchors and held the soil particles together so the water couldn’t wash them away as easily. Cover crops work the same way on farm fields. They protect the soil between growing seasons and help farmers keep healthy soil.)

TEACHER RESOURCES

Extension Ideas:

- Watch our simulation of the experiment: <https://www.youtube.com/watch?v=EJl77Tyvy9A>
- Read “Who is responsible for Soil Conservation” article in our IAITC Soil Ag Mag at agintheclassroom.org
- Discuss additional benefits of cover crops. (improve soil health, add nutrients to the soil, help the soil hold water, etc.)
- Provide students with additional materials like straw, leaves, sticks or mulch. Have groups of 3-4 students design their own way of protecting their paint tray of soil from erosion. Allow them to test their design and compare how it protected their soil vs. the cover crop tray.

Set Up:



TEACHER RESOURCES

Example of field with Erosion:



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Example of field with Cover Crop:

