CARING FOR THE LAND

LESSON PLAN

Grade Level(s)

3 - 5

Estimated Time

1 hour

Purpose

Students will explain why people have different opinions regarding soil management and identify cause and effect relationships relating to agriculture and the environment.

Materials

- "Caring for the Land" activity sheets

Suggested Companion Resources

- A Handful of Dirt (Book/Booklet)
- Amazing Grazing (Book/Booklet)
- Compost by Gosh! (Book/Booklet)
- Diary of a Worm (Book/Booklet)
- Dirt: The Scoop on Soil (Book/Booklet)

Vocabulary

pesticide: word used to describe a variety of substances used to control insects (insecticide), plants (herbicide), or animals (rodenticide for mice, etc.)

organism: any living thing, plant or animal

legume: a family of plants which, with the aid of symbiotic bacteria, convert nitrogen from the air into a form that plants can use; legumes include many valuable food and forage species, including peas, beans, peanuts, clover, and alfalfa

farmer: a person who works with land, plants, and animals to produce raw materials for food, clothing, shelter, and other products that are used in industry and manufacturing

environmental activist: a person who works to protect the natural world through direct, vigorous action that is often focused on controversial issues

environmentalist: a person who works to protect the natural world from pollution and other threats

decompose: to decay or break down into smaller pieces

crop rotation: the practice of planting different crops in consecutive growing seasons to maintain soil health

contaminate: to make impure by contact or mixture with harmful bacteria, fungi, or dangerous chemicals

chemical (inorganic) fertilizers: synthetic materials that are added to the soil to provide nutrients—including nitrogen, phosphorus, and potassium—necessary to sustain plant growth

Interest Approach or Motivator

Ask students to think about people they know who are farmers or environmentalists. Can farmers be environmentalists?

Essential Questions:

1. Why would farmers be motivated to protect natural resources like soil and water?
2. What motivates environmentalists to protect natural resources?
3. What are some methods farmers use to protect soil and water quality?

Background Agricultural Connections

The land is the livelihood of farmers. Most people, farmers included, try to avoid practices that harm their way of life. When raising crops and livestock, farmers actively manage soil, water, plants, and animals. Farming is one of the closest working relationships that people have with the environment, and sometimes farming practices lead to environmental problems. Often, it takes years for the environmental impacts of human activity to become evident, and it can be complicated to identify and change environmentally damaging actions. Farmers work both to produce food and to care for the land that is their livelihood, but there are many different strategies for accomplishing these goals.

Considering the history of environmental issues can put modern-day controversies into context. People began polluting long ago. Early settlers in the United States dumped their trash into rivers and streams without considering the harm it might do. Before gasoline-powered tractors began releasing exhaust

fumes, work horses created pollution problems of their own. The average farm horse produced 35 pounds of solid waste and 2 gallons of liquid waste each day. Although horse manure can be an excellent fertilizer when spread across a field, large amounts in small areas can create high concentrations of nitrogen and bacteria that can contaminate the water supply.

Thousands of years ago, people began to farm because they found they could produce more food more reliably by growing crops than by hunting and gathering. Over the years, people discovered that some farming practices harmed the land. Cutting down trees, clearing vegetation, and allowing animals to overgraze left the topsoil unprotected and vulnerable to erosion by wind and water. Planting the same crop on the same field year after year used up all the soil's nutrients, and the fields lost their ability to produce good crops.

Early farmers learned from their mistakes and developed better farming methods. They learned to farm on the contour and build terraces—ridges of soil built across the slope to slow water runoff. They learned to rotate their crops, moving them from one field to another to let the soil rest. They learned how to spread animal manure on their fields to restore organic matter and nutrients.
When European settlers came to the New World, they were dazzled by what seemed like endless resources—acres and acres of rich soil. Many farmers abandoned the methods their ancestors used to protect the land. When one field began to produce poor crops, the farmer would simply abandon it and move farther into the wilderness.

As more people moved in, more land was needed for farms. In the early twentieth century, farmers began plowing up the native grasses of the Southern Plains to plant wheat. They had no way of knowing that their hard work would be the first step leading to what would come to be known as the Dust Bowl. A severe drought dried up the exposed soil. With no grass roots to hold the sandy soil in place, it simply blew away with the strong summer winds.

Recognizing a problem is the first step toward solving it. Farmers didn't know that plowing up large, flat tracts of land would cause the soil to blow away in the event of a drought. Once they saw what had happened, they did what farmers have been doing for thousands of years. They began thinking of different methods they could use that would protect the soil.

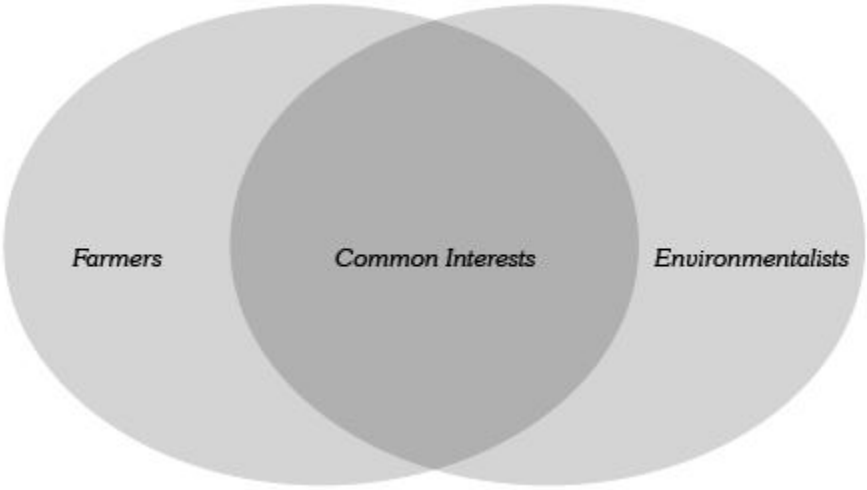
One method involved using chemicals on weeds instead of turning the soil with a plow. For many years, this method seemed like an excellent way to keep the soil in place while producing the food people needed. Then, scientists discovered that some chemicals were getting into the water supply and making birds, fish, animals, and people sick. Other chemicals have begun to lose their effectiveness as weeds develop resistance to them. Today, farmers and agricultural researchers are working on ways to solve food production problems while taking into consideration the growing world population, the state of food prices and economics, and the condition of environmental resources such as soil and water.

Procedures

1. Begin the lesson by asking students to describe and define in their own terms the words: *farmer*,*environmentalist*, and *environmental activist*.

2. Ask students if they have heard any news reports about conflicts between farmers and environmental activists (endangered species preservation, invasive species management, public land use, wetland preservation, etc.).

3. Draw a Venn diagram on the whiteboard (see the example below), and ask students to list things on which farmers and environmental activists disagree and the things they have in common. For example, both care about the land, both need food to eat. Note: You may have to make very large



circles.

4. Share the background material and discuss problem/solution and cause/effect relationships.

5. Divide your class into three groups, and hand out copies of one of the "Caring for the Land" activity sheets to each group.

6. Ask students to read the situation described in the text carefully to identify the cause and effect, the problem and solution, and any alternatives and their effects. Ask each group to share what they discussed with the class.

7. Discuss the following questions:

    - Why do we need farmers? (food, clothes, shelter, other manufactured goods)
    - Who should decide how to use the land?
    - How should we decide how to use the land?

Essential Files (maps, charts, pictures, or documents)

- "Caring for the Land" activity sheet answers
- "Caring for the Land" activity sheets

Sources/Credits

Lesson adapted from materials provided by Oklahoma Agriculture in the Classroom.

Author(s)

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Organization Affiliation

Utah Agriculture in the Classroom

- Agricultural Literacy Outcomes
- Education Content Standards
- Common Core Connections

Agricultural Literacy Outcomes

Plants and Animals for Food, Fiber & Energy

- Understand the concept of land stewardship and identify ways farmers care for land, plants, and animals

Agriculture and the Environment

- Identify land and water conservation methods used in farming systems (wind barriers, conservation tillage, laser leveling, GPS planting, etc.)