Conservation

*Lesson Plan for Grade 4, Science*

*Prepared by NAITC*

*Modified by Mississippi State University, School of Human Sciences*

*for Mississippi Farm Bureau Federation - AITC*

# OVERVIEW & PURPOSE

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

# EDUCATION STANDARDS

**Mississippi College-and-Career Readiness Standards:**

E.4.9c.3 Construct scientific arguments from evidence to support claims that human activities, such as conservation efforts or pollution, affect the land,oceans,and atmosphere of Earth.

ELA- SL 4.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others’ ideas and expressing their own clearly.

**NALOs**

T1.305 a Describe similarities and differences between managed and natural systems (e.g. wild forests and tree population; natural lake/ocean and fish farm).

T2.3-5 e Understand the concept of stewardship and identify ways farmers/ranchers care for soil, water, plants and animals.

T4.3-5 b Describe how technology helps farmers/ranchers increase their outputs (crop and livestock yields) with fewer inputs (less water, fertilizer, and land) while using the same amount of space.

# OBJECTIVES

* Students will examine the stewardship of farmers
* Students will distinguish between cause and effects of issues with land management

# MATERIALS NEEDED

Activity 1

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

* [Caring for the Land Activity Sheets](https://drive.google.com/file/d/19c7UcnnNyT5IdK_cxXaE0MeP6emsnnrx/view?usp=drive_link)
* [Caring for the Land Activity Sheets ANSWER KEY](https://drive.google.com/file/d/1Pm-E0GzAYhBvmxqWKb31b2Dqi5Oky2Yv/view?usp=drive_link)

# Lesson Set Up:

* Print caring for the land activity sheets (1 for every student)

# Vocabulary

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

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

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

**decompose:** to decay or break down into smaller pieces

**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

**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

**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

**organism:** any living thing, plant or animal

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

# Ag Facts:

* Agriculture in **Mississippi** is a 7.72 billion-dollar industry. There are approximately 34,700 farms in the state covering 10.4 million **acres**. The average size **farm** is composed of 299 **acres**.

# Background Information for Teacher:

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. 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 produces 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 in a more reliable manner 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 (**crop rotation**), 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.

# LEARNING PROCEDURES

Interest Approach:

1. Ask students to think about people they know who are farmers or environmentalists.

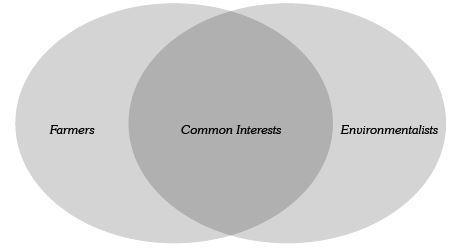
**“Can farmers be environmentalists?”**

1. Continue discussion on the topic to create interest and gauge students' prior knowledge using the following questions:
   * Why would farmers be motivated to protect natural resources like soil and water?
   * What motivates environmentalists to protect natural resources?
   * What are some methods farmers use to protect soil and water quality?

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

4. 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.).

5. Draw a Venn diagram on the whiteboard (see the example below), and ask students to list things about 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.

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

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

8. 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.

9. Discuss the following questions:

* + Why do we need farmers? (food, clothes, shelter, other manufactured goods)
  + Who should decide how to use the land? (everyone)
  + How should we decide how to use the land? (In the best interest of the environment, animals, and human population)

**Concept Elaboration and Evaluation**

After conducting these activities, review and summarize the following key concepts:

* The land is the livelihood of farmers, and most farmers try to avoid practices that harm their way of life.
* People have differing opinions about environmental issues.
* Farms provide food, shelter, clothing, and other manufactured goods.

# Additional Learning Procedures

To help students review and elaborate more about conservation, try using the [“The Carousel”](https://drive.google.com/file/d/15Eq2Hg2gWuHjdQgcmBfbhEaW8PcuytxR/view?usp=drive_link) method to allow students to think deeper and make new connections.

Additional Texts to Include:

[Water. Sources. Use. Conservation.](https://www.agfoundation.org/recommended-pubs/water.-sources.-use.-conservation)

[Water Wise](https://www.agfoundation.org/recommended-pubs/water-wise)



Source: https://www.agclassroom.org/teacher/matrix/

*For more information and additional lessons visit*

*https://msfb.org/ag-in-the-classroom/lesson-plans/.*