CONSERVATION

*Lesson Plan for Grade 5, Science*

*Prepared by NAITC*

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

*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.

# EDUCATIONAL STANDARDS

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

E.5.10 Students will demonstrate an understanding of the effects of human interaction with Earth and how Earth's natural resources can be protected and conserved.

E.5.10.1 Collect and organize scientific ideas that individuals and communities can use to conserve Earth’s natural resources and systems (e.g., implementing watershed management practices to conserve water resources, utilizing no-till farming to improve soil fertility, reducing emissions to abate air pollution, or recycling to reduce landfill waste).

ELA-RF.5.4 Read with sufficient accuracy and fluency to support comprehension.

**NALOs:**

T1.3-5 c Identify land and water conservation methods used in farming systems (wind barriers, conservation tillage, laser leveling, GPS planting, etc.).

T2.3-5 e Understand the concept of stewardship and identify ways farmer/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, fertilization, and land) while using the same amount of space.

# OBJECTIVES

* Explain why people have different opinions regarding soil management
* Identify cause and effect relationships relating to agriculture and the environment

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# MATERIALS NEEDED

# *Caring for the Land* activity sheets (One for every student)

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

### [Caring for the Land Activity Sheets](https://drive.google.com/file/d/1NChmDubH2CLjTR6ud333dghKbIjHZPEn/view?usp=drive_link)

### [Caring for the Land Activity Sheets ANSWER KEY](https://drive.google.com/file/d/11GAs5wXPHaZmBdNu609g4DY8MA1LbQg5/view?usp=drive_link)

# Lesson Set Up:

1. Print the Caring for the Land Activity Sheets (one for every student).
2. Pre-determine pairs of students or let them pick their own to complete the activity sheet.

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

# Ag Facts:

* Agriculture is the single largest employer in the world.
* There are 914 million acres of farmland just in the U.S.
* The average U.S. farmer can feed 155 people.
* Beef farming accounts for 29% of American farms.
* In 2015, $133.1 billion worth of American agricultural products were exported around the world.

# Background Information for Teachers:

# 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. Start out by going over the vocabulary definitions for the students.

Ask students:

**“Think about people that you know who are farmers or environmentalists. Can farmers be environmentalists?”**

Answer: “Yes farmers can be environmentalist because they actively work with the land everyday”

**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?”**

Answer: “ Farmers have to use soil and water to grow their crops and raise their animals. They would not want to run out because then they would not be able to farm.”

**“What motivates environmentalists to protect natural resources?”**

Answer: “Environmentalist want to protect natural resources so that the Earth does not run out of them”

**“What are some methods farmers use to protect soil and water quality?”**

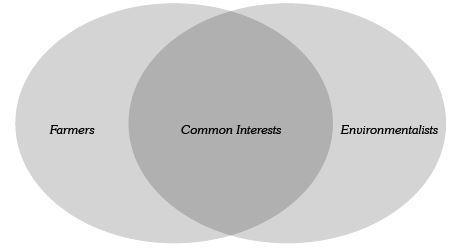
Answer: “There are a lot of ways farmers can protect the soil and water quality. One way is by not plowing up their fields. This is called no-till farming. This is when farmers do not dig up the soil to plant their next crop”.

1. Begin the lesson by asking students:

**“Describe and define in your own terms the words: *farmer*, *environmentalist*, and *environmental activist*.”**

Ask students:

**“Have you ever heard any news reports about conflicts between farmers and environmental activists (endangered species preservation, invasive species management, public land use, wetland preservation, etc.).”**

1. 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. 
2. Share the background material and discuss problem/solution and cause/effect relationships.
3. Divide your class into pairs of students, and hand out copies of one of the *Caring for the Land* activity sheets to each group.

Instruct students:

**“Read the situation described in the text carefully to identify the cause and effect, the problem and solution, and any alternatives and their effects.”**

1. Ask each group to share what they discussed with the class.
2. Discuss the following questions:

**“Why do we need farmers?”**

Answer: So that we will have food, clothes, shelter, other manufactured goods.

**“Who should decide how to use the land?”**

Answer: Everybody

**Concept Elaboration and Evaluation:**

After conducting these activities, have students complete the reflection sheet. Have students turn in reflection sheets and then discuss the answers with the class.

1. Is land important for farmers? Why?

Yes. Land is one of the most important tools for a farmer to use. Without land he cannot grow plants (crops) or animals (livestock) to produce food for people to eat or fiber for clothes for people to wear.

1. Do you think most farmers try to take care of their land? Why?

Yes. If farmers did not take care of their land then they would not have it to farm and would not be able to produce anything off of it.

1. Why do people have different opinions about environmental issues?

People have differing opinions about environmental issues because everybody lives different lives.

1. What do farms provide for you and your family?

Farms provide me and my family food, clothing, and shelter.

# Additional Learning Procedures

To help students review and elaborate more about conservation, try using the [“Write About”](https://drive.google.com/file/d/1XV9_4I7FfqxqoD9mYwb3_21ypIZ9Aepc/view?usp=drive_link) method to allow students to think deeper and make new connections.

Additional Texts to Include:

[Children of the Dust Bowl](https://agclassroom.org/matrix/resource/17/)

[Erosion: How Hugh Bennet Saved America’s Soil and Ended the Dust Bowl](https://agclassroom.org/matrix/resource/1049/)

[Survival in the Storm](https://agclassroom.org/matrix/resource/514/)



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

*For more information and additional lessons visit*

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