

“Dirty History”

A Science and History Lesson about Wind Erosion

Description

“Dirty History” integrates science, technology, history and social studies through a presentation and classroom experiment. Participants are introduced to the important role soil and agriculture have played in American history. Participants are shown examples of how agriculture and soil erosion and, later on, soil conservation have influenced the government, the economy and society.

Wind erosion and drought played a role in decreasing agriculture production in the great plain states during the Dust bowl. The amount of soil moved by wind during a severe wind storm is difficult to understand. During wind erosion, the wind physically lifts soil particles and moves them. Erosion reduces the level of organic matter that contributes to the breakdown of the soil structure. When the soil isn’t healthy, it doesn’t produce very good crops.

The presentation includes a hands-on experiment addressing the problem of wind erosion where students create two mini-examples of the soil surface of many farms in the plains states during the Dust Bowl era. One sample has bare soil (plowing/old method of farming). The second sample has crop residue, or vegetative cover (no-till/new conservation method of farming), which is the solution to reducing wind erosion effects on soil. The vegetative cover keeps soil particles in place. Students simulate the problem of wind erosion by blowing through a drinking straw across each soil sample. The presentation and experiment help students gain a cumulative understanding of the importance of conservation practices in reducing wind erosion so the mistakes of the early 1900s and the Dust Bowl era are not repeated. The lesson also introduces careers in agriculture and challenges students to continue learning so they can become responsible citizens who contribute in a positive manner to a sustainable future for mankind.

Objectives

Participants will answer these questions about the dust bowl and soil science:

- What are some environmental factors that caused the Dust Bowl?
- What are some human factors that caused the Dust Bowl?
- How can wind erosion be reduced?
- What were some of the effects on the people living in the Dust Bowl? (i.e., medical, emotional, economical, lasting soil problems.)
- Why are grass and top soil so important in the Great Plains states?

Participants will explore these introductory wind erosion concepts:

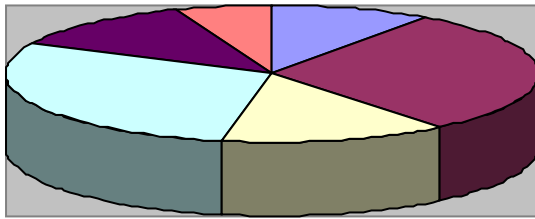
- Soil particle sizes and properties.
- Simulating bare overworked soil surface in controlled environment.
- Demonstrate wind erosion comparable to that experienced in the Dust Bowl era.

South Dakota State Education Standards

6th -8th grade standards Science Technology, Environment, and Society : Indicator 1: Analyze various implication/effects of scientific advancement within the environment and society. Indicator 2: Analyze the relationships/interactions among science, technology, environment and society. For 6th specifically 6S1.1 Describe how science and technology have helped society to solve problems. 6S 2.1 Given a scenario identify the problem of human activity on the local, regional or global environment. Earth/Space Indicator 1 Analyze the various structures and processes of the Earth system. 6E 1.1. Students are able to describe how the spheres (atmosphere, biosphere, lithosphere and hydrosphere) interact. E.1.2 Students are able to examine the role of water on the Earth E.1.3 Students are able to explain the processes involved in the formation of the Earth's structure.

Conducting the Lesson

The lesson was conducted five times during the school day with each class having a 50-minute class period and 20-25 students.



- Introduction and Soils Review
- Presentation
- Excerpt Black Blizzard DVD
- Wind Erosion Experiment
- Conservation and the Future
- Q&A and Cleanup

Materials Needed:

- “Dirty History” PowerPoint Presentation.
- “The Black Blizzard” DVD from The History Channel; play the introduction through the first seven minutes of the documentary.
- Copies of the Wind Erosion Demonstration Worksheet
- Supplies for the Wind Erosion Demonstration (*see activity page*).
- Soil Profile poster/banner – *this item is not essential, but the image helps students comprehend production agriculture and the importance of topsoil.*

This lesson was developed by the USDA Natural Resources Conservation Service in cooperation with staff and students at Georgia Morris Middle School in Pierre, SD.

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