

Soil Erosion

Grade Level: 4-8

Lesson Overview

Has soil erosion increased or decreased in the last decades? Students will use soil erosion data to complete mathematical problems and in the drawing and use of a bar graph.

Student Objectives

1. Use computation skills and reading of graphs to learn about soil.
2. Demonstrate the principles of soil erosion through a bar graph.
3. Express percentages, fractions and decimals.
4. Computation of large numbers.

Materials

- ✓ graph paper
- ✓ Soil Erosion worksheet

Vocabulary

- **conservation** - preventing unnecessary loss of resources.
- **conservation method** - a combination of land uses and practices to protect and improve soil productivity and to prevent soil erosion.
- **erosion** - the process in which water or wind moves soil from one location to another.

Background Information

In agriculture, soil erosion refers to the wearing away of a field's topsoil by the natural physical forces of water and wind or through forces associated with farming activities such as tillage.

In this lesson, we are concerned with water and wind erosion. Various conservation methods have been used to lower the erosion factor.

Procedure

Teacher will instruct students to complete Soil Erosion worksheet, discuss findings, and summarize the importance of conservation methods.

Extension Activities

The Dust Bowl lesson complements this lesson.

Additional Resources

- <https://youtu.be/Fzv7fVmHPzs> explanation of earth's useable land for growing plants and how they help conserve the land.
- <https://youtu.be/G5Rp9MJJGCU> Landforms and water erosion are explained
- <https://youtu.be/xwPOhfV7loo> Explanation of soil erosion, Dust Bowl and agricultural soil conservation methods.
- <https://youtu.be/3j5MRJeCoYs> Iowa farmer using cover crops, his reasons why.
- Soil Ag Mag from Illinois Agriculture in the Classroom
http://www.agintheclassroom.org/TeacherResources/AgMags/Soil%20Ag%20Mag_2019_Online_Interactive.pdf
- Soil Reader from Illinois Agriculture in the Classroom
http://www.agintheclassroom.org/TeacherResources/terra_nova.shtml

Standards

Illinois Mathematics Standard

6.RP.3c-1 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double-line diagrams, or equations.

Illinois Science Standard

MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Illinois English Language Arts Standard

RST 1: Cite specific textual evidence to support analysis of science and technical texts.

The **M**ultidisciplinary **A**gricultural Integrated Curriculum (mAGic) was created in 2004 under the leadership of the Illinois State Board of Education (ISBE) and the Facilitating Coordination in Agricultural Education Project (FCAE). Funding was made available through the FCAE grant budget from the agricultural education line item of the ISBE budget. This revision, as printed, was developed in April 2021.



These mAGic lessons are designed to bring agriculture to life in your classroom. They address the Illinois Learning Standards in math, science, English language arts and social studies.

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Name _____

Soil Erosion Worksheet

Soil loss in the USA due to wind and water erosion in tons/acre:

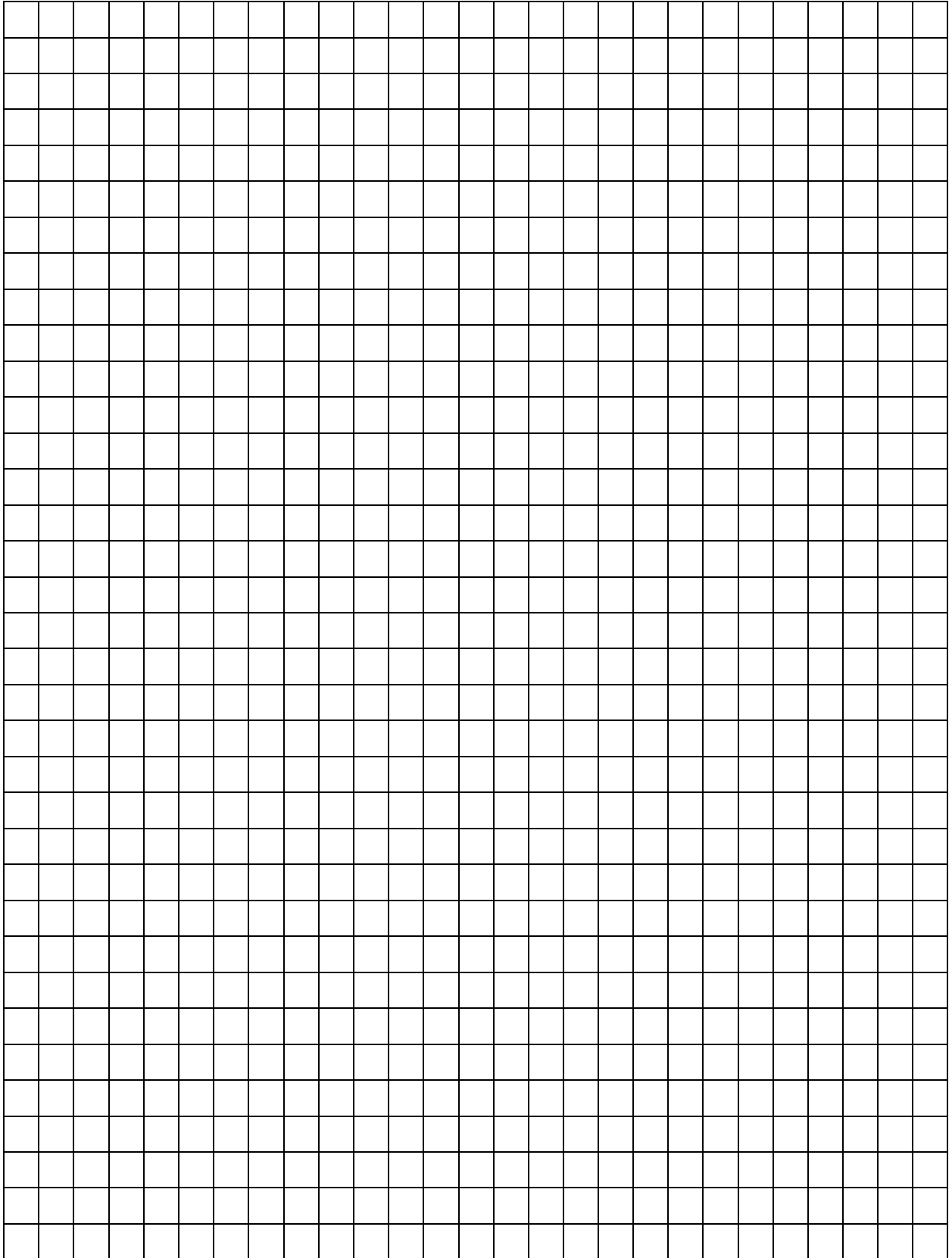
1982	7.0
1987	6.7
1992	5.6
1997	4.9
2002	4.7
2007	4.6
2012	4.6
2017	4.6

1. Make a bar graph to show the erosion data on a separate paper.
2. Using your bar graph, answer the questions:
 - a. Has the soil erosion increased or decreased? _____

 - b. What is the difference between the soil erosion in 1982 and 2017?
 - c. Between which years did the biggest changes take place? _____
3. Cover crops are plants that are planted to cover the soil, not for the purpose of being harvested. So, the farmer plants a cover crop after harvesting his crop (corn, soybeans, etc.), lets the cover crop grow until spring and then plants new crop of corn or soybeans. Why do you think this helps with soil and water erosion? _____

4. No till farming is the practice of leaving crop residues (roots and stump of plant) on the surface after harvesting. The residue helps absorb water and limits runoff. Planting takes place in the spring without turning over the soil (no tillage). How do you think this helps in the conservation of soil and water? _____
5. Contour farming, where farmers plant crops across the slope of the land is also used in conservation practices. Why do you think this would help the loss of soil and water?

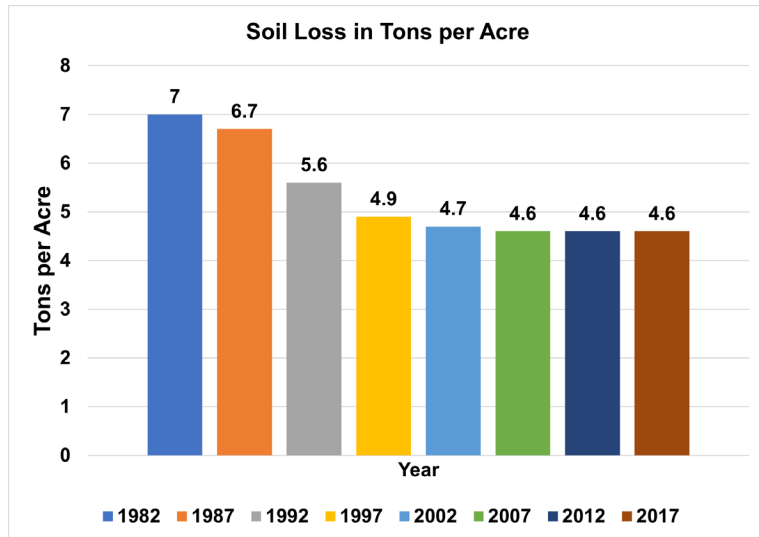
Name _____



Soil Erosion Worksheet ANSWER KEY

Soil loss in the USA due to wind and water erosion in tons/acre:

1982	7.0
1987	6.7
1992	5.6
1997	4.9
2002	4.7
2007	4.6
2012	4.6
2017	4.6



- 1 Make a bar graph to show the erosion data on a separate paper.
- 2 Using your bar graph, answer the questions:
 - a. Has the soil erosion increased or decreased? Decreased
 - b. What is the difference between the soil erosion in 1982 and 2017? $7.0 - 4.6 = 2.4$ tons/acre
 - c. Between which years did the biggest changes take place? 1987 and 1992
- 3 Cover crops are plants that are planted to **cover** the soil, not for the purpose of being harvested. So, the farmer plants a cover crop after harvesting his crop (corn, soybeans, etc.), lets the cover crop grow until spring and then plants new crop of corn or soybeans. Why do you think this helps with soil and water erosion? Answers will vary
- 4 No till farming is the practice of leaving crop residues (Roots and stump of plant) on the surface after harvesting. The residue helps absorb water and limits runoff. Planting takes place in the spring without turning over the soil (no tillage). How do you think this helps in the conservation of soil and water? Answers will vary
- 5 Contour farming, where farmers plant crops across the slope of the land is also used in conservation practices. Why do you think this would help the loss of soil and water? Answers will vary