

From Bluestem and Bison to Corn and Cattle

Grade Level: 4-8

Lesson Overview

Have you ever stopped to think just how small 1/100th of 1% is? This activity provides students with a perspective of how the landscape of Illinois has changed from tallgrass prairie to fields of corn and soybeans. All it takes is a sheet of paper. Students will listen to directions on how to fold and tear this paper to represent the Illinois prairie landscape changes that occurred in less than 100 years. Students will use math and listening skills.

Student Objectives

1. Use simple math computations
2. Listen and follow directions to accomplish a project

Materials

- ✓ sheet of 8.5" x 11" copy paper

Background Information

What is prairie? The classic image of the prairie is of a sea of tall waving grasses and wildflowers with rich black soil and plants adapted to moderate rainfall and regular fires. The prairie is an ecosystem of mostly grasses and forbs (flowering plants) with many other fauna, fungi, the soil, geology, and fire playing important roles. All elements of a prairie are interdependent upon each other. The prairie is an intricate web, with more of its living mass below ground, in the deep roots of the grasses and flowering plants, than we can see above ground.

How much prairie is left in the United States? Native prairie once stretched for hundreds of miles across the middle section of our country, covering nearly a quarter of the lower 48 states. In the early 1800's, the United States was covered by 250 million acres of tallgrass prairie that went from Texas north to Canada and from Ohio west to Kansas. In fact, it was the largest ecosystem or natural area in the country. In the span of 70 years (1830-1900), 240 million acres were converted to farmland. Today, less than one million acres remain in the United States.

How much Illinois prairie is left? In 1820, Illinois had approximately 22 million acres of prairie land and 14 million acres of forests. Prairies were mainly in the northern two-thirds of the state with forests in the southern one-third. By 1900, most of Illinois' prairies were gone. The majority of these lands were converted to agricultural practices once

settlers realized the richness of the prairie soils. Today, approximately 2,000 acres of high quality prairie remain in the entire state. This equates to less than 1/100th of 1% of Illinois native prairies remaining. Most of these remaining undisturbed prairie sites today are found along railroad rights-of-way, in pioneer cemeteries and in places that are not suitable for farming.

Prairie is endangered. The prairie's demise is the result of many factors including agriculture conversion, urban sprawl and fire suppression. Native prairie grasslands were once the dominant feature of the American landscape. Now, tallgrass prairie is considered to be more rare than the famous tropical rainforests. In fact, Native tallgrass prairie is the MOST ENDANGERED ecosystem in North America.

Procedure

The activity can be used as a classroom demonstration or as a participatory activity to show changes to the Illinois prairie landscape.

Using an 8.5" x 11" sheet of copy paper, students are provided with directions on how to fold and tear the paper. Numbers are rounded to expedite the process.

Each time the paper is folded and torn, represents a 50% reduction in size of the Illinois prairie. Students can determine this amount.

Student Directions: This sheet of paper represents the 22,000,000+ acres of Illinois prairie that existed in the 1820. To begin the activity, round this to 20,000,000 as some prairie was lost to the founding of new towns, railroads being built and the conversion to farmland.

Fold the sheet of paper in half ("hamburger" fold) and then tear. Discard one of the two sheets. There are now 10,000,000 acres of tallgrass prairie left in Illinois.

Repeat the process of fold in half and tear. There are now 5,000,000 acres of Illinois prairie.

With each paper tear, the amount of prairie will be reduced by one-half. Ask students to determine how many acres of prairie remain in Illinois with each fold and tear.

Repeat this process until the paper has been reduced in size to represent the remaining 2,000 acres of native prairie. In all, the paper will be folded and torn thirteen (13) times.

When completed, only a "speck" of paper will be left. This represents the one-hundredth of one percent of native prairie that now exists in Illinois. (*Approximately 3.125 square miles*)

Here are the figures that can be used with the paper fold and tear activity:

22,000,000 Acres (Early 1800's) (Round to 20,000,000)
10,000,000
5,000,000
2,500,000
1,250,000
625,000
312,500 (Round to 300,000)
150,000
75,000
37,500
18,750 (Round to 18,000)
9,000
4,500 (Round to 4,000)
2,000 (Number of native prairie acres that exist today)

Extension Activities

1. Calculate how many square miles would be in 22,000,000 acres and in 2,000 acres. Using the key on an Illinois roadmap, show how much area would have been tallgrass prairie and then, how much remains.
2. Do some research: What historical events occurred that allowed the prairie sod to be turned in such a short time? With so much prairie being converted to other uses, did this have an effect on the animals that roamed the prairie?

Additional Resources

- <https://www.ilforestry.org/forestmap1820>
- <https://www.ilforestry.org/forestmap2000/>
- Eco-meet Guide from Army Corps of Engineers:
<https://www.mvs.usace.army.mil/Portals/54/docs/recreation/lakeshelbyville/Education/Tallgrass%20Prairie%20Study%20Guide-Varsity%202014.pdf>
- Information on number of original acres to now...discussion about the John Deere plow: <https://www.inhs.illinois.edu/animals-plants/prairie/tallgrass/settlement/>
- Illinois Department of Natural Resources "What Is A Prairie":
<https://www2.illinois.gov/dnr/education/Documents/PrairieIntroductionSheet.pdf>

Standards

Illinois English Language Arts Standard

CCRA.SL.1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

Illinois Social Science Standard

SS.G.1.6-8.MC. Construct different representations to explain the spatial patterns of cultural and environmental characteristics.

Illinois Mathematics Standards

CC.4.NF.3d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

CC.5.NBT.3 Read, write, and compare decimals to thousandths.

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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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