

# Prairie Connections

## Teacher Guide

---

Grade Levels: 1 – 3

### Program overview

This program will introduce students to many native Oklahoma animals and plants who thrive in a grassland ecosystem. Students will learn about some of the amazing adaptations of prairie wildlife and use their new knowledge to discover the connections between different members of the prairie community.

### Objectives/Student Learning Outcomes

After participating in this program, students will be able to:

- Discuss characteristics of a grassland ecosystem
- Recognize several different plant and animal species native to Oklahoma, including many state symbols of Oklahoma
- Discuss the types of connections between living things and give examples

### P.A.S.S.

#### GRADE 1

Science Process – 1.2, 2.1, 3.1  
Life Science – 2.1, 2.2

#### GRADE 2

Science Process – 1.2, 3.1, 4.2, 4.3  
Life Science – 2.1, 2.2

#### GRADE 3

Science Process – 1.2, 3.1, 4.2, 4.3  
Life Science – 2.1, 2.2, 2.3

### Background

**Grassland** ecosystems are widespread across North America, but are generally the least understood of all ecosystems. Students often know more about tropical rainforest animals than they know about animals they may actually encounter closer to home. Grasslands occur where there is not enough rain for a forest, but just enough rain to avoid a desert, between 10 and 60 inches per year. These areas tend to be flat or hilly, open expanses of land with occasional water in the form of streams, rivers, springs, and sporadic wetlands. Just as the name indicates, grasslands are dominated by grasses, with many other varieties of wildflowers, shrubs and few trees.

Rainfall patterns vary across the great plains of North America. These small differences in water lead to big differences in the kinds of grasses that grow there. Short grass **prairie** dominates the western reaches of the plains where 10-20 inches of rain fall each year, while mixed grass **prairies** occur where there is slightly more rain, about 20-45 inches of rain annually. Tall grass **prairies** need a bit more rain to thrive, 45-60 inches per year, and these ecosystems are found on the eastern reaches of the great plains. Oklahoma is uniquely situated in the great plains so that all three types of **prairie** occur in our state!

Grasses are plants built for survival. **Grass** stems are hollow, making them flexible enough to bend and not break in the prairie winds. More than half of the plant is underground, so if a plant is eaten or grazed heavily, or burned by fire, it can grow fresh leaves quickly because of the energy stored in the large **root** system. Protected by the earth, the root systems of grasses can grow very deep to reach water and mineral **resources**, so grass can thrive in areas too dry for trees.

Prairie animals have several challenges to meet if they are to survive. Water is scarce, and shelter can be hard to find in the absence of many trees. Food can be plentiful or sparse, depending who you are. Large **grazers**, or grass eaters, like bison have plenty to eat, but must keep moving to find more grass to eat. Smaller plant eaters such as cotton rats may only run short on food seasonally in the winter when few grasses are producing seeds to eat. **Predators** such as bull snakes and red-tailed hawks must depend on their keen senses and some luck to find and catch **prey** to eat.

Many prairie residents seek shelter underground. If you visit a wild prairie, it may appear quiet and lifeless. But prairies are busy places! If you could look underground, you'd see many burrows made by coyotes, prairie dogs, badgers or burrowing owls, thick mats of plant roots many feet thick, millions of invertebrates living all or part of their lives in the soil. Many prairie animals make their homes right on the ground or just above it, hidden in the thick grasses. Birds may nest on the ground or weave the grasses together to create a floating home for young. Cotton rats nest in the dense bases of grasses.

### Vocabulary

**Grass** – a green plant with hollow stems and long slender leaves.

**Grazer** – an animal who eats grass. A specific kind of plant eater. (Browsers eat tree leaves, bark, and twigs, vines, and shrubs.)

**Plant** – a living thing that makes it's own food using photosynthesis, can not move on its own, and has cell walls.

**Seed** – a small object made by a plant that can produce another plant; the reproductive unit of a flowering plant.

**Root** – the underground part of a plant that helps the plant get water and nutrients from the soil and helps hold the plant up.

**Grassland** – a habitat or biome type that is covered with grasses and few trees, receives 10 to 16 inches of rainfall annually. Pampas, bush, llanos, prairie, savanna, steppes, and veldt are all types of grasslands.

**Plant eater** – an animal that eats plants; herbivore.

**Prairie** – the grasslands of North America

**Organism** – a living thing that can grow, reproduce, and die.

**Adaptation** – a special feature of a living thing that makes it better suited to its particular way of life.

Grasslands are the most productive areas on the planet, up to twelve times more productive than tropical rainforests. These are the lands that have been plowed for vast fields of wheat, corn, oats, barley, rice, and sugarcane. The available energy in grass makes it perfect for large grazing animals, such as bison, who have been replaced in recent times by cattle. This productivity and use by humans has led to the destruction of most of the native prairie in North America, making it the most endangered ecosystem in the world.

### **At the Museum**

#### Hall of Natural Wonders

The Mixed Grass Prairie exhibit features prairie plants and animals. The exhibit panels and labels highlight many unique adaptations of prairie residents. This is a great supplement to your educational program. The prairie community is brought to life in this open exhibit.

Activity: Ask your students to locate one (or more) prairie animals or plants and identify their adaptation for prairie life. Where do these animals live? What do they eat? How do they find food?

#### Hall of Ancient Life

The Cenozoic Era is characterized by the rise of grasslands and mammals. The large dinosaurs became extinct at the end of the Mesozoic Era, about 65 million years ago. Vast grassy plains became home to many large mammals, such as mammoths, horses, camels, rhinoceros, sloths, bears, bison, and many more.

Activity: Look for the large mammals in the Cenozoic Era gallery. Can you figure out what these large animals ate? What do you think the largest animals ate? Who were the predators in this era? What kinds of animals did they eat?

**Habitat** - the physical place where an animal lives; it provides all of the resources needed for life.

**Resources** - substances or objects required by an organism for normal maintenance, growth, and reproduction.

**Camouflage** - the way animals hide by blending in with their surroundings.

**Predator** - an animal that kills and eats other animals.

**Prey** - an animal that is killed and eaten by another animal.

## **Supplementary/Enrichment Activities**

### **Science**

1. **What is a grass?** To many students, grass is something that grows in a lawn.
  - Take your students outside to a grassy area around your school. Taller grass is better, but any grass will work.
  - Ask each student to collect some grass, and encourage them to try to get the whole plant, including some roots (flower beds and landscaped areas are a great place to collect grass and “weed” at the same time!).

- Encourage students to look at their grass plants closely. Magnifying glasses work well for this activity (if you don't have any, they can be purchased for one or two dollars each from many school supply catalogs).
- Discussion questions: Are the leaves covered with hairs or smooth? Are the stems hollow or solid? How long are the leaves? Can you find any seeds? Can you find any flowers? Are there any animals on your grass, like spiders or insects? Is there any evidence that an animal ate some of your grass? Does everyone have the same kind of grass, or are there different kinds of grass?

2. **Be a Scientist!** You don't have to be a botanist to study grass. Your students can study the local grassland ecosystem right on your school grounds.

- Supplies: string or rope, tent stakes or wooden stakes, tape measure. Students can set up the squares – it's a good exercise in measuring.
- Set up four squares anywhere on the grass. Make the first square by measuring three feet on the tape measure and place a stake in the ground in either end. Then measure the other three sides of your square, and place a stake at the other two corners. Wrap the string around the outside of the square, creating a visual square of grass. Repeat for the other three (or more if you have a large class) squares, separating them just enough so that they are in slightly different areas.
- Try placing one square in full sun, one in the shade, one in an area that gets walked on a lot, and one in an area that doesn't get mowed as often as the others.
- Divide your class into groups and assign each group to a square. Ask the students to predict which square will have the most and least variety of plants.
- Ask your students to count as many different kinds of grass and other plants in their square as they can. One student in each group can be the "grass holder" as his or her classmates collect small pieces of each different kind of plant.
- Record their results for each square. If there is time, have the groups rotate through one additional or all four squares.
- Discuss the results. Discussion questions: Which square had the most kinds of plants? Which had the least? Why do you think that is? Did you find more kinds of grass than you expected?

### 3. **Who eats grass?**

- Ask each student to bring in one empty food package from home. This should be something with an ingredient list on the side, such as a soup can, bread bag, pasta box, or candy wrapper.
- Lay all the food packages out on the floor or a table. Ask students to sort the food into two groups: foods that contain grass, and foods that do not.
- Once they have sorted, read the ingredient lists. The following foods are grasses: wheat, corn, sugar, oats, rye, barley, rice. These common ingredients are made from grass: corn syrup, high fructose corn syrup, dextrose, sucrose, fructose, corn starch, corn gluten meal, wheat starch, maltodextrin, molasses, wheat germ, malt syrup, sugar, glycerol, malt extract, tagatose, sorbitol, sucralose.
- Just about everything that your students brought in will have at least one grass-based ingredient. Even many meat products, such as beef jerky, are sweetened with corn syrup.

- If there are any packages left in the not grass pile, they will most likely be meat products. These animals were probably fed grass, either grazing on pasture or eating corn based animal feed (where 90 percent of the corn grown in the US ends up).
- So who eats grass? EVERYONE! If you like eating food, then grasslands are important to you and important to know about!

### **Language Arts**

#### **1. Little House on the Prairie.**

- Read a passage (or the entire book) from *Little House on the Prairie* by Laura Ingalls Wilder to your students. There are many parts that show what prairie life was like for pioneer families. The main character, Laura, is about the same age as first through third graders.
- Ask your students to discuss Laura's daily life and that of her family members. Discussion questions: How is Laura's daily life different from your lives? How does Laura's family make their living on the prairie? What kinds of chores do the children do? How does Laura get to school? What kinds of games do Laura and her sisters play for fun? How do Laura and Mary do their school work?

### **Art**

1. **Day in the life of a prairie critter.** Imagine you are a prairie animal. What kind of animal are you? What do you look like? Where do you live? Draw your prairie animal.

## **Additional Resources**

### **For Early Elementary**

*A Walk in the Prairie.* Rebecca L. Johnson. Biomes of North America series. Carolrhoda Books, 2001.

*A Tallgrass Prairie Alphabet.* Claudia McGehee. University of Iowa Press, 2004.

*Peeking Prairie Dogs.* Christine Zuchora-Walske. Learner Publishing Group, 1999.

*Little House on the Prairie.* Laura Ingalls Wilder. Harper Collins, 2004. Third book in the Little House series, originally published in 1935.

*Lewis and Clark: A Prairie Dog for the President.* Shirley-Ray Redmond. Bantam Doubleday Dell Books for Young Readers, 2003.

### **For Teachers**

*The Prairie.* Alison Ormsby. Ecosystems of North America series; Benchmark Books, 1999.