

## Kansas Prairies

# I See a Coyote

## Kansas Prairies

### Science, Ecology

#### Materials

Copy of Worksheet A for each student

#### Overview

After studying the prairie biome, the lesson in environmental education is necessary to show students the interdependence of animal life with their environment. With our planet in the serious condition it exists today, students need to see the plan of nature so that they can understand the need to preserve and protect our resources.

#### Objectives

1. Students will identify and describe food, water, space, and shelter as four essential components of any habitat.
2. Students will describe the importance of good habitat for animals.
3. Students will define “limiting factors” and give examples.
4. Students will recognize that some fluctuations in wildlife populations are natural as ecological systems undergo a constant change.

#### Instant Expert

*Exploring Kansas Natural Resources Educator’s Guide*. Unit 2 – Prairies (13-32). Kansas Foundation for Agriculture in the Classroom. To order, visit [www.ksagclassroom.org](http://www.ksagclassroom.org).

#### Background Information

The grassland biome purifies the air through photosynthesis. In the process of photosynthesis, the chlorophyll-containing cells in green plants convert sunlight into chemical energy. As the plants do their work, they take in carbon dioxide and release oxygen. One source of carbon dioxide is human-produced fossil fuel emissions. The grass-filled prairies of Kansas are serving as a cleansing filter for the earth’s human population as well as the food supply for its livestock and wildlife, and in succession, its people.

All member of the grass family, not only prairie grasses, live and grow on food manufactured mostly in their own green leaves. Rangeland or any grass crop can flourish only if the individual plant can make food for its own growth. The raw materials to make plant food are present in the soil and air.

Water entering the soil forms a film around each soil particle and dissolves some of the minerals

**Grade Level: 4-6**

**Time: 45 minutes**

**Standards:  
Science**

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present. Tiny root hairs from the plant come in contact with these films of water and absorb the mineral solution. A network of small roots carries this mineral solution to the main roots. The roots transport it to the stems; stems carry it to the leaves.

Plants use phosphorus, nitrogen, potassium, calcium, magnesium, and sulfur to manufacture their food. They use other minerals such as iron, manganese, molybdenum, copper, boron, and zinc in smaller quantities but must have them for good plant growth. All these minerals are contained in the solution carried to the plant.

Minerals from the soil make up about five percent of the solid material found in plants. Carbon, hydrogen, and oxygen from the air and water make up most of the other 95 percent.

Throughout the growing cycle, grass is consumed by grazing animals: bison, throughout history, and domestic cattle as well as others. The nutrients produced in the muscles of these grazers—some of which are so unique they can be found in no other food source—are passed to meat eaters in a nutrient dense package. Each link in the process is vital to the health of the grassland and to other consumers, like coyotes, in the food web.

*Information adapted from Exploring Kansas Natural Resources Educator's Guide. Unit 2 – Prairies (13-32). Kansas Foundation for Agriculture in the Classroom. To order, visit [www.ksagclassroom.org](http://www.ksagclassroom.org).*

### **Instructional Format**

1. Share background information with students.
2. Students will follow procedures to play the game called “I See a Coyote.”
3. Upon completing the lesson, students will discuss the activity and answer assessment questions.

### **Procedures**

Demonstrate to students that without food, water, shelter, and space prairie animals cannot survive. You may actually use any animal found on the prairie to play this game.

1. Go outside to a playground. If a playground isn't available, a school gym or your classroom would also be suitable.
2. Have students count off in fives with all those sharing the same number gathering in certain corners of the class-room or on your playground area.
3. Mark two parallel lines on the playground or floor that are about 15 to 20 yards apart. This distance can be ad-justed according to the size of the room available.
4. Have all the number “5's” line up behind one line while all the rest of the students line up behind the second line. The 5's will be the coyotes. You could use deer or bison, as well.
5. The students numbered 1 through 4 will become the necessary parts of the habitat: food, water, shelter, and space.

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6. A coyote can look for any of its needs during each round, but it cannot change what it is looking for in that round. It can change in the next round if it survives. This point needs to be stressed.
  - When a coyote is looking for food, it should clamp its hands over its stomach.
  - When it's looking for water, it puts its hands over its mouth.
  - When the coyote is looking for shelter, it holds its hands together over its head.
  - When it's looking for space, it should hold its arms straight out at its sides.Similarly, those students who are the necessary parts of the habitat need to make the same signs to represent which part of the habitat they have chosen to be during that round.
7. The game starts with all players lined up on their lines and with their backs to each other. The teacher asks all students to pick their sign. When they are in position with their sign, count: "one.....two.....three". At the count of three, the students turn and face each other showing their signs. They need to maintain their sign during each round.
8. Let the coyotes run while the resources can only walk quickly. The coyotes run to the habitat for the necessary part they need and take it back to the coyote side of the line. This represents the coyote successfully meeting its needs and reproducing as a result. Any coyote that fails to find the necessary process to maintain life it was looking for will die and become part of the habitat, joining the students on the habitat side. This concludes the first round. When the resources run out and the coyote can't find what it needs, have those students go to another area and discuss what may happen to them – either they die or move locations.
9. The teacher keeps track of the number of coyotes at the beginning and ending of each round. Continue play for five to 10 rounds depending on number of students.
10. At the end of the rounds discuss the activity and have students answer the conclusion questions.

### **Conclusion Questions (Assessments)**

1. What did you see or encounter during the rounds, and how did this make you feel?
2. Did the group grow and when? What happened as the game went on?  
*The fluctuation of the group of coyotes is a natural process unless factors that limit population become excessive.*
3. What would be some limiting factors?  
*Examples might be drought, fire, lack of food, overgrazing, uncontrolled hunting, humans, etc.*
4. What would happen in the habitat if disease caused the coyote population to be reduced?  
*There may be excess of those things considered to be food for the coyote population, which would cause a shift in the balance of the ecosystem.*
5. What would happen on the prairie if it is over-grazed?  
*There would not be enough food to sustain wildlife. Therefore, animals may die or move to a location that does provide food.*

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6. What are the four essential components of any habitat?  
*Food, water, space and shelter.*
7. Can you summarize what you learned from the prairie activity?
8. Can you name a time on the prairie when too many of one organism caused a large imbalance of the prairie ecosystem?  
*Grasshopper plagues during drought*  
*[http://www.kshs.org/portraits/grasshopper\\_plague.htm](http://www.kshs.org/portraits/grasshopper_plague.htm)*  
*Jack rabbit drives*  
*[http://www.kshs.org/portraits/jackrabbit\\_drives.htm](http://www.kshs.org/portraits/jackrabbit_drives.htm)*

### **Resources**

*Exploring Kansas Natural Resources Educator's Guide. Unit 2 – Prairies (13-32). Kansas Foundation for Agriculture in the Classroom. To order, visit [www.ksagclassroom.org](http://www.ksagclassroom.org).*

Kansas State Historical Society. Flint Hills firestick. <http://www.kshs.org/cool/firestick.htm>

Natural Kansas. Welcome to natural Kansas. <http://www.naturalkansas.org/welcome.htm>

The Nature Conservancy. Flint Hills tallgrass prairie preserve.

<http://www.nature.org/wherewework/northamerica/states/kansas/preserves/art62.html>

### **Want More? Extensions**

For a math moment, have students make a line graph showing the number of coyotes alive at the end of each round.

Follow-up question: Can you make predictions from the data about future events? Why or why not?

