

Prairies

Where's the Grass?

Science

Materials

Per Class:

Large area on playground OR large area in classroom (some where students can spread out)

Play horse/cow on a stick (or use a picture stapled onto a measuring stick)

Per Student:

Grass or weed signs for each student w/string to hang around their neck (or tape to their shirt)

Grade Level: 4-10

Time: 45-60 minutes

Standards:

Science

1.1.2

1.1.3

Overview

In this activity students will be the grass or weed and the teacher will be the grazing animal (cow, sheep, goat, deer, etc.). The grass students will be grazed and the weed students will see if they have an opportunity for invasion. *This is a great activity to introduce a plants unit.*

Objectives

1. Students will understand the importance of native grasslands to Kansas' economy.
2. Students will learn about different management techniques ranchers use to maintain the health of native grasslands.
3. Students will act out the roles of native plants and invasive weeds to see the impact overgrazing can have in pastures.

Instant Experts

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.

Background Information

Native grasslands support a unique web of life. They allow Kansas ranchers to be among the top producers of beef cattle in the country, offer a diverse assortment of gaming wildlife and display a dazzling assortment of colors throughout the spring and summer. Kansas must protect this valuable resource. There are some natural management techniques that can be used. Different practices are used in rangeland management and are used as a guide for farmers and ranchers. Stocking rates and the concept of "take half, leave half" are two such concepts.

Promoting the health of native grasslands is important through management, but natural processes are also used to promote native plants to thrive. One natural process is use of fire by burning in the spring. Controlled burning is used to stunt the growth of introduced plant species,

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like fescue and give the native species, like big bluestem, a running start at growth. The use of fire, over a period of several years, can actually promote these native plants so much that it reduces the amount of introduced plant species.

A stocking rate (stocking rate = number of animals per acre) is a way to measure how many acres of rangeland it takes over a given amount of time to provide a single cow and their calf with enough nutrients to maintain production. The stocking rate is often set by “what granddad used to do.” However, these rates can change significantly based on rainfall, temperature and many other factors. Stocking rates are determined by looking at the plant species present, the health of those plant species, evidence of weeds and invasive plants and a few other factors. Stocking rates can change from year to year as well due to environmental factors such as weather. There are some specific methods such as intensive grazing and strip grazing that branch off this type of practice. The use of stocking rates is by far the most efficient management tool for farmers and ranchers.

Farmers and ranchers are protecting native grasslands through the idea of “take half, leave half.” This practice is where farmers and ranchers will monitor their rangelands and when the cows have eaten half of the growth of grass, the cows are moved to another area or pasture. This practice keeps the grasses healthy and protects them from being overgrazed. In an overgrazing situation, too much leafy material is eaten by the cattle, leaving a weakened plant that is unable to grow back. These weakened plants may lose root structure, which means that they will produce less leafy material in the coming years. Less leafy material means that that area will not be able to support as many cows in the coming years. It also means that weeds and invasive species may be able to get a foothold into the pasture. In the worst possible scenario this will be the death of the plant.

Farmers and ranchers monitor their native grasslands through many different practices. One practice is called a monitor cage. This is an area that has been “caged” off so that grazing animals do not have access to its leafy material. Ranchers can view this caged area and compare the height of grass within the cage to the height of grass outside of the cage and make decisions from that point.

Information 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.

Instructional Format

1. Share background information with students.
2. Upon completing the lesson, students will answer conclusion questions and discuss activity.

Procedures

1. Divide students into a grass group (90% of students) and a weed group (10% of students).
 - Have the grass students spread out over area. Instruct grass students to stand like a big X, with their arms stretched in a “v” above their head and the legs spread out as well.

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Students should not be touching, but need to be close enough that it is difficult to maneuver through their outstretched arms and legs.

- When weed students invade their arms need to be extended above their heads with their hands clasped together, taking “baby” steps as they try to invade the grass (make sure to tell weeds that they are NOT to push or “nudge” a grass plant to fit into a space AND if they touch a grass plant they are not allowed to participate any further). Tell them they are “invading” this way because they are seedlings. As the activity progresses, have the weed students try to grow (extend their arms and legs like the grass students). The grazing animals do NOT like to graze these particular weeds.
- 2. With the grass students spread out, talk about canopy of grass and the importance of maintaining our native grasslands.
- 3. Instruct grass students that when they are grazed (touched with the play horse/cow), they must put one of their arms down, if they are grazed again they must put their other arm down, if they are grazed a third time they must stand on one leg and if they are grazed a fourth time they must sit down (Indian style) because they have been overgrazed to the point of death.
- 4. Before starting have the weed students try to invade the ungrazed native grassland. (No weed should be able to get through w/o touching a grass student.)
- 5. Using the play horse/cow touch each grass student once.
- 6. Have the weed students try to invade again.
- 7. Using the play horse/cow touch each grass student once or twice more. At this point all grass students should have both arms to their sides. Tell the students that at this point the grasses have been grazed, but still have enough leafy material and healthy roots to grow back. If grazing is stopped at this point the grassland can recover and grow more. *If you want at this point you could throw out some candy labeled with sun, fertilizer, or rain. Those students who caught and ate the candy would grow more. If this is done there are more opportunities for grazing animals to graze.*
- 8. Have the weed students try to invade again.
- 9. Using the play horse/cow touch several grass student until they are sitting/dead.
- 10. Have the weed students try to invade again.

Conclusion Questions (Assessment)

1. How does the activity relate to the idea of “take half, leave half?”
Grass students could grow when their arms were still down, so this means that the grass would be able to recover.
2. At what point was it easiest for the weed students to invade?
When the grass students had both of their arms to their sides, were on one leg, or were sitting down.
3. What would be some implications if grazing animals are allowed to graze too much?
There would be little/no grass left for the animals to graze and grow, weeds would take over and there wouldn't be the right type of nutrition available for the grazing animal.

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Resources

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Spencer, Douglas, USDA-NRCS.

Want More? Extensions

Have a water bottle available as “herbicide” for the invading weeds. This will bring up discussion about how rangeland is brought back into good health. Other ideas would be a picture of fire and how that weakens and kills some invasive weeds.

This lesson plan was created by Sarah Spencer.

