

# Pasture Game

## Animal Management

Science, Economics, Math

### Materials

Varieties of individually wrapped candy (food) - 10 per student  
4 plastic sandwich bags per student  
Flagging or cording (to mark off pasture area)  
1 kitchen timer or watch with a second hand  
1 copy of Handout A

### Overview

The class will simulate the decisions that farmers and ranchers make about the number of animals in their pastures and chart the class's decisions.

### Objectives

Students should not share their candy.

Once a student collects 10 pieces of 'food' they must stop collecting for that round and sit down at the edge of the pasture.

### Background Information

Kansas is home to many types of animals. There are vast numbers of wild and domestic animals within our state borders. Domestication is a gradual process that starts with wild animals and plants. People refine these wild animals and plants into domestic forms according to their use through many generations. Exactly how, in what order and when wild animals began to be domesticated is uncertain. It is generally believed that wolves were the first animals to be domesticated around 10,000 B.C. in southwest Asia. It is believed that sheep, goats and pigs followed about 8,000 B.C. in that same region of the world. About 4,000 B.C. donkeys (Egypt), horses (Ukraine) and water buffalo (Southwest Asia or China) began to be domesticated, with other animals following. Cattle were domesticated around 3,000 B.C. although the ancestor of cattle is extinct. Animal domestication changed human life tremendously. Humans went from being nomadic hunters and gatherers to settling in one area in order to tend to animals and crops. This action increased the nutrition available to humans and also encouraged the concepts of land ownership and wealth within social and cultural development.

**Grade Level:** 4-6

**Time:** 30 minutes

**Standards:**

*For Kansas standards, visit  
[www.ksde.org](http://www.ksde.org)*



# Primary Name

## **Habitats**

Today wild and domestic mammals, birds, reptiles, amphibians and insects thrive in the many diverse habitats in Kansas. A habitat is the area in which an animal or plant lives.

Habitats have four elements: food, water, shelter and space. There are many different habitats for Kansas livestock and wild animals. Some include prairies, barnyards, streams, ponds, woodlands, crop fields and even cities. The habitat of wild animals is controlled by nature. Therefore wild animals depend on their instincts for their food, water, space and shelter needs. Domestic animals such as cattle, swine, sheep, goats and poultry depend on their owners for food, water, space and shelter. These domesticated animals are generally referred to as livestock. Farmers and ranchers care for their domestic animals in a wide variety of ways. This care is sometimes referred to as animal husbandry. Animal husbandry not only includes feeding and watering animals but also gathering eggs, shearing sheep, building shelters, sorting pigs, fixing fences and milking cows.

## **Groups**

People refer to groups of animals by different names. Groups of cattle, swine, horses and bison (buffalo) are called herds. Groups of sheep and birds, including poultry, are referred to as flocks. A beehive is occupied by a group of honeybees called a colony. Many factors influence the size and location of groups of animals. There are three influences that are of extreme importance: (1) competition for available food and water, (2) the size of the food supply, and (3) availability of new feeding areas. The amount of food and water available is probably the most crucial factor in determining an area's carrying capacity. The carrying capacity is the greatest number of organisms that can be supported (carried) by an area without damaging that area. Usually a herd of deer or other groups of wild animals will forage for food in the same area year after year. This well established territory is known as their home range. Usually only extreme conditions, such as lack of food, loss of habitat, or severe weather, will force them out of their home range. When their home range no longer contains enough food, water, space or shelter, the animals may disperse in search of new feeding areas. Domestic animals depend on their owners for their food, water, space and shelter. It is important that farmers and ranchers meet the needs of their animals because healthy, well-cared for animals cost less to produce than do unhealthy animals. There are many factors that contribute to the decisions farmers and ranchers make every day. What to feed their animals, how much water their animals require, as well as the amount of space and shelter each animal needs are all questions that they ask themselves. These factors contribute to determining how many animals can be carried by a pasture or pen or barnyard.

## **Instructional Format**

Use the flagging or cord to mark off a circle "pen" approximately 30 feet in diameter or a square 25 feet by 25 feet to represent the pasture. Scatter the food chips throughout the circle, to represent the amount of food available in that pasture.

The students will be playing a game involving a herd of cattle. Each cow will be represented by a plastic sandwich bag. Discuss the decisions that farmers and ranchers make when determining the number of animals for their pastures (rainfall, size of pasture, available drinking water). Point out that the pasture is marked out by the flagging and the 'food' represent the amount of food available in the pasture.



# Primary Name

## Procedure

### ***The First Year***

1. Give each student one sandwich bag.
2. Set the timer for one minute and allow students to collect 'food.' (If one minute is not adequate or too long, you may adjust the time available for collecting candy).
3. At the end of the period, record on the chart the number of cattle that started the round and the number that met their food chip requirement.
4. Collect the bags that have fewer than 5 red food chips. These animals would not have had enough to eat. (All the cattle should have adequate nutrition for the first year because there were 10 food chips per student distributed.)
5. Explain that well-cared for pastures will grow and regenerate the food supply each year. Collect the food chips from the students and redistribute throughout the area.

### ***The Second Year***

1. Explain to the students that herds grow through reproduction. Tell them they will simulate the effect of reproduction by adding one cow for every cow that survived the first year. Hand out one additional sandwich bag to each student. Each student should now be collecting 'food' for two cows (bags).
2. Predict the number of cattle who will meet their nutritional needs during the second year. Record the students' prediction on the chart.
3. Set the timer. On signal, each student should try to collect between 5 and 10 pieces of 'food' for each cow (bag) they have. When they have collected 10 red food chips per bag they should sit down.
4. Record the number of cattle who met their food needs on the chart. Compare the number of thriving cattle with the group's prediction.
5. Discuss the options that farmers and ranchers have for the cattle who don't meet their food needs. Farmers and ranchers can provide supplemental feed or new pasture. A second option would be to sell them from the herd.
6. Vote on the two options. If the class votes to sell the cattle, collect the bags that have fewer than 5 pieces of candy and eliminate them from the game. If the class votes to provide feed, then move the students with fewer than 5 pieces of candy in their bag to a second designated area. Record the decision on the chart.
7. Collect the bags and redistribute the 'food' within the first pasture.

### ***The Third Year***

1. For the cattle remaining in the first pasture, distribute one additional sandwich bag for each surviving cow. If a second pasture is used, then distribute the a different color of candy within the second pasture. The cattle in the second pasture will not have reproduced this year because of inadequate nutrition.
2. Continue as with year 2, making sure to make predictions and record the number of cattle.





## Conclusion Answers

Name \_\_\_\_\_

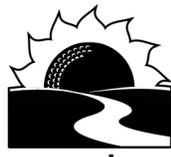
1. What factors determine how many cattle meet nutritional requirements? (How much feed is available and how many cattle are in the pasture.)
  
2. What would happen if 1/4 of the food chips were removed from the pasture? Example: Because of low rainfall the pasture did not grow normally and would not sustain as many cattle. (More cattle would have to be moved or sold or additional feed would have to be provided.)
  
3. How would the price of new pasture influence the decision in year 2? (If the cost was too high, the cattle would be sold instead of being moved.)



# Pasture Game

2-3 Worksheet a

Name _____	<b>Pasture Game Recording Chart</b>			End of Year Options
	Year	Number of Cattle at Start	Number of Cattle at End	
	1.			
	2.			Feed _____ Sell _____
	3.			



## Vocabulary

**Habitat** - An area where plants and animals live with these four elements:

- food
- water
- shelter
- space

**Animal Husbandry** - The care of domesticated animals.

**Herd** - A group of cattle, bison, swine, or horses.

**Flock** - A group of sheep or poultry.

**Carrying Capacity** - The greatest number of organisms that can be supported by an available habitat without damaging the area or depleting the food, water, shelter, or space.

**Forage** - To actively locate and consume feed.

**Range** - The territory a herd or stock of animals will usually forage. Usually the same area year after year.

**Pasture** - An area of grass. Usually fenced in.

**Ruminant** - Animals such as cattle, sheep, bison, deer, and goats with cloven hooves. These animals also have a four compartment stomach and no top teeth in their mouths.

### Want More? Extensions

