

Cattle & Our Grass Resources

Subject Area: Animal Science

Unit Title: Colorado Ranching

Grade Level: 4th & 5th grade

Objectives: For students understand the importance of cattle ranching and how ranchers manage land and grass resources.

Colorado Content Standards to be covered:

ECONOMICS

Standard III - Students to understand the results of trade, exchange, and interdependence among individuals, households, businesses, governments, and societies.

GEOGRAPHY

Standard V- Students understand the effects of interactions between human and physical systems and changes in meaning, use, distribution, and importance of resources.

SCIENCE

Standard IV - Life Science: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.

Standard V - Students know and understand interrelationships among science, technology, and human activity and how they can affect the world.

MATHEMATICS

Standard I - Students will utilize language, symbolism, and technology to develop number sense and to communicate those mathematical ideas.

Materials:

- pieces of paper
- photocopies of the “Your Turn” handout
- calculators

Anticipatory Set: Create and model filling out a Vocabulary Map (see left) by having students fold a piece of paper into 1/2 and then 1/2 again. Then they should open the paper and write in the middle the word “carrying capacity.” In the upper left corner they should write the definition or “what it is”. The definition is: how many of certain types of animals can be kept on a pasture for any length of time. Then they should write in the upper right “what it isn’t”. In the bot-

What it is:	What it isn't:
Vocabulary Word: Carrying Capacity	
Example:	Draw a Picture or Sentence:

tom left write an example such as “12 AUM or 12 animal unit months” etc. Finally in the lower right the should draw a picture or use the word in a sentence.

Input:

Why Are Cattle Important?

Ranching families raise cattle for food, clothing and everyday products. Cattle provide us with many of the essential things we need to live. Over 2/3 of the feed that is fed to cattle consists of substances that are either undesirable or unsuited for human food. The cow’s ability to turn inedible food into human food — beef, helps to improve the quality of the diets for humans.

Did you know we use every part of a bovine animal? Bovine means relating to a ruminant mammal such as a cow, ox or buffalo. Aruminant mammal has four stomach compartments. After removing the meat, the rest of the cow is used to make medicines, soaps, clothing, tires, film, glue, steel, leather, and many more products. Humans have learned to use nearly all of the animal -nothing is left to become waste! Ninety-seven percent of the cow is used and the other 3% that’s not used is the “moo!”

Carrying Capacity

A successful rancher must be a good range manager, or “caretaker of the land.” Ranchers have to decide how to take care of the land by estimating the carrying capacity of a pasture as accurately as possible. Carrying capacity can be defined as to how many of certain types of animals can be kept on a pasture for any length of time. A pasture produces only so many pounds of forage (grass, trees, shrubs, etc.) each year. Local experts can help an inexperienced rancher determine how much forage a pasture is producing. Usually this figure will be in Animal Unit Months, commonly known as AUMs. An AUM is the amount of forage a 1,000-pound cow with a calf will eat in one month. This is approximately 800 pounds of grass. So a cow/calf equals 1.00 AUM. Below is a list of examples of different species and their AUM ratings.

If you estimate how much forage you have on your pastures, automatically deduct 50% of the estimate so that the grass has the resources to grow back later. Then, take the total remaining pounds of forage and divide it by the AUM rate of the livestock species (from list). This will determine how many months of pasture you have for your species.

- | | |
|---------------------------------|--------------------|
| • Cow with calf = 1.00 AUM | • Horse = 1.25 AUM |
| • Cow without calf = .92 AUM | • Sheep = .20 AUM |
| • Calf (4 months old) = .30 AUM | • Deer = .20 AUM |
| • Calf (1 year old) = .60 AUM | • Llama = .20 AUM |
| • Bull = 1.35 AUM | • Rhino = 1.35 AUM |

Here is an example:

- 10,000 acres
 - 600 pounds of forage per acre per year $10,000 \text{ acres} \times 600 \text{ pounds of forage} = 6,000,000 \text{ pounds produced}$
 - 3,000,000 pounds available for grazing without pasture damage $6,000,000 \times .50 = 3,000,000$ (50 % deduction)
 - $3,000,000/800 = 3750$ total animal units available
 - You want to graze the largest number of cows with calves but 100 deer also share the land.
 - You also graze 4 horses in the pasture.
 - How many cows and calves can you graze for 12 months?
- 100 head of deer are on the pasture for 12 months and they are .20 AUM; $100 \times 12 = 1200 \times .20 = 240 \text{ AU}$
 4 horses are on the pasture for 12 months and they are 1.25 AUM; $4 \times 12 = 48 \times 1.25 = 60 \text{ AU}$
 $3750 \text{ AU} - 300 \text{ for the deer and the horses leave } 3450 \text{ for cattle. } 3450/12 \text{ months} = 287\text{-}288 \text{ cows with calves}$
- Your pasture will carry 287-288 cows with calves if properly managed

Estimating carrying capacity has many other factors to consider, but these are the basics. Each ecosystem will vary carrying capacity with the plant community, weather patterns, wildlife present and management approaches.

How well did you read? What does AUM mean?

Checking for Understanding: At the end of this section choose one of the following for a quick check: ask the students to partner share and think, pair and share, do a quick 3 word write up as an exit slip, do a quick sketch or give each other a quick thumbs up or down to check for understanding. Determine the level of mastery for each student and provide individual remediation as needed.

Procedures/Activities:

Your Turn (see below)

Prep:

Photocopy the exercise below.

Directions:

Have the students do the math exercises using the handout and a calculator.

Closure:

Review and clarify the key points of the lesson by going back and reviewing the vocabulary map.

Extension:

Use some of the pages in *Cattle in Colorado History* (page1, 18 and 19) for this lesson. Book is available from Colorado Foundation for Agriculture.

Handout

Your turn... Show your work on the lines below.

- 40 acres of land that produces 800 pounds of forage per acre per year

How many pounds of forage will your land produce? _____

How many pounds are available for grazing without pasture damage? _____

How many AUM for cows with calves will your pasture provide? _____

If you have 20 cow/calf pairs, how many months could they graze? _____

If you had 5 cow/calf pairs, how many months could they graze? _____

If you had 4 horses how many months could they graze? _____

Handout Key

Your turn... Show your work on the lines below.

- 40 acres of land that produces 800 pounds of forage per acre per year

How many pounds of forage will your land produce? 40 acres x 800 pounds of forage = 32,000 pounds produced

How many pounds are available for grazing without pasture damage? 32,000 x .50 = 16,000 (50% deduction)

How many AUM for cows with calves will your pasture provide? 32,000/800 = 40 total animal units available

If you have 20 cow/calf pairs, how many months could they graze? 20 x 1.00 AUM = 20, 40 total AUM/20 = 2 months

If you had 5 cow/calf pairs, how many months could they graze? 5x1.00 AUM = 5, 40 total AUM/5 = 8 months

If you had 4 horses how many months could they graze? 4x1.25 AUM = 5, 40 total AUM/5 = 8 months