

MATH

Can Take You Places

LESSON 15

“Ranchers and Patterns”

by Julie Morris

CONCEPT AREA Patterns

GRADE LEVEL 4

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Students will be able to recognize patterns within sets of numbers and predict the next steps within a set.

LESSON ACTIVITIES OVERVIEW Students use problem solving and patterns to help a rancher buy enough land to feed his herd of cattle.

LEARNING OBJECTIVES Students will be able to:

- Identify patterns in a given set.
- Describe the process (or rule) for continuing a set.

STANDARDS (TEKS) From the Texas Essential Knowledge and Skills for Math for grade 4:

Grade 4
4.5B

MEDIA COMPONENTS Video: *Math Can Take You Places* #005 “Patterns”
Internet:

Cow Facts

<http://www.aipl.arsusda.gov/kc/cowfacts.html>

MATERIALS Chart paper

PREP FOR TEACHERS

- Cue the video.
- Encourage the class to pay close attention to the student problem-solving segments.

Note:

The concepts of **patterns** will be covered during this lesson. Students may need to review the concept prior to beginning the activities.

If your class includes students who are acquiring English as a second language (ESL), you may also need to brainstorm problem-solving strategies or offer a list of possible strategies for students to refer to while completing the activities.

INTRODUCTORY ACTIVITY: 1. Present the class with a local rancher’s problem of making sure the rancher has enough pastures for his or her herd of cattle.

MATH

Can Take You Places

LESSON 15

“Ranchers and Patterns”

by Julie Morris

SETTING THE STAGE

2. The rancher explains to the class that at least 5 acres of land are needed for every cow. There are about 200 cattle. The rancher is negotiating land leases and needs to make sure that there will be enough land to sustain the herd.

3. Can you help this rancher? *Solution: At least 1,000 acres.*

LEARNING ACTIVITIES

1. Set up a t-chart. Label one side “Number of cattle” and the other side “Number of acres.” Get students started on entering the data on the chart by giving them two ordered pairs that fit the problem situation; for example, four cows would need how many acres? (20 acres) Then let the students continue entering data into the chart. Did the students agree on how much land the rancher needed to lease? (1,000 acres) Have them draw pictures to illustrate their answers, if necessary.

2. Have the class write an equation that represents a new problem situation. How much land would the rancher need if another 200 head of cattle are added to the herd? (*Multiply the 1,000 by 2 to get a solution of 2,000 acres.*)

3. Say: “Now let’s explore some other data. We are planting a garden. Each student can plant three plants. How many plants do we need to purchase for the whole class (25) to participate?” *Solution: 75 plants.* “How many fewer plants would we need if only 17 students wanted to participate?” *Solution: 3 (25) – 3 (17) = 24 fewer plants.*

CULMINATING ACTIVITY

1. Watch video, *Math Can Take You Places #005 “Patterns.”* Brainstorm other ways that patterns are used in the real world (for example, currency exchange, grocery shopping for things in bulk, etc.).

2. Allow students to develop and illustrate a problem using rates and ratios on their own, creating their own scenario. Have students exchange their problems and solve. Allow the class to vote for the most creative problem.

CROSS-CURRICULAR EXTENSIONS

Science

Compare weights in pounds on other planets. Ex: 1 pound on Earth equals 90 pounds on Venus. How much does 5 pounds on Venus weigh on the Earth?

Technology

Ask the technology instructor to teach students how to create a Microsoft Excel spreadsheet with formulas that automatically figures the amount of land needed for a set number of cows.

Language Arts

Use the “Cow Facts” link listed in Media Components section to create a trivia game.

REAL-WORLD CONNECTIONS

There are a number of real-world connections. For example, develop ratios for passengers to pieces of luggage, or carry-on luggage on an airplane to passengers. Plan a class camping trip where the students will sleep in cabins. There will be one adult chaperone to every 8 students. How many chaperones are needed if there are 74 students?

MATH

Can Take You Places

LESSON 15

“Ranchers and Patterns”

by Julie Morris

ASSESSMENT For the final assessment, have students solve the following problem where students must apply problem-solving strategies:

A classroom needs 4 square feet per student. How big does the classroom need to be to accommodate 20 students (*80 sq. ft.*)? 28 students (*112 sq. ft.*)?

Possible lesson extensions would be to talk about the different dimensions (lengths and widths) that the room could be for the area needed to accommodate 20 students and 28 students

STUDENT None
HANDOUTS