

Teacher's Guide

AG IN THE CLASSROOM—HELPING THE NEXT GENERATION UNDERSTAND THEIR CONNECTION TO AGRICULTURE

Resources

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Wool and Sheep Activity Book
Learn about raising sheep while reinforcing basic learning skills in this 32-page book. Available from
Colorado Wool Growers
8833 Ralston Rd., Arvada, CO 80002
(303) 431-8310

Cattle in Colorado History is a brief study of the development of the cattle business in Colorado's early history and other facets of the industry, including the rancher's equipment and the importance of beef products. *Cattle in Colorado History* is intended for use in fourth grade in conjunction with *Colorado History*. FREE from Colorado Foundation for Agriculture. See address below.

Other Reading:

Farming
by Jan Drake and Ann Love
published by Kids Can Press, 1998
Farming introduces Nick, who lives on a vegetable farm in Ohio, and his cousin Karin, who lives on a cattle ranch in Nebraska. Both describe their family's particular type of agriculture, explaining the necessary chores, processes, and equipment. The labeled pictures help to introduce farm-specific vocabulary.

Maddie
by Sylvia Tomlinson
published by Redbud Publishing, 2002
A story about the life of an intelligent, twelve-year-old girl responsible for her share in the never-ending upkeep of her family's farm. Maddie is an empathetic and meaningful tale addressing the challenges of growing up in a changing world.

Comments, questions, suggestions and feedback about the Colorado Reader are welcome.

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More about...

Proso Millet is an annual (growing from seed each year) warm-season grass. It has a low moisture requirement and will produce feed where other grain crops would fail. Originally from the tropics, it is well suited to semi-arid climates such as Colorado and the Great Plains, central Russia and the Middle East. Its popularity in the United States is on the rise because of increased interest in and demand for birdseed. It is used in many parts of the world for baked goods and cereal.

While one farmer may intentionally plant a field of proso millet, another farmer may consider it a weed which can offer a serious threat to his production. Proso millet spreads rapidly and can contaminate large acreages of crop land. The seeds may be inadvertently spread by combines and other farm equipment traveling from farm to farm.

Definition: A **weed** is a plant that is "out of place" or interferes with land use and water resources. It hinders the growth of plants we want to grow.

Hands-on Activity:

Build a Simple Birdfeeder from a Two Liter Soda Bottle

This project and others can be found at <http://birding.about.com/library/weekly/aa032000b.htm>

Materials: soda bottles, drill, duct tape, approximately 8-9" long, 1/4" wide dowels, wire (from a clothes hanger)

1. Remove all labels and stickers from the bottle and wash and rinse thoroughly. Let it dry and close the top with the bottle cap. Note: the top of the bottle will become the bottom of the bird feeder.
2. Drill 2 small holes in the bottom of the bottle (what will become the top of the bird-feeder). Thread a wire through one hole and out the other. Twist the ends of the wire together to make a loop for hanging the feeder. Use a small piece of duct tape to seal each hole so rain can not get into the feeder.
3. Make one 1/4" hole on one side of the bottle and another on the opposite side and insert your dowels through the pair of holes.
4. Make 1/8" to 5/16" slots 1 1/2" above the perches. Use a smaller slot (1/8") for smaller seed like thistle or niger seed, or use a larger slot (5/16" for sunflower or other large seeds. Fill it with birdseed and you're ready to hang it from a branch!

Hands-on Activity:

Make Bird Seed Balls

from *The Fence Post*, October 7, 2002

Materials: empty egg carton, plastic wrap, pipe cleaners, 1 egg, 1 Tbsp. honey, birdseed

1. Mix the egg and honey together.
2. Stir in birdseed of your choice.
3. Press mixture into an egg carton lined with plastic wrap.
4. Push pipe cleaners into center of balls.
5. Let dry 4 days or more before hanging on tree branches.

Note: Birds can become dependent on birdfeeders especially in the winter months, so keep on filling your birdfeeder and feed them through the winter.

(continued on page 2)

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More about ...

Plants are living organisms that use photosynthesis to convert energy from the sun into food. They make their own food and vary greatly in size, shape and environment in which they live. Roots anchor the plant in the ground and absorb water and minerals. Leaves contain chloroplasts in which photosynthesis occurs and pores through which carbon dioxide is absorbed.

Some of the ways you can grow plants are by planting seeds (proso millet), bulbs (onion), or tubers (potato).

Definitions:

A **seed** is a ripened plant ovule containing an embryo and its food source.

A **bulb** is a short, underground stem surrounded by usually fleshy leaves that contain stored food for the shoot within.

A **tuber** a fleshy underground stem or root serving for reproductive and food storage, usually containing starchy matter like a potato.

A **taproot** is the main root of a plant growing straight downward from the stem to a considerable depth without dividing.

Answers to Word Scramble.

A carrot is a (torapto) taproot.

An onion is a (lubb) bulb.

A potato is a (buret) tuber.

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More about...Value of Farm & Ranch Products Sold

Map this map shows just a few of the hundreds of commodities grown and produced in Colorado, based on production from the top three counties for each product.

Definitions:

Revenue is all the income produced by a particular source.

A **commodity** is an article of trade or commerce, especially an agricultural or mining product that can be processed and resold.

Discussion

Talk with your students about what is grown and produced near where you live. Ask if anyone has a family member or friend who is involved in agriculture or peripheral industries like processing, transportation or distribution. If you live in the mountains, ask the students if they know any ranchers who “summer” cattle on their mountain pastures.

Answers to Value of Farm & Ranch Products Sold

1. \$4 million
2. \$20 million
3. Northwest and Mountains
4. sunflowers
5. dry beans
6. \$4 million
7. fall potatoes
8. apples
9. \$4 million
10. 138

Page 4

Definitions:

A **perennial** is a plant that lives three or more years.

An **annual** is a plant that lives or grows for only one

year or season.

Answers to Alphabet Soup Missing Vowel Game:

cold, winter, plant, snow, heat, grow, crops, spring, light, water, seeds

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Note: The modern spelling for the calendar book is “almanac”. It was spelled “almanack” when Benjamin Franklin’s published his version, *Poor Richard’s Almanack*.

Hands-on Activity:

Make A Rain/Snow Gauge

Materials: clear cup or jar (make sure the edges are straight—like some jelly or mayonnaise jars), ruler with 1/16”, clear tape

1. Place the ruler in the inside of the cup and tape to the side.
2. Put the gauge in a flat, open area (so it doesn’t collect roof runoff).
3. After a rainfall, record the amount on the calendar.
4. After a snowfall, bring the gauge inside and let the snow melt then record the depth of the water on your calendar.

Note: If a cup is too small to hold snow in your area, get a large empty can (coffee can) to collect the snow, once it melts then pour it into the gauge.

Answers to climograph questions:

1. Hilo
2. July
3. 6 inches
4. 128 inches
5. Hilo
6. November
7. 74 degrees
8. May
9. 40 degrees
10. 15 inches
11. 50 degrees

Page 6

Definitions:

A **ruminant** is any of the various cud-chewing, hooped mammals having a stomach divided into four (occasionally three) compartments.

More about...

By-products

Livestock provide more than just meat. Most of the products we use everyday are manufactured with something from animal agriculture. Many households contain items using livestock by-products:

candles, ceramics, cosmetics, crayons, deodorants, detergents, floor wax, hand lotion, insulation, linoleum, mouthwash, paints, paper, perfume, plastic, shaving cream, soaps, synthetic rubber, textiles and toothpaste

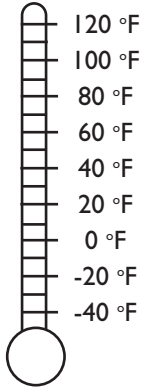
Hides of animals provide us with leather which is used to make clothing, shoes, boots, belts, purses, gloves, luggage, furniture and sports equipment.

Animal products are used to make many medicines including: anti-rejection drugs (for organ transplants), chymotrypsin which promotes healing of burns and wounds, collagen used in plastic surgery and to make non-stick bandages, cortisol is an (continued on page 4)

January Calendar/Climograph Activity:

Enlarge and print out the calendar (below). Fill in the dates and start recording the high and low temperatures for each day. You can look temperatures up in the newspaper or note them from television weather reports or www.weather.com. At the end of the month, mark the high and low for the month on the thermometer chart. Use a blue marker or crayon for low

temperature and a red marker or crayon for high temperature. Average the high and low temperatures and total the precipitation for the month and plot the first month on the climograph (below) for your area. When you have the climograph for the year complete, you can compare it with the other Climographs from Hilo and Denver in the *Colorado Reader*.



Make a note of the type of weather you are having at the bottom of the page, such as: rain, snow, sleet, hail, windstorms, snowstorms, blizzards, thunderstorms, tornados, dust storms, heat waves, cold waves, cloudy weather, and sunny weather.

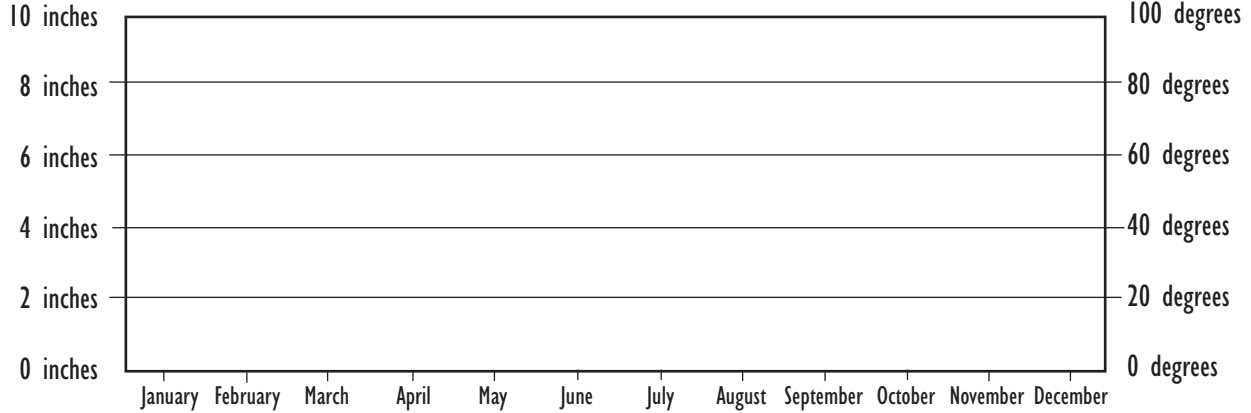
- _____ High temperature
- _____ Low temperature
- _____ Average temperature
- _____ Total precipitation

Weather Calendar

for month of _____

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
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<input type="text"/> High <input type="text"/> Low <input type="text"/> Precip.	<input type="text"/> High <input type="text"/> Low <input type="text"/> Precip.	Notes: _____ _____ _____				

PRECIPITATION Climograph for _____ TEMPERATURE



Precipitation in inches
 Temperature in degrees

Total Annual Precipitation = _____ Average Annual Temperature = _____

(continued from page 2)

anti-inflammatory, glucagon treats low blood sugar, heparin is used to treat blood clots, insulin for treating high blood sugar, pancreatin aids in digestion of food, thrombin helps blood to clot and vitamin B-12 helps prevent B-complex deficiencies.

Livestock help us travel...

- antifreeze contains glycerol derived from fat
- asphalt contains a binding agent from beef fat
- animal fats and proteins are used to make auto and jet lubricants, outboard engine oil, high performance greases and brake fluid
- tires contain stearic acid which makes rubber hold its shape

Answers to Counting Haystacks Game:

<u>256,001</u> h	265,000 p	256,010 s
729,322 m	<u>729,233</u> a	739,322 o
<u>101,489</u> y	110,489 x	101,498 b
399,876 g	<u>393,876</u> f	399,776 i
654,000 c	<u>645,010</u> e	645,101 z
989,353 t	<u>988,353</u> v	989,533 h
<u>506,235</u> e	506,333 d	566,235 n
422,727 u	427,727 p	<u>422,227</u> r

The cow and sheep couldn't sleep because they had hay fever.

**Page 7
More about...**

Sheep can increase the value, health and beauty of our environment. Sheep grazing can be a good way to control weeds and other plant growth. Sheep have pointed hooves that break up the soil so seeds can find a place to grow.

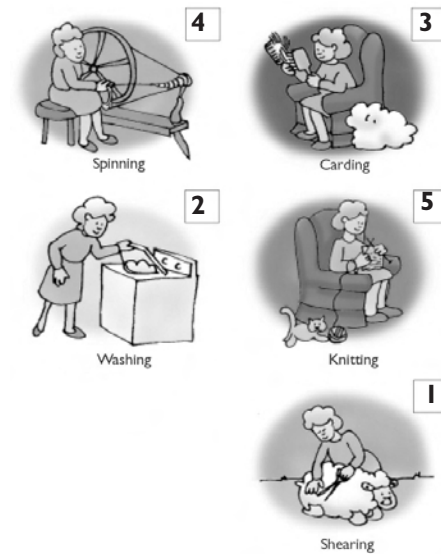
When the soil is broken water can easily get into the ground helping plants grow and preventing soil erosion.

Sheep eat woody and broadleaf plants as well as tall weeds and grasses. Sheep make a good tool to control underbrush in forests and other areas. The U.S. Forest Service uses "fire-fighting" sheep as a low-tech, low-cost way to control brush. If sheep have eaten the brush, there is less fuel to burn in the fire. This makes fires easier to control.

Imagine mowing the grass at a ski slope? Rocks and steep slopes make it nearly impossible to mow. Vermont's Mount Snow Ski Resort uses a quiet, economical and energy-efficient mowing system—sheep.

Junk yards help to recycle car parts. It is difficult to control weeds and grasses in a junk yard. When they grow it makes it hard to find parts. A junk yard owner in Grand Bay, Alabama rents sheep to graze around the junk. Weeds are kept down and it is a lot cheaper than mowing with a machine.

Answers to How Does Wool Become Clothing Quiz:



**Page 8
More about...**

Value added agriculture

As more and more farms go out of business each year, farmers are particularly interested in finding new ways to increase profit and create new markets.

Value-added agriculture transforms crops and livestock into products of greater economic value and consumer appeal through changes in genetics, processing or diversification. Some farmers and ranchers are establishing regional producer owned coops that provide help in processing, packaging and marketing goods. Some are expanding markets internationally.

Value-added agriculture increases farm income, creates jobs and benefits families and communities.

Definitions:

Processing is a series of operations performed in the making or treatment of a product, in food processing it can be sorting, washing, cutting, etc.

Packaging is to place into a pack or make a package of.

Marketing is the commercial functions involved in promoting and transferring goods from producer to consumer.

Discussion:

Many foods we eat are not grown in Colorado. Ask your students to check the labels on various food items the next time they are in the grocery store and make a note of where the product came from. If they aren't labeled ask the produce or grocery store manager where they came from. Talk about how the food was probably transported.

The next time you're at the local fast food restaurant ask the manager where the hamburger comes from. Some fast food chains import their hamburger all the way from Argentina!

Answers to Alphabetize the Farmers Market Mix Up Game:

- | | | | |
|---------------|------------------|-----------------|------------------|
| 1. apples | 7. chicken★ | 13. onions | 19. salsa★ |
| 2. bacon★ | 8. chile peppers | 14. peaches | 20. strawberries |
| 3. broccoli | 9. eggs | 15. pinto beans | 21. sweet corn |
| 4. cantaloupe | 10. hamburger★ | 16. popcorn★ | 22. tomatoes |
| 5. carrots | 11. jam★ | 17. potatoes | 23. watermelon |
| 6. cherries | 12. lettuce | 18. pumpkins | 24. zucchini |

Review Questions

AG IN THE CLASSROOM—HELPING THE NEXT GENERATION UNDERSTAND THEIR CONNECTION TO AGRICULTURE

Directions: Read page one and choose the best answer to the following questions. Fill in the circle beside the correct answer or answers.

1. Proso millet is

- a vegetable
- a grain
- not edible by human
- makes good bird feed

2. The only state that produces more carrots than Colorado is

- Florida
- Utah
- California
- Connecticut

3. Last year Colorado rank third in the production of

- cattle on feed
- summer potatoes
- proso millet
- market sheep and lambs

4. "Cattle on feed" are

- cattle grazing on pasture
- cattle fed in feedlots
- cattle found in dairies
- cattle that are fed only hay

Read the article "It's Coold Out There!!!" and answers to the following questions.

5. Which months of the year have the shortest days?

- January & February
- November & December
- December & January
- February & March

6. Describe two ways animals might stay warm in the winter. Use complete sentences to answer this task.

7. Using a complete sentence give one reason why ranchers might calve or lamb in late winter months.

8. Read the article "Wooly-Booly" on page seven. The main topic of this article is:

9. Read the article "It All Adds Up" on page eight. Use complete sentences, how would you define "value-added?"

10. If you see the Colorado Proud logo on a product, what does it mean?

Reading

Standard 1:

Students read and understand a variety of materials.

- use a full range of strategies to comprehend a variety of texts, such as non-fiction, rhymes, poems, and stories (for example, skim and scan, self-monitor for understanding);
- identify supporting details and main idea;
- summarize long text passages;
- draw inferences using contextual clues;
- set a purpose for reading;
- use bold print, italics, titles, sub-titles, quotations, and underlined words to comprehend text;
- identify sequential order in expository text.

Standard 2:

Students write and speak for a variety of purposes and audiences.

- generate topics and develop ideas for a variety of writing and speaking purposes
- organize their writing;
- chose vocabulary that communicates their messages clearly and precisely;
- create readable documents with legible handwriting or word processing at the appropriate time.

Standard 4:

Students apply thinking skills to their reading, writing, speaking, listening, and viewing.

- use reading, writing, speaking, and listening to define and solve problems;
- respond to written and oral presentations as a reader, listener, and articulate speaker.

Standard 5:

Students read to locate, select, and make use of relevant information from a variety of media, reference, and technological sources.

- use organizational features of printed text (for example, page numbering, alphabetizing, glossaries, chapter heading, tables of contents, indexes, captions);
- recognize organizational features of electronic information;
- take notes, outline, and identify main ideas in resource materials;
- sort information as it relates to a specific topic or purpose;

Science

Standard 3:

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. (Focus: Biology--Anatomy, Physiology, Botany, Zoology, Ecology)

3. 1 Students know and understand the characteristics of living things, the diversity of life, and how living things interact with each other and with their environment.

- describing the basic needs (for example, food, water, air, shelter, space) of an organism;

4. 2 Students know and understand the general characteristics of the atmosphere and fundamental processes of weather.

Answers to the Review Questions

1. a grain and makes good bird seed
2. California
3. summer potatoes and market sheep and lambs
4. cattle fed in fedlots
5. December & January
6. Answers will vary. Be sure each sentence begins with a capital letter and ends with a period and is a complete sentence. Here are some examples:
Some animal hibernate to stay warm in the winter.
Some animal grow long thick winter coat of many layers to keep them warm in the winter.
7. Answers may vary. Here is an example:
Ranchers might calve or lamb iduring the early month of winter to lower the spread of diseases.
8. This article is about wool.
9. Answers may vary. Value added means to process products so they are worth more money to the consumer.
10. The Colorado Proud logo on a product means the product was raised or produced in Colorado.