

Why is Water Important to Agriculture in Nevada?

Nevada Agriculture and Water Series

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Grade Levels: 3-5

Purpose:

Students will learn about the food grown and animals raised for consumption in Nevada, their need for water, and why certain crops are not grown in our climate.

Materials:

- Ag in the Classroom Personal Experience Bingo

Activity 1

- Video & worksheet: Gilcrease Orchard: Growing food in the desert
- Video & worksheet: Desert Farming Initiative: Growing food in high desert climates

Activity 2

- Handout: Nevada Agriculture Commodities Map

Activity 3

- Handout: Water and Agriculture images
- *Ag Today: Issue 3 – Agriculture and the Environment*

Activity 4

- Teff – Nevada’s Newest Grain handout
- Teff – Nevada’s Newest Grain worksheet

Vocabulary:

- | | | |
|---------------|---------------|---------------------|
| • Animal Feed | • Fibers | • Livestock |
| • Commodity | • Forestry | • Precipitation |
| • Consumers | • Fuel | • Public Lands |
| • Crop | • Grazing | • Natural Resources |
| • Drought | • Landscaping | • Nursery |

Background Agricultural Connections:

Nevada is the most arid state in the Nation, receiving as little as 3 inches of annual precipitation in some parts of the state, while total statewide annual precipitation measures less than 10 inches. Consequently, Nevada has large streams but no large rivers and only a few large lakes. Water resources throughout the State are limited making data about streams and lakes extremely important. (Source: United States Geological Survey, US Department of Interior)

Plants, animals, and humans all rely on water to sustain life. Farmers and ranchers are faced with the demand to grow more using less natural resources. We’re facing an increasing World population that will need to be fed, clothed, and supplied needed materials manufactured with agricultural commodities. Agriculture crops and animal by-products can be found as ingredients in your cosmetics, medicines, cleaning agents, entertainment such as crayons, footballs, sports fields, and more. Additionally, there are goals to transition from petroleum-based products to plant-based plastics and biofuels which will require increased production. At the same time,

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we're seeing less water in the West, less open land for large-scale growing due to urban sprawl and soil suitability. Water isn't just needed to grow the plants and water the animals as raw materials, but also to process them and manufacture the final product. Advancements in science and technology are helping farmers to be good stewards of natural resources including water use, water quality and soil health.

Despite being the driest state, we do grow things in Nevada! The Nevada Agriculture Commodities map features the main items grown in each county of Nevada. These commodities showcase the diversity of food and agriculture. The industry accounts for plants and animals raised for food, fiber, fuel, forestry, ornamental plants and more.

The Nevada Department of Agriculture releases economic impact analysis reports for the state's food and agriculture industry. You can view the state report and fact sheets for each county at <http://agri.nv.gov/Outreach/Publications/>.

Interest Approach:

Option A

Brainstorming crops and farm animals in Nevada

1. Ask the students to take out a blank piece of paper. Determine a specific time for this activity based on student's needs. Example: 3 minutes or 5 minutes.
2. Define crops and farm animals with the students.
3. Instructions for students: We're going to put 3 minutes on the stop watch. During that three minutes I want you to write down all the crops and farm animals you've seen growing in Nevada or that you think can be grown here?
4. Complete the exercise.
5. Hold a class discussion with students sharing what they put on their lists. Clarify any items students share that wouldn't grow in our climate such as bananas or things that might grow well in Southern Nevada due to the warmer temperature vs. Northern Nevada, such as pomegranate trees.
6. Review if anyone identified a crop that wasn't grown for human or animals to eat. Discuss types of plants farmers grow such as flowers, lawn or turf, tree, and other ornamental plants for use in landscaping.

Option B

1. Pass out a copy of the Bingo card to each student. Note: the squares can be edited with experiences you know your specific students will have had with the theme.
 2. Instruct the class that you'll be playing "Personal Experience Bingo." Their goal is to go around to their classmates and ask them if they've ever done the items listed on the game board. If they have, they sign their name in that box. Depending on the class size, you can limit it to one signature per student or multiple. They then move to another classmate collecting signatures from their personal experiences while attempting to get those signatures down, across, or in a diagonal. The first student to do so should yell "Bingo" to indicate they've won.
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3. Have the students return to their seat and lead them through processing the activity. At the top of each column is a line for them to write notes. Starting with the first column, ask them what theme or topic all those experiences have in common? Ask students guiding questions until they identify the theme and then have them write the word describing the column on the line at the top.
4. Wrap up with a review of the diversity of agriculture and what it provides us in our daily lives.

Procedures:

Activity 1: Growing Food in Nevada

1. Ask the students
 - a. Do you think we grow a lot of food in Nevada?
 - b. Do you think we grow food in large cities like Las Vegas or Reno?
2. Distribute the worksheets and play the following videos available at https://www.youtube.com/playlist?list=PLGdlCTs4dQTdFThAVQn_yZYcp_8ZMbTLf
 - a. Gilcrease Orchard: Growing food in the desert
 - b. Desert Farming Initiative: Growing food in high desert climates

Activity 2: Nevada Commodities

1. Define the term “commodity” with students. Explain that a commodity is a raw material or primary agricultural product that can be bought and sold. Examples:
 - a. Milk is a raw ingredient for what foods? (Answer: cheese, butter, ice cream, yogurt, etc.)
 - b. Wheat is a raw ingredient for what foods? (Answer: bread, pasta, baked goods like cookies and cake, pizza dough, cereal, etc.)
2. Distribute or display the Nevada commodities map handout.
3. Discuss the legend with students. Have them identify your county. Were they surprised by items on the map? What were some commodities Nevada farmers and ranchers are raising that they didn’t hadn’t heard of? What crops on the list are animal feed versus food for humans?

Activity 3: Water and Agriculture

1. Ask students,
 - a. Do we receive a lot of water in Nevada in the form of precipitation?
 - b. What happens if a plant, animal, or human doesn’t have water?
2. Water to sustain plant life is just one-time water is needed to get food and agriculture products to consumers. Besides irrigation, in what other ways does agriculture use water?

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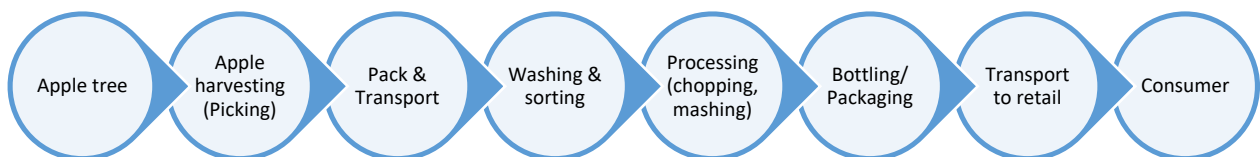


Food Processing

Have the students think about how apples get from a tree to become apple juice and draw a diagram of the process and where they think water is used.

- Refer to photo A from the Water and Agriculture images handout.

From Apple to Apple Juice: Water for the apple trees to grow and produce, washing the fruit before processing, washing the bottles or containers before juice is added. Extension: Talk to the students about potential to recycle the apple juice bottle/package and the washing that would take place during the recycling process.



Watering Livestock & Poultry

Livestock and poultry production is an important part of the agricultural economy of the United States; the resulting meat, eggs, milk and other food products contribute to a healthy diet, and Americans also benefit from wool, fur, and leather these animals produce. Common examples of livestock include horses, pigs, goats, cows and sheep. Like humans, animals need water for survival.

Some of these animals are raised directly on a farm and the farmer provides water to the livestock. However, many Nevada ranchers who raise cattle or sheep rely on grazing of Nevada's public lands. The cattle and sheep roam a section of the open public lands eating grasses and broad leaf plants. While grazing they'll drink from streams or other water sources in the area. If surface water isn't available for livestock and wildlife to drink from, ranchers will bring in water for the animals to drink.

- Refer to photo B from the Water and Agriculture images handout.

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Sanitation & Cleaning

Water is involved in almost all aspects of cleaning, and food production and processing are no exception. Just as you take a bath, livestock may need washed down for their health or human health. Before dairy cattle are milked, their udder is cleaned to reduce bacteria, dirt or manure getting into the milk. Just like water is used in a toilet, farmers wash their barns to remove animal manure.

- Refer to photo C from the Water and Agriculture images handout.

3. Since water is a limited resource, farmers and ranchers must work to use water efficiently and keep it clean.
 - a. Project or print copies of *Ag Today: Issue 3 – Agriculture and the Environment* available at https://www.agclassroom.org/teacher/matrix/resources.cfm?rid=829&search_term_cr=ag%20today
 - b. Use the Teacher's Guide from the same webpage for Discussion Prompters.

Activity 4: Science and Research Helping Grow More Food with Less Water

1. Introduce the idea that some crops require more water to grow. Some plants are sensitive to drought and will not thrive in times when little water is available.
2. Print and distribute one copy per student of the Teff- Nevada's Newest Grain handout and worksheet.
3. Review how there are careers in science, research, and technology development and engineering that work on challenges farmers and ranchers face. If they find it interesting that an African grain was brought to Nevada because it was drought tolerant and is feeding humans and animals in America now, then maybe someday they will have an innovation for Nevada farmers and ranchers.

Enriching Activities

Request the following FREE resources from the Nevada Department of Agriculture at http://agri.nv.gov/Outreach/Ag_Literacy/Resources/.

- Request individual student copies or print files of the **Healthy Eating, Smart Learning – Nevada School Meal Pattern Activity Booklet Series**. Each activity booklet addresses one of the food groups on a student's breakfast or lunch tray (fruits, grains, meat & meat alternates, milk, and vegetables). Students learn about healthy eating, food and agriculture, a connection of a food group to Nevada, career opportunities and more.
- **Invite Moolissa or Moonique, the Incredible Milking Cows to a school event.** Dairy educators with the Nevada Department of Agriculture can bring this life-size, interactive tool, which allows children of all ages to experience the art of milking. Dairy educators can present on the topics of dairy, dairy farming, and dairy foods.

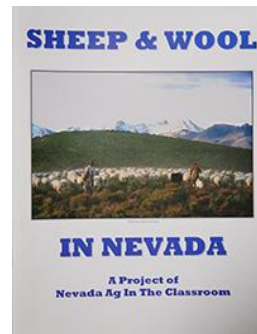


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- **Nevada Ag Products Poster Series (10 poster/info packet).** Real images of Nevada agriculture on 11"x17" poster sized paper. Also includes a packet with additional information related to specific products, facts, and suggested activities.
- **Sheep & Wool in Nevada Activity Book.** Educates students about the unique history of sheep production in Nevada utilizing federally managed lands and introduces them to the Basque culture which has been important throughout Nevada history. This is accomplished through multidisciplinary lessons and activities.



Vocabulary

Animal Feed: Food grown or developed for livestock and poultry. Refers particularly to foods or forages given to the animals (including plants cut and carried to them), rather than that which they forage for themselves.

Commodity: A raw material or primary agricultural product that can be bought or sold.

Consumers: A person who purchases goods and services.

Crop: A type of plant grown for food, fiber, or landscaping. Examples are apples, corn, lettuce, trees, cotton, and flowers.

Drought: A prolonged period of abnormally low rainfall, leading to a shortage of water.

Fiber: The base of human-made clothes or fabrics. Natural fibers can be obtained from plants, animals and minerals.

Forestry: The art and science of managing forests to produce various products and benefits including timber, wildlife habitat, clean water, biodiversity and recreation.

Fuel: Material that is burned to produce energy in the form of heat or power.

Livestock Grazing: A method of feeding animals.

Landscaping: The process of making a yard or other piece of land more attractive by altering the existing design, adding ornamental features, and planting trees and shrubs.

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Livestock: Farm animals regarded as an asset. Intentionally reared in an agricultural setting to make produce such as food or fiber, or for its labor.

Natural Resources: Natural resources are useful raw materials that we get from the Earth. They occur naturally, which means that humans cannot make natural resources. Includes land, minerals, forests, and water.

Nursery: A place where young plants and trees are grown for sale or for planting elsewhere.

Precipitation: Rain, snow, sleet, or hail that falls to the ground.

Public Lands: Land owned by local, state, or federal government.

Educational Standards Addressed

Nevada Academic Content Science Standards/Next Generation Science Standards

5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Nevada Academic Content Social Studies Standards

SS.3.22. Explain how human settlements and movements relate to a location's physical geography and natural resources.

SS.3.24. Identify how people use natural resources, human resources, and physical capital to produce goods and services to trade around the world.

SS.4.27. Using historical and contemporary examples discuss the importance of major industries in Nevada's economy.

Nevada Academic Content English Language Arts/Common Core

Key Ideas and Details:

CCSS.ELA-LITERACY.RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

CCSS.ELA-LITERACY.RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

CCSS.ELA-LITERACY.RI.4.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

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CCSS.ELA-LITERACY.RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

Craft and Structure:

CCSS.ELA-LITERACY.RI.3.4, 4.4, 5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3, grade 4, grade 5, topic or subject area

Integration of Knowledge and Ideas:

CCSS.ELA-LITERACY.RI.3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

CCSS.ELA-LITERACY.RI.4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

CCSS.ELA-LITERACY.RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

National Agricultural Literacy Outcomes

T1.3-4e Recognize the natural resources used in agricultural practices to produce food, feed, clothing, landscaping plants, and fuel. (Water)

T2.3-5e Understand the concept of stewardship and identify ways farmers/ranchers care for soil, water, plants, and animals.

Thank you to our sponsors



Nevada Agricultural Foundation