

## Where Does Our Water Come From? Nevada Agriculture and Water Series



**Where Does Our Water Come From? Resources to review the water cycle and how watersheds and aquifers support life in Nevada.**

**Grade Levels:** 3-5

**Purpose:**

Students will review the water cycle and understand how Nevada’s watersheds and aquifers support life in the high desert.

**Materials:**

- Varies depending on lessons and activities selected.

**Vocabulary:**

- Aquifer
- Closed Basin
- Condensation
- Extraction
- Groundwater
- Infiltration
- Landform
- Precipitation
- Spring Water
- Surface water
- Terminal Lake
- Tributary
- Watershed

**Background Agricultural Connections:**

Watersheds are important to agriculture because water is needed for all living things. It is needed for plants and animals to grow, and in processing of our raw products. Everything we do affects our water system. Agriculturalists recognize the need to be good stewards of this limited resource, not only as a good business practice, but to ensure we have a safe, abundant food supply within our country.

In these lessons, students will discover what a watershed is and why they are important. A watershed is the land that water flows across or under as it flows to a stream, river, or lake. Watersheds can have hills, mountains, or be on flat land. Watersheds include farmland, rangeland, small towns and cities.

We all live in a watershed. Some of the water farmers use to irrigate their fields runs off and returns to the river. Down the river a farmer may use some of the same water out of the river to irrigate his crops. Cities use water for drinking, bathing, cooking and cleaning and then household water is treated and returned to the river. Some of the water industries use also returns to the river.

Most of Nevada is part of the Great Basin Watershed and is a closed basin. The water in the Great Basin does not flow to the ocean. Instead, it flows to lakes where it is trapped like water in your kitchen sink. Watersheds that don’t have an outlet are called closed basins. There are not very many closed basins in the world. Any lakes that are within the Great Basin are called terminal lakes because the rivers that flow into the lake ends there. Pyramid Lake is an example.

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Alternatively, two large watersheds that are partially in Nevada and flow to the ocean are the Colorado River and Snake River watersheds.

There are 72 watersheds in Nevada's 17 counties.

Watershed management is studying the characteristics of a watershed and creating and implementing plans and programs to sustain and enhance the functions that affect the plants, animals and humans within that watershed boundary. There are many agencies that help manage our water supply, water quality and water rights.

Aquifers are an important part of our watershed. The water that soaks into the ground is filtered as it travels through particles of sand, gravel, and cracks in rocks and accumulates in open spaces between particles, much like a sponge holding water. To get the water out of these aquifers, wells are drilled to pump the water up to the surface. Pumping too much water too fast lowers the water in the aquifer. This causes a well to yield less and less water and even run dry. Groundwater is important for crops and livestock in Nevada. Farmers and ranchers are careful stewards of groundwater and they help conserve and protect this precious resource. Some of the groundwater is unusable because it is polluted, too salty, or would be too deep to reach.

Many farmers rely on municipal wells for their groundwater, while others have built their own ponds to capture runoff water to reduce pollution and maximize use of water. These ponds also create habitat for wildlife. This minimizes the impact on the local watershed.

Homeowners can plant and maintain natural vegetation in their landscapes to help water quality by soaking up rainfall and reduce runoff. Replacing lawn with drought tolerant plants helps homeowners conserve water. Keeping leaves, lawn clippings, and pollutants like automobile oils and pet waste out of the street and gutter can all help protect our water quality and watersheds.

### Procedures:

#### Water Cycle

1. Water Cycle Bracelet lesson plan available from Illinois Agriculture in the Classroom available at <http://www.agintheclassroom.org/TeacherResources/InterestApproaches/WATER%20CYCLE%20BRACELET.pdf>. (Requires purchase of beads for this activity).
2. Water Supply lesson plan, Activity 3: The Earth's Water Supply from Utah Agriculture in the Classroom available at <http://utah.agclassroom.org/matrix/lessonplan.cfm?lpid=225>.
3. Resources and activities from The Groundwater Foundation at <https://www.groundwater.org/kids/activities-library-results.html>
  - a. Water Cycle Bangles
  - b. There's No New Water
  - c. Water Under Teacher's Guide

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## Watershed

1. Wad-a-Watershed lesson plan from Minnesota Agriculture in the Classroom available at [https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=67&author\\_state=0&search\\_term\\_lp=watershed](https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=67&author_state=0&search_term_lp=watershed)
2. Resources and activities from The Groundwater Foundation at <https://www.groundwater.org/kids/activities-library-results.html>
  - a. Water Travel Scavenger Hunt
3. River Science in Action web resources and videos on watersheds and the Colorado River available at <http://www.riverscienceinaction.org/content/what-watershed> .
4. Nevada Bureau of Mines and Geology K-12 Earth Science Educational Resources offers free water resource posters. Information on how to order available at <http://www.nbmg.unr.edu/ScienceEducation/K12.html>.

## Aquifer

1. Resources and activities from The Groundwater Foundation at <https://www.groundwater.org/kids/activities-library-results.html>
  - a. Aquifer kit for purchase
  - b. DIY Aquifer kit
  - c. Edible Aquifer
  - d. Aquifer in a cup
  - e. And more

## Vocabulary

**Aquifer:** Naturally occurring, underground formations that store water, think of a very wet sponge. The water can be collected by drilling a well into the aquifer and then pumping it to the surface. Then it can be used for crops, livestock, and human consumption.

**Closed Basin:** A watershed that does not have an outlet. Most of Nevada is in the Great Basin which is a closed basin.

### Condensation:

1. Water which collects as droplets on a cold surface when humid air is in contact with it.
2. The conversion of a vapor or gas to a liquid.

**Extraction:** The process of removing water from an aquifer, typically by pumping it through wells drilled into the saturated layer of the aquifer.

**Groundwater:** Some precipitation infiltrates into the ground to become groundwater. Groundwater is the major contributor to many streams and rivers. Groundwater is recharged by rainwater that falls onto soil and percolates down through the soil and rocks into the aquifer.

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**Infiltration:** The process by which water enters the ground. As water on the surface permeates into the ground, this is known as infiltration.

**Landform:** A physical feature, such as a hill, mountain, valley, river, lake, etc.

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

**Spring Water:** A spring is any natural situation where water flows from an underground aquifer to the Earth's surface.

**Surface Water:** Water on top of the ground (lakes, rivers, streams, oceans). Rain and snow fall from the sky each year. About 1/3 of that water ends up in the rivers, lakes, and streams.

**Terminal Lake:** A terminal lake is one in which the rivers that flow into the lake end or terminate at the lake. They do not flow out of the lake anywhere.

**Tributary:** A stream feeding into a larger stream, or lake.

**Watershed:** An area of land where all water drains, or "sheds," to the same river, reservoir, or other body of water. The watershed is named for the body of water into which it drains.

### **Educational Standards Addressed**

#### **Nevada Academic Content Science Standards/Next Generation Science Standards**

4-ESS2-2 Analyze and interpret data from maps to describe patterns of Earth's features.

5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

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

#### **National Agricultural Literacy Outcomes**

T1.3-5.b Explain how the interaction of the sun, soil, water and weather in plant and animal growth impacts agricultural production.

T1.3-5d Identify the major ecosystems and agro-ecosystems in their community or region with agro-ecosystems.

T1.3-5e Recognize the natural resources used in agricultural practices to produce food, feed, clothing, landscaping plants, and fuel.

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

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