



## Theme: Water (Grades 3-5)

### Pre-Visit Activity #1 What is an Aquifer?

#### Overview:

The springs around the Las Vegas Valley were created when rainwater seeped beneath the ground into a layer of permeable rock called an aquifer. Usually people drill into an aquifer to get water, but here the earth opened up and the water from the aquifer came to the surface as springs. In this activity students will construct their own aquifer to see how they are able to store water.

#### Objectives:

- Students will understand what an aquifer is.
- Students will learn about the different layers of the ground surrounding the aquifer.
- Students will understand how springs affected the growth of Las Vegas.

#### Materials:

- One clear plastic cup (3" deep by 3" wide) per student
- Modeling clay (enough for each student to make a 2" circle)
- White play sand (enough to fill each student's cup 1/4")
- Aquarium gravel or pebbles in earth tones (enough to fill each student's cup halfway)
- One bucket of water with an extra cup (to dip into bucket)

#### Activity:

1. Have students pour 1/4" of white play sand into their cups. This is what is known as the "permeable layer"- a layer of porous material that allows water to seep through.
2. Using the extra cup, take a cup of water from the bucket and begin to add water to the cup of sand. Only add enough water so that the sand is wet, with no standing water above the sand. Allow students to observe what happened to the water. Where did the water go? Did it evaporate? Did it absorb into the sand? Show the students that the water is still there, but is surrounding the sand particles just like it does in the earth.
3. Give students enough modeling clay to cover 1/2 the sand and have them flatten it like a pancake. Once the students flatten the clay, have them cover only half of the sand and press the clay to one side of the cup, in order to ensure no

water gets through. The clay is a representation of the “impermeable” layer, which is the layer that water cannot seep through. Pour a very small amount of water onto the modeling clay to allow the students to observe how the clay does not let water pass through. Also allow students to observe how the water flows to the sand below only in the section where there is no clay.

4. Next students will take their ½ cup of aquarium rocks or pebbles and cascade the rocks so that they make a “hill” on one side of the cup, and an empty space that represents a “valley” on the other side of the cup. Be sure that the pebbles cover the top of both the sand and the modeling clay.
5. Explain to students that the three visible layers represent a cross-section of the layers underneath the earth’s surface. Pour water, using the cup and bucket method, so that the “valley” is even with the “hill.”
6. Ask students to observe the finished product. Ask the students what they observe about the rocks and about the model of surface water that they have built. Through this visualization, students will gain a better understanding about ground and surface water.

### Discussion:

Explain to the students that the reason we are all here in Las Vegas is that an aquifer, just like this one, became a spring and supplied water to the Native Americans and Early Settlers. The aquifer bubbled up into springs all around the Las Vegas Valley. The Springs Preserve site had 4 springs, and is considered to be the birthplace of Las Vegas.

### Suggested Reading:

1. ***Brother Eagle, Sister Sky: A Message from Chief Seattle*** illustrated by Susan Jeffers. A story about Native American beliefs and how each generation deserves to breathe fresh air, drink pure water and to enjoy all the beauty that the earth offers.
2. ***The Drop in My Drink*** by Meredith Hooper and Chris Coady. Water takes on fascinating new significance as readers discover the amazing complexity of a substance we take for granted. Includes a detailed depiction of water cycles, amazing facts and important environmental information.
3. ***A Drop of Water: A Book of Science and Wonder*** by Walter Wick. Shows the different forms of water in amazingly detailed photographs; explains water’s properties.
4. ***The Earth and I*** by Frank Asch. Explains the friendship between the earth and a young child and what each can do for the other. .
5. ***Gullywasher*** by Joyce Rossi. In English and Spanish. A grandfather tells tall tales of his life as a cowboy (vaquero) and of the harsh life in the desert, flash floods, and wildlife.
6. ***I Am Water*** by Jean Marzollo. A first book about water in its different forms and uses.

7. ***One Small Square: Cactus Desert*** by Donald M. Silver. Teaches about all the plants and wildlife that exist in one small square of desert - an excellent introduction to ecosystems and biodiversity.
8. ***Snail Girl Brings Water*** by Geri Reams. A retelling of a traditional Navaho creation myth which explains how water came to earth.
9. ***This Place is Dry*** by Vicki Cobb, illustrated by Barbara Lavallee. Surveys the living conditions in Arizona's Sonoran Desert for the people and the unusual animals that live there. Also describes the engineering accomplishment of the Hoover Dam.
10. ***Water Science, Water Fun: Great Things to Do with H<sub>2</sub>O*** by Noel Fiarotta and Phyllis Fiarotta. Lessons and experiments teach about floating, refraction, leaching temperature gravity, buoyancy, flow and other water properties.
11. ***Where Does Water Come From?*** by C. Vance Cast. Clever Clavin shows how much water there is on earth, how wells are dug to bring it out of the ground, and how water treatment plants work.
12. ***The Woman Who Outshone the Sun/La Mujer Que Brillaba Aún Más Que el Sol*** by Alejandro Cruz Martinez, illustrated by Fernando Olivera. A bilingual tale from ancient Mexico that tells of a beautiful woman who arrives in a mountain village and is driven out because she is different, taking the river with her.