



Lesson Plan: Water & Your Impact

ELEMENTARY SCHOOL





Learning Goals:

- Students will understand the importance of protecting and preserving the Floridan aquifer.
- Students will analyze how human interaction impacts water quality.
- Students will consider the importance of water conservation.

RELATED STANDARDS:

- SC.4.E.6.6: Identify resources available in Florida (water, phosphate, oil, limestone, silicon, wind, and solar energy).
- SC.4.E.6.3: Recognize that humans need resources found on Earth and that these are either renewable or nonrenewable.
- SC.4.L.17.4: Recognize ways plants and animals, including humans, can impact the environment.
- SC.3.N.3.2 - SC.4. N. 3.2: Recognize that scientists use models to help understand and explain how things work.





DID YOU KNOW?

The largest aquifer in the southeastern United States is the Floridan. The Floridan aquifer is found beneath all of Florida and portions of Alabama, Georgia and South Carolina, and extends into the Gulf of Mexico and the Atlantic Ocean.

Engage

Directions: Display photos of local recreational waterways such as the Ichetucknee Springs, Suwannee River, Poe Springs, Madison Blue Springs etc. Show the photographs on a large screen or print out an image for small groups to observe. Photos are found for download at SuwanneeRiverPartnership.com.

BACKGROUND INFORMATION TO LEAD DISCUSSION:

- **The Ichetucknee River and Springs** is one of the most pristine spring-run systems in north-central Florida and one of the world's most popular tubing, diving, and canoeing destinations. The natural spring water flows from the Floridan aquifer. Long ago, Native Americans lived near the banks of the river to access fresh water. In fact, Ichetucknee is an Indian word meaning "beaver pond."
- **The Suwannee River** winds 246 miles from Georgia through Florida to the Gulf of Mexico. It is a great location for canoeing, kayaking, and boating. There are many places to discover the many springs that flow into the river. You can enjoy a picnic on the riverbanks or on a sandbar. The sounds of nature will surround you.
- **Poe Springs** offers nature trails and springs that give you a glimpse into Florida's past. The springs flow into the Santa Fe River.
- **Madison Blue Spring State Park** is home to a first magnitude spring that is popular for swimming and scuba diving. The spring flows into the Withlacoochee River.

Discuss these questions:

- ☞ "What do you do with water?"
- "Have you ever gone to a lake, river, or spring? What do you see there?"
- "What kinds of things can you do there?"
- "Besides recreation, what are other ways we use water?"
Ex: drinking water, cooking, washing, watering lawn and crops, putting out fires, water for animals and livestock.
- "Where do you think drinking water comes from?"





DID YOU KNOW?

More than ninety percent of the people in north-central Florida use groundwater from the aquifer as their water supply.

Explore & Explain

INTRODUCE TOPIC AND VOCABULARY

“We all use and rely on water that comes from the Floridan aquifer. When water escapes from the aquifer, it creates a spring. Springs are vital to the environment, the economy, our way of life, and our futures. It is important to protect the quality of our water because human interaction can impact water quality. It is important to understand how everyone can do their part to preserve and protect our natural resources, including you!”

Vocabulary:

- **Aquifer:** an underground layer of rock and sediment that stores and transports water
- **Groundwater:** the water found below the surface of the Earth
- **Nonpoint source pollution:** pollution that cannot be traced to one specific source
- **Pollution:** contamination from chemicals or waste materials
- **Spring:** a natural opening in the ground where groundwater emerges from the aquifer to Earth’s surface
- **Surface water:** the water found above the surface of the Earth - lakes, ponds, rivers, streams
- **Water conservation:** choosing to use water wisely by only using as much water as needed
- **Water ecosystem:** a water environment in which the plants and animals live in or on the water
- **Water quality:** the condition of the water based on its physical, biological, and chemical properties

SHOW VIDEO WHICH WILL INCLUDE THESE TOPICS:

- Introduction to water
- Defining surface water and groundwater
- Defining the Floridan aquifer
- Wells and pumps
- Water quality
- Scientist roles- measure water quality and protect water
- How to conserve water and protect water quality



DID YOU KNOW?

People who live in areas where the Floridan aquifer is not suitable for drinking without treatment get their drinking water primarily from surface water or shallow aquifers.

DEMONSTRATION ACTIVITY

This model of an aquifer will help students gain an understanding of how the groundwater system works. This can be completed as a whole-group demonstration by the teacher, or students could participate in small groups to create their own models. Pause throughout the demonstration to discuss observations.

Note for Teacher: [this instructional video](#) was made to clarify instructions for the demonstration. This elementary lesson focuses on the “Aquifer Model” and “Pollution Demonstration” in the video. The “Well Demonstration” requires additional materials, but could be used as an extension activity. This video is intended for teacher use, and not to be presented to the students.

Materials Needed:

- Clear plastic container(s)
- Small gravel, coarse sand, and/or aquarium rock
- Water
- Blue food coloring- to color water for easier visibility
- Red food coloring- to demonstrate pollution
- Optional: dropper or pipette

Procedure:

- Step 1:** Add a layer of small gravel and coarse sand into the bottom of the container, banking it up to one side about 3-4 inches high.
- Step 2:** Add 1-2 cups of water (with blue food coloring), depending on the size of your container.
- Ideas for Discussion: Notice how the water is being absorbed. Where did the water go? The water filled the spaces between the particles of sand/gravel. Explain that the water IN AND BELOW the sand is groundwater.
- Step 3:** Continue to fill the container with more water, so that water remains above the top of the sand/gravel.
- Ideas for Discussion: Notice the water ABOVE the rock and sand. Explain that this models surface water such as rivers, lakes, and streams.
- Step 4:** Put 1-2 drops of red food coloring into a cup of water. Explain that this red water will demonstrate pollution.
- Ideas for Discussion: Predict what will happen when this is added to the model.
- Step 5:** Use a dropper or pour a small amount of red water at the highest point of the bank. Pause to make observations. Then pour the remaining red water into the container.
- Ideas for Discussion: What do you observe? How does pollution impact both groundwater and surface water?



DID YOU KNOW?

The Floridan aquifer averages 1,000 feet thick, and freshwater can extend to a depth of 2,000 feet below land surface. Freshwater is thickest in the central portions of the state and rapidly thins toward the coast and the south.

Elaborate

DISCUSS THE DEMONSTRATION AND MAKE CONNECTIONS

Pollution above ground can impact water below the ground.

Ask Students:

- “What impacts might pollution have on surface water and water ecosystems?”
- “What impacts might pollution have on groundwater and potential drinking water?”
- “How can we protect and conserve water at home?”

Brainstorm ideas as a class discussion. Here are some suggestions:

Inside the home:

- “There are lots of things you and your families can do to save water inside your home.”
- It is important to not use water when you do not need to. When you brush your teeth, do not run the water while you are brushing. When you wash your hands, turn off the faucet while you are scrubbing your hands. Do not flush trash down the toilet.
- When you help with the dishes, do not turn on the faucet until you are ready to rinse the dishes.
- To help save water, your grown-ups can fix things that leak.
- Only run full loads of dishes and laundry.
- Use environmentally-friendly cleaning products.
- Take a shower instead of a bath. Take short showers and use an aerator or low flow shower head.

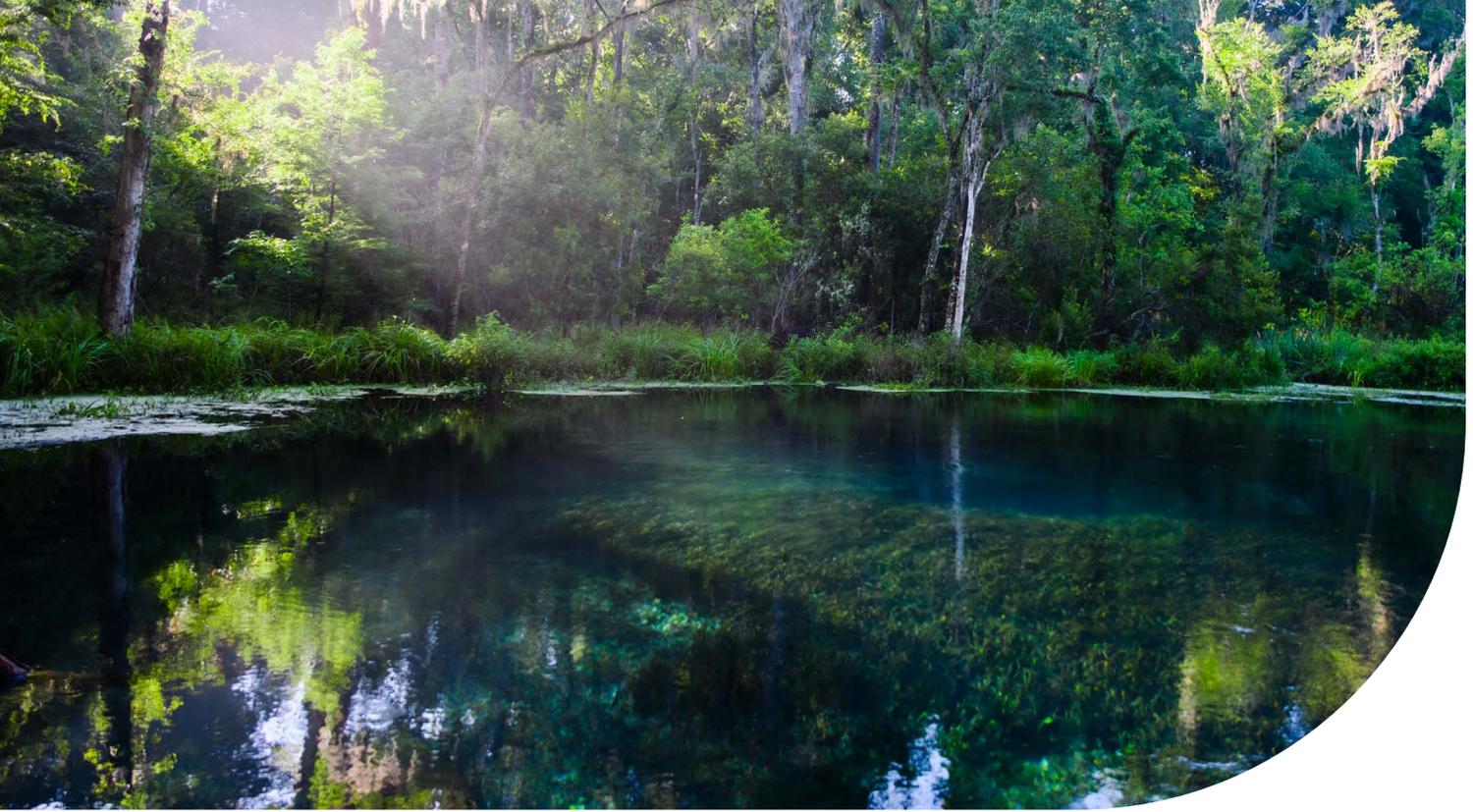
Outside the home:

- “There are lots of things you and your families can do to save water outside your home.”
- It is good to have a nozzle on your hose to turn it on and off.
- Water the grass during cooler hours of the day and only when the grass needs water. Using the right amount of water is good for your lawn. Using too much water is wasteful and can also be bad for your lawn.
- Reduce, reuse, and recycle!

Ask students:

- “How can we protect and conserve water in the community?”
- Discuss community-wide conservation efforts.
- Discuss scientists and other professionals and their roles in supporting water conservation.





DID YOU KNOW?

In general, the water that comes from deeper aquifers is considered better than the water that comes from shallow aquifers because deeper aquifers are less susceptible to contamination.

Evaluate

WHAT DID I LEARN? WHY IS IT IMPORTANT?

Journal Reflection Prompts:

- Why is water important to our lives? Draw and write to show what you know.
- How can you do your part to protect and preserve our Floridan Aquifer? Draw and write about wise water choices you will make.

Extensions

Water Conservation Poster: Students will design and create their own water conservation poster. This could be an individual or group activity. Have students present and explain their poster to the class after completion.

Water Conservation Scavenger Hunt: Look around your home, school, or neighborhood for ways you can help save water and prevent pollution. Make a list of all the ways you and your family can help conserve and protect water.

School-to-Home Connection: Copy and distribute the **Be a Part of the Solution fact sheet**. Have students take home this handout and share conservation tips with their families.





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