

WEEKDAY WONDERS



Content developed by the
Tennessee Aquarium
Education Department



TENNESSEE
AQUARIUM



Water Warriors: Day 4

This week your young scientist has a chance to get to know water better. Your scientist will consider the question, “How much water do I use in a day?” S/he will also consider ways to keep water clean and how people and animals use water, including having fun in it. The Tennessee Aquarium works to make sure that humans and animals have clean water. This week, your scientist will have that same opportunity.

These curated activities are listed in a suggested sequence but may be done in the order that works best for you and your young scientists. Learn more about this series in the [Introduction to Weekday Wonders](#).



Question of the Day

How does water quality affect wild animals?



Daily Nature Journal

Encourage your young scientist to go outside to add to his/her Daily Nature Journal. If you need inspiration, use the [Guide to Nature Journaling](#) to support him/her in nature journaling each day. Urge your young scientist to use all the senses to experience nature today, then write or draw that experience.



Water for Wildlife

Ask your young scientist to go outside and find three areas that s/he thinks wildlife might use as a water source. Have him or her write down a description of each area or draw a picture of it. For each area, have your scientist add information about the following questions.

- Is there wildlife drinking from the area? If not, why do you think it would be a good water source?
- Would you call the water clean or dirty? Why?



Soaking It In

Gather the materials your young scientist will need for this activity.

- 1 new sponge, white or light-colored is best
- Measuring cup
- Bowl
- Water
- Food coloring

Explain to your young scientist that the sponge represents a salamander. Help your scientist measure a cup of water. Have him or her record “1 cup” as the “starting amount of water.”

Have your scientist put the sponge in the bowl and pour the water over it. Ask him or her to wait until the sponge has absorbed as much water as possible then pour any leftover water back in the measuring cup. S/he should record this amount as “water the salamander did not absorb.”

Your scientist should calculate how much water the sponge can hold by subtracting the amount left from the total amount of water that your scientist added to the bowl. S/he should record the amount as “amount the salamander can hold.”

Have your young scientist empty the measuring cup and squeeze as much water as possible out of the sponge. Ask him or her to measure the water and record it as “amount that can leave the salamander.”

Your scientist should compare the last two numbers he or she recorded. Ask if the total amount the salamander can hold is the same as the amount that was squeezed out. The answer should be that not all of the water can be squeezed out. Share that there will always be water inside a live frog or salamander. The water squeezed out represents water lost through evaporation or waste.

Amphibians (frogs and salamanders) can live for a time without this water but needs to be fully hydrated to thrive.

Now tell your scientist that s/he is going to do another investigation with the salamander. The sponge represents a healthy amphibian that has had all it needs to drink and is living in water. Starting with an empty measuring cup, ask your young scientist to squeeze as much water as possible from the sponge and measure it.

Have your young scientist add food coloring to the water in the measuring cup. Now have him/her pour it back onto the sponge. Have your scientist examine whether the food coloring stays in the bowl or if some enters the sponge. Ask him or her what might happen if the coloring had been something harmful to amphibians.

Share with your young scientist that many amphibians (frogs and salamanders) can both drink and breathe through their skins. If water is contaminated, it enters the salamanders’ bodies and can make them sick or die. This is why it is important to make sure we try to keep water as clean as we can.

Extension: The Tennessee Aquarium exhibits North America’s largest salamander, the Hellbender. These are lungless salamanders that breathe ONLY through its skin. Have your young scientist

research Hellbenders to learn more about them and how they can protect the water Hellbenders live in.

Our scientists at the Tennessee Aquarium Conservation Institute are working with salamanders in artificial streams where water depth, temperature and rate of flow can be controlled. We hope to discover what effects climate change has on salamanders.



Skin in the Game

In this activity, your young scientist will have a chance to explore more about salamander skin and how it differs from human skin. There are two options for how to complete this activity; choose the one that best fits the materials you have available.

Option 1:

Make Gak, or homemade slime. Two different recipe options are below.

Recipe 1

4 oz. white glue

1/3 cup warm water

2 tsp borax dissolved in a little water

Mix glue and warm water. Add dissolved borax and knead into a ball.

Recipe 2

1/4 cup clear or white glue

2-3 Tbsp liquid starch

Mix ingredients and knead into a ball.

Flatten out the Gak and help your young scientist wrap it around his or her forearm or sleeve. Then follow the directions below.

Option 2

Wet the sponge from the previous activity. Secure the sponge to your young scientist's lower leg using string. Try to attach it as securely as possible. Then follow the directions below.

Directions

Encourage your young scientist to go outside and run around, hop, slither, roll, and walk through grasses, woods, and weeds. After a time, ask your young scientist to examine the Gak or sponge.

Share with your young scientist that, as he or she saw in the previous activity, amphibian skin allows liquids and gases through very easily. This lets them breathe because oxygen can pass through easily. But, it also means that frogs and salamanders lose a lot of water through their skin. Because of this, they are often found in moist areas to help replace the water.

Tell your scientist that the Gak or sponge represented amphibian skin. Ask your young scientist to compare how it is similar and different to human skin. Your scientist should notice that many more items stuck to the amphibian skin than they do to human skin. Ask your scientist about what they think would happen if those materials stayed on the skin or went into the amphibian's body.

Amphibians are called indicator species because if an area is polluted or dirty, frogs and salamanders cannot live there. Encourage your scientist to think of ways he or she might help keep harmful substances out of the water and places that frogs and salamanders live.

Helpful tips about Gak

1. Dispose of Gak in the trash, not a sink.
2. Do not leave Gak sitting on surfaces such as carpet or furniture for long periods of time as it may stain.
3. During clean-up, Gak will stick to sponges and cleaning rags. Use a rag you can throw away or scrub utensils with used dryer sheets.
4. Some people prefer to wet their hands before handling Gak, so it does not stick.
5. Gak is non-toxic, but always wash your hands after playing with it.