

# The Hydrosphere

Good morning Naturalists! Welcome to our exploration of the hydrosphere-the wonderful world of water! Get ready to learn about one of the most powerful forces on our planet.

Where do we find water on Earth? Just about everywhere! The planet's surface is about 71% covered in water, in places like oceans, lakes, streams, ponds, and wetlands. Can you think of other places in nature to find water? Go ahead and write those down!

**-INSERT CLOUD PICTURE-**

We'll take a quick moment here to talk about the water cycle. Yesterday, we talked a bit about a couple of these steps. We mentioned precipitation, water falling from the atmosphere in some form. We also saw a bit of condensation when we created our own cloud-in-a-bottle. Let's examine the other steps.

Take a journey with me, and feel free to follow along by drawing a picture! Imagine that you are a drop of water that lands on a solid, steep rock on top of a mountain. Where might you go? Water that flows across a surface is called "runoff". You can see this a lot in parking lots after rain storms, when the water is moving towards storm drains.

**-INSERT Flowing water picture-**

Eventually, that water droplet may stop moving in a place like a lake, pond, or even a puddle! Water droplets collect on low-lying places. This water may eventually continue on its downward movement, or it may evaporate back into the clouds for the cycle to begin in the atmosphere again.

But what else might happen to the water? One of my favorite collection points is my water bottle. When we drink water, we bring it into our bodies, and it has to leave somehow. Yes, there are the obvious ways, including sweat and urine, but anyone that's ever stepped outside on a cold day has seen that we also breathe out a bit of water every time we breathe. This is called transpiration, and it is another way for water to enter the atmosphere!

**-INSERT WATER CYCLE PAGE OF JOURNAL-**

Speaking of that, a quick note: When we sweat, that water evaporates off of our bodies. When the sweat leaves our skin, it takes with it some of the heat from our bodies, allowing us to cool off in turn. So while sweat may feel really gross, it is very important to keep us from overheating! If you haven't done so lately, let's all take a big sip of fresh water to thank it for helping us stay healthy. In fact, when I get a headache or a stomach ache, the first thing I usually do is drink water, because it usually means I'm a bit dehydrated!

**-INSERT ONSC WATER BOTTLE PICTURE-**

Here's an activity to get you thinking about water. On Google Maps, or another map of your town, try to find the closest creek, river, or lake to your house. From there, try to map where that river eventually ends up. Where does it go from there? Map it all the way to the ocean if you can. For a moment, consider what would happen if you dumped some oil or another form of pollution into your water source. Who lives downstream? What do they use water for?

To find out where our water at ONSC goes, watch this video!  
<https://www.youtube.com/watch?v=fHhdK8m37Wk&feature=youtu.be>

One more activity we have for you today is our water olympics! These activities will test three of the major qualities of water: **adhesion** (it sticks to other things-like tape), **cohesion** (it sticks to itself), and **surface tension** (some things can rest on top of it).

**-INSERT WATER DROP PICTURE HERE-**

*What do these pictures represent?*

### **EXPERIMENT #1:**

For our first activity, your challenge is to create a soap boat. For this activity, you need a piece of heavy paper (like an index card or thin cereal box), a pair of scissors, a sink, and one or two drops of dish soap.

To create your boat, draw a simple boat design like this template, taken from egfi(<http://teachers.egfi-k12.org/chemistry-activities-propelling-a-toy-boat/> )

**-INSERT PAPER BOAT DESIGN HERE -**

Fill your sink with only a couple of inches of water, and place your boat on the surface. Notice how it floats, as the surface tension keeps it above water. What happens if you drop a bit of soap onto the back? Does it start to move? What direction? Why?

In this case, the adhesive quality of water was originally pulling your boat in all directions at once, but soap breaks down that adhesion. The force of the water itself pulled your boat forward!

### **EXPERIMENT #2**

This experiment only requires three things- water, a penny, and something you can use to slowly drip water. The experiment itself is equally simple: How many drops of water can you drop on a penny before it rolls over the side?

In this case, you can see the adhesion of the water sticking to the penny, but you can also see the cohesive quality of water as it seems to defy gravity, going up and over the sides!

Over the next few days, take some time to see where you spot water! Send your water-inspired art to our email address!