Resources for Teaching About Water

How much of the Earth's water can we drink?

Jug
Small jars or cups
Eye dropper
Water
Salt
Ice cubes

About 70% of the surface of the Earth is covered in water. But almost all of it is in the ocean. Can we drink the water that's in the ocean? No, because it's full of salt. Where do we get our water from? We can get it from surface water, like lakes, or from groundwater, if you live somewhere that has a well. Let's see how much of the planet's water we can drink.

To Do: Fill the jug with 2L of water. That's 2000 mL of water. Take out 6 mL and put it in a small jar. Pour salt in the jug. The jug now represents all the water in the ocean. The 6 mL that we've set aside in the graduated cylinder is all the *freshwater*. Using the eyedropper, move about 1.8 mL of water from the first graduated cylinder to the other. Put the remaining 4.2 mL in the bowl of ice. The container in the ice now represents all the freshwater that is frozen on the Earth today. The 1.8 mL that remains is how much freshwater there is available for ALL living things that need it.

Water pollution 1

White paper
Markers
Spray bottle
Paper towel

Many chemicals that pollute our water get washed down storm drains and into the ocean from roads, parking lots and backyards. We will make a watershed to see how water picks up pollution and then flows into lakes, rivers, and oceans.

To Do: Draw a map of an imaginary place. Include things like fields, forests, roads, houses and other buildings. Use different colours to show different kinds of things on the landscape. Once the drawing is complete, crumple up the paper into a ball. Then, slowly unfold it and flatten it slightly by just pulling on the corners of the paper. This should leave some mountains and valleys on the landscape. Put your wrinkled map on top of some paper towel. Finally, take a spray bottle and spray water on the land. See what happens to the colours. This is what happens when it rains. The rain picks up pollution from roads and parking lots, or it picks up chemicals and fertilizers from lawns and farms; all of it gets carried into rivers and eventually out into the ocean. Look at the paper towel under your landscape. Has water carried contaminants into the soil?

Water pollution 2

Deep clear plastic container
Water (with blue food colouring)
Crude oil (vegetable oil mixed with cocoa powder)
Cotton balls
Sponges
Spoons

Oil, gasoline and other fuels can easily pollute water if they are spilled or dumped into the ocean or down a storm drain. How much water do you think can be polluted by 2 L of oil? Enough to fill an Olympic sized swimming pool like the Aquarena at MUN! Does anybody know how much oil spilled into the ocean last November when a Husky Energy oil platform was damaged during a windstorm? The estimates were about 250 000 L. That's enough oil to pollute ALL the water used by the city of St John's for **6 years and 4 months**.

To Do: Fill the plastic container halfway with water and mix in the blue food colouring (can add some rocks to make it look like the ocean). Next, spill some oil into the ocean. Notice how the oil sticks together. Do you think this will make it easier or harder to clean? Have the kids try all the different tools (spoons, sponges, cotton swabs) to try and clean the oil out of the water, notice how it keeps spreading more and more. Have them notice how many cotton swabs it takes for a little amount of oil. What would they do in the real ocean with millions and millions of litres?

Water Quality Testing 1

Clear cups or glasses
Water
Red cabbage
Lemon juice
Vinegar
Baking soda

There are lots of ways for scientists to determine if an aquatic habitat is healthy and safe for animals to live in and humans to drink. One thing that scientists will measure is the pH of the water. The pH of the water can be anywhere from 0 to 14. If it's neutral water, it will be near 7. If it's becoming acidic, it will be lower than 7. This can be dangerous for animals like snails because acid will cause their shells to dissolve. If it's becoming basic, it will be higher than 7. If you've ever had soap in your eyes, you know that bases can cause your eyes to sting and burn! Swimming in water that is too basic is dangerous for living things like fish.

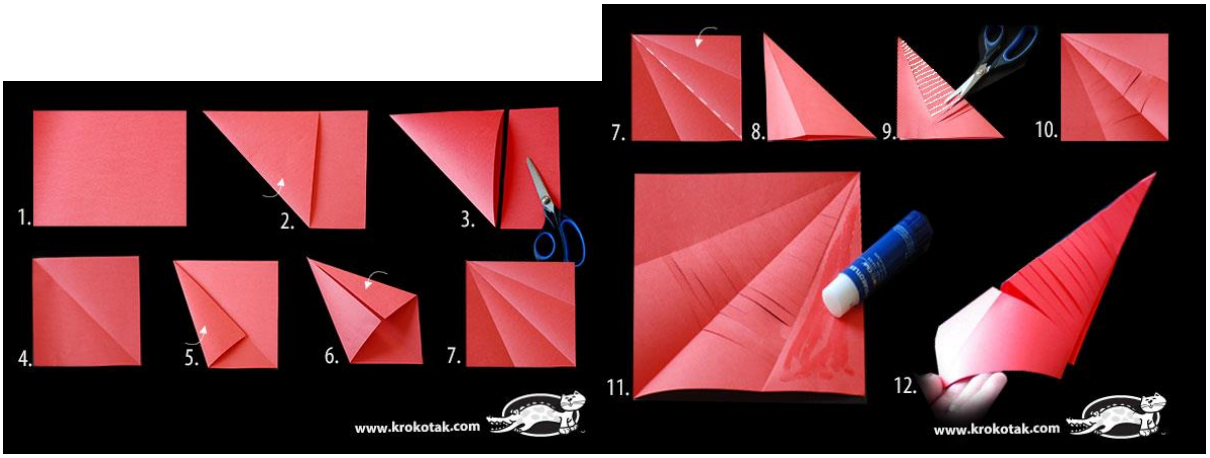
To Do: With help from an adult, chop up the red cabbage and put it in a pot of water on the stove. Bring it to a boil, then let it steep for one hour. Pour the cabbage liquid into several clear cups.

Test what happens when you pour an acid (lemon juice, vinegar) into one of the cups. Dissolve some baking soda in water (this is a base). Pour that mixture into one of the cups. What happened this time? What if you pour an acid into the cup that already has a base in it? Try testing other things around your house. Try testing your tap water.

Fish craft

Coloured paper
Scissors
Glue sticks

To Do: First, cut out a large square in whatever colour you want the fish to be. Then, fold it in half along the diagonal. Next, fold the sides in to meet along the middle fold, creating a kite shape. Score the lines and unfold. Next, refold along the diagonal and cut lines in the paper perpendicular to the fold which end at the scored lines created by the kite shape. Glue the two uncut portions of the square together to form a prism. This makes the bendy body of the fish.



Snip off the pointy end at the base of the cone to form a rounded fish face. Glue a semicircle of paper to the bottom of the fish to form a lower jaw. Finally, add fins to the body and tail and eyes to the face.

Homework:

Life in the water

Water is home to many different kinds of creatures. It's especially important for larvae - the baby versions of many animals. Insects like dragonflies and mayflies start out life in the water, so do frogs and many snails. Other creatures live their whole lives in the water, like water striders, fish, and leeches. It only takes a small puddle to observe some of these creatures! Next time you go for a walk in your neighbourhood, take a close look at a puddle or small pond. What's living in there? Could you draw the animal you see? What would you call it? Is there any other sign of life in this puddle? Record your observations.