



## WATER SCIENCE PROJECTS

### Where did the water come from?

Have you ever watched a stream and wondered where the water flowing past you came from? Scientists figure this out through a process called “fingerprinting.” By simply testing the water to find out what’s in it, they can discover where the water began its journey.

Imagine you’re walking along a beach, and you come across a small pool of water. You wonder, “Is that fresh water?” Or “Is this pool of water somehow being fed by the salty ocean?” You don’t find the answer by tasting the water. That may not be safe! So how can you tell?

Here’s an experiment that can help you answer this question:

**What you’ll need:** *Table salt*  
*Food coloring*  
*2 clear drinking glasses*

#### Instructions:

- Fill both drinking glasses halfway with fresh water.
- Add 2 tablespoons of salt to one of the glasses and mix well.
- Add a few drops of food coloring to the other glass of water.
- Now add a few drops of another color of food coloring to the glass with the salt.
- VERY SLOWLY** pour one water sample into the other.



#### Questions:

What happened? Did the colors mix? Or did they stay separate? What does this tell you? Could it mean that one of your water samples (fresh or salty) is more or less **dense\*** than the other? By determining if the water on the beach is fresh or salty, you will learn whether the pond was fed by the ocean, by a freshwater lake or stream, or if it was perhaps formed by rain water.

**\*Density** is a measure of the amount or **weight of matter** contained by a given **volume**.

## Get the Salt Out!

**ATTENTION: Never taste or put anything in your mouth during this or any other experiment, unless you're told that it's safe to do so (as in the following water experiment).**

The earth's plants, animals, and **people** depend on fresh water to survive. But the water on our planet is almost all saltwater! That's why it's so important that we protect all the freshwater we have. With more and more people on the planet, and more and more water being used, in some parts of the world freshwater is already hard to come by.

In countries such as Saudi Arabia and Kuwait—which are extremely dry and surrounded by saltwater—a process called “**desalination**” is used to remove salt from water and make it drinkable. Some cities in America desalinate water too. Two examples are Santa Barbara, California and Tampa Bay, Florida.

***The earth naturally desalinates water!*** Water is constantly evaporating from the ocean, turning into clouds, and falling on the earth as fresh rainwater. It's just one part of the water cycle, which constantly recycles the planet's water supply.

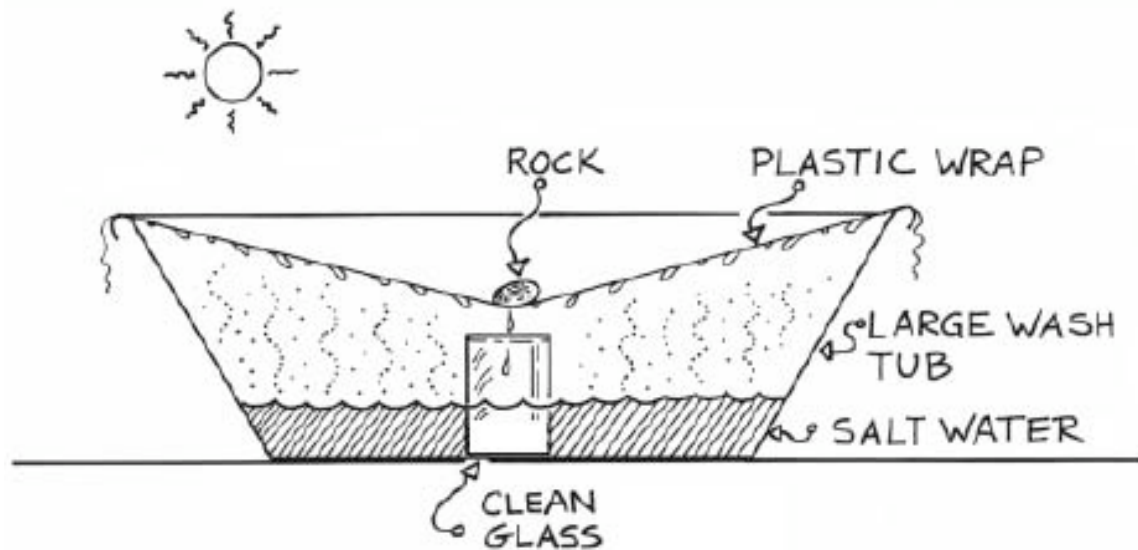
Do you want to try naturally desalinating your own water? With the following experiment, you can make your own water cycle!

**Here's what you'll need:**

- Large bowl or wash tub*
- A few cups of water*
- Empty drinking glass*
- Table salt*
- Plastic wrap*
- Small rock or coins*

### Instructions:

- Mix the table salt into the water to make it taste salty.
- Pour a couple of inches of this salt water into a large bowl or wash tub.
- Place the clean drinking glass in the center of the bowl or wash tub.
- Cover the bowl or wash tub with plastic wrap, making sure it's tightly sealed.
- Place a small rock or a few coins in the middle of the plastic wrap, directly over the glass. This will form a small depression in the plastic without it touching the glass. ( See the illustration below.)
- Place your water cycle outside, in sunlight, for the best results.



When the water in your bowl (which represents salty sea water) is exposed to sunlight, it gets warm. Then it evaporates into the air, becoming water vapor. When the water vapor reaches the cooler plastic wrap, it condenses in the form of droplets. When these droplets get large enough, they fall into your glass, just like rain falls to the earth.

Want to test it? Once there's enough water in the glass for a taste, put your tongue into the drinking glass water and taste-test it. Is it salty or fresh?

## Collecting water samples

Water scientists like Adina Paytan do their experiments on water samples from many different places. But first they have to **collect** those water samples. Often it's not as simple as just dipping a test tube into the water. Scientists may have to travel far and go to extreme places to gather the water they need.

### Think about it!

- Where would you go to collect 50 gallons of icy ocean water? How would you do it?
- How would you collect 10 samples of pond water, without pulling up or hurting any plants or animals?
- If there's an hour of rain in the forecast, and you need to collect 10 gallons of rainwater for a series of tests, how would you collect that much of it?
- Let's say you need water samples from the river, ocean, lake, and a swamp. How could you collect them *without* getting wet?

Scientists use many different sampling devices, many of which are extremely complicated! Take a look at the examples below. How do you think they're used?

Then think about collecting water in your own neighborhood. How would you do it? See if you can draw or **build**, your very own water sampler using ordinary household materials. *Hint:* start your search for supplies in the kitchen.

Remember to think about what type of water your device will be used to collect, and how much water it should hold. Be creative, and have fun!



Here are two examples of professional water collecting devices.

Here's an example of the type of water collector you can build at home



*Kids' Science Challenge* Science Projects are presented by the award-winning radio series, *Pulse of the Planet*.



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