

DROPS OF KNOWLEDGE FOR RIVERS OF CHANGE



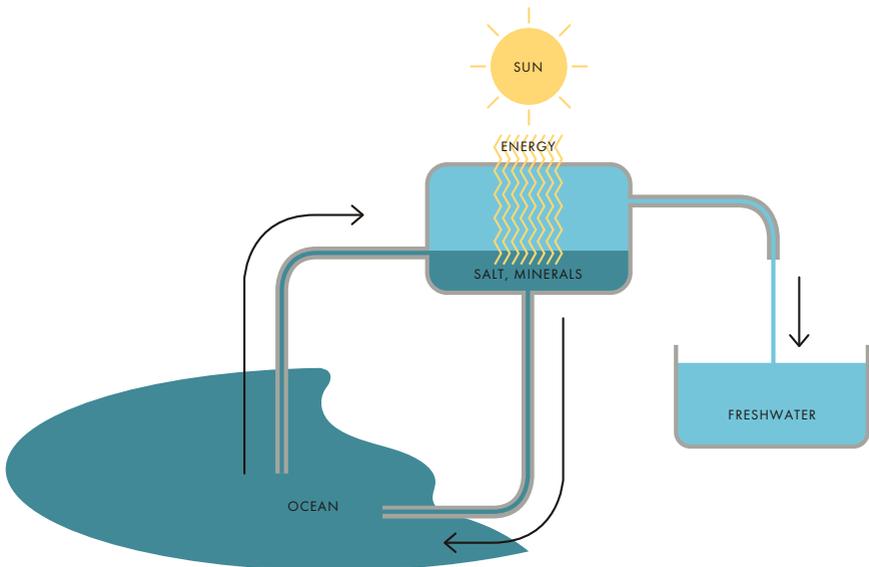
GLOBAL TEACHING
AND LEARNING MATERIAL

A hands-on guide to teaching
and learning about
water, sanitation, hygiene,
and the environment

SWAROVSKI
WATERSCHOOL

ACTIVITY 2.3: DOES THE SALT COME OUT OF SALT WATER? IF SO, HOW?

Desalination, or the distillation of salty water into safe, drinkable water, is one of the earliest forms of water treatment and is still a popular method used throughout the world today. In ancient times, many civilizations used this process on their ships to convert seawater into drinking water. Today, desalination plants are used to convert seawater to drinking water on ships and in many dry and drought-stricken regions of the world, as well as in other areas to treat water that is fouled by natural and unnatural contaminants. In this activity, students will use the sun to desalinate water and see for themselves how it works.



Source <http://water.usgs.gov/edu/drinkseawater.html>

Time: 90 minutes / **Thematic Areas:** Science, Mathematics, Geography /

Goal for Learning: : Learn about freshwater compared to salty or brackish water in the context of both ecological balance and human consumption.



Materials: □ 720 milliliters (3 cups) of water / □ 1 large mixing bowl / □ 22.5 grams (1½ tablespoons) of regular table salt / □ 1 shallow cup or small, light bowl / □ Clear plastic wrap, cellophane, or a piece of a clear plastic bag (large enough to cover the top of the bowl) / □ 1 large rubber band / □ 3-4 small rocks (or substitute materials, i.e.: a small stack of magnets might create a heavier weight with a smaller surface area)



Optional Extension: □ The students can experiment with options such as a stack of coins / □ 1 glass half filled with water / □ 1 egg (in the shell) / □ A container of salt (enough to use freely) / □ Kitchen scale (if available)

ACTIVITY STEPS:



- 1 Pour the water into the mixing bowl and ask students to mix the salt into the water, stirring thoroughly until it is fully dissolved.
- 2 Place the cup or smaller bowl so it floats in the mixing bowl, taking care to keep the salty water out of the cup
- 3 Stretch a layer of clear plastic wrap over the top of the mixing bowl, smooth it down on all sides so that the bowl is airtight, and secure the plastic with the rubber band.
- 4 Take a small rock (not too big or it will break the plastic-wrap seal) and place it in the middle of the plastic wrap, so that all of the plastic slants slightly toward the middle of the bowl, where the cup is.
- 5 Put the whole setup in full, hot sun, and wait. Within an hour, you should see water droplets begin to form on the underside of the plastic. They will flow and drip into the center of the bowl, and into the cup.

ACTIVITY 2.3

- 6 Wait several hours, and then take the plastic off. A good amount of water should now be in the small cup.
- 7 Invite students to taste the water in the cup; it is no longer salty. Explain that the water turned to steam in the heat of the sun, and then returned to its liquid state. Salt is heavier than water, so it stayed in the large bowl.

Optional Extension:

- 8 Fill a glass half full with water. Place an egg, in the shell, into the water—it will sink because it is denser than the water.
- 9 Start adding salt to the water one tablespoon at a time. Help the salt dissolve by stirring. What happens? How much salt do you have to add to get your egg to float?
- 10 Explain to students that adding salt to the water makes the water denser than the egg, so now it will float.
- 11 If a kitchen scale is available, weigh a cup of salt water and a cup of freshwater. Compare the weights. The salt water will weigh more than the freshwater even though it is taking up the same amount of space (a cup). This is because the salt water is denser than the freshwater.

OBSERVATION AND DISCUSSION:

Look at a map of your country and discuss the nearest ocean or salty lake. Ask if students have tasted the water and/or what they know about drinking salty water.

Talk about places nearest to your community that are facing drought situations.