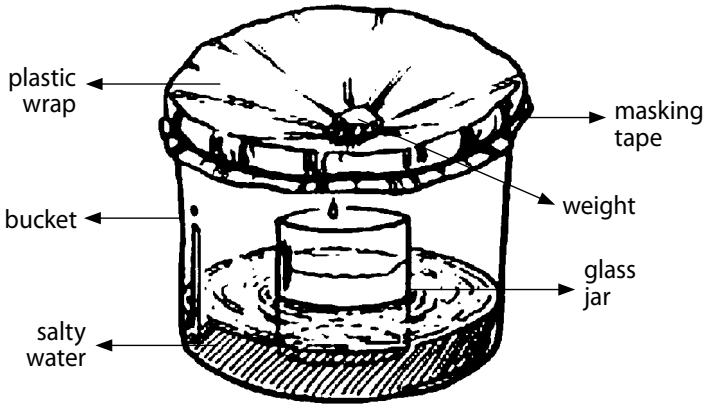
Build a Solar Water Purifier

Grades 3 – 5



BACKGROUND:
Only a very small percentage of the earth's water is available for human use, since most is salty ocean water that cannot be used for drinking, washing, irrigation, or industry. Usable water can be created from salt water in a process called **desalination**, but the process is controversial. (Desalination is expensive and requires a lot of energy.) Desalination has been used successfully in the Middle East to supply drinking water to desert cities and in the California city of Santa Barbara.

In this desalination activity, the sun's rays cause the salt water in the bucket to evaporate and, leaving the salt behind, to condense on the underside of the plastic wrap. Because the plastic wrap is weighted in the center, the condensed fresh water will drip down to the center and collect in the jar or beaker below.

QUESTION:
Can drinkable water be made from salt water?

OBJECTIVES:
To help youth:
- Understand how the process of evaporation can be used to purify salt water for drinking.
- Practice contributing to the progress of a group engaged in a cooperative project.

TIME: (Minimum of 3 hours)

MATERIALS:
- Clean bucket
- Beaker or glass jar
- Two small weights
- Plastic wrap
- Masking tape
- Salty water (1 T. of salt to 20 oz. of water)

PROCEDURE:
1) Follow the illustration to set up your solar water purifier. The salt water level should be at least an inch below the top of the beaker or jar.

2) Be sure that the plastic completely covers the top of the bucket. The plastic should sag enough when the weight is placed on it so that a cone shape is formed that points down toward the beaker. Make sure that the plastic does not touch the beaker.

3) Place your purifier in the heat of the sun and leave it there for a few hours.

4) After several hours or the next day, remove the plastic covering and taste the water in the beaker.

5) **Optional:** Put another material besides salt in the water (food coloring, lemon juice, sugar) and see what happens.

Picture from http://www.solarknoxville.org/for-students/science-projects/
Adapted from the U.S. Department of Energy http://www1.eere.energy.gov/education/pdfs/solar_rainmachine.pdf

SONOMA COUNTY WATER AGENCY