



# Watts On Your Mind?

Solar energy educational activities for schools

## Activity Overview

Grade Level: 6-8

Activity: M-1

### General Description

Students will design and construct a solar still to demonstrate how impure (salty) water can be made clean using solar energy while observing the evaporation process. The teacher will lead a discussion about the water cycle, drinkable vs. non-drinkable water, and the process of evaporation. Students will identify a country which could benefit from this form of water purification and list reasons why he or she chose that particular country.

### Learning Outcome

Students will understand the concept of desalination and the process of evaporation by building a solar still. These concepts will be related to areas throughout the world which are in need of drinkable water.

### Subjects

Science, social studies, writing

### Process Skills

Observation, listening, reading, analyzing, communication, writing, grouping facts, conducting research, working in teams

### Duration

Two class periods (30 minutes each)

### Key Vocabulary

Desalination, evaporation

### Curriculum Standards

Texas (TEKS):

112.22.b.6.8, 112.24.b.8.10

Louisiana (LSCS):

ESS-M-C6, PS-M-C3

Arkansas (ASCF):

3.1.20, 3.1.25

National (AAAS Project 2016):

The Designed World – 8<sup>th</sup>

## Rain Machine - Solar Distillation

### Materials

- 1 large plastic cup for each pair or group of students
- 1 smaller paper cup for each pair or group of students
- 1 rubber band for each group or group of students
- Clear plastic food wrap
- Small rock for each pair or group of students
- Salty water

### Method

1. Have students work in pairs.
2. Fill large plastic cup with 2 cm (about 1 inch) of salty water.
3. Place the small empty paper cup inside the large cup. It will float.
4. Cover the plastic cup with clear plastic. Secure it tightly with a rubber band.
5. Put a rock on the plastic wrap to make it sag in the middle, but don't let the rock touch the salt water or tear the plastic wrap.
6. Place the cup on a tray and put the tray in the sun or outside if possible. As the water evaporates, notice the tiny droplets that condense on the cool plastic wrap and run down into the cup.)
7. After 3-5 days, check the cups by removing the plastic wrap. You can let students drink the water in the inner, small cup.
8. Write the word EVAPORATION on the board. Discuss results.

### Background

Water covers 75% of the earth's surface, but 97.4% of the earth's water is saltwater.



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Only 2.6% is fresh water. 77% of the fresh water is frozen in polar ice caps and glaciers. 22% of the fresh water is groundwater and the remaining small fraction is in lakes, rivers, plants, and animals.

The potable water is recycled via the water cycle:

Water - Evaporation - Clouds - Precipitation

All of the water we drink has been on earth since the earth was formed. Therefore, the water we are drinking today is the same water the cavemen and the dinosaurs drank!

## Questions/Discussion

1. What happens to rain on a sidewalk after the sun comes back out?

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2. How has renewable energy been used in this experiment? Where might you apply this "technology" on a big scale? Refer back to the problem asked in question #1.

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3. Why does this water taste different from tap water? What is in tap water? Have a student contact the local water plant. Ask what minerals are in tap water.

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## Assessments

Students problem solve cooperatively. Students communicate information.

Source: "Getting Energized", National Renewable Energy Laboratory, Energy Programs Office, Golden, CO