



SOLAR ENERGY FOR THE CLASSROOM



Provided by Pierce Cedar Creek Institute
www.cedarcreekinstitute.org

Activity Overview

Grade Level: 6-8

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.

Learning Outcome

Students will understand the concept of desalinization and the process of evaporation by building a solar still.

Science Content Standards

Content Area: Constructing New Scientific Knowledge (C) I.1.1

Standard: All students will generate scientific questions about the world based on observation.

Content Area: Constructing New Scientific Knowledge (C) I.1.2

Standard: All students will design and conduct scientific investigations.

Content Area: Constructing New Scientific Knowledge (C) I.1.6

Standard: All students will write and follow procedures in the form of step-by-step instructions, formulas, flow diagrams, and sketches.

Content Area: Reflecting on Scientific Knowledge (R) II.1.4

Standard: All students will describe the advantages and risks of new technologies.

Removing Water Impurities With Solar Energy

Background

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

The potable (drinkable) water is recycled via the water cycle:
Water-Evaporation-Clouds-Precipitation

Materials

- 1 large plastic cup for each pair/group of students
- 1 smaller paper cup for each pair/group of students
- 1 rubber band for each pair/group of students
- 1 small rock for each pair/group of students
- Salty water

Methods

1. Have the students work in pairs or small groups.
2. Fill the 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.



SOLAR ENERGY FOR THE CLASSROOM

Science Content Standards

Content Area: Changes in Matter (PCM)
IV.2.4

Standard: All students will describe common energy transformations in every day situations.

Content Area: Waves and Vibrations (PWV)
IV.4.4

Standard: All students will describe ways in which light interacts with matter.

Methods (cont'd.)

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 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 and discuss results.

Discussion/Assessment

- What happens to rain on a sidewalk after the sun comes back out?
- How has renewable energy been used in this experiment?
- Where might you apply this "technology" on a big scale?
- Why does this water taste different from the tap water?
- What is in tap water?
- Have a student contact the local water plant to ask what minerals are in tap water.
- Have students identify a country which could benefit from this form of water purification and list reasons why he or she chose that particular country.

Source: This activity was adapted from a *Watts on Your Mind* activity: Rain Machine – Solar Distillation