

SECTION 2 ACTIVITIES

Activity 4: Build a Solar Water Purifier

ACTIVITY TYPE: Teacher Demonstration

OVERVIEW: This experiment demonstrates how solar energy can be used to desalinate water.

GOAL: Students learn solar thermal principles through a low-tech application.

SUBJECTS: Science

TIME: 10 minutes to set up demonstration. 3-4 hours on a sunny day to desalinate water.

SETTING: Classroom and outside on a sunny day.

MATERIALS: Water, salt, large bowl, small glass or beaker, plastic wrap, masking tape, and a small weight [e.g., nickels, bolts, stones].

KEY VOCABULARY: Heat, solar energy, and solar thermal.

CORRELATIONS TO STANDARDS	
NATIONAL	Physical Science – Transfer of Energy 3g: The sun is the major source of energy for changes on the earth’s surface.
IDAHO	Science – Goal 5.3: Understand the importance of natural resources and the need to manage and conserve them.
OREGON	Science – Energy: Describe and explain various energy transfers and resulting transformations.
WASHINGTON	Science – Systems 1.3 Changes: Understand how interactions within and among systems cause changes in matter and energy.

ABOUT THE AUTHORS: Founded in 1998, Bonneville Environmental Foundation (BEF) is essentially a non-profit business. Through the sales and marketing of green power products (known as carbon offsets) BEF gives individuals and businesses a way to participate in solving our most pressing environmental issues. All of the net revenues, or “profits,” that the organization makes are reinvested in projects that restore damaged watersheds and support the development and understanding of renewable energy technologies such as solar, wind, and biomass.



* ACTIVITY 4: BUILD A SOLAR WATER PURIFIER

source: Bonneville Environmental Foundation (BEF)

Build a Solar Water Purifier: Teacher Guide



1. Fill a large bowl with water, add a few tablespoons of salt, and stir until the salt dissolves.



2. Place a small glass in the middle of the bowl. The glass should be shorter than the rim of the bowl but taller than the level of the saltwater.



3. Cover the bowl with plastic wrap. To get a tight seal, tape the edges if necessary. Place weights (e.g., nickels) on top of the plastic directly over the small glass in the bowl. This helps direct the distilled water toward the small glass. Start with a little weight (e.g., one nickel) and increase the weight over time to increase the slope of the droplets into the glass.

4. Place the bowl in direct sunlight or use reflectors to increase the temperature of the water faster. Leave the bowl in the sun for several hours or for the whole day if you have the time. When you check it again, there will be water in the cup. Taste it to find out if it is salty or fresh!

Note: You can also use electricity to test it for saltiness by making a saltwater circuit.

What Happened?

The sun warmed the water in the bowl until the water evaporated and became a gas. When the gas rose and hit the plastic, it condensed there in droplets (just like water vapor condenses into clouds). The droplets rolled down the plastic toward the weight and eventually fell into the glass (like rain falling from the sky). The salt was left behind in the bowl, making the water in the glass pure enough to drink.

