

SECTION 2 ACTIVITIES

Activity 7: Solar Oven

ACTIVITY TYPE: Science-Kit Lab

OVERVIEW: This is a two-part activity. In Part I students work with the Sun Oven to cook food and purify water using solar energy. In Part II students make their own solar ovens using common household materials.

GOAL: Students learn the basic principles of solar-thermal and passive-solar heating.

SUBJECTS: Math and Science

TIME FOR PART I: 30 minutes to 1 hour

TIME FOR PART II: 2-3 1-hour class periods

SETTING FOR PART I: Outside on a sunny day.

SETTING FOR PART II: Classroom for oven construction and outside on a sunny day for testing ovens and cooking.

MATERIALS FOR PART I: The Sun Oven and Sun Oven manual are in your science kit. You'll also need a pot to hold water, water, and food to warm up in the oven (e.g., 1-2 student lunches).

MATERIALS FOR PART II: Pizza boxes, tin foil, clear plastic wrap, tape, black construction paper, a stick (for propping the oven open), thermometer, and food to cook in the oven (e.g., bread with cheese).

KEY VOCABULARY: Energy, heat, passive solar, pasteurization, photon, renewable resource, solar energy, solar heat, and solar thermal.

CORRELATIONS TO STANDARDS	
NATIONAL	<p>Science as Inquiry – 1: Abilities necessary to do scientific inquiry.</p> <p>2: Understandings about scientific inquiry and using tools to measure results.</p>
IDAHO	<p>Science – Goal 1.1: Understand systems, order, and organization.</p>
OREGON	<p>Grade 5 Science – Energy: Identify forms of various types of energy and their effects on matter. Describe energy transfer.</p> <p>Grade 3 Science – Energy: Identify common types and uses for energy</p>
WASHINGTON	<p>Science – Application 3.1 Designing Solutions: Apply knowledge and skills of science and technology to design solutions to human problems.</p>

ABOUT THE AUTHORS: Solar Cookers International (SCI) assists communities to use the power of the sun to cook food and pasteurize water for the benefit of people and environments. The Solar Oven Activity is adapted from SCI's Solar Cooking Archives (<http://solarcooking.org/>).



* ACTIVITY 7: SOLAR OVEN

source: *Solar Cookers International (SCI)*

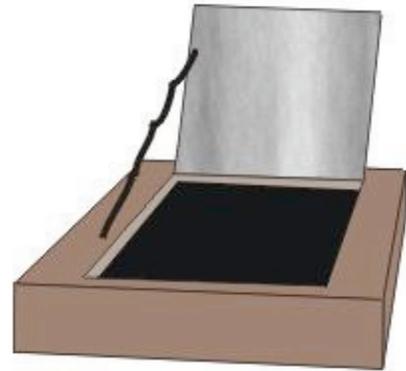
Solar Oven

Instructions for Teachers

PART I: Use the Sun Oven and the Sun Oven manual to cook food and pasteurize water in the oven. The oven has a built-in temperature gauge so the process can be monitored.

PART II: Construct homemade solar ovens. Depending on class size, students can work in groups of three to five.

1. Use a box knife or sharp scissors to cut a flap in the lid of the pizza box. Cut along three sides, leaving about an inch between the sides of the flap and the edges of the lid. Fold the flap out so that it stands up when the box lid is closed. Cover the inner side of the flap with aluminum foil so that the rays from the sun will be reflected off.
2. Use clear plastic wrap to create an airtight window for sunlight to enter into the box. Do this by opening the box and taping a double layer of plastic wrap over the opening you made when you cut the flap in the lid. Leave about an inch of plastic overlap around the sides and tape each side down securely, sealing out air.
3. Line the bottom of the box with aluminum foil to reflect heat and then cover that with black construction paper (black absorbs heat).
4. Now your oven is ready to try out! Take it outside to a sunny spot and adjust the flap until the most sunlight possible is reflecting off the aluminum foil and onto the plastic-covered window. Use a stick or a dowel to prop the flap at the right angle.



Pizza-box solar ovens will reach about 200 °C on a sunny day, so they take longer to heat things up than a conventional oven does. Try melting mozzarella cheese over toast with basil and tomatoes, warming leftovers for lunch, or experimenting with any other food you can think of ideas for.

To build a more advanced homemade oven, visit the Solar Cooking Archives online (<http://solarcooking.org/>).

