

INTERMEDIATE ACTIVITY: Solar Cooking

GOAL: To build a solar hot dog cooker and test its ability to function.

MATERIALS PER STUDENT:

- | | |
|---|---|
| <input type="checkbox"/> 1 Pringles Potato Chip Can | <input type="checkbox"/> 1 Piece of Transparency Film (8" x 4") |
| <input type="checkbox"/> 1 Scissors or Exacto Knife | <input type="checkbox"/> 1 Hot Dog |
| <input type="checkbox"/> 1 Wooden Skewer (14") | <input type="checkbox"/> Tape |

PREPARATION:

1. Prepare a set of materials listed above for each student.
2. Make a copy of these instructions for each student.

STUDENT PROCEDURE:

1. Radiant energy from the sun can be reflected and concentrated on an object. Much of the radiant energy absorbed by an object is converted into thermal energy (heat). Radiant energy can pass through clear materials much more easily than thermal energy.
2. Cut the Pringles can as shown in Diagram 1. Bend back the flaps but do not remove from the can. They will be used to reflect radiant energy onto the hot dog.
3. Cover the opening on the inside of the can with the transparency film and tape the film into place.
4. Make small holes in the metal end of the can and in the plastic lid. Remove the plastic lid from the can.
5. Put a hot dog onto the skewer, slide the skewer into the can, and place the end of the skewer through the hole in the metal end. Put the plastic lid back on the can, fitting the other end of the skewer through the hole. The hot dog should be suspended in the can as shown in Diagram 2.
6. Place the Solar Hot Dog Cooker into direct sunlight, positioning the flaps so that they will reflect radiant energy onto the hot dog. Remember that the angle of incidence of light equals the angle of reflection.
7. Time how long it takes for your hot dog to cook. If it is a very cold day, consider how you might insulate your cooker to improve energy efficiency.
8. Will your cooker work in artificial light? Experiment with a powerful artificial light such as an overhead projector.

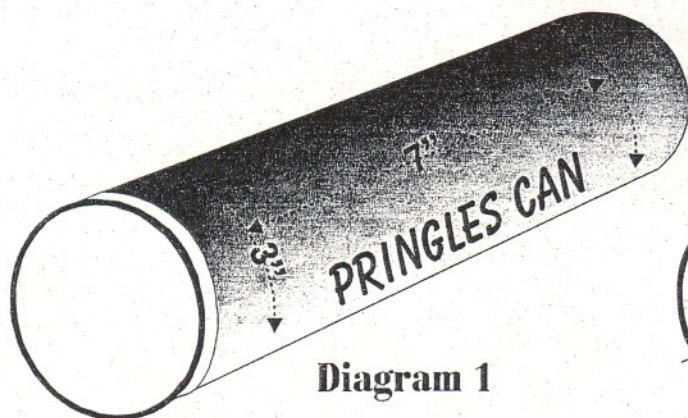


Diagram 1

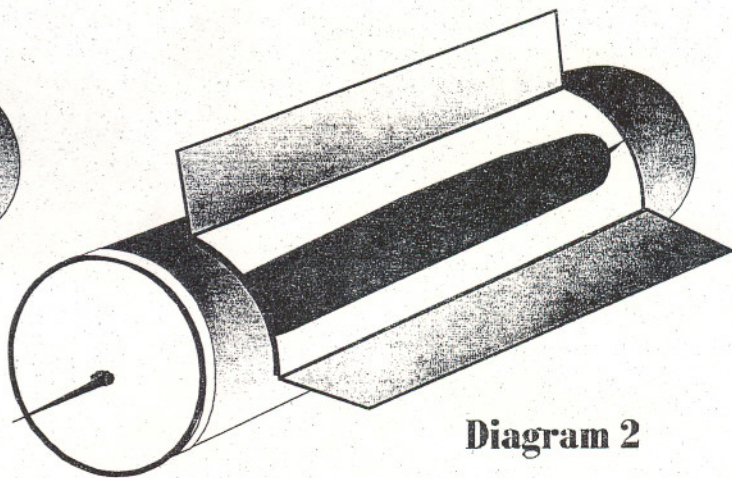


Diagram 2

PRIMARY ENERGY ACTIVITY: Energy from the Sun

When solar energy hits objects, some of the energy is reflected and some is absorbed and changed into heat. Some colors absorb more solar energy than others.

Step 1: Put three thermometers in a sunny place.

Step 2: Cover the bulb of one with black paper. Cover the bulb of one with white paper.

Step 3: Predict which thermometer will get hottest. Number them 1-3, with 1 as the hottest.

Step 4: Wait five minutes.

Step 5: Record your results by coloring the tubes of the thermometers.

Step 6: Look at the results and number the thermometers 1-3 with 1 as the hottest.

How well did you predict?

