

# **Bridgeport Public Schools Science Department**

**Embedded Performance Task**



## **Solar Cooker**

**Laboratory Investigation  
Student Materials**

# Solar Cooker

## Student Materials

Most people in the United States use an electric stove or a natural gas stove to cook their food. This is not the case in much of the world. Approximately 50% of the people on Earth cook using fire from burning wood. However, due to overuse, wood is becoming a scarce commodity in many countries. In addition, burning wood is a major source of air pollution.

One alternative to cooking with wood is using solar cookers. These devices use energy from the sun to cook food without producing any pollution. While there are many designs for solar cookers, a simple solar cooker can be made from everyday materials. There are many factors that can influence the effectiveness of a solar cooker including the size of the collector, the orientation of the panel and the color of the container.

### Your Task

You and your lab partner will design and conduct an experiment to investigate one factor that contributes to the effectiveness of a solar cooker in heating water. Factors you may want to investigate include: the shape of the collector, the shape of the water container, orientation of the collector, surface area or color of the container.

You have been provided with the following materials and equipment. It may not be necessary to use all of the equipment that has been provided.

#### Suggested materials:

heat lamps or sunlight	tape
cardboard	thermometer
aluminum foil	water
container for water	colored paper or paint
safety goggles	

## Designing and Conducting Your Experiment

- 1. In your words, state the problem you are going to investigate. Write a hypothesis using an “If ... then ... because ...” statement that describes what you expect to find and why.** Include a clear identification of the independent and dependent variables that will be studied.
- 2. Design an experiment to solve the problem.** Your experimental design should match the statement of the problem and should be clearly described so that someone else could easily replicate your experiment. Include a control if appropriate and state which variables need to be held constant.
- 3. Review your design with your teacher before you begin your experiment.**
- 4. Conduct your experiment.** While conducting your experiment, take notes and organize your data into tables.

**Safety note: Students must wear approved safety goggles and follow all safety instructions.**

**When you have finished, your teacher will give you instructions for cleanup procedures, including proper disposal of all materials.**

## Communicating Your Findings

Working on your own, summarize your investigation in a laboratory report that includes the following:

- **A statement of the problem you investigated. A hypothesis (“If ... then ... because ...” statement) that described what you expected to find and why.** Include a clear identification of the independent and dependent variables.
- **A description of the experiment you carried out.** Your description should be clear and complete enough so that someone could easily replicate your experiment.
- **Data from your experiment.** Your data should be organized into tables, charts and/or graphs as appropriate.
- **Your conclusions from the experiment.** Your conclusions should be fully supported by your data and address your hypothesis.
- **Discuss the reliability of your data and any factors that contribute to a lack of validity of your conclusions.** Also, include ways that your experiment could be improved if you were to do it again.