



Solar cooking: Using basics of solar energy to prepare a delicious treat



Materials list

- Solar Balloon Energy Kit(s) ([SB52005](#))
- PocketLab Weather Sensor ([NA10341](#))
- Hot pad for handling pan ([SB01889](#))
- Graham crackers, marshmallows, and chocolate bars

Objectives

Students will...

- Learn about two different forms of energy (optical and thermal)
- Learn that energy may be converted from one form to another
- Build a solar cooker based on the Solar Balloon Energy Kit
- Cook S'mores using the Solar Balloon and the power of the sun
- Learn how clean energy conversion, like optical to thermal, can benefit people and the environment
- Apply critical thinking to energy conversion

Activity

Introduction

Students study two different forms of energy — optical and thermal. Energy may be converted from one form to another form (or forms) based on the energy conservation law. However, there may be losses when energy is converted from one form to another form. This does not mean that some energy disappeared. It means part of the energy is converted to different forms. Students will use the Solar Balloon Energy Kit to build a solar cooker to convert optical energy (sunlight) to thermal energy (heat). They will record the heat rise and will use the generated heat to prepare a treat.

Optional: Students can study how solar cooking has a positive effect on human health and the health of the environment.

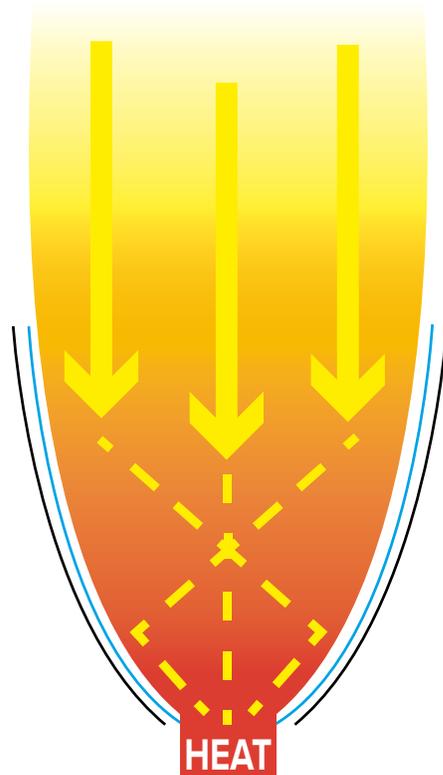
Build a solar cooker

Based on the number of students in the class and the available Solar Balloon Energy Kits, divide the students into several groups. Each group has one Solar Balloon Energy Kit. Each group of students will build a solar cooker according to the instructions that come with the energy kits. Encourage students to be creative. Younger students may need more guidance.

Convert optical energy to thermal energy (Choose a sunny or partially sunny day)

Each group of students will prepare a pan of S'mores based upon the recipe and picture below. They should use the PocketLab Weather Sensor to measure the temperature of the pan of uncooked S'mores before it's inserted into the cooking sleeve. Record the time of the measurement, the temperature of the pan, and the ambient temperature. Put the cooking package into the cooking sleeve under the small end of the balloon. Orient the balloon toward the sun. Continue to measure and record the temperature in the cooking package every 2 minutes until the temperature reaches 250° F. Within 10-15 minutes after reaching 250° F, the S'mores should be ready to enjoy.

SUNLIGHT



Assessment

Teacher observation, participation in activities, cooperation, handling materials, participation in oral discussion, completeness of projects, written work, and illustrations.



Please use caution and protection when removing the cooking package. It will be hot!



Solar S'mores

Ingredients

- Graham crackers
- Marshmallows
- Chocolate bars

1. Break a graham cracker in 2 pieces and place on the black pan.
2. Put 2 marshmallows on one of the graham crackers and 2-3 chocolate squares on the other piece of graham cracker.
3. Prepare the cooking package according to the instructions provided with the Solar Balloon Energy Kit
4. Put the cooking package into the cooking sleeve under the small end of the balloon.
5. Orient the balloon toward the sun.
6. Within 10-15 minutes after reaching 250° F, the S'mores should be ready.

Sandwich the two pieces of graham cracker together and enjoy!