

# Solar Ovens

In this project, you will be part of a team that will compete to build the hottest **solar energy collector** for cooking. The winning team will be the first to successfully raise the internal temperature to 180 degrees F. That should be hot enough to melt marshmallows in order to make "S'mores".

There are a few requirements that you must meet:

- 1. Your oven will be a box style.
- 2. You must choose a variable to test during the project (insulation, size, color, etc).
- 3. You must complete the Heat Island Trek activity during the third day of this project.

Other than that, the planning and construction of the cooker is up to you, so put your **HOT** ideas to work!

#### Day 1: Identify Your Research Question

Research on the Internet to find what shape, size or other features are needed to collect the most sunlight effectively. Choose a feature to test. This will lead to your research question. (For example, "What will be the best insulator to keep heat inside my solar box?.")

## Form a Hypothesis

• Based on your research, record a hypothesis statement on the line below about what solar cooker features will best accomplish your goal. (For example, "Styrofoam will be the best insulator to keep heat inside my solar oven.")

#### Develop your Design

• As a group, write a design proposal that includes a drawing. Make it as detailed as possible. You will also need a materials list so that you all will bring the items necessary to build the cookers next class. Bring your materials.

Drawing:

Materials: Who is bringing what?

# Day 2: Construct Your Oven and Conduct an Experiment

• Begin the construction of the cooker. Each team member should have a specific task in the process. If time allows you may test your cooker and evaluate any problems in the design. Put a thermometer inside the solar oven. Then record the temp every 5 minutes. What changes can you make to make the solar oven hotter?

## Day 3: Solar Cook-Off

- Have your solar cooker and marshmallows ready to go and remember some safety rules. Don't be blinded! The reflection of the sun in your eyes will damage the retina. Don't burn yourself! Solar cookers can get extremely hot.
- Analyze the Results: Evaluate your solar cooker. What worked? What didn't? How did your final product compare to your initial design? Was it expensive to build? Explain. Was it easy to transport? Explain.

Data Table   Time Time   Time Tome					
(min)	(°F)	<b>Descriptions or Observations</b>	(min)	(°F)	Descriptions or Observations
0			30		
2			32		
4			34		
6			36		
8			38		
10			40		
12			42		
14			44		
16			46		
18			48		
20			50		
24			52		
26			54		
28			56		

## Communicate the Results:

## A Basic Diagram and Explanation of the Greenhouse Effect:

In the space below, please provide a simple diagram that shows the fundamental parts of the greenhouse effect and is labeled to explain the basic processes that are included.

**Analysis:** as a reflection of your project, write at least a six sentence paragraph that summarizes your project in the space provided below.

You should answer questions such as: what worked and what didn't? How is this project related to what we have been learning in class about the atmosphere? How did your final product compare to what you had planned? What would you change if you were to do it again? How could this project be more beneficial to students to learn about the atmosphere?