



PARABOLIC COOKER

SOLAR LESSON

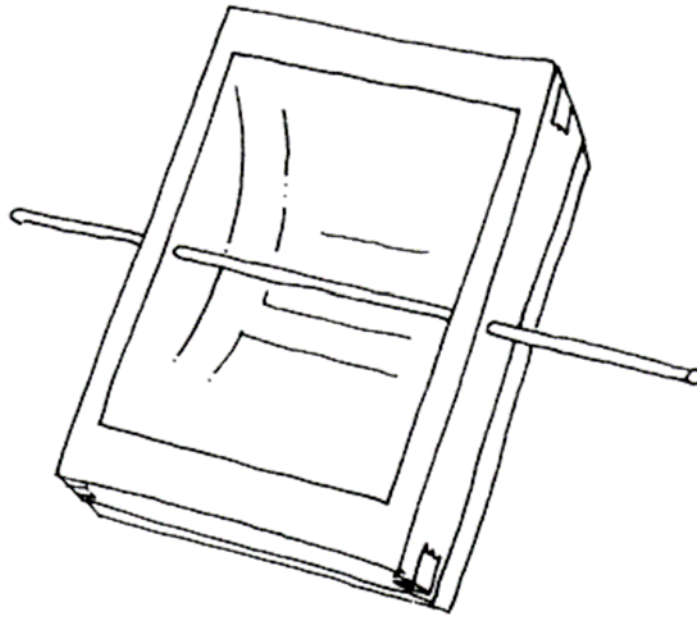
JUSTIN TAYLOR

Time Frame:		Standards:	
2 – 60 minutes sessions 6 th Grade		6.S.1.2.3 Use models to explain or demonstrate a concept. 6.S.1.8.1 Read, give, and execute technical instructions.	
Objectives:			
SWBAT follow directions and make a working solar cooker.			
Background Information:			
The model to be built in this activity is an example of a parabolic trough or line focus type collector. The sun's rays are focused along a line at the focal point of the parabolic curve. If a tube (painted black) carrying water is placed along the focal line it will heat the water. Alternatively a thin rod can be positioned along the focal line. If food (e.g., sausages, apples etc.) is placed on the rod, the collector can be used as a cooker.			
Materials:			
<ul style="list-style-type: none">• Plan for a half parabola• A cardboard box• Light weight poster board.• Adhesive tape and adhesive spray• Stanley knife or similar• Aluminum foil used for cooking (300 mm)• 500 mm of strong wire (or a straightened wire coat hanger).			

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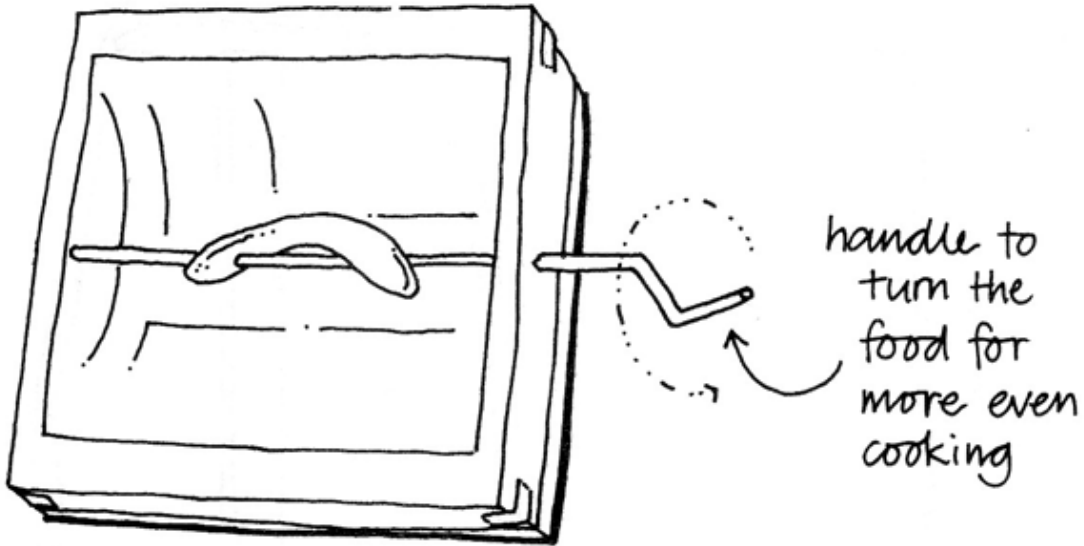
Procedure:

1. Use the pattern provided on the following page. This has a focal length of 75 mm. The shape provided is a 'half parabola'. Use this to make a full size parabolic template as shown.
2. Using your template mark the parabolic shape on the end of a cardboard box and cut it out with your knife.
3. Cut the poster board to suit the length of the box and lay it into the curve of the box. Use spray adhesive to glue the aluminum foil onto the poster board. This will become your reflector.
4. Cut the ends to suit the box and mark the focal point accurately. Mount the ends to the box, with holes punched at the focal points
5. Place a cooking rod (e.g. length of straight strong wire) through the focal points. Try cooking sausage, apples, bananas etc.

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Assessment:

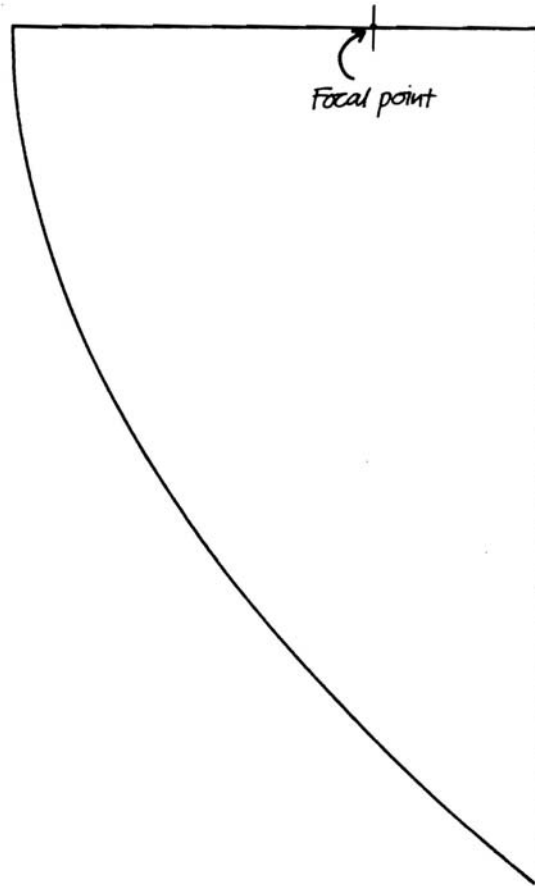
This is an observation assessment. Are the students able to create a working solar cooker?

Additional Content:

Renewable Energy School Workshops: *Solar Cooking*

Page 13 of 17

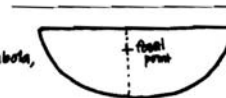
HALF-PARABOLA (focal length 75mm)



Place the half-parabola shape on a piece of folded paper



cut around the half-parabola, then unfold the paper...



...this is a full parabola. Use this as your master template.

Prepared by the Queensland Sustainable Energy Industry Development Group 2004



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References:

Solar Cooking is one of a series of five publications collated by the Queensland Sustainable Energy Industry Development Group, a nongovernment alliance of organizations whose aim is to enhance the sustainability of Queensland's energy supply. Each of the topics in the series contain a range of practical activity-based workshops for use in Queensland schools and aims to allow students and teachers to explore and discover the fundamental principles that underpin sustainable energy.

Other activity sets in this series include:

- Global Warming and Climate Change
- Passive Solar Building Design
- Photovoltaic (Solar Electricity)
- Wind Power

The project “*Expand community knowledge, understanding and uptake of renewable energy and energy efficiency technologies*” was undertaken with the assistance and support of the Queensland Government, through the Sustainable Industries Division of the EPA and the Commonwealth Government, through the Australian Greenhouse Office.

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