

Making a Solar Oven

a 4-H STEM lesson



Objective: To understand the use of solar energy by using it to cook

Age Ranges: All Ages

Hands-on Activity: Make a solar oven

Introduction

Using heat and light from the sun, we will create waves of *radiant energy* that we will use to penetrate the food in the solar oven. Solar ovens are a method of radiation cooking, along with toaster ovens and microwaves. *Radiation* is energy made through the transmission of waves through space. *Solar energy* uses the energy waves created by the sun. Solar ovens are heated when the heat from the sun is trapped inside. Solar ovens are also called collector boxes because they collect the sunlight inside. We use aluminum foil to reflect the rays and bounce them directly into the open box, cooking your food as it does.

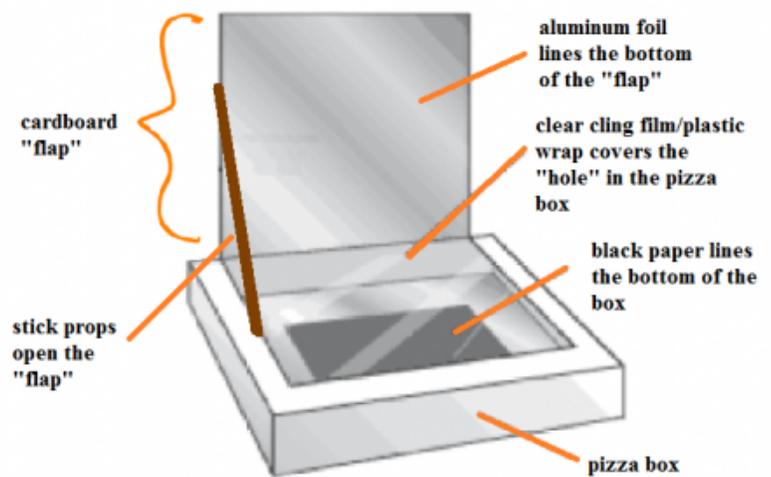


Figure 1: Solar Oven
Source: <https://thekrazycouponlady.com/>

Materials

Cardboard Box (a pizza box will work best)
Aluminum Foil
Plastic Wrap
Scissors
Tape
Ruler or wooden dowel
Paper plate or pie plate

Activity Instructions

1. Cut a flap in the top of the pizza box, leaving a 1 to 2-inch border around the edges.
2. Wrap the inside of the box with aluminum foil. Also, wrap the bottom of the flap you cut out with foil. Note: Make sure the shiny side is up. It will reflect more of the sun's rays. Secure the foil with tape.
3. Using plastic wrap, cover the hole created by the flap, creating a lid that will protect the food you are cooking.
4. Set up your oven in a sunny area, using a ruler or dowel to hold up the flap. Position your box and flap so that the sun reflects directly into your oven.
5. Place the plate inside your solar oven, under the plastic wrap, along with what you decide to cook. Let the solar energy do the cooking! Note: Remember to remove carefully because it will be hot.

Tip: Remember the solar oven will cook a little slower than a regular oven. You will have to keep check on the food you are cooking. Cook time will depend on the temperature and time of day.

Bonus Fun: Try crumpling newspaper sheets and placing along the inside edges to provide extra insulation. Use a kitchen thermometer to measure how hot your homemade oven gets during this activity.

Reflective Questions

- What types of food do you think you could cook in your Solar Oven?
- Where else might you see the use of solar energy?
- What changes would you make to this design to make it more effective?

Conclusion

Solar ovens are a great way to learn about the properties and power of heat and light. You may be surprised at how hot your oven gets during this process. Harnessing the power of the sun is a way to provide clean energy, and is becoming a common way to provide energy for everyday use. Look for solar panels in various places in your community.

Additional Resources

NASA: Climate Kids

<https://climatekids.nasa.gov/smores/>

Solar Oven Recipes

<https://www.sunshineonmyshoulder.com/6-easy-recipes-for-kids/>

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