

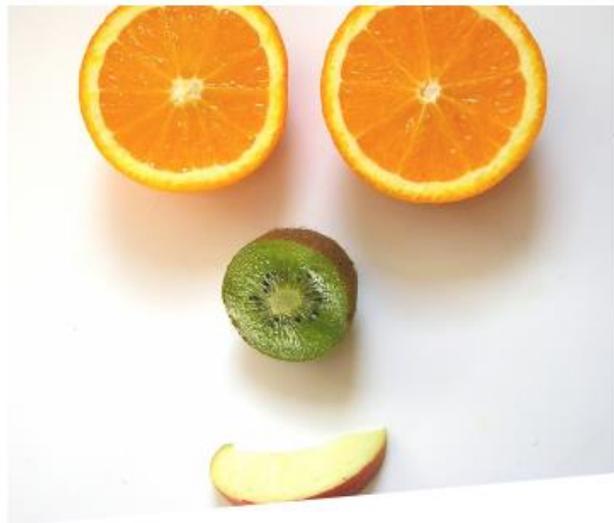


Science and
Technology

Pillar: Science & Technology

Project: Food Science previously 'Fun with Foods'

Activity: DIY Solar Oven



CANADA
4-H Saskatchewan

**Food
Science**

Activity Guide

Create a Solar Oven

What you need:

- Cardboard box (the kind delivered pizza comes in)
- Box knife or scissors
- Aluminum foil
- Clear tape
- Plastic wrap (a heavy-duty or freezer zip lock bag will also work)
- Black construction paper
- Newspaper
- Ruler or wooden spoon
- Thermometer

Instructions:

1. Use a box knife or sharp scissors to cut a flap in the lid of the pizza box. Cut along three sides, leaving about an inch between the sides of the flap and the edges of the lid. Fold this flap out so that it stands up when the box lid is closed.
2. Cover the inner side of the flap with aluminum foil so that it will reflect rays from the sun. To do this, tightly wrap foil around the flap, then tape it to the back, or outer side of the flap.
3. Use clear plastic wrap to create an airtight window for sunlight to enter into the box. Do this by opening the box and taping a double layer of plastic wrap over the opening you made when you cut the flap in the lid. Leave about an inch of plastic overlap around the sides and tape each side down securely, sealing out air. If you use a plastic bag, cut out a square big enough to cover the opening, and tape one layer over the opening.
4. Line the bottom of the box with black construction paper. The black surface is where your food will be set to cook. Make sure you have enough to cover the entire bottom and all sides of the box.
5. To insulate your oven so it holds in more heat, roll up sheets of newspaper and place them on the bottom of the box. Tape them down so that they form a border around the cooking area. It may be helpful to also tape the rolls closed first. The newspaper rolls should make it so that the lid can still close, but there is a seal inside of the box, so air cannot escape.
6. The best hours to set up your solar oven are when the sun is high overhead—from 11 am to 3 pm. Take it outside to a sunny spot and adjust the flap until the most sunlight possible is reflecting off the aluminum foil and onto the plastic-covered window. Use a ruler to prop the flap at the right angle. You may want to angle the entire box by using a rolled up towel.
7. You can make toast by buttering a slice of bread then letting the sun do the rest. Cooking a hot dog or making nachos with chips and cheese are also fun treats to make in your solar oven! It would also work great to heat up leftovers. So the paper at the bottom doesn't get dirty, put what you would like to cook on a clear plastic or glass plate. A pie plate would work well. Place the thermometer inside your oven before you close it, so you can check the temperature.
8. To take food out of the oven, open up the lid of the pizza box, and using oven mitts or potholders, lift the glass dish out of the oven.



What Happened?

- The heat from the sun is trapped inside of your pizza box solar oven, and it starts getting very hot.
- Ovens like this one are called collector boxes, because they collect the sunlight inside.
- Rays of sunlight are coming to the earth. The foil reflects the ray, and bounces it directly into the opening of the box.
- The reflected sunlight heats up the air that is trapped inside.
- The black paper absorbs the heat at the bottom of the oven.
- The newspaper makes sure that the heat stays inside
- Your solar oven can reach about 200° F on a sunny day!
- On partly cloudy days (during the summer in Saskatchewan) there may be enough heat and light from the sun to cook something.
- Tips for solar oven success:
 - Stir liquids about every 10 minutes.
 - Rotate solid food every 10-15 minutes so it cooks evenly.
 - Reposition your solar oven when needed, so that it faces direct sunlight.
 - Make sure that the foil-covered flap is reflecting light into the box, through the plastic-covered window.



Don't forget to post a picture of your solar oven in action on the 4-H Saskatchewan Exploring 4-H At Home Page and use **#exploring4hathome**

Why do we use these materials?

Here is a list of the materials we used to make the solar ovens. Using what you've learned, list why each of these materials was important to making a working solar oven!

Material	Purpose
Cardboard box	
Box knife or scissors	
Aluminum foil	
Clear tape	
Plastic wrap	
Black construction paper	
Newspaper	
Ruler	
Thermometer	

Sources:

<https://www.homesciencetools.com/article/how-to-build-a-solar-oven-project/>