

Make Your Own Solar Oven

Use the sun's energy to heat up a tasty treat with this simple solar oven! Have you ever heard the expression that it's so hot out you could fry an egg on the sidewalk? Have you ever wondered if it's true? Find out with this easy, fun, and delicious solar oven science project that uses only household items and a pizza box. Plus, learn about absorption, insulation, and the sun's energy.

Materials:

- Cardboard pizza 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
- Newspapers
- Ruler, or wooden spoon
- Thermometer
- An adult to help with cutting



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. 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. Open the box and tape 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.
5. 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. 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 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. As it sits out in the sun, your oven eventually heats up enough to melt cheese, or cook a hot dog! How does it happen? Rays of light are coming to the earth at an angle. The foil reflects the ray, and bounces it directly into the opening of the box. Once it has gone through the plastic wrap, it heats up the air that is trapped inside. The black paper absorbs the heat at the bottom of the oven, and the newspaper make sure that the heat stays where it is, instead of escaping out the sides of the oven.