

Science Activities: Make a Solar Oven

You will need

- Cardboard box (preferable pizza or thin Amazon box)
- Aluminium Foil
- Clear plastic bag or cling-film
- Black paper
- Pencil
- Scissors
- Tape
- Newspapers
- Foil tray or baking tray
- Ruler or wooden spoon
- Oven mitt
- Thermometer (optional)



Health and Safety: This practical requires adult supervision. Please remember that you cannot cook meat or reheat anything in this oven. Never leave your solar oven unattended and place on a stone/concrete when in use.

Method

1. Use 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 aluminium foil so that it will reflect rays from the sun. To do this, tightly wrap foil around the flap, then tape it to the outer side of the flap.
- 3.



4. Use clear plastic wrap to create an airtight window for sunlight to enter into the box. Tape a double layer of plastic cling-film over the opening you have 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.

5. Line the bottom of the box with black paper—black absorbs heat. The black surface is where your food will be set to cook.

6. 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.



7. 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 aluminium foil and onto the plastic-covered window. Use a ruler (or wooden spoon) to prop the flap at the right angle. You may want to angle the entire box by using a rolled up towel.



8. You can cook smores (biscuit, chocolate and marshmallows) or cheesy nachos. Put what you want to cook on a plate, on top of the black paper. Place the thermometer inside your oven before you close it, so you can check the temperature. It may take up to 45 mins to melt chocolate or cheese.
9. 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.

How does this work?

Heat from the sun gets trapped inside your solar oven. The foil reflects the sun's rays into the opening of the box. It goes through the plastic layer and heats up the air inside. The black paper at the bottom of the oven absorbs the heat and the newspaper acts as an insulator making sure the heat does not leave through the sides of the oven.