

Build a Pizza Box Solar Oven

Grades: K-4, 5-8, 9-12

Topic: Solar Energy

Owner: Office of Energy Efficiency and Renewable Energy

**U.S. Department of Energy - Energy Efficiency and Renewable Energy
Roofus' Solar and Efficient Home**

Build a Pizza Box Solar Oven

The sun is hot enough to bake food. Here's how to make a simple solar oven that gets hot enough to warm up cookies and other treats, like s'mores. It won't get really hot, though, so you can't bake things in it and you won't burn yourself when playing with it. Be sure to have an adult help you with this!



To make your own solar oven you need:

- One pizza box from a local pizza delivery store.
Here's a good excuse to ask your parents to order pizza tonight!
- Newspapers
- Tape
- Scissors
- Black construction paper
- Clear plastic wrap
- Aluminum foil
- A piece of notebook paper
- A pencil or pen
- A ruler or a wooden dowel or a stick

Now you are ready to build:

1. Make sure the cardboard is folded into its box shape and closed.
2. Place the piece of notebook paper in the center of the lid of the box and trace its outline on the lid. Put the piece of paper aside.
3. Carefully cut the two long edges and one of the short edges of the rectangle that you just traced on the lid of the box, forming a flap of cardboard.
4. Gently fold the flap back along the uncut edge to form a crease.
5. Wrap the underside (inside) face of this flap with aluminum foil. Tape it on the other side so that the foil is held firmly. Try to keep the tape from showing on the foil side of the flap. The foil will help to reflect the sunlight into the box.
6. Open the box and place a piece of black construction paper in so it fits the bottom of the box. This will help to absorb the sun's heat.
7. Close the box, roll up some newspaper, and fit it around the inside edges of the box. This is the insulation that helps hold in the sun's heat. It should be about 1 to 1 1/2 inches thick. Use tape to hold the newspaper in place, but only tape it to the bottom of the box, not the lid.
8. Cut two pieces of plastic wrap an inch larger than the flap opening on the box top. Open the box again and tape one piece of plastic wrap to the underside of the flap opening. After taping one side, BE SURE TO PULL THE PLASTIC WRAP TIGHT, and tape down all four sides so the plastic is sealed against the cardboard. Then close the box and tape the other piece of plastic wrap to the top of the flap opening. Again, be sure the plastic wrap is tight and tape down all four edges to form a seal. This creates a layer of air as insulation that helps keep the sun's heat in the box.

Finished building—Let's give it a try!

On a sunny day, pick a treat to warm up and carry it and the box outside to a sunny spot. If it's cold outside, put a towel or blanket under the box so the bottom doesn't get cold. Open the box, put the treat in the center, and close the box. Now open the flap and turn the box so the foil is facing the sun. The shadow of the flap should go straight back from the back of the box. Move the flap up and down and note how it reflects the sunlight. Use a dowel, ruler, or stick to prop up the flap so that it bounces the sunlight into the box.

Wait about a half hour for the box to warm up in the sun. Then enjoy your warmed-up treat!

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