Pizza Box Solar Oven

UConn 4-H Earth Agents

Background

The sun is an amazing source of energy! Solar energy, or energy produced by the sun, is considered renewable because it is created and maintained by natural processes. Wind and hydropower (water) energy are also considerable renewable. Non-renewable energy comes from finite, limited sources that eventually will be used up, like the fossil fuels we use to power our cars. We are working nationally and globally to become increasingly sustainable with our energy use by relying more and more on renewable sources.

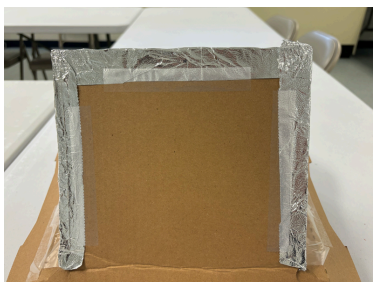
One of the ways that we can harness the power of the sun is to use it as a heat source. You likely have noticed that on a cold winter afternoon, the warmest place to be is in the sun. The same principle can be applied to heat up a delicious snack! Follow the instructions below to build your own pizza box solar oven.

Activity Source: Roofus' Solar and Efficient Home, U.S. Department of Energy

Supplies and Tools

Pizza box	**Clear plastic wrap (2 pieces)**
Newspaper	**Aluminum foil**
Tape	**1 piece of notebook or printer paper**
Scissors	**Pen or pencil**
Black construction paper	**A ruler, wooden dowel, or a stick**

Activity Steps

Notes	Visuals
1. Make sure the cardboard is folded into its box shape and closed. Place the piece of notebook paper in the center of the lid of the box, leaving about an inch on the flap side, and trace its outline on the lid. Put the piece of paper aside.	
2. 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. Gently fold the flap back along the uncut edge to form a crease. Note: the cut flap will open the same way as the pizza box lid.	
3. 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.	
4. 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.	

5. 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.

6. 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.

7. 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!

If you enjoyed this project, visit 4-h.extension.uconn.edu to learn more about UConn 4-H. Check out the UConn 4-H webpage to view the video associated with this activity.

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