Easy Solar Cooker by

zippetydooda (/member/zippetydooda/) in solar (/explore/category/workshop/keyword/solar/)

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How to Make a Basic Solar Oven (/id/How-to-Make-a-Basic-Solar-Oven/)

Here is an idea for a solar cooker that is easy to build and is versatile. Solar cookers do not have to be complicated or require expensive hard-to-work with materials. In fact, the simpler (and cheaper!), the better as far as I'm concerned. The first ones I built were a variation of the funnel types made with two rectangular reflectors fastened together at one end and spread out at a 45 degree angle to form a wedge. Each reflector was about 18 inches by 30 inches. An isosceles triangle, 24 to 30 inches tall was used as the bottom reflector. The beauty of this type, besides being super simple to build with no complicated angles or folds, is that it is very efficient and works well whether the sun is low (winter) or high (summer) in the sky. Another positive attribute is that it only has to be adjusted on the horizontal axis, not the vertical like some more complex styles of funnels. It is also a good style for camping, traveling, etc. because it all folds up flat. The downsides are that the ends need to be staked down if it's windy and it requires the use of an oven bag to insulate the cooking vessel from the ambient air.

I have wanted to build a solar cooker that was not susceptible to wind and didn't require an oven bag for insulation. I have made a couple of box cookers/ovens, but could never get them to work very well. It seemed I just couldn't get them to heat up enough to cook. However, the other day I was out in my shop and saw an old wood ammo box and thought I would give the box cooker another try.

Materials:

- A large wooden box with lid

- Heavy duty foil
- Spray adhesive
- Heavy cardboard
- Some ¾ inch pine boards
- A 5/16 inch wood dowel rod
- A piece of plexiglass or glass to fit the box

Step 1:

This box was made from ¾ inch pine and is about 16 inches by 20 inches and 9 inches deep and has a hinged lid. You can look around army surplus stores or yard sales or just build your own wood box. You could use a cardboard box, but it would need to be insulated and would be susceptible to wind. The first thing to do is to line the box and lid with foil using the spray adhesive. This is not an oven and we don't want to waste solar energy heating the box, so the entire interior is reflective, not black as some cooker/ovens are constructed.

Step 2:

by dezine (/member/dezine/)

Solar Oven by the Science Wizards (/id/Solar-Oven-by-the-Science-Wizards/)
by sciencewiz16

Solar Oven Box (/id/Solar-Oven-Box/)
by TylerArnold22 (/member/TylerArnold22/)

Next, I made a couple of small reflectors from cardboard to fit at 45 degree angle inside the box. These are loose and can be removed to accommodate different sized cooking vessels, etc.

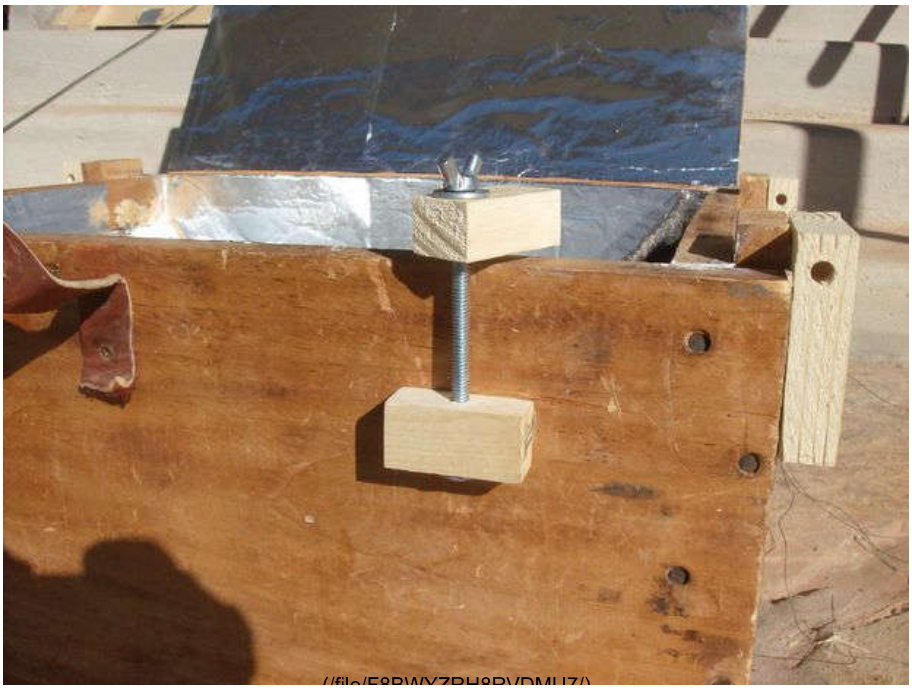
Step 3:

Then I made a couple of prototype (I may make these from ¼ inch plywood later) side reflectors from cardboard. These are approximately 16 inches by 20 inches.

To attach the side reflectors you will need to make four hinges. If you have a ready-made box, this is the only part that requires any real construction, but even so, it only took me about 20 minutes. I made the hinges from eight little blocks of ¾ inch pine and 4 pieces of 5/16 inch dowel rod. The little blocks are 2 ½" to 3" wide and 4 inches long. I would make the reflector wing blocks a bit longer if I remake them as it would give more stability. Drill holes ½ inch from the end of each block and insert dowels in the four that go on the reflector wings. Glue/screw the female hinge blocks to the box. If you staple (as opposed to gluing)

the reflector male hinge blocks onto the reflectors, they can be reused when the cardboard gets wet or breaks. When fastening the blocks to the wings leave plenty of slack so the wing does not bind in the primitive little hinge.

Step 4:



As you can see in this picture, the box is on its 'back' and doesn't look like a typical 'box cooker.' When the sun is low (this was taken Nov. 1) it works best in this configuration and almost resembles the 'wedge cooker' I described before. The two wings and small reflector inserts function exactly the same. Even here in New Mexico the sun is fairly low in the sky in the winter and will strike the cooking pot better in this position. The glazing (plexiglass) is held in place with two little clamps made with ¼ inch bolts, wing nuts and wood blocks.

Step 5:

In this photo I have it set up like a typical box cooker and this will work best in the summer when the sun is higher in the sky. Since the sun is more intense when straight overhead, you may not even need the side reflectors.

Step 6:

Here are the cooking vessels I use. The jar and tin are painted with heat resistant (stove paint) flat black paint:

From left to right: A mason jar with ring and lid. These are great because they function like small pressure cookers since the lid seal gives a little and releases the pressure when it becomes too great. Be very careful though and do not handle these when they are really cooking as the lid could come loose and spray you with boiling water (I speak from experience!!).

Next is an enameled kettle. This one has a dark blue finish and works fine unpainted.

Next is an 8 inch cast iron dutch oven. Cast iron is great for solar cooking because it holds heat so well and transfers it all around the food.

Finally, is a round tin with lid and a one pound coffee can. Metal coffee cans are becoming hard to find as coffee now comes in plastic (arrgg!) so you may have to improvise. This is my bread baking outfit. The coffee can fits inside the tin without touching the sides. The dough goes in the coffee can and the tin acts as a miniature oven, getting very hot on the inside, but not touching the bread and causing it to burn. This turns out the prettiest little round loaf of bread you have ever seen!

So, if you have thought about cooking with the sun, build yourself a cooker and give it a try.

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audreyobscura (/member/audreyobscura/) 2012-11-08 Reply

This is one of the simpler designs I have seen for a solar oven. I like it.

Harrrrry21 (/member/Harrrrry21/) ▸ audreyobscura (/member/audreyobscura/)

2015-12-07 Reply

Good

maydaysmusings (/member/maydaysmusings/) 2015-02-11 Reply

Thank you so much.

maydaysmusings (/member/maydaysmusings/) 2015-02-11 Reply

Just a quick question. When you put the plexiglass in place, would your cookinh vessel already be inside?

zippetydooda (/member/zippetydooda/) ▸ maydaysmusings (/member/maydaysmusings/) 2015-02-11 Reply

Yes, the front is the only opening. Place the pot inside - lay the plexi on top and hold it in place with the little homemade clips.

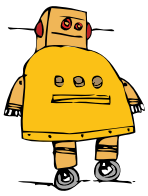
zippetydooda (/member/zippetydooda/) 2013-11-07 Reply

Thank you. It does make quite a nice cooker - very durable and it works very good.

avenger22 (/member/avenger22/) 2013-11-06 Reply

I love it. A scouts dream, man.

More Comments



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