

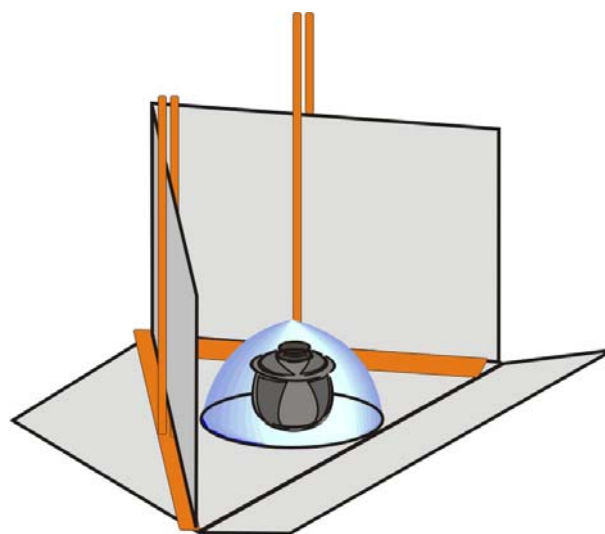
Constructing a portable open panel solar cooker with two pieces of cardboard

A frequent problem with the construction of a portable open panel solar cooker, based on the original idea of the collapsible solar cooker made out of two pieces of cardboard, is to find an alternative of fixing the "V" shaped reflectors on top of the base. A solution provided here is to construct a supporting base with two thin pieces of board on which 2 or 4 pairs of round wooden sticks are attached. The "V" shaped cardboard reflectors are then inserted and gripped in between these round wooden sticks (cf. Tsagliotis, 2004).



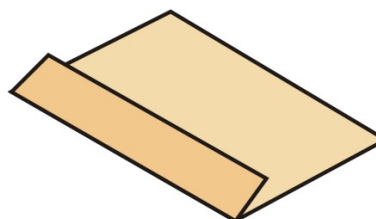
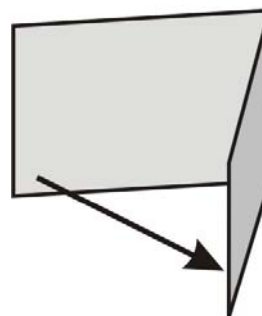
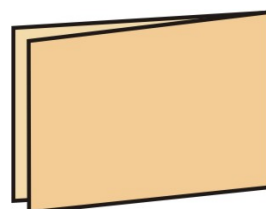
Materials

- ✓ 2 large pieces of cardboard, possibly cut out of the sides of big cardboard boxes
- ✓ 2 pieces of a thin board, in relevant dimensions to the base and reflectors cardboards
- ✓ 4 or 8 round wooden sticks used for craftwork and/or technology projects, in relevant dimensions to the height of the "V" shaped reflectors
- ✓ 2 pieces of self adhesive Velcro tape
- ✓ aluminium foil
- ✓ white glue and a paint brush
- ✓ scissors, cutter
- ✓ ruler, pen or pencil



Let's put it together

- 1** Find a large piece of cardboard for the "V" shaped reflectors or cut a piece out of the sides of a big cardboard box used for packing a refrigerator or a washing machine etc.
 Fold it in the middle as shown in the drawing.
- 2** Then unfold the cardboard and glue aluminium foil on the inner surface of the reflectors, with its shiny side facing outwards (*see drawing*).
- 3** Find another big piece of cardboard for the base and the front reflector of the solar cooker. Fold it roughly in 2/3 by leaving the bigger part for the base of the solar cooker and the smaller part for the front reflector.



4 Unfold the cardboard and glue aluminium foil on the inner surface of the base and the front reflector, with its shiny side facing outwards (*see drawing*).

5 Next, the supporting base for the "V" shaped reflectors needs to be constructed.

Take two pieces of thin board with relevant length according to the width of the cardboard used for the base and the front reflector of the solar cooker. Ask for assistance from an expert adult to drill one or two pairs of holes in each board, to the diameter of the round wooden sticks you have available. These holes are opposite to one another, in a rather diagonal mode.

Then, glue the wooden sticks in the right places on both pieces of board (*see drawing*)

6 Adjust *roughly* the two pieces of board with the vertical wooden sticks on the surface of the cardboard base and mark their desirable position. Then stick one piece of the self adhesive Velcro tape along the two lines you have marked and the other piece under the two pieces of board (*see drawing*).

7 Place the two pieces of board on top of the two pieces of the Velcro tape stuck on the base of the cardboard and press to grip and fix them firmly.

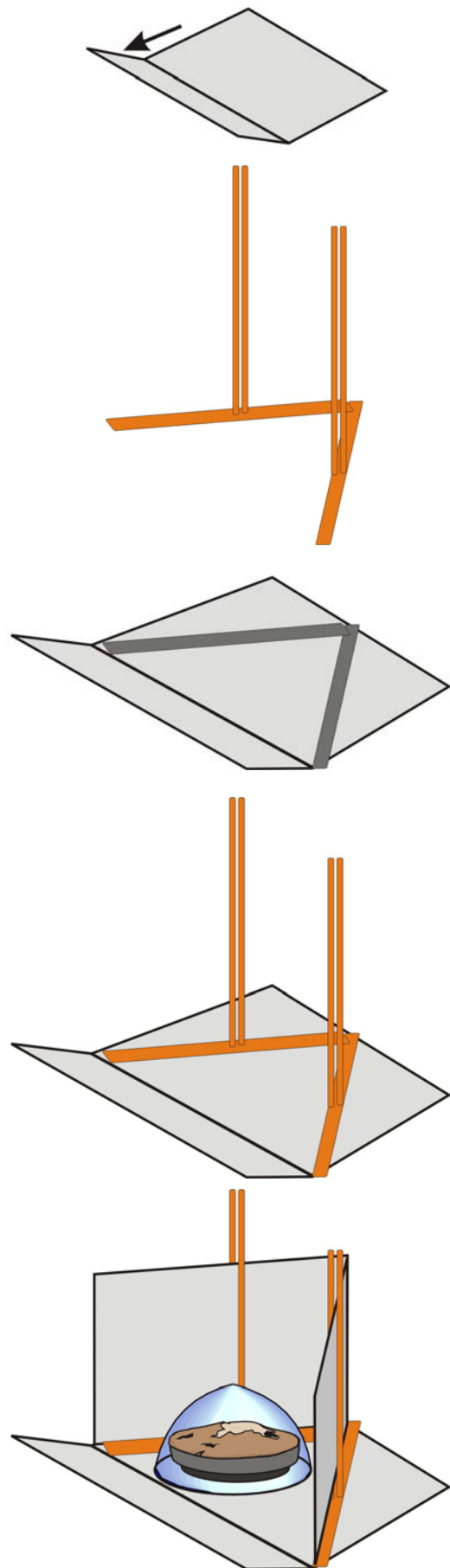
The two pieces of board are now in place and the wooden sticks are ready to hold the "V" shaped reflectors.

In the drawing aside, there are only two pairs of sticks fixed on each piece of board. You may also fix another two pairs of sticks, one on each piece of board respectively, for a more durable construction.

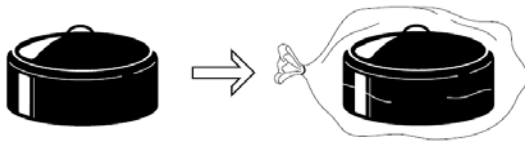
8 Insert the reflectors in between the two round wooden sticks fixed on each piece of board and push it down to grip firmly. The friction in between the sticks and the cardboard of the "V" shaped reflectors will hold them in place, even if it gets windy.

This version of the open panel solar cooker is now ready!

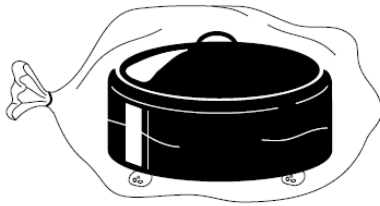
Whether you wish to disassemble it, lift off the reflectors, remove the two pieces of board from the cooker base and fold the two pieces of cardboard together.



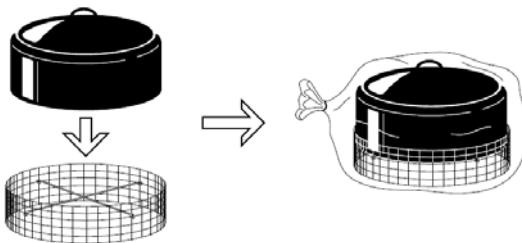
Some more tips for cooking with open panel solar cookers ...



As it can easily be retrieved from the *Solar Cookers: How to make, use and enjoy* (2004) e-book, you may "put the pot in a clear, heat-resistant plastic bag and bind the open end of the bag or simply fold it under the pot in such a way as to prevent air from escaping. The bag should be loose enough that a small, insulating layer of air exists around the pot." (p. 13)



Moreover, the "cooking efficiency may be marginally improved by placing the pot on a pot "stand" - three or four stones, a couple of twigs, a small wire rack, etc. - located inside the bag. This helps create a thin layer of air under the pot, reducing heat loss to the cooker itself." (p. 14)



For optimal performance, Dr. Steven Jones of Brigham Young University recommends "raising the pot 6 cm with an open-mesh wire stand located inside the bag (see image aside). This allows sunlight to be reflected underneath the pot as well as on the sides and top. For best pot stability, make the wire stand slightly wider than the pot, and slightly taller than 6 cm, so that the pot can rest inside the stand on two crossed wires at the 6 cm height." (ibid. p. 14)

Constructing this version of **open panel solar cooker** in class has been a rather easy task, provided that the two pieces of board with the affixed round wooden sticks were constructed by the teacher and/or an adult supervisor of the group of children who carried out the relevant project. The portable and rather durable nature of this construction has turned it to a favourite solar cooker for demonstrations and for science fair projects and activities (*see photos that follow*).



Photo 1: Constructing in class a portable open panel solar cooker with two pieces of cardboard. Notice the two pieces of board with the two pairs of round wooden sticks supporting the "V" shaped reflectors (*front view*).



Photo 2: Constructing in class a portable open panel solar cooker with two pieces of cardboard. Notice the two pieces of board with the two pairs of round wooden sticks supporting the "V" shaped reflectors (*side view*).



Photo 3: A portable open panel solar cooker cooking a cake during a science fair at the school yard.



Photo 4: Children discussing with a visitor how a portable open panel solar cooker works during a science fair at the school yard ...

References & Resources

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