Source: https://solarcooking.fandom.com/wiki/Fun-Panel

Fun-Panel

The **Fun-Panel** solar panel cooker can be built in one to two hours from a single cardboard box, aluminum foil, a pot, and an oven bag. This is significant, because traditional solar panel cookers such as the CooKit often require a large sheet of cardboard for construction. The Fun-Panel can also be adjusted more easily for different sun angles.

Teong Tan's rationale for designing this cooker is the following: The Funnel solar cooker is very efficient in capturing sunlight with its 60° conical reflecting surface. However, it has an unstable shape that makes it difficult to keep the cooker and the pot in position. Also, it is not possible to fit a regular-size cooking pot into a regular-size Funnel cooker because of limited space at the lower end of the cooker. The Fun-Panel retains the very efficient conical reflecting surface of the Funnel cooker but eliminates its disadvantages.

This is a very good design to build in construction workshops. Please see Fun-Panel Class Handout.

[Note that Teong Tan has recently released an improved design for this cooker. To see the updated design, see Fun-Panel 2 Construction Plans.]

Some advantages

- Easy to cut and fold this cooker using the cardboard from half of a single box — you don't need a big sheet of perfect cardboard. Every U.S. Post Office sells a large cube-shaped 50 cm x 50 cm x 50 cm box (20 in x 20 in x 20 in) for about USD 6.00 that can be used to make two Fun-Panels.
- Bernhard Mueller and Celestino Ruivo recommend scaling up the size for more cooking power. Instead of 50 cm (19.7 in) by 50 cm (19.7 in), one can use 60 cm (23.6 in) by 60 cm (23.6 in) or even 65 cm (25.6 in) by 65 cm (25.6 in)
- All cuts are 90° cuts — no curves
- It's easily scaled to the size of cardboard box you have on hand
- You can cook at all sun angles, including low sun angles (morning and evening or high/low latitudes)

Building the Cooker

What You Will Need

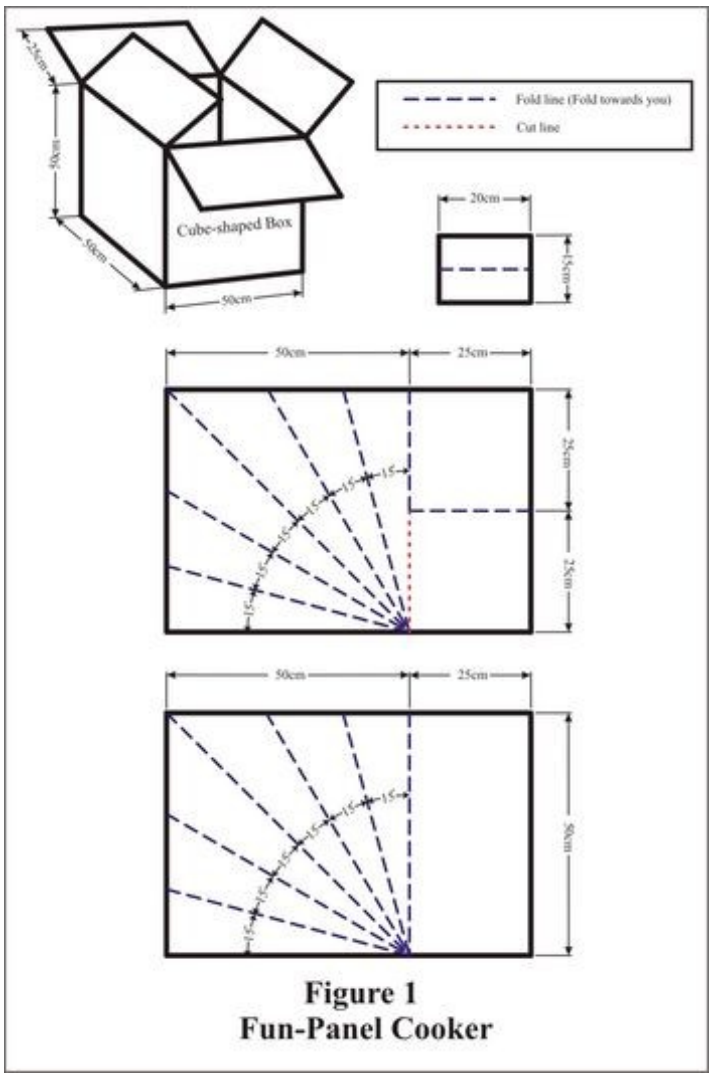


Figure 1
Fun-Panel Cooker

The construction materials required for a Fun-Panel cooker are simple and low cost. Teong made his cooker from a used cardboard box that measured about 50 cm (19.7 in) on all edges. If you use a box with different dimensions, just modify the design to suit your box. One cube-shaped

cardboard box has enough material for two Fun-Panel cookers. If only a rectangular-shaped box is available, you can cut the side panel to make it square.

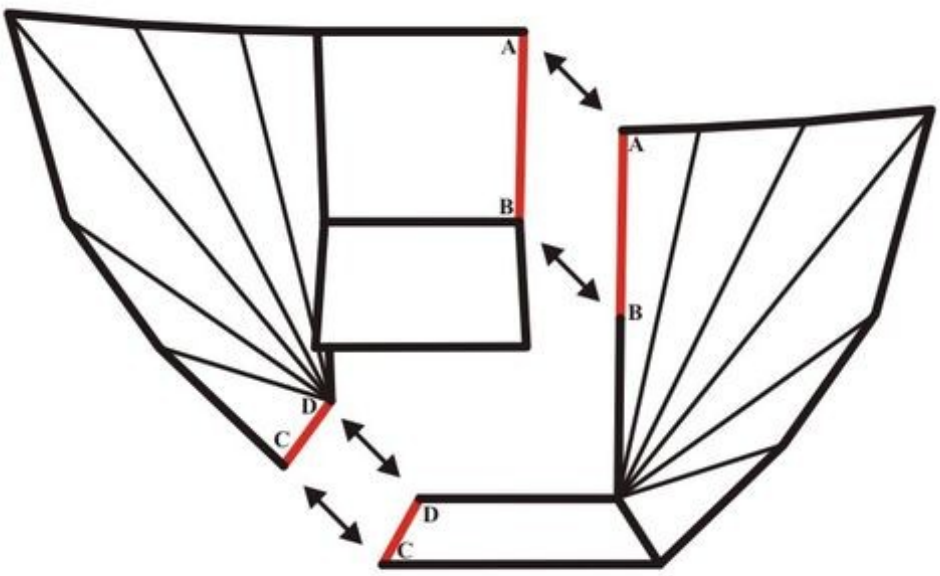
- A cardboard box
- Tape
- Aluminum foil
- Glue
- One jar or pot
- Oven bag

Creating the Panels

- Cut the cube-shaped cardboard box to obtain two large rectangular panels. Each panel is made up of one square face of the box together with one flap.
- Draw all the fold lines at 15° angles (see a simple way to measure 15° angles) and cut lines onto the panels following the Modified Fun-Panel Plan.
- Cut along the cut lines, then fold along the fold lines.
- Glue aluminum foil onto the inner side of the two large rectangular cardboard panels. Mix equal amounts of white glue and water. Wheat paste can also be used. For more information see Glue.

Assembling the Panels

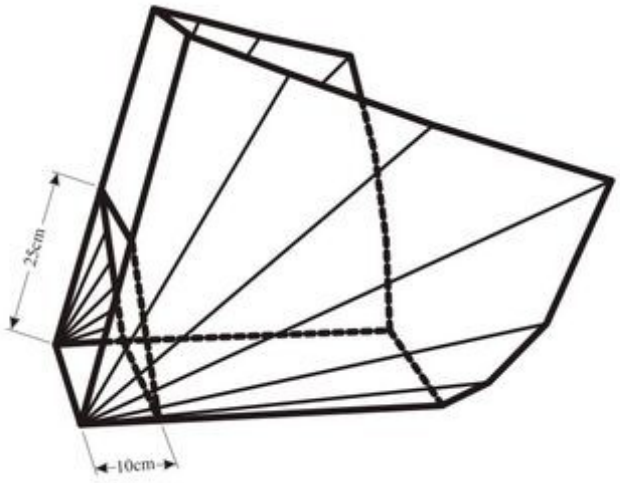
- Join the two large rectangular cardboard panels together according to Figure 2 to form the cooker.



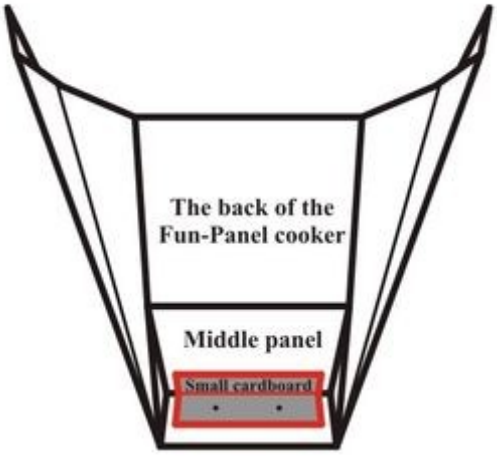
Assemble the two rectangular panels to form the cooker by joining both 'AB' and 'CD' edges together with paper tape

Figure 2
Fun-Panel Cooker

Adding small cardboard support



Push forward the lower edge of the center square panel by a distance of 10 cm from the rear edge, and keep it in that position.



Glue the small folded-cardboard to the lower edge of the middle panel only. Punch two holes through the horizontal face of the small cardboard and its adjacent base. Tie them together with a string to keep the middle panel in this desired position.

Figure 3
Fun-Panel Cooker

Setting up the Cooker

Low sun angle

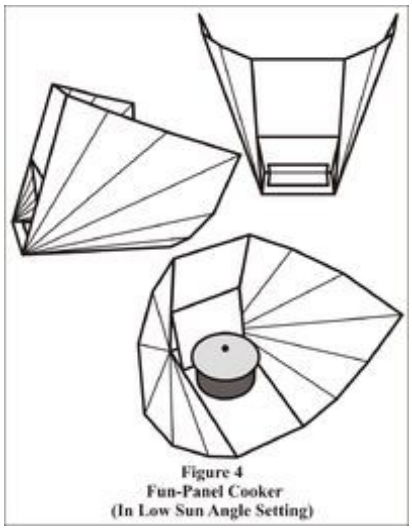


Figure 4
Fun-Panel Cooker
(In Low Sun Angle Setting)

For low sun angle cooking (between 35 and 50 degrees), place the cooker down with the rectangular panel on the floor, as shown in Figure 4. For very low sun angle cooking (below 35 degrees), raise the pot by 5 to 7.5 cm (2 to 3 in) above the base to better capture the sunlight.

High sun angle

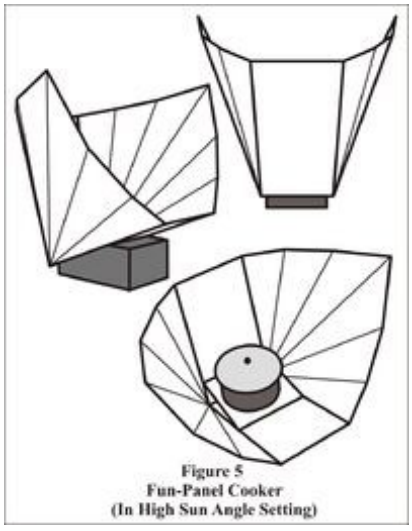


Figure 5
Fun-Panel Cooker
(In High Sun Angle Setting)

With a rising sun angle (between 50 and 70 degrees), flip the cooker around so that the square panel in the middle of the cooker is now horizontal, and place the cooker on top of a small box. (A box 12 to 15 cm high, or 5 to 6 inches, is now required, as shown in Figure 5.)

The small box serves to support both the cooker and the cooking pot in this high sun angle setting. For very high sun angle cooking (above 70 degrees), tilt the vertical rectangular panels slightly

backward until the pot receives maximum reflected sunlight. Tie the two ends of the string together to hold the rectangular panel in that position.

The pot and plastic bag

To cook, put foods inside a suitable cooking pot. Enclose the pot in a oven cooking bag. Use an oven cooking bag alone or a normal plastic bag around a wire frame to keep the pot from touching the bag (to avoid melting the bag). Set the cooker according to the sun angle and face it towards the sun. Place the cooking pot in the cooker and start cooking.

Photo of Fun-Panel showing pot inside plastic bag.

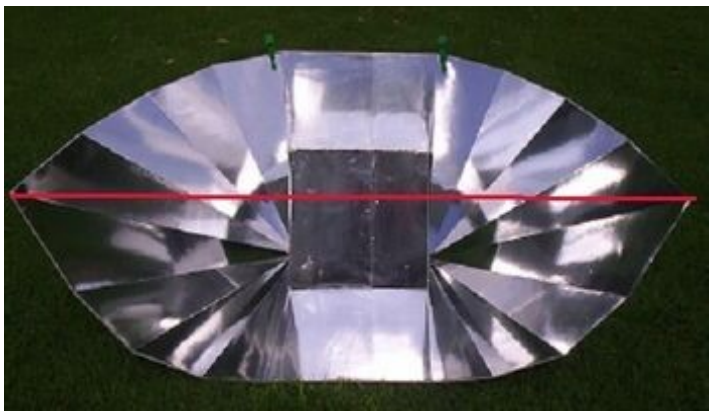
The Fun-Panel cooker is also capable of cooking without the plastic bag enclosure if you have good sunshine. A test in Singapore without the use of a bag recorded a maximum empty pot temperature of 130 °C (266 °F). The four-liter pot used had a clear glass lid. The cooker was set to the high sun angle setting, and the sun's angle was 55 degrees when the temperature was taken.

Wind stability

A large rock can be placed on the back shelf to help stop the cooker from blowing away on windy days. If more wind stability is needed, tie a string to each upper corner of the reflector wings (~5 cm, or two inches, in from each edge). Then tie the strings to stakes in the ground or heavy objects such as a rocks, bricks, etc.

Panel stability

Some users have found that positioning the reflector can be helped by attaching a string between the upper corners.



Jumbo variation

Jumbo version of the Fun-Panel by Elmo Dutra

- Jumbo version of the Fun-Panel solar cooker - *Elmo Dutra*

Cement Variation

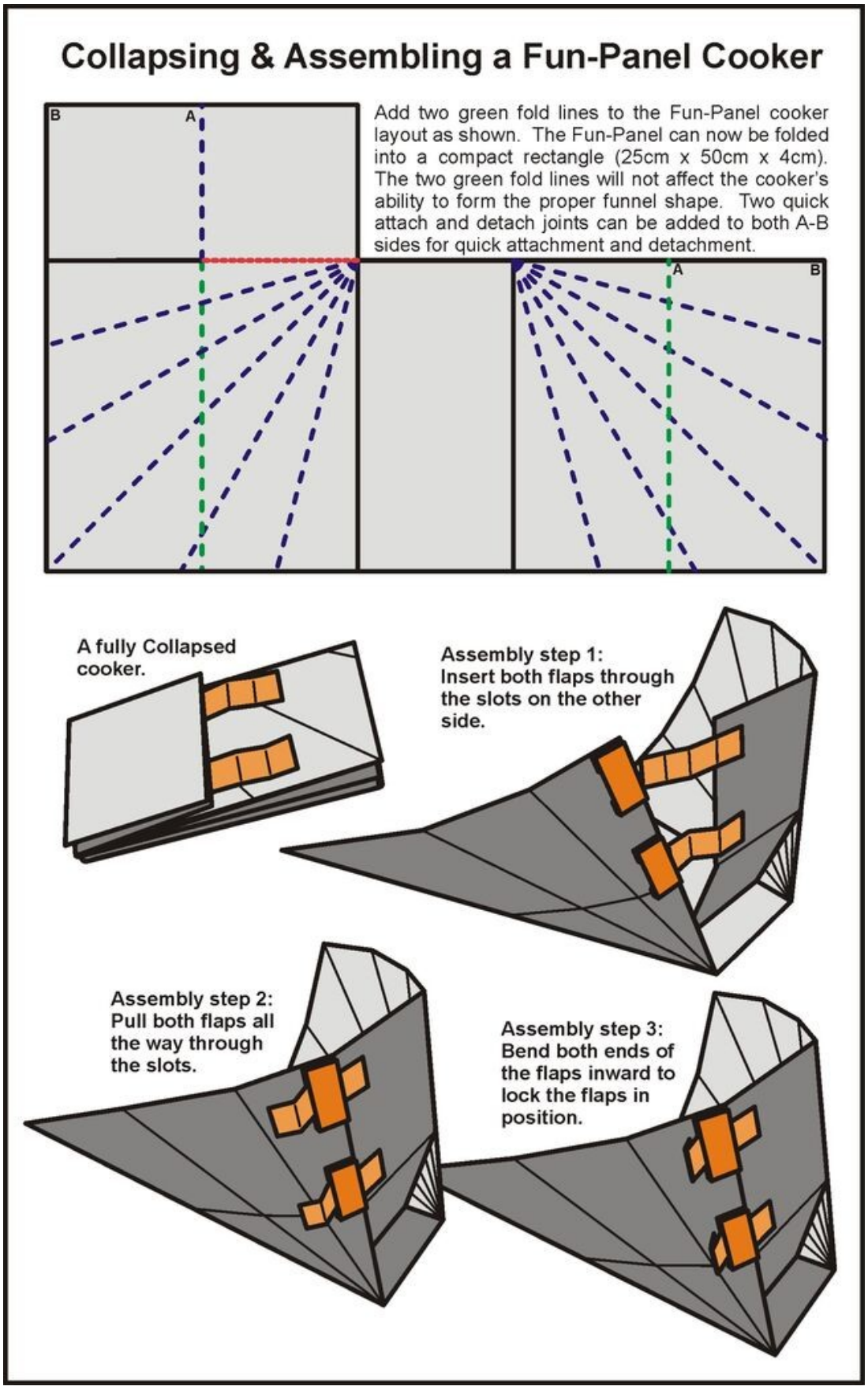
Cement Fun-Panels.

In 2009 Celestino Ruivo developed a Fun-Panel in concrete using mirrors for reflecting the sun rays to the pot. To make the greenhouse effect he used two recycled windows of clothes-washing machines instead of a plastic bag. This model is working now during winter time—no problem with rain and wind. It is easy to clean and it is very heavy and thus theft resistant. The Fun-Panel solar cooker in concrete with mirrors is durable and can last many years. It can be a good alternative to

a solar CooKit whose service length may only be several months. In African countries, this kind of solar cooker may also be constructed locally.

- See Concrete Funnel Solar Cooker: Making and Cooking

Making the Fun-Panel Collapsible (Optional)



Fun-Panel Version 2

- Teong Tan has updated this design. See Construction plans (English) and Planoj por Konstruado (Esperanto).

Audio and video

https://www.youtube.com/watch?v=GsVOOfwV8h8

Tom Sponheim at Sustainable NE Seattle's Solar Cookout

Tom Sponheim, a long-time advocate of solar cooking, discusses the Fun Panel cooker.

https://www.youtube.com/watch?v=hsWZ0sLubXU

Boiling water with cardboard and aluminum foil 2

A similar design to the Fun Panel demonstrating its ability to boil water.