Cardboard solar concentrator (type of solar cooker)

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https://wiki.lowtechlab.org/wiki/Cardboard_solar_concentrator_(type_of_solar_cooker)

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Difficulté **Facile**

Durée **40 minute(s)**

Coût **10 EUR (€)**

Description

Small solar parabola light, cheap and very easy to make.

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Introduction

Overview
This small solar parabola is light, cheap and very easy to make.
It produces a medium temperature of 120°C, wether it is to fuel a Stirling engine or to cook (hard-boiled eggs in 30 min.)
It is made of 24 small reflective panels to concentrate the sunlight.
You need: aluminium foil, cardboard, duct tape, small bamboo or wooden sticks and a rope.

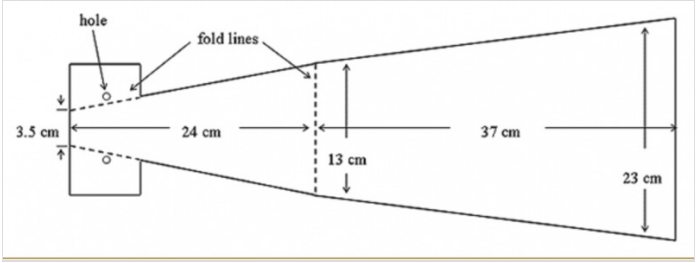
Matériaux

- Aluminium foil
- Cardboard
- Duct tape
- Small bamboo or wooden sticks
- Rope

Outils

Étape 1 - Step 1 Building the parabola

Cut the cardboard into 12 rectangular pieces of about 23cm x 61 cm each. Draw and cut the shape as below on each of the cardboard panel.



Étape 2 - Step 2' Building the parabola '

Make a straight fold 24 cm inches away from the small end of the panel. Drill a hole in each of the two lid flaps in the narrow end of the panel (please refer to the image). As indicated below, fold the lid flaps away from you.

Étape 3 - Step 3 The positioning of the panels

Position the panels side by side, alongside the longer side of each panel and tie them with the duct tape until they are joined together and form a circle. Glue the aluminium foil on the whole inner surface of the parabola.

Étape 4 -

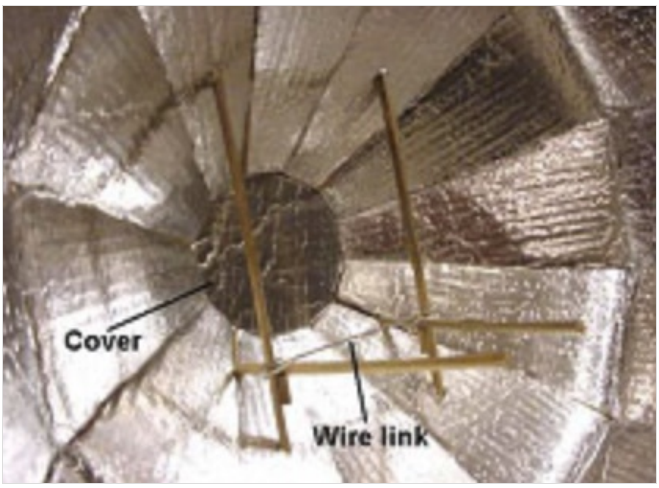
Thread a rope through the holes you previously drilled in the lower end of the parabola to join the lower panels together.

Étape 5 -

Tie a knot with the slack rope around a short stick: we now have a stiff and deep parabolic shape. For greater efficiency, cover the circular opening at the bottom of the parabola with a reflective disc.

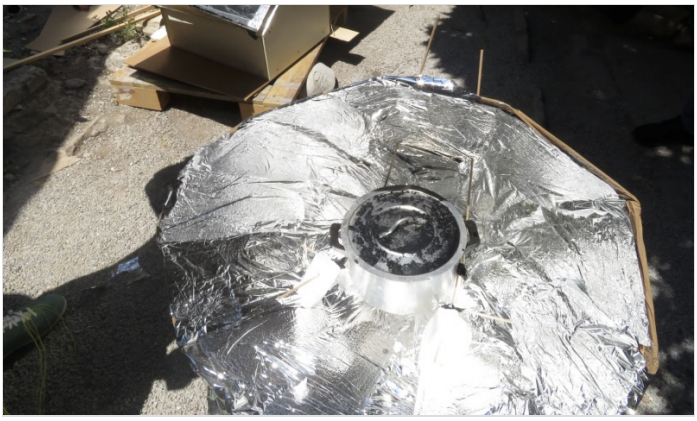
Étape 6 - Step 4 : The creation of the support

To create the support, drill a small hole in the middle of the lower half in four of the panels. Once you have done the first hole, leave a panel between it and the next hole. Do the same for the panels in front in order for them to be symmetrical.



Étape 7 -

Slide two 35 cm-long bamboo or wooden sticks in parallel through the four holes to form a pair of support rails for the Stirling engine or the cooking pot. Glue small pieces of cardboard on the exterior, close to the narrow opening and alongside the sticks for more resistant rails. Secure the edges of the stick on the exterior with rubber band to prevent the sticks from sliding. Tie two 29 cm-long bamboo or wooden sticks perpendicularly to the support rails and tighten the sticks' lower end between the folded lid flaps for each lower panel.



Étape 8 -

Join both perpendicular junctions of the rails/sticks to a thread or a rope for better load stability - it can carry up to 2.5 kg.

Étape 9 - Step 5 Ready to cook

Your parabolic solar cooker is now ready. You just need to position it in front of the sun so it can produce heat. For cooking, please make sure to use a black container.

Notes et références

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