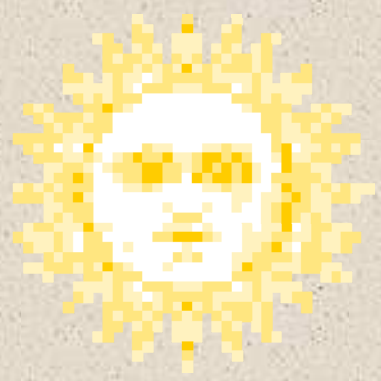
Solar Cooking



By

Alison

Lashawna

Maria

Choosing a solar cooker

We chose to make the "Heaven's Flame" Solar Cooker

Form and Function

The inside is painted flat black. Dark material absorbs heat, and dullness causes no light to be reflected away.

The panels on top are large and shiny. They reflect a lot of sunlight into the box.

Form and Function

You can't see it, but the box has two walls and is insulated with folded cardboard.

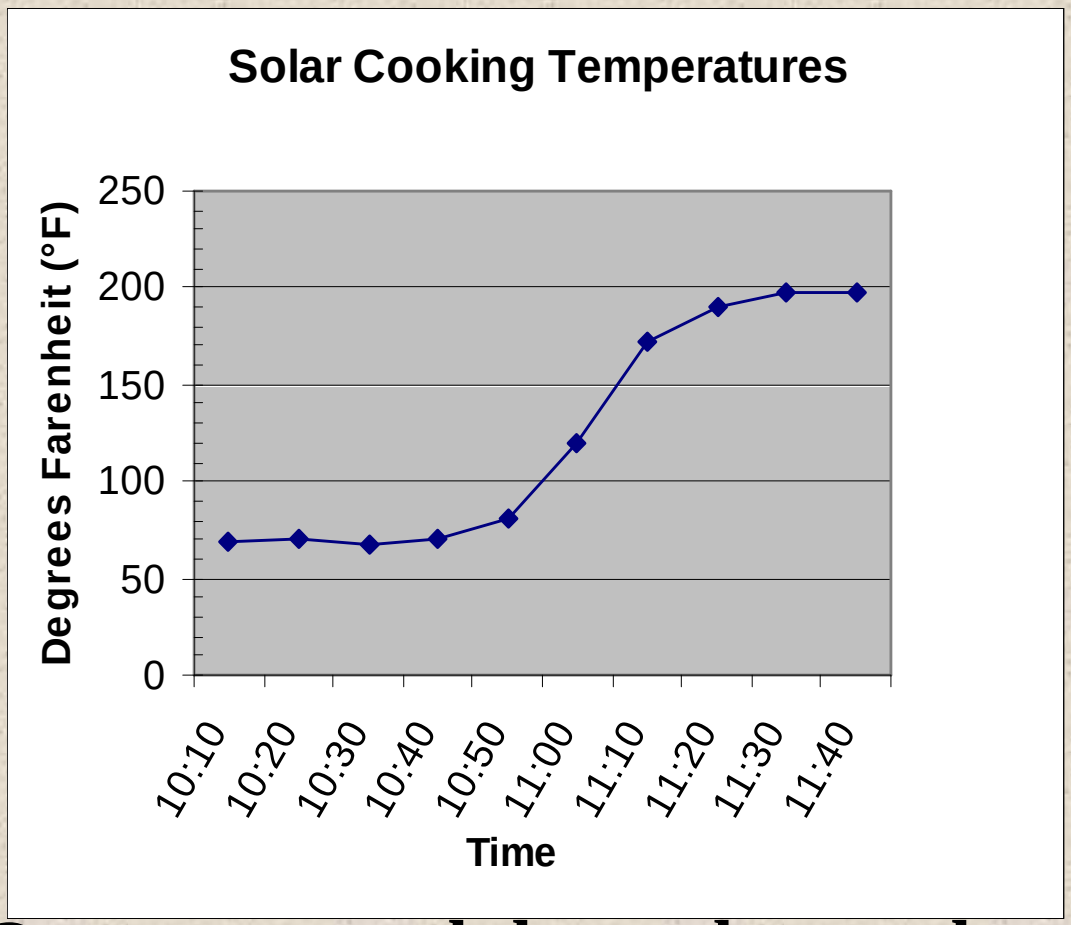
A glass lid lets light in, and keeps heat from escaping.

Form and Function

Rocks and a book help slant the cooker so it aims at the sun.

Reflectors are aluminum foil over cardboard. They are fragile, so duct tape adds strength.

Heating Our Cooker



During the first hour the cooker didn't get very hot. In the second hour it got hot fast for two reasons:

One, we moved the cooker, and two, it was closer to noon, so the sun's rays were stronger.

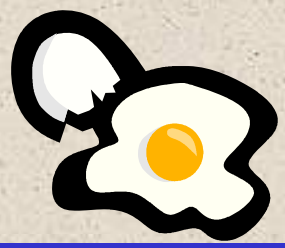
Our Project: Choosing a Design

We chose the Heaven's Flame cooker after looking at a pizza box cooker, and a parabolic cooker. It seemed to be in-between these two kinds of cookers.

•The PB cooker was very simple, but the Web site didn't tell how hot it would cook. It didn't look up to the job. The parabolic cooker gets really hot and has great plans, but it looked really hard to make, and took special materials.

•Another group made a Heaven's Flame cooker, too.

Our Project: Construction



- **Maria's mom helped us get materials and build our cooker.**
- **We bought the glass and families donated everything else.**
- **It took all the time we had and some more at recess to get it built. Measuring angles for the reflectors was the hardest part. Stitching the panels was hard, too (but it was fun).**

Our Project: Troubleshooting

- **Measurement day was cloudy, so we had to wait a day.**
- **We used what we learned from shadow plots to decide how to point the cooker.**
- **Temperature measuring was great, because we got a cooker hot enough to cook an egg (we thought...), 194°F.**
- **We had trouble moving the glass on and off, so we made a tab handle out of duct tape.**

Our Project: The Challenge!!!

- **The class agreed to start heating the cookers at 11:00 a.m.**
- **At 11:50 our cooker was 170°F. We couldn't seem to get it hotter, so we put the egg in a custard cup.**
- **The egg white turned solid at the edges, but not in the middle. It got kind of dry on top, but that's it.**
- **Other eggs cooked better than ours. One oven got up to 250°F. It cooked great.**

Conclusion and Reflection

The other Heaven's Flame cooker turned out like ours. We think the angle of the reflectors needs to stay in one place – they kind of flopped.

There's another problem with our box. The inside is really small. If we want to cook anything bigger than an egg we need two boxes that are closer to the same size, and thinner insulation. Maybe we'll use thin bricks like another group did.

We liked solar cooking a lot. It takes planning and patience to cook with solar, but it can save energy.

References

- **Cooker Designs:** www.exoticblades.com/tamara/sol_cook/
- **Pizza Box Cooker:** www.eecs.umich.edu/mathscience/funexperiments/agesubject/lessons/other/solar.html
- **The Solar Cooking Archive:** solarcooking.org/plans.htm