How Can You Make Your Own Solar-Powered Oven?

Members

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Problem

Our experiment is important because it could help people save money and survive, it also helps the planet by protecting the environment. Living in a country located in the Equator, the sun is available to use all year round.

Hypothesis

The oven with the aluminum foil booster will cook faster than the one with the newspaper booster.

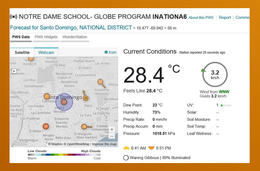
Experiment

We designed an experiment that could answer our question. We agreed that the best way to reach our result was to work with a sealed box with two different types of materials to power-up the oven to see which one works better.

Independent variable	Dependent variable	Control
Type of material used to boost the oven	Cooking time	Structure of oven, type of food being cooked

Materials:

School Weather Station:



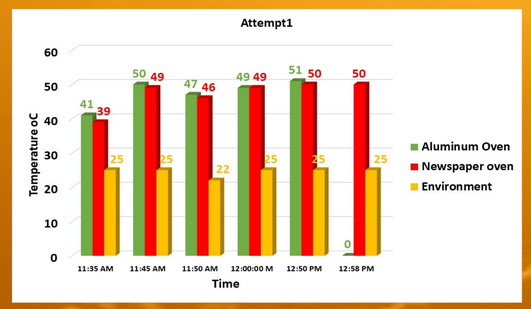
Procedure:

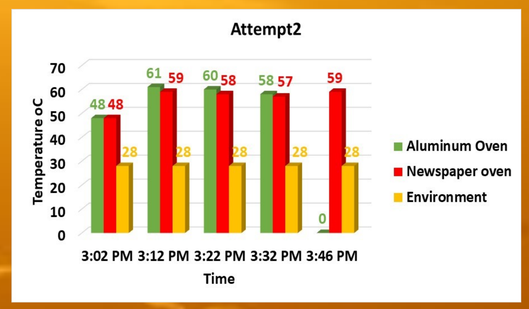
Data

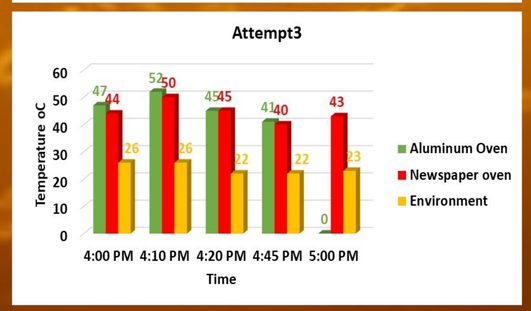
Attempt 1	Mostly cloudy				23-Mar-19							
	11:35 AM		11:45 AM		11:50 AM		12:00:00 M		12:50 PM		12:58 PM	
	°C	Obsv	°C	Obsv	°C	Obsv	°C	Obsv	°C	Obsv	°C	Obsv
Newspaper oven	39		49	Hershey continue melting	46	Hershey continue melting	49	Hershey continue melting	50	Hershey continue melting, marshmallow beginning to melt	50	cooked
Aluminum Oven	41		50	Hershey continue melting	47	Hershey continue melting	49	Hershey continue melting, marshmallow beginning to melt	51	cooked	-	-
Environment	25	sunny	25	cloudy	22	partly cloudy	25	cloudy	25	parly cloudy	25	sunny

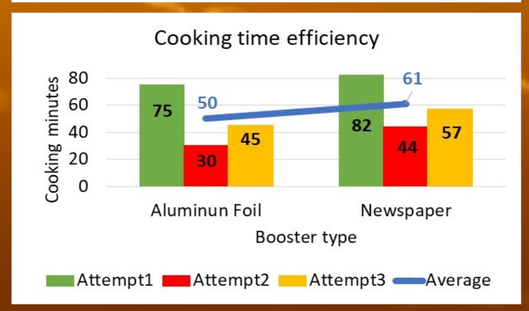
Attempt 2	sunny		23-Mar-19							
	3:02 PM		3:12 PM		3:22 PM		3:32 PM		3:46 PM	
	°C	Obsv	°C	Obsv	°C	Obsv	°C	Obsv	°C	Obsv
Newspaper oven	48	-	59	Hershey beginning to melt	58	Hershey continue melting, marshmallow melting	57	Hershey and marshmallow continue melting	59	cooked
Aluminum Oven	48	-	61	Hershey beginning to melt	60	Hershey continue melting, marshmallow beginning to melt	58	cooked	-	-
Environment	28	sunny	28	sunny	28	sunny	28	sunny	28	sunny

Attempt 3	sunny/partly cloudy				23-Mar-19					
	4:00 PM		4:10 PM		4:20 PM		4:45 PM		4:57 PM	
	°C	Obsv	°C	Obsv	°C	Obsv	°C	Obsv	°C	Obsv
Newspaper oven	44	-	50	-	45	Hershey beginning to melt	40	Hershey and marshmallow continue melting	43	cooked
Aluminum Oven	47	-	52	-	45	Hershey beginning to melt	41	cooked	-	-
Environment	26	sunny	26	sunny	22	cloudy	22	partly cloudy	23	partly cloudy









Results

Attempt 1

Attempt 2

Attempt 3

After conducting the experiments:

Aluminum foil works better than newspaper when it is sunny.

There was not a lot of difference between both of the ovens when it is partly clouded.

The plates were warm after each trial.

Even though at times it was cloudy, the ovens succeeded in cooking their s'mores.

The black construction paper help with rising temperatures by absorption of heat.

In the aluminum foil boosted oven, we saw that aluminum helps trapped more heat because it reflects the sun to warm the oven. At all 3 attempts, the aluminum boosted oven worked better by an average of 11 minutes faster.

In the newspaper oven, when it is sunny, it doesn't keep up as much as it does when it's cloudy because it only works with the temperature at the moment, since newspaper can't reflect the sunlight.

Conclusion

Our ovens work, no matter if it's cloudy or sunny, but it works faster when it's sunny. Aluminum foil boosted oven worked better because this material reflects the sunlight giving the oven an extra source of heat to raise the cooking temperature. Newspaper though, only depend of environment temperature. Our hypothesis was correct, aluminum foil worked faster than newspaper.

Next Time

The future goal will be to make a more efficient and durable solar cooking to help the environment while people save money.