



# Solar S'Mores

You don't need to build a campfire to get your fill of gooey marshmallow-and-chocolate s'mores this season. Just tap into the sun, the fuel source that people around the world use to power solar ovens. Here's an easy pizza box model that will let you catch enough backyard rays to cook the coolest s'mores on the block.

**Be sure you have adult supervision during this activity!**

## MATERIALS NEEDED:

Large pizza box  
Pencil and ruler  
Craft knife  
Aluminum foil  
Scissors  
Glue stick  
Black construction paper  
Clear packing tape  
Clear plastic (we used 2 sheet protectors, available at office supply stores)  
Graham crackers, chocolate bars, and marshmallows  
Stick or dowel

1. On the top of the pizza box, draw a square that is an inch smaller than the lid all the way around. Use the craft knife (adults only) to cut through the cardboard along three sides, as shown, and then fold the cardboard up along the uncut line to form a flap.
2. Glue aluminum foil, shiny side out, to the bottom of the flap, keeping it as wrinkle-free as you can.
3. Glue another piece of foil to the inside bottom of the box, then tape black construction paper on top of the foil.
4. Tape clear plastic to the underside of the lid to seal the opening created by the flap. For the best results, the seal should be as airtight as possible.
5. Place your oven outdoors in direct sunlight with the flap opened toward the sun. For each s'more, center two graham crackers on the construction paper. Top one with chocolate and the other with a marshmallow. Close the box and then use a stick or dowel to prop the flap open at the angle that reflects the most sunlight into the box (check it periodically to adjust the angle).
6. Within an hour (or sooner if it's a really hot day), the chocolate squares and marshmallows should melt enough to assemble into s'mores.



## What's Happening:

If you've learned about the greenhouse effect, you may have already guessed how the oven works. The foil flap gathers sunlight and reflects it through the plastic and into the oven, doubling the amount of incoming light. The black paper absorbs the light and converts it to heat, and the clear plastic allows the sun to shine in while keeping all that heat from escaping. (In the greenhouse effect, atmospheric gases allow sunlight to pass through to the earth's surface but keep the heat it generates from escaping back into space.) As more light hits the black paper, more heat is created and trapped. After an hour or so on a sunny day, the oven can be as hot as 275 degrees -- hot enough to melt chocolate and marshmallows.