




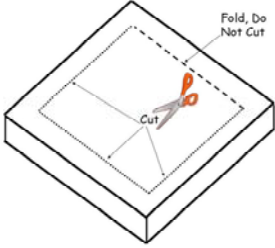
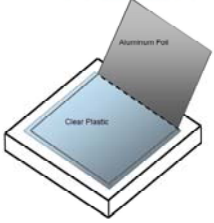
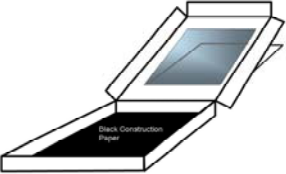
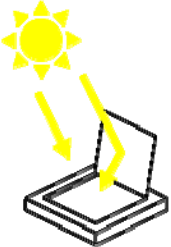
## 2011/12 KIDZ LAB CHALLENGE SOLAR OVEN PLAN – BASIC PIZZA RECIPE - TIPS

### Making and using a box solar oven:

Using the sun's rays to cook is really cool! When you cook with a solar oven, you're working with a clean source of energy that uses two of the three basic principles of passive solar design - solar gain and insulation. A solar oven can reach temperatures of 93°C (200°F) or more, which is hot enough to cook food.

### Basic box solar oven plan:

Use this basic plan to determine how to build a solar oven with a box. We've used a pizza box here, but any box or other materials will do - use your creativity to make your solar oven something unique and special!

<p><b>Materials:</b>          Box – any type will do!          Black construction paper, Newspaper          Aluminum foil          Clear plastic - heavy plastic laminate works best          Non-toxic glue, tape, scissors or utility knife          Ruler, marker          Wooden dowel or straw</p> <p><b>Step One:</b></p> <ul style="list-style-type: none"> <li>- Draw a 2.5 cm border on the top of the box</li> <li>- Cut along three sides leaving the line along the back of the box uncut</li> </ul>	<p><i>Did You Know?</i>          You can use any type of box (or other material) when making a solar oven.</p>  
<p><b>Step Two:</b></p> <ul style="list-style-type: none"> <li>- Make a crease along the uncut side and gently fold open to make a flap</li> <li>- Cut a piece of aluminum foil to fit the flap, ensure it is smooth and glue it to the inside of the flap</li> <li>- Measure 2 pieces of plastic that are a bit larger than the opening created in the top. Tape the plastic tightly to the underside and top of the opening</li> <li>- Make sure the plastic is a tightly sealed window so that air cannot escape from the oven</li> </ul>	
<p><b>Step Three:</b></p> <ul style="list-style-type: none"> <li>- Cover the bottom of the box with black construction paper and tape into place</li> <li>- Make four 4 cm thick newspaper rolls, fit them around the inside edges of the box and tape them into place. (This is the insulation that helps hold in the sun's heat)</li> </ul>	
<p><b>Step Four:</b></p> <ul style="list-style-type: none"> <li>- Put your pizza in the box, close the top and prop open the flap with a dowel or a straw</li> <li>- Face towards the sun and adjust until the aluminum reflects the maximum sunlight through the window into the oven interior. The shadow of the flap should go straight back from the back of the box.</li> <li>- Wait about a half hour for the box to warm up in the sun. Then enjoy your creation!</li> </ul> <p>Plans, instructions and tips courtesy of: <a href="http://solarnow.org">solarnow.org</a>; <a href="http://nmsea.org">nmsea.org</a>, <a href="http://solarcooker-at-cantinawest.com">solarcooker-at-cantinawest.com</a>; <a href="http://greenlearning.ca">greenlearning.ca</a></p>	

### Basic pizza recipe:

Here's a basic pizza recipe. Now, use your taste buds and creativity in the kitchen to invent an original, delicious concoction!

Ingredients: English muffin, pizza sauce and grated cheese

1. Cut an English muffin in half.
2. Spoon sauce onto each half.
3. Sprinkle with grated cheese.
4. Bake until the cheese is melted.

**Tip:** Please use ingredients that can safely be out of the refrigerator for long periods of time.



### Tips for using your box solar oven:

- Allow the oven to preheat for 30 to 60 minutes.
- Cooking with a solar oven takes time, roughly twice as long as a conventional oven. Don't worry about overcooking.
- The sun changes position so move your oven to follow the sun for maximum effect.
- Additional flaps around your oven will reflect more sunlight into the oven and make it hotter.
- The prime hours for cooking are between 11:00 a.m. and 3:00 p.m. as the position of the sun is more directly overhead and the sun's rays make their way through the earth's atmosphere.
- Make sure you cook on a clear, bright, sunny day - especially in winter - because energy from sunlight is affected by clouds, dust and pollution in the atmosphere
- Place your oven in an open area and away from structures, trees and buildings.
- A towel or blanket under the box will keep the box bottom warm.
- For greater heat retention and better cooking results, use a shallow, black pan or dish inside the oven.
- A thermometer in the box will help you measure the temperature the oven achieves.

### Solar oven safety:

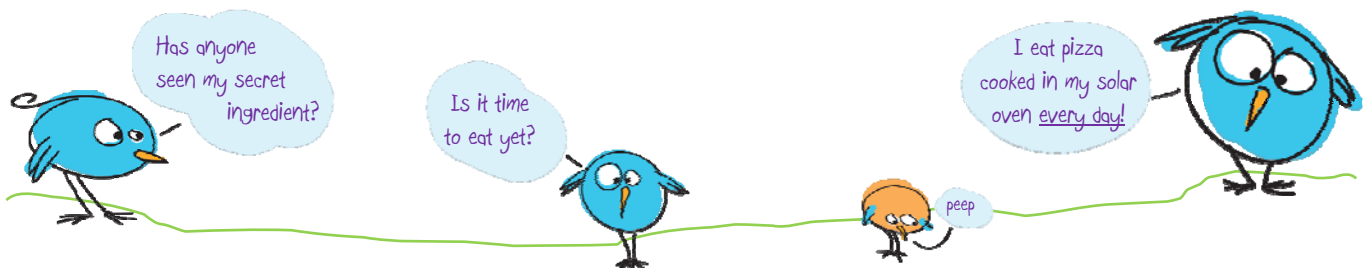
- Be sure to have an adult help you.
- Avoid using materials that you think may become a health hazard when heated.
- Use extreme caution when cutting cardboard with the utility knife. Extend the blade only as far as is needed to cut through the cardboard, and lock it into place. Do your cutting on a cutting board or piece of scrap plywood or cardboard.
- Use sunglasses when working with shiny materials in sunlight.
- Solar ovens can get very hot! Use oven mitts or gloves to prevent burns.

For more information on solar ovens, check out this website: <http://solarcooking.org>

### Dictionary of terms:

**Solar Gain** - arranging for sunlight to enter a device as a source of energy. In this case, the gain is accomplished both by reflection and direct gain. This principle also includes using dark colored surfaces to absorb the solar energy that enters a device.

**Insulation** – material which traps air inside and around a device to contain heat.



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