Reflective Box Oven

You can make different kinds of ovens from materials found around the home. A reflective box oven, made from corrugated cardboard boxes and aluminum foil, uses the heat from your campfire to bake things like bread, pizza, muffins, and cookies.

Supplies:

- 1 apple box with Lid, or 2 large, matching boxes with flaps cut off
- Heavy duty aluminum foil
- Stapler
- Heavy duty scissors
- Metal wire rack that fits inside the box
- Metal wire (optional)
- 2 aluminum pie pans
- Bricks or boards for a base
- Charcoal
- Tongs
- Hot pads

Instructions:

1. Completely cover the inside and bottom of the apple box with heavy duty aluminum foil. Fold the foil over the edges about 2" and staple it to the box. Turn the box on its side.

2. Place a rack in the box so that it is level and approximately 8" from the bottom of the box. You may secure it with wire on all 4 corners of the rack. Or, use a rack that comes with legs. Make sure the rack fits completely inside the box.

3. Cut the lid of the apple box or second matching box down to about 3" to 4" from the bottom. This is now the door of the oven.

4. Cover the outside of the door with foil and secure the foil in place with staples. Place the lid with the foil side toward the opening of the oven to form a door.

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5. Place bricks or boards under the bottom edges of the oven so air can circulate and keep the outside of the box cool.

6. Join two pie pans with the bottoms together and the tops facing up and down. The top pan holds the coals while the lower pan holds the coals off the bottom of the oven. Place about twelve hot coals in the top pie pan and place both pans in the bottom, center of the oven.

7. Place food on the rack for cooking like you would in a normal oven.

8. Cover with the oven door to cook the food.

9. Use a pair of pliers or tongs to adjust the coals and a hot pad to remove the hot pans from the oven.

Reflector Oven:
To use the oven as a reflector oven, you don't need the pie tins or the door. Place the pan of food on the rack in the oven and set the oven close to and facing a heat source like a campfire. The radiant heat from the heat source will then cook the food.

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Soda Can Stove

You can make different kinds of stoves from materials found around the home. A soda can stove, made from three soda pop cans and rubbing alcohol, can be used indoors or outdoors to cook small amounts of food. It's light-weight and great for back-packers and in emergency kits.

Supplies:
- 3 standard soda pop cans
- Denatured or rubbing alcohol
- Matches or lighter
- 1" x 1.5" x 5" swath of fiberglass insulation (optional)
- Heat resistant foil tape (optional)

Tools:
- Drill
- 1/8" & 1/16" drill bits
- Utility knife
- Scissors
- Straight edge
- Ruler
- Marking pen

Instructions:

1. Score the bottom of one can with the utility knife until it easily pops out.

2. Drill 1/16 inch holes spaced evenly around the bottom ring of the can for the burner. Drill one 1/8 inch hole as a drain for leftover fuel.

3. Using scissors, cut around the edge of the drilled end of the can until it is one inch high all the way around. This is the top of the stove. Cut another one inch base from a second can. This is the bottom of the stove.

4. On the top can, cut slits up from the bottom, stopping 1/8 inch from the top. This piece will now fit inside the bottom can with some careful pressure.

5. Carefully slide top and bottom pieces temporarily together. Measure from top to bottom (between the arrows) to get the width of the inner shield.

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6. Use a straight edge and utility knife to cut a strip from the third can to the width measured in Step 5.

7. Place the inner shield into the base of the stove to get the correct circular measurement. Then cut opposite slits and join the ends together forming a ring.

8. Cut about three notches on the bottom of the inner shield to allow fuel to flow into the outer ring.

9. Place the inner shield in the base. Place the optional fiberglass in the space between the inner shield and the outer wall of the base.

10. Slide the top half into the bottom half of the stove. Be careful to fit the inner shield into the inner lip of the top and bottom halves of the stove. If there is any over hang from the bottom half, crimp the edges over with your thumb or a screw driver. You may use the heat resistant foil tape to cover the seams between the top and bottom halves of the stove to help prevent leaks.

11. Completed stove.

Add no more than 2 ounces of alcohol to the center of the stove and light it. The stove lights promptly, so be careful. You won't see an alcohol flame in daylight. It takes about a minute for the alcohol to heat up and achieve an even burn out of the burner holes. Cover the stove with a larger can to put out the flame. To cook, support a pot of food or water 1.5 inches to 2 inches above the stove. One ounce of fuel lasts a little longer than 5 minutes, just long enough to boil 12 ounces of water.

Practice fire safety indoors and out. Have fire extinguishers ready.

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Solar Oven

You can make different kinds of ovens from materials found around the home. A solar oven, made from two cardboard boxes, aluminum foil, and a turkey oven bag, can be used in sunny weather to cook food and purify water. It does not require any fuel other than direct sunlight, and there is no fire hazard.

Solar ovens work on three principles:

1. Sunlight is converted into heat as it is absorbed by dark colored surfaces in the oven.
2. Additional sunlight is channeled into the oven by reflective flaps.
3. Heat builds up in the oven and is trapped through airtight seals and insulation.

Following these principles, you can adapt these plans to make your oven hotter and even more efficient.

Supplies:

- One corrugated cardboard copy paper box and its lid. This will be the outside of the oven.
- One corrugated cardboard box at least two inches shorter in width and length than the copy paper box and at least four inches taller. This will be the inside of the oven.
- One roll of heavy duty aluminum foil
- One can of high-temperature, flat black, "non-toxic when dry" spray paint
- One turkey-sized oven cooking bag
- A stack of newspapers
- One wire clothes hanger
- One trivet or small rack that fits inside the inner box
- Dark non-reflective metal or glass cooking pot or pan that fits inside the inner box.

Tools:

- Utility knife and/or scissors
- Wire cutter and pliers
- Ruler/straight edge
- Marking pen
- White glue
- Stapler
- Heavy duty packing or duct tape

Instructions:

1. Slit the corners of the copy paper box down one inch. Using a straight edge, lightly score the inside of the box one inch from the top of the box. Do not cut all the way through.

2. Carefully fold the flaps, but do not yet tape them together.

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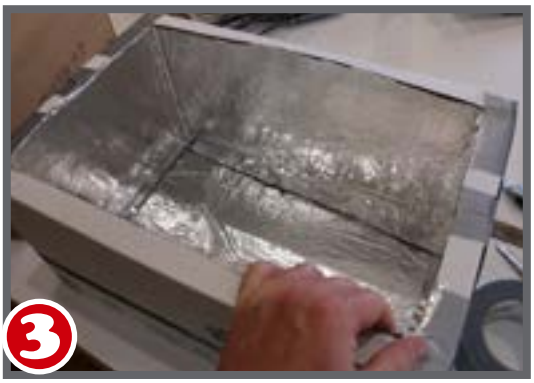
3. Glue aluminum foil, shiny side up, to the inside of the copy paper box. Start on the bottom and overlap the foil on the sides. Now tape the one inch flaps closed, creating a one inch lip around the top of the box.



4. Set the inner box on top of the copy paper box and trace a line around it onto the folded lip. Cut along the traced line to form a hole that fits the inner box.

5. Put five to six wads of crumbled newspaper for insulation in the bottom of the copy paper box, creating a loose layer. Place the inner box in the copy paper box on top of the newspaper and tamp it down into place, leaving a one inch space between the bottom of the two boxes.

6. Stuff crumpled newspaper all around and between the walls of the boxes.

7. Slit the corners of the inner box down to the top of the copy paper box. Lightly score the outside of the inner box to create flaps that lay over the top of the copy paper box.

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8. Trace the outer edge of the copy paper box onto the underside of the inner box flaps and trim the inner box flaps to meet the outer edge of the copy paper box. Do not yet tape the inner box flaps in place.

9. Glue aluminum foil, shiny side up, to the inside of the inner box.

   Now tape the flaps of the inner box to the one inch lip of the copy paper box, joining the two boxes together.

   The base of the oven is now complete.

10. To make the solar oven lid, draw a line on the copy paper box lid, forming a rectangle the same size as the opening of the oven base. Cut around two short sides and only one of the long sides. Then score and fold the resulting flap up, forming the reflector flap.

11. Glue foil, shiny side out to the inside of the reflector flap.

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12. Make the prop for the reflector flap by cutting a length of wire from the hanger about twelve inches long. Bend the wire as shown and insert the ends of the wire into the corrugations of the paper box lid and the reflector flap.

13. Open the turkey bag and cut off one side making a single sheet of plastic. Keep the other half as a replacement since the plastic will become opaque and brittle after a few weeks of constant use in the oven. This plastic sheet needs to be clean and clear to allow as much sunlight in as possible. Trim the sheet to be an inch wider on all sides of the flap opening. Tape the bag in place on the inside of the lid, making an airtight seal.

14. Slide the lid onto the base of the oven. The oven is now finished.

To increase the heat created by your oven, you can spray the outside of the oven with the flat black, high-temperature spray paint. If you paint the lid, be sure to NOT get any paint on the turkey bag sheet or the aluminum foil covered reflector flap.

You can also tape additional reflector flaps to the lid to direct more sunlight into your oven. Make additional wire props to hold the reflector flaps open.
Add a trivet or small rack to the bottom of the oven to allow hot air to circulate under your food dish. Place an oven thermometer in the oven to monitor temperature.

To cook, place food in a dark colored pan with a lid inside the oven and replace the oven lid. Put the oven outside, in direct sunlight, minimizing shadows inside the oven. For fastest cooking times, reposition the oven every 20 minutes according to the movement of the sun. The best times for cooking in the solar oven are between 10:00 AM and 3:00 PM. With sufficient sunlight, cooking time will be about twice as long as in a standard oven, depending on your solar oven's efficiency.