



April 2012: Go green or go home

Have you ever heard adults (or kids) talking about Earth Day, "going green" or "green living?" Have you wondered what they mean? How can someone "go" or "live" a color? In this issue, we'll explore the meaning behind Earth Day, and green living choices you can make! While "green" includes topics from recycling to solar energy, we'll simply define it as making efforts to use fewer resources while creating less waste and a lower impact on the environment.

Earth Day

Earth Day is an international holiday devoted to making people aware of how their choices affect the environment and how they can protect it. The first Earth Day took place in 1970 and is now observed in nearly 200 countries across the world. Are there any local Earth Day Activities where you live? In many communities, Earth Day is as simple as a city clean-up day where citizens and businesses band together to clean up trash.

The Three Rs

The most common green practices are the three Rs: reduce, reuse, and recycle. Reduce means cutting down on waste and energy usage (like garbage and electricity). Reuse means to find another way to use something rather than throwing it away (like using a jelly jar for a drinking glass). Recycling makes new things out of old things (soda pop cans are made of mostly recycled aluminum). Do you and your family already practice the three Rs? How many ways to reduce waste and energy usage can you think of? An example is turning off lights when you leave a room. How many different reuse techniques can you think of? One way is to cut up ripped, stained, or old t-shirts to use as cleaning rags. Do you know what items are recyclable where you live? Plastic bottles (with a 1 or 2 on the bottom), cans, and newspaper are usually recycled in most areas. What else does your local recycling center take?



But why do the three Rs matter? Have you ever wondered what happens to the garbage (or waste) the garbage truck removes from your curb each week? It's usually taken to a landfill. Some experts say that the average American produces four pounds of solid waste each day! As you can imagine, all that garbage adds up, and we're running out of places to put it. And landfills don't break down garbage; they simply bury it from view. That means even once a landfill closes and no longer accepts trash, the garbage that's stored there will remain and need to be monitored to ensure it doesn't interfere with the earth, air, and water in the area and harm the plants, animals, and people living nearby. When you reduce, reuse, and recycle, you're decreasing the amount of waste that ends up in a landfill.

Resources and Energy

Another part of the "green" movement concerns our planet's natural resources. Natural resources are materials that occur naturally, like water, land, and coal. Humans use natural resources for all kinds of things, like heating our homes, fueling our cars, and to make other things, like plastic. Natural resources can be put in two categories: renewable and nonrenewable. Renewable resources are things like wind and sunlight. Nonrenewable resources are things like land, water, and fossil fuels, such as oil and coal. Fossil fuels are made from living and plants and animals that lived on the Earth a long, long time ago. We rely on fossil fuels for heat, to make electricity, and to drive our cars. Even though using fossil fuels helps people, we're using them up faster than they're being replenished. Some sources estimate the 90% of the world's energy use comes from fossil fuels! Also, when we burn fossil fuels, it can release harmful toxins into our air! Some people think a good way to use less fossil fuel is to use more renewable resources for energy, like the wind, water, and the sun. These are known as alternative or renewable energy sources.



Wind Power

Wind is also a form of renewable kinetic energy. Kinetic means energy in motion. For centuries people have used windmills to turn moving energy into a mechanical form to do things like grind grain or pump water. But today, we mostly use energy in the form of electricity, so we turn wind power into electricity. Instead of windmills, today we use wind turbines, which are designed to produce electricity to feed into the local power grid. Have you ever

driven through the country and noticed a line of wind turbines in a field? These are wind farms, where a group of turbines work together to produce energy.

Make an anemometer

What you need:

- 4 [small paper cups](#)
- strips of stiff cardboard, about 3x12"
- Stapler
- Sharpened pencil with eraser
- Pushpin
- [Modeling clay](#)
- [Stopwatch](#)
- An adult's help (with cutting and stapling)

What to do

1. Color the outside of one cup.
2. Cross the cardboard strips to form a plus sign. Staple them together.
3. Staple the cups to the ends of the plus sign, making sure they're all facing the same way.
4. Stick the pushpin through the *exact* middle of the plus sign into the eraser of the pencil.
5. Stick the pointy side of the pencil in to the clay and mound it up so your anemometer can stand.
6. Make sure your anemometer spins freely. If not, you may need to adjust it a bit.
7. Take it outside and set it down in an open area.
8. Using the stopwatch, count how many times the colored cup goes around in one minute.

What happened:

You measured the wind's speed in turns (or revolutions) per minute (RPM). Weather services use anemometers to measure wind, but they convert the RPMs into miles per hour to tell us how windy it will be. To be considered a good wind resource to produce wind power, the wind speeds need to be at least 13 miles per hour, on average. Use your anemometer to measure wind speeds at a different times of day over several days. According to your anemometer, is wind a good resource where you live?

Visit our website to make a [pinwheel wind turbine](#) > >

Solar Energy

Solar energy comes from the sun. The sun shines in the day, giving us light. It also makes the earth warmer, giving us heat. The sun has a lot of energy, which comes to the earth through light. Rays of light have energy. This energy can be changed into electricity with a solar cell. A solar cell collects sunlight, and then the sunlight breaks up into electrons and protons which flow through wire and bring electrical energy to a light bulb or other object that is connected to it. Solar energy can be used for a lot of things, such as powering vehicles, traffic lights, lights in a home or outdoors, heating water or pools, cooking food, and more.

Make a solar oven

Get an adult to help with this pizza box solar oven, then try out a few recipes from our solar oven cookbook. Your solar oven will reach about 200° F on a sunny day, and will take longer to heat things than a conventional oven. Although this takes longer, it's easy to use and safe to leave alone while the energy from the sun cooks your food. If you don't want to wait as long, try reheating something that has already been cooked, like leftovers or canned ravioli. Put solid food in a glass dish and liquids in a heavy plastic zip lock bag. You can also pre-heat your oven by setting it in direct sun for up to an hour.

What you need:

- Cardboard pizza box (the kind delivered pizza comes in)
- Box knife or scissors
- Aluminum foil
- Clear tape
- Plastic wrap (a heavy-duty or freezer zip lock bag will also work)
- Black construction paper
- Newspapers
- Ruler, or wooden spoon
- An adult's help with cutting

What to do:

1. Have an adult use a box knife or sharp scissors to cut a flap in the lid of the pizza box. Cut along three sides, leaving about an inch between the sides of the flap and the edges of the lid. Fold this flap out so that it stands up when the box lid is closed.
2. Cover the inner side of the flap with aluminum foil so that it will reflect rays from the sun. To do this, tightly wrap foil around the flap, then tape it to the back, or outer side of the flap.

3. Use clear plastic wrap to create an airtight window for sunlight to enter into the box. Do this by opening the box and taping a double layer of plastic wrap over the opening you made when you cut the flap in the lid. Leave about an inch of plastic overlap around the sides and tape each side down securely, sealing out air. If you use a plastic bag, cut out a square big enough to cover the opening, and tape one layer over the opening.
4. Line the bottom of the box with black construction paper (black absorbs heat). The black surface is where your food will be set to cook.
5. To insulate your oven so it holds in more heat, roll up sheets of newspaper and place them on the bottom of the box. Tape them down so that they form a border around the cooking area. The newspaper rolls should make it so that the lid can still close, but there is a seal inside of the box, so air cannot escape.
6. The best hours to use your solar oven are when the sun is high overhead, from 11 am to 3 pm. Take it outside to a sunny spot and adjust the flap until the most sunlight possible is reflecting off the aluminum foil and onto the plastic-covered window. Use a ruler to prop the flap at the right angle. You can angle the entire box by using a rolled up towel underneath it.
7. Make toast by buttering a slice of bread and letting the sun do the rest. So the paper at the bottom doesn't get dirty, put whatever you cook on a clear plastic or glass plate. A pie plate would work well.
8. To take food out of the oven, open up the lid of the pizza box, and use oven mitts or potholders to lift the glass dish out of the oven.

What happened:

The heat from the sun is trapped inside of your pizza box solar oven, and it starts getting very hot. Ovens like this one are called collector boxes, because they collect the sunlight inside. As it sits out in the sun, your oven eventually heats up enough to melt cheese, or cook a hot dog! How does it happen? Rays of light are coming to the earth at an angle. The foil reflects the ray, and bounces it directly into the opening of the box. Once it has gone through the plastic wrap, it heats up the air that is trapped inside. The black paper absorbs the heat at the bottom of the oven, and the newspaper make sure that the heat stays where it is, instead of escaping out the sides of the oven. Even on partly cloudy days, there may be enough heat and light from the sun to slow cook a special dish.

Download a printable pdf of our [solar oven cookbook](#) > >

Solar oven success tips:

- Stir liquids every 10 minutes.
- Rotate solid food every 10-15 minutes, so it cooks evenly.
- Your solar oven should face direct sunlight. During use, check your oven periodically and reposition as necessary.
- Make sure that the foil-covered flap reflects light into the pizza box through the plastic-covered window.

Solar Oven Recipes

Banana Boats

1. Cut a slit in the banana peel with a plastic knife and slice the banana lengthwise and crosswise. Leave the peel on!
2. Add mini marshmallows, sliced almonds (if desired) and chocolate chips.
3. Wrap in tin foil and bake in solar oven till insides are melted. Check the boat every 10 minutes.
4. Remove with an oven mitt when cooked and eat directly out of the banana peel with a spoon.

Ham & Cheese

1. On a slice of bread put slices of ham with thin slices of cheese on top.
2. Put the bread with ham and cheese on a clear plastic or glass plate and place it in the oven.
3. Leave the sandwich open-faced until the cheese is melted, then add a second slice of bread.
4. Once the bread is toasted (it won't brown like it would in a conventional toaster) carefully remove the plate from the oven using a pot holder.
5. Transfer the sandwich to a cool plate and eat.

Bean Burrito

1. Spread a thin layer of refried beans onto a flour tortilla.
2. Top with grated cheese.
3. Put the tortilla onto a glass plate and place it in the solar oven.
4. When the cheese is melted, carefully take the plate out using an oven mitt.
5. If you like, add salsa, sour cream, or other toppings. Roll the tortilla up and enjoy!

Hot Dog

1. Place a hot dog in a bun, and put the bun on a clear plastic or glass plate.
2. Put the plate in the solar oven and leave it there for up to half an hour. Check the hot dog every 10 minutes.
3. When it is done (the hot dog should be warm all the way through) carefully remove the plate using an oven mitt.
4. Transfer your hot dog to a cool plate and add your favorite toppings!

Chocolate Fondue

To make a tasty dipping sauce for fruit combine ½ cup of chocolate chips with 2 teaspoons of cream in a glass dish. Put the dish in a pre-heated solar oven to melt the chocolate. Stir every 10 minutes until the mixture is smooth and creamy.

Sunshine Eggs

1. Set up your solar oven in a sunny area, and make sure that sunlight is being reflected into the window.
2. Carefully wrap an egg in a clean black sock. Or use the foot from a pair of black nylons to wrap the egg several times, until you can't see any white.
3. Put the egg in the center of a pre-heated pizza box oven, and cover with a small glass dish. If it is a bright day, your egg will take about 2 hours to cook, or longer on a less sunny day.
4. Remove the egg using a potholder. Peel off the shell, to reveal a solar-cooked egg.

Earth Day Word Search

Look for the twelve words about Earth Day in the puzzle below. The words can either be going straight across or up and down. There are no diagonal words. Circle or highlight each word you find!

O N V R Q R E N E W A B L E D
X F S Q Y L F Z L V O T S C E
T E F L G P S O L A R P V I J
H N X I B O E J T N E M T K E
M E R I L W S R M V S U S H B
B R U Y L M V B X M O M Y A H
L G Q J Q Y K S Y P U O S G C
S Y L A N D F I L L R O V N J
W U V X F Q R E D U C E N L T
K G E A R T H D A Y E L L E G
D R I W B A F M R E S C Z S U
P E R E C Y C L E W A S T E O
A E Y I S L B R E U S E I T K
U N Q V S D K R M P J A G G K
P E N V I R O N M E N T R X H

Look for these words:

EARTH DAY

ENERGY

ENVIRONMENT

GREEN

LANDFILL

RECYCLE

REDUCE

RENEWABLE

RESOURCES

REUSE

SOLAR

WASTE