

Do Your Part -

BE DESERT SMART!

◆ We live in the California deserts. Some of us live in the Colorado Desert and some of us live in the Mojave



Desert. Whichever desert we live in, life is a challenge that takes a little extra effort.

So, what makes a desert a desert?

1. Little rainfall

(less than 10 inches per year; average for us is 4 inches)



A desert is a place where plants and animals (that includes us humans) compete for the few resources that are here. We humans can help out and be desert smart.



2. Extreme temperatures

(in the summer it can get up to 125 degrees Fahrenheit, and in the winter it can be below freezing or 32 degrees Fahrenheit)



Inside these pages you will find activities to help you find ways to live comfortably in the desert while helping our desert environment to survive for future generations. After all, people have lived here for at least 9,000 years!

For doing your part and being desert smart, you will get a desert smart certificate, and a decal you can display on your family's car or window.



3. Soil/dirt with few nutrients

4. Rapid evaporation (aridity and low humidity)



Take this guide home and do the activities with your family. When you have completed them, bring the guide to one of the places listed on the back.

Good Luck and

**DO YOUR PART -
BE DESERT SMART!**



AIR SMART

◆ The average person breathes in and out 17,280 times per day. Breathing keeps us alive so it is obviously important that the air we breathe be clean. Air is made of a mixture of gases and some water vapor. The cleaner the air is the healthier we are.

The U.S. Government passed the Clean Air Act in 1970 to protect all Americans from polluted air. Some of it comes from factories and power-generating stations, fires, storms, pollen, and acid rain. Sixty percent of air pollution comes from smog: exhaust from cars. The average American car emits its own weight in pollutants every year!

There are many ways in which we can help reduce air



pollution and make a positive contribution to improving the air quality for all living things. If each of us takes a few steps in the right direction we may be surprised at how much we can improve air quality on our planet.

What Can We Do?

Here is a list of suggestions that will help reduce the amount of pollution that goes into the air we breathe:

1. Plant a tree.

Trees produce oxygen and help keep the air clean.

2. Use less electricity.

Turn off lights, computers, and stereo systems when not using them. The power plants that provide electricity also produce pollution.

3. Walk, ride a bike or skateboard, or take a bus

instead of asking an adult for a ride in a personal vehicle. Remember: 60% of all air pollution comes from cars.

4. Rake leaves or use a broom
gas-powered leaf-blowers emit pollution.



Rake leaves instead of using a leaf blower.

5. Write a letter or e-mail to:

helpline@arb.ca.gov with your own suggestions for things people can do to reduce air pollution.

6. Ask your family members to use:

electric or chimney-style BBQ briquette starters. Charcoal lighter fluid produces a lot of smoke.

7. Replace light bulbs with compact fluorescent bulbs:

available at most hardware or discount department stores.

8. Do a clean air project at school

to share what you've learned with others.

9. Politely ask the adults you know to stop smoking around you –

better yet, encourage them to quit. It's better for them and for the air we all breathe.

10. If you heat your home with a woodstove,

always leave a window cracked: indoor air can be up to 100x dirtier than the air outdoors, and woodsmoke can be especially unhealthy.

11. Use a push or electric lawn mower.

12. Reuse paper bags

and other household items. The more we reuse, the less factories have to produce.

Activities You Can Do at Home



Planting a tree helps oxygen production.

Air Pollution Experiment

Find out How Dirty the Air is in Your Neighborhood.

You will need:

- Three sheets of white paper or cardboard
- Petroleum jelly (Vaseline)

Instructions: Smear two sheets of paper on one side with petroleum jelly. Put the sheets next to each other, smeared sides up, on a window sill and clamp the sheets in place with the closed window. Or, you can tape them to the outside of the window (unless it's raining or snowing).

Take in one of the sheets at the end of a full day (24 hours) and see how dirty it looks compared to a clean sheet of paper. Save the dirty sheet. Take the other sheet in after one week and compare it to the first dirty sheet and the clean sheet.

Explanation: Pollutants floating through the air stick to the petroleum jelly. Visible pollutants show up on the white paper. Do we breathe this air? Yes. What are some of the particles made of? The most common visible particles are dust, pollen, mold, sand, skin flakes and pet dandruff. Yikes! Don't forget that there are other pollutants such as ozone and nitrogen dioxide that aren't visible to the naked eye.

Visibility Experiment

Compare Local Landmarks Over a Period of Time.

You will need:

- A camera if you plan to take photographs, or
- Photos of local landmarks from the nearest library or historical society if you don't take your own photos, or
- Back issues of a local newspaper, or
- A checklist to help you keep track of your own daily observations

Instructions: If you are using your own camera, select a landmark, such as a building, mountain or utility pole and photograph it from the same viewpoint every day or every week for a predetermined period. If you are using someone else's photos, compare how visible specific landmarks are over time or during a certain part of the year. Place the photos in chronological order and see if the landmarks have become easier or more difficult to see over time. If you aren't taking photos, then you can record your observations on a sheet by looking at the same land-

mark every day for a week or two and rating it on a subjective scale, describing the visibility by using words like "clear," "hazy," "barely visible," or "not visible."

Explanation: Particulate matter, or small particles of matter, are released into the air both by natural and human-caused means. These particles may come from chimney smoke, dust, vehicle exhaust, power plants, pollen, sandstorms, or wildfires. They make it more difficult to see objects at a distance because, on a small scale, they block our view. We can't control all sources of particulate matter—sandstorms, for instance—but we do have control over some sources.



Send a letter to our government with your own pollution reduction ideas.

Tell us about what you did: _____

Tell us about what you did: _____



Walk or ride a bike, bus or skateboard instead of using cars.



EARTH SMART

◆ Living in the desert is challenging. People from other areas sometimes need to adjust and develop land ethics consistent with the desert's lack of water and extreme temperature changes.

How do you design a yard that is earth smart yet enjoyable? Go native! Desert plants are adapted to the desert and survive well! Non-native plants are slowly killing off native plants and animals by making them compete for the little water we have. Joshua Tree National Park's increased fire activity is largely due to the increase of non-native grasses. In California, only one percent of the plants people put in their yards is native to the area, meaning the plants that survive best are being replaced by exotic plants that often take more resources.

By using native plants we will benefit in the long run. We will use less water, decrease our water bill and leave more water available for the future.



What Can We Do?

Here is a list of suggestions that will help us to become earth smart about living in a desert environment:



Plant native plants that use less water.

- 1. Plant native plants**
like cacti and other low water users in your yard.
- 2. Water plants with drip irrigation**
which is more efficient and wastes less water.
- 3. Water plants either in the early morning or the late evening**
after the sun goes down.
- 4. Remove grass lawns**
which use huge amounts of water.
- 5. Place plants needing more water**
in areas where water naturally ponds up in your yard after a rain.



- 6. Use mulch around plants**
to prevent water loss and insulate against the heat.
- 7. Use light-colored rocks**
instead of dark to reflect heat away from the plants.
- 8. Cluster plants in similar groupings**
as to the amount of water they need.
- 9. Create a desert backyard habitat.**
- 10. Create a compost pile to mulch your yard.**
- 11. Don't use your swimming pool, fill it.**
Create something new like a cactus garden in it.



Create a compost pile to mulch your yard.



Activities You Can Do at Home



Who lives in a Native Plants Neighborhood?

Many people do not know that plant grasses and non-native plants use up our precious water. Do a survey of your neighborhood to see what kinds of plants are around you. Survey at least 10 yards.

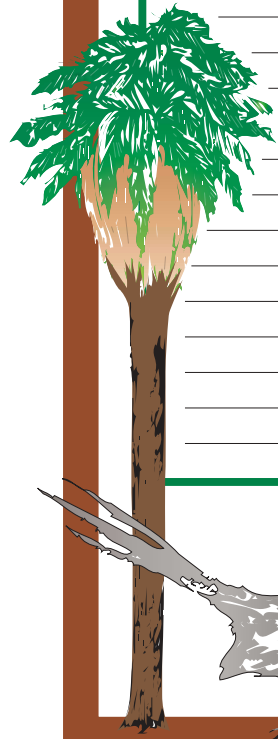
Non-native plants

- How many yards have grass? _____
- How many yards have big leafy trees like cottonwoods? _____
- How many yards have flowers like marigolds, pansies, etc? _____
- How many yards have cacti? _____
- How many yards have skinny leaved trees like palo verde and willow? _____
- How many yards have sand and rocks? _____

Native Plants

- Now look at each yard. If the yard has over half of its landscaping as non-native, it is a non-native yard. If over half has native plants, then it is a native yard.
- How many of the yards are mainly planted with non-native plants? _____
- Multiple this by 10. This will give you a rough percentage of how many people have non-native yards in your area. _____%

Tell us about what you did: _____



Create a Landscape that is Desert Smart

Looking at your yard, draw in the space below what you have planted and where it is in relation to your house. Which plants grow naturally in a desert? Which plants, like lawn, use a lot of water and have a hard time in the heat?



Now imagine that you have no plants in your yard. What types of plants could you use that take little water and can stand the intense heat? In the other space, draw a landscape plan. A landscape plan helps you figure out where to place plants before you put anything in the ground. Here are some suggestions:

- Use native plants that grow in the desert like cacti, yuccas, ocotillos and succulents.
- For trees, look at desert varieties like desert willow, palo verde, smoke trees, mesquite, palm, and Joshua trees. Stay away from cottonwoods and tamarisk which use a lot of water.
- Remove all lawns and planted grasses. They use lots of water.
- Look at places where you could use light-colored rocks to accent and help reflect the heat.
- In low places in the yard where water ponds when it rains, plant desert plants that need more water like palms and mesquite trees.
- Don't remove the dead leaves on the plants as they protect the plants from the heat and provide many desert animals with great homes.
- Put in plants from the list of desert plants.
- Enjoy your time outdoors!

Tell us about what you did: _____



Create a Backyard Desert Refuge



Observe your yard and think of ways to make it more welcoming for our local butterflies, birds, small mammals, reptiles, and insects.

Almost every living thing needs water to survive. In addition to water, butterflies need the nutrients and minerals that are left behind by evaporating water. By creating a "puddling pond" you will be helping butterflies as well as birds, small animals, and insects find the water and nutrients they need in order to live.

Decide first if you want the responsibility of providing a backyard refuge for animals. This takes time and energy and must be kept up. The animals will be depending on you.

Create a "puddling pond" by digging a small shallow area in your yard, lining it with sand and filling it with water. You should also provide some flat rocks around and in your pond so that the butterflies, birds, small mammals and insects can rest comfortably near your pond.

Your pond should be located in an area that is quiet and does not get much traffic. Refresh the water at least every other day to keep it fresh.

Remember you are responsible now for keeping the "puddling pond" filled and cleaned. The butterflies, birds, small animals and insects will be counting on you to continue to provide this water refuge for them.

Read *Alejandro's Gift* by Richard E. Albert which can be checked out from your local library.



RECYCLE SMART

◆ People have always produced waste and have had to deal with disposing of it. With human populations growing quickly, some communities are running out of places to put their garbage. We are filling up our landfills. Some of our limited resources are getting used up. Some people have come up with solutions to use fewer resources and help save landfill space.

There are many things people do to manage waste. Many of these are described by the three environmental R's: **Reduce, Reuse, and Recycle.**

First, reduce the resources used: buy loose, unpackaged fruits and vegetables without plastic wrappings and styrofoam.

Next, figure out a way to reuse things, and try to repair things to make them last. You could use a soup can as a pencil holder to make less garbage. Finally, recycle as much as you can by



sending used things like cans and bottles to a factory that turns them into new things like cans or a plastic bench.

What Can We Do?

Here is a list with some ideas to reduce, reuse, and recycle at home so that you can produce less waste.



Reuse grocery bags.

1. **Reuse grocery bags** or use cloth bags when grocery shopping. Many stores give discounts for bringing your own.

2. **Buy products with less packaging.** Some foods, for example, can be purchased in an economy size or in bulk.

3. **Encourage your local area to offer recycling** if they do not already, and start recycling!

4. **Consider composting biodegradable waste** such as yard trimmings, fruit peels and other biodegradable left-overs. Composting provides fertilizer for your yard and reduces the burden on landfills. You can also leave lawn trimmings on your lawn- it's good fertilizer and will keep it out of a landfill and spare you the use of a bag to throw it away.

5. **Buy recycled products when possible.**

6. **Buy long-lasting, durable items** rather than disposable ones.

7. **Use rechargeable batteries** instead of disposable ones.

8. **Request that your name not be sold to mailing list companies.** The average American receives an amount of junk mail each year that is equivalent to 1.5 trees.

9. **Use a refillable coffee mug** rather than buying coffee in a disposable cup.

10. **Recycle everything you can!**



Get your name off mailing lists.



Use a refillable coffee mug.



Activities You Can Do at Home

Peeking at Packaging

Just about everything we buy comes in some sort of package.

Packaging is necessary to protect an item, keep it fresh, make it tamper-proof, or make the item easy to transport and store. Buying products with less packaging is one way to cut down on the amount of waste produced in your home. In this activity you will examine different products and their packaging and decide why items are packaged differently.

1. Take a trip to a local supermarket.
2. Walk through the market and try to find at least one item to fit each of the following categories:
 1. packaged well
 2. packaged poorly
 3. packaged in unnecessary materials
 4. packaged mainly to attract the consumer (pretty, colorful, fancy, etc.)

5. packaged in bulk or economy size
 6. packaged with material that has been recycled
 7. packaged with material that is recyclable
 8. packaged in something reusable by the consumer
3. Choose one of the products you found and decide how the packaging could be improved while lessening the materials used.
 4. As a family, assess items that are normally purchased for the household and come up with ways to buy items with less packaging.



Tell us about what you did: _____

Garbage Art

One way to decrease the amount of waste you produce is to reuse the things you normally throw away.

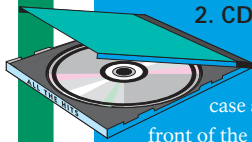
With a little creativity you can use things like boxes, milk cartons, string, egg cartons, jars, cans, paper, and other “waste” products to make arts and crafts projects. This activity will explain a few simple ideas for creating art from garbage.

1. Homemade wrapping paper:

Save paper, brown paper bags, and newspaper instead of throwing it away or recycling it. Use it to create wrapping paper by drawing or painting words or designs on it. Old greeting cards, scrap paper and magazines can be cut up and glued onto the wrapping paper. Stickers are also fun to use or anything else that can be affixed to the paper. This is a novel way to make beautiful, unique, inexpensive wrapping paper that reuses materials instead of consuming new resources.

2. CD Case Picture Frame:

Use empty CD cases to make original picture frames. Insert a piece of pretty paper or cardboard into the case as a border. Glue a photo onto the border. Decorate the front of the case with ribbon, string, stickers, buttons, shells, beads, or old cut-up magazines or greeting cards. Another idea is to write a message or the date the picture was taken on the border. Close the case and glue on a piece of ribbon or string as a hanger. Be creative!



3. Tin Can Pencil Holder:

Save and wash soup, vegetable, and fruit tin cans. Cover outside of can by gluing on paper cut to fit the can. Decorate the can with anything that you can affix with glue. The materials used for the wrapping paper and picture frame will also work well for the pencil holder.



4. TP Roll Binoculars:

Save cardboard toilet paper rolls. Paint them and decorate them if you would like. Tape them together with masking tape, punch a hole on both sides and add some string so they will hang around a child's neck. Have fun viewing the world through homemade binoculars!

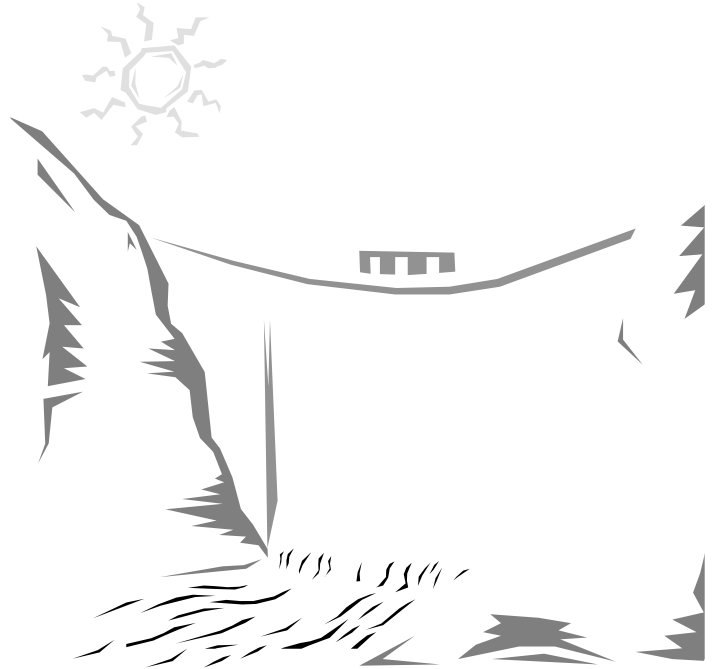
Many items can be used to make garbage art. For more ideas check the following websites:

- www.familycrafts.about.com www.makestuff.com
www.daniellesplace.com www.kidsdomain.com

Tell us about what you did: _____



WATER SMART



What Can We Do?

Here are some Water Smart tips:

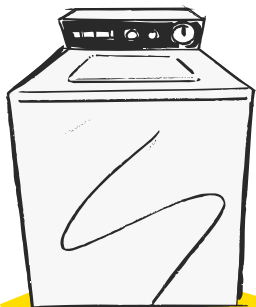
1. **Check the toilet for leaks** by putting a few drops of food coloring in the tank. Wait 30 minutes. If the dye shows up in the bowl, your toilet has a leak. Leaky toilets can usually be repaired inexpensively. *Savings:* at least 50 gallons per day.
2. **Don't use your toilet as a trash can or as an ashtray.** Every time you flush trash or cigarettes, you waste water. *Savings:* 5 gallons per flush.

6. **Use the washing machine and automatic dishwasher only for full loads.** *Savings:* 10-35 gallons.
7. **Turn off the water while cleaning vegetables.** Instead, half-fill a sink with water, then rinse all vegetables together. *Savings:* 3 gallons per minute.
8. **Keep drinking water in the refrigerator.** Stop the wasteful practice of running the tap to cool water. *Savings:* 3 gallons per minute.
9. **Thaw frozen foods ahead of time, not under running water.** *Savings:* 3 gallons per minute.



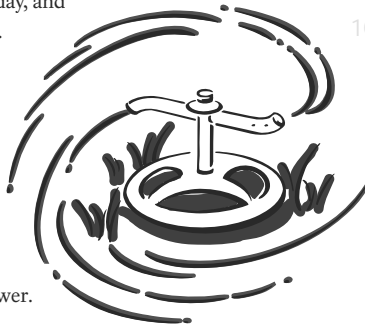
Keep drinking water in the refrigerator.

3. **Convert your toilet into a deluxe water-saver model-- without spending any money!** Put one inch of sand in a quart plastic bottle, fill the rest of the bottle with water, cap the bottle, and place it in your toilet tank, away from the operating mechanism. *Savings:* – gallon per flush, 3 gallons per day, and more than 1000 gallons in a year.
4. **Turn off the water while brushing your teeth.** Use the water to rinse only. *Savings:* 3 gallons per minute.



Use your washing machine only for full loads.

5. **Install water-saving showerheads.** A quality water-saving showerhead provides a refreshing, luxurious shower with a third the quantity of water. *Savings:* 24 gallons per shower.



10. **Instead of using grass,** landscape your yard with native plants that use less water. *Savings:* possibly hundreds of gallons per month.

Save water by planting native plants instead of sprinkling a lawn.

Activities You Can Do at Home

Be a Water Detective

Every day in the United States, dripping faucets and leaking toilets waste an average of 10 gallons of water per person. Is there a wasteful leak in your house? The only way to find out is to become a Water Detective.

Start by turning off all faucets and water-using appliances. Make sure no one in your house uses water for thirty minutes.

Next, find your water meter. It should have a number visible.

Write down the number. Wait for thirty minutes. Check the number again. If the number is different from the one you wrote down, then you have a leak.

Dripping faucets are usually easy to spot. Most dripping faucets can be fixed with a screwdriver and an inexpensive washer.

The toilet is the most common place for leaks. To find out if your toilet is leaking, try the Water Detective toilet test. Put a few drops of food coloring, or several spoonfuls of grape-flavored drink mix, in each tank. The tank is the area that contains all the flushing machinery. If, after 30 minutes, color shows up in the bowl, then your toilet has a leak.

If you have a leaky toilet, how do you fix it? Here is another Water Detective test, to find out exactly which part of the toilet is leaking. Draw a pencil line on the inside back wall of the tank-- at the waterline.

Then turn off the water supply, either under the tank or at the main shutoff. Wait 20 to 30 minutes. If the water level remains at the pencil mark, then the leak is occurring at the *refill valve*, the unit in the left side of the tank. If the water level falls below the pencil mark, the leak is in the *flush valve*, the unit located in the center of the tank. Toilets are usually cheap and easy to fix; inexpensive parts are found at your local hardware store.



Rain is a precious source of water in our dry Southern California landscape.

Tell us about what you did: _____

Tell us about what you did: _____

Be a Conservation Businessperson

For this activity, you will need a calculator and a copy of your family's water bill.

Using the facts you just learned about water use and water conservation, brainstorm different ways to save water in your house.

Add all of the possible savings together to figure out how many gallons your entire family could save in a *day*. Multiply this number by thirty to estimate how many total gallons of water you will save in a *month*. Now multiply the number of gallons you will save in one month by the *price per gallon* on your family's water bill. This is how much money the family will save in a month if everyone conserves. Try to follow through with your plan. Did it work? Did the family save money? If your parents agree, then the money saved by everyone's water conservation will go into *your pocket*. Congratulations! You have become a conservation businessperson.

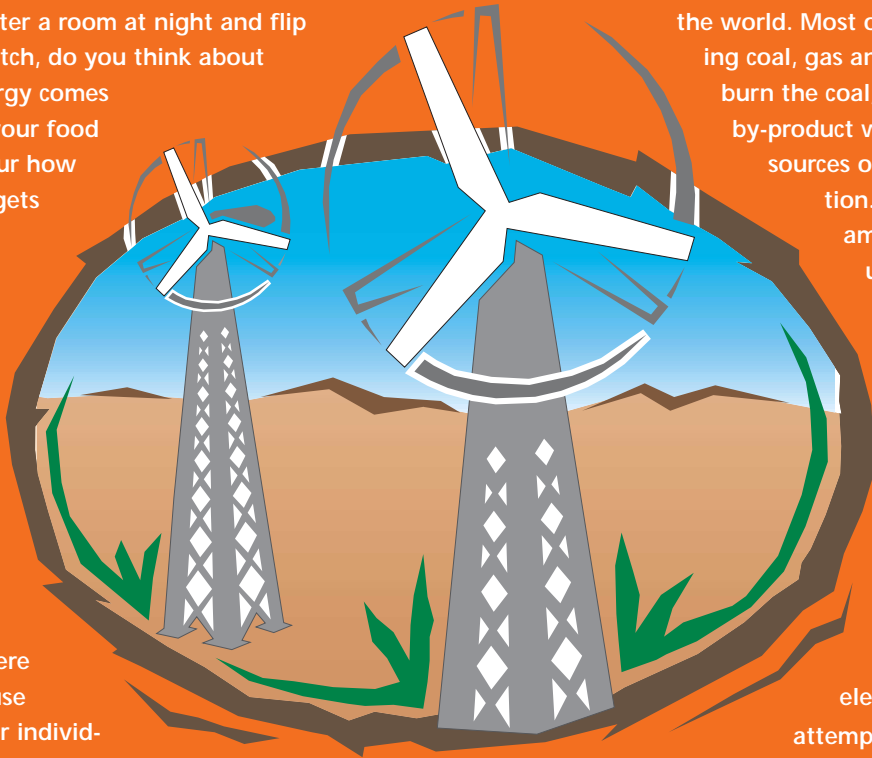


Being water smart will mean more water available for everyone to enjoy.



ENERGY SMART

◆ When you enter a room at night and flip on the light switch, do you think about where that energy comes from? Or how your food gets cooked? Or how the school bus gets you to school? The machines that do these things run on energy: some use engines while others are hooked up to an electric or gas company that provides energy. Here in the U.S. we use more energy per individual than any other nation in



the world. Most of it comes from burning coal, gas and oil. The plants that burn the coal, gas and oil make a by-product which is one of the sources of air and water pollution. By reducing the amount of energy we use, we reduce pollution and reduce our energy bill.

People have been exploring alternative energy sources that do not use coal, gas or oil. Examples are: solar panels, the windmill farms in Palm Springs, and electric cars. These are attempts to reduce the by-products put into our air and water.

What Can We Do?

Here is a list of suggestions that will help us use less energy and save power:

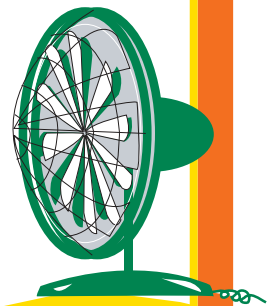


1. Replace old household appliances with energy-efficient ones.
2. Replace incandescent light bulbs with energy-efficient compact fluorescent bulbs.
3. Turn off the lights when you are the last person to leave a room.
4. Close the doors and heating/cooling ducts to rooms you do not use.
5. For cooling systems, set the thermostat between 75 and 80 degrees.



Put on a sweater when you are cold instead of turning up the heater.

6. Use energy-efficient fans to circulate air.
7. For heating, set the thermostat between 65 and 70 degrees.
8. If you are cold, put on a sweater or add another layer of clothing.
9. Set the thermostat on your hot water heater to no higher than 120 degrees.
10. When washing clothes, only run full loads in the washer.
11. Use appliances during non-peak hours (early morning and evening).
12. On a warm day, hang your clothes outside to dry instead of using a clothes dryer.



For air circulation, use energy-efficient fans.



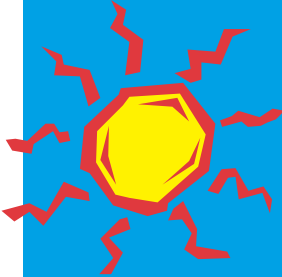
Solar panels are a popular source of alternative energy.



Activities You Can Do at Home



Cooking With the Sun



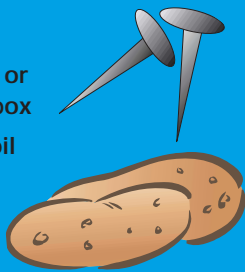
The Sun produces a lot of energy and can be used for cooking.

This is similar to microwave

ovens which use less energy to cook. Both the sun and the microwave oven use energy to cook food by using radio waves or infrared rays. To see how this works you will need a basket, foil, tape, potato, and fork or clean nail. This works best on a very hot day. Place the foil inside the basket making sure the foil is as smooth as possible and tape the foil to the basket. Push the fork or nail through the bottom of the basket and attach it to the potato. Set up your "solar cooker" to face the sun. Turn the cooker to face the sun as it moves across the sky. The sun will eventually cook the potato if the sun is hot enough. Check your cooker in a hour and see if the potato is thoroughly cooked.

MATERIALS:

- Small basket or cardboard box
- Aluminum foil
- Raw potato
- Nail or fork
- Tape

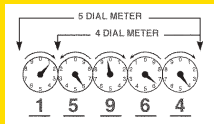


Reading the Meter



Using less energy means you pay less and save money.

To see how much you can save, try a little experiment. Find the electrical meter for your home. Write down the numbers in the box provided. If you have a dial meter, read



the numbers from right to left. (See example at left, numbers would be written 46951)

One week later, check the meter again and write down the numbers. Subtract the new number from the old number. This is how many kilowatt hours your family used for that week. Next, choose several of the energy-saving tips from above or think of your

own. Follow those tips for a week and read the meter again. Write the number down. Subtract the new meter reading from the last week's reading. This is how many kilowatt-hours of energy you used. Is there a difference in the number of kilowatt-hours?

Now multiply these two numbers by 15 cents. This is what the electric company will bill you for your use of energy. Is there a difference between the two? Multiply these amounts by 4 weeks. This represents the cost for a month. Is there a difference? How much would you save if you included the energy-saving tips into your everyday life?

First meter reading: _____ (A)

Second meter reading _____ (B)

Third meter reading _____ (C)

Second meter reading – (minus) First meter reading = Kilowatt-hours used
 _____ (B) – _____ (A) = _____ (D)

Kilowatt-hours used (D) _____ x .15 = \$ _____ (E)
(cost for week without energy-saving tips)

Third meter reading – (minus) Second meter reading = Kilowatt-hours used
 _____ (C) – _____ (B) = _____ (F)

Kilowatt-hours used (F) _____ x .15 = \$ _____ (G)
(cost for week with energy-saving tips)

Cost without energy-saving tips for a month:
 \$ _____ (E) x 4 = _____ (H)

Cost with energy-saving tips for a month:
 \$ _____ (G) x 4 = _____ (H)

How much money did you save? _____

Tell us about what you did: _____



Most air pollution comes from energy plants that burn coal, gas and oil.

Once you have completed this activity book,
take it to one of the following places to receive your certificate
and your decal for being desert smart!

Joshua Tree National Park (any visitor center)

Mojave National Preserve (any visitor center)

The Living Desert (Palm Desert, Discovery Room)

Palm Springs Desert Museum (Palm Springs, Education Department)

Big Morongo Canyon National Preserve (Morongo Valley)

Santa Rosa and San Jacinto Mountains National Monument (Palm Desert Visitor Center)

The Pledge

I pledge to do my part and be desert smart.
I will be earth smart, energy smart, air smart,
water smart and recycling smart! It will help to
take care of the desert in which I live
and our country and our planet!

BE DESERT SMART
- and -
BE DESERT SAFE!



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Natural Resource Environmental Agency,
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Big Morongo Canyon National Preserve

The Living Desert

Joshua Tree National Park

Mojave National Preserve

Palm Springs Desert Museum