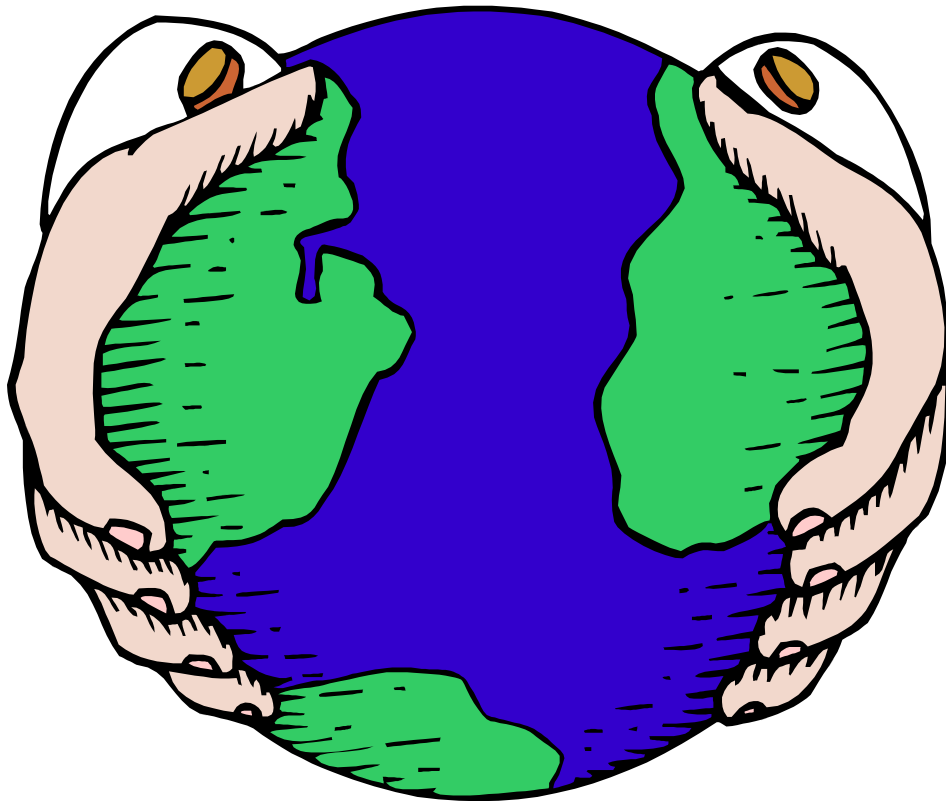


Highland County Environmental Officer Handbook



*Ohio State University Extension
Highland County
119 Governor Foraker Place
Hillsboro, OH 45133
937-393-1918*



Name _____

Address: _____

Report For Year: _____ to _____
(beginning date) (ending date)

Hello!

We are pleased to provide you with this environmental officer handbook to serve as a guide in fulfilling your duties as 4-H Club Environmental Officer.

Your job is a very important one. As Environmental Officer, you will help your 4-H club members become more aware of and learn new, exciting things about our world.

This guide will help you to teach your club about litter, recycling, water quality and energy conservation. Although the book only covers four topics, don't limit yourself --- explore new areas of our environment. It's a big world out there!

Good luck and have fun!

ENVIRONMENTAL OFFICER HANDBOOK

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COMPOSTING

It is no secret to anyone that landfills are becoming more and more scarce. According to U.S. Environmental Protection Agency, in 2003 the average person generated 4.5 pounds of waste per day. This doesn't mean that each of us throws away this much stuff every day, but that we are responsible for the waste. Think about the waste it takes to manufacture, ship and provide each of us with food, clothing, medical care, education and recreation. We are always seeking new ways to handle our waste. One of these ways is by composting.

Composting is a natural biological process. Organic material is decomposed under aerobic conditions. In a compost pile, what does the work are bacteria, fungi and protozoan. The resulting organic matter from composting is call humus. Humus can be used to put back into the earth in a family garden or flower bed.

In this section, you will be able to learn more about composting by completing one or more of the activities.

Your objective as the Environmental Officer in your 4-H Club is to help your club members learn more about composting and encourage them to start their own compost pile at home.

Activity 1 – Making a Compost Pile

Composting is the most practical and convenient way to handle your yard waste. Since December 1, 1993 people have not allowed to bag and dispose yard waste in a landfill. Compost also improves your soil and the plants growing in it. If you have a garden, a lawn, trees, shrubs or even planter boxes, you have a use for compost.

Here is what you need to start a compost pile.

Structure

Although composting can be done easily on bare ground without structures, some type of enclosure is often used to save space, hasten decomposition, prevent animals from digging in the pile, and keep the yard looking neat. Composting structures can consist of a variety of materials and can be as simple or complex as desired. (A handout containing a variety of compost structures is available from the Extension Office.)

A compost structure should be large enough to hold heat and small enough to admit air into its center. As a rule of thumb, the minimum dimensions should be 3 feet x 3 feet x 3 feet (1 cubic yard) to hold heat. The maximum dimensions to allow air to the center of the pile is 5 feet x 5 feet x any length.

Compost Material

The following type of materials can go into your backyard compost pile:

- Vegetable peelings and seeds
- Tea leaves
- Hay or straw
- Wood ashes
- Garden weeds
- Fruit peelings and seeds
- Eggshells
- Grass clippings
- Sawdust
- Tree and shrub clippings
- Coffee grounds
- Nutshells
- Leaves
- Wood chips
- Shredded paper

Those items that should not be put into your compost pile are:

- Meat scraps and bones
- Dairy products such as butter, cheese and milk
- Salad oils and dressings

To Start Your Pile

- Choose a structure and place a layer of waste in it.
- Chop or shred the materials if you want them to decompose more quickly.
- Spread a layer of soil over the pile. This contains microbes and will speed up the process.
- Adjust the moisture content: Add dry straw or sawdust to soggy or wet materials; add water to piles that are dry. You want the material wet to the touch, but not so wet that you can squeeze water from it.
- Allow the pile to get hot (100° - 120°) in four to five days.
- Turn the compost when the temperature gets too hot or too cold. You want to expose as many surfaces of the material to the composting process as possible

The compost pile will settle over time. This is a sign that the decomposition is occurring. If you turn the pile weekly, it should be ready in one or two months. Otherwise, the pile will take six to twelve months to prepare.

The final product should look like a dark crumbly soil mixed with small pieces of organic matter. This is call humus. It should have a sweet, earthy smell.

To complete this activity, answer the following questions:

1. What difficulties did you encounter in constructing your compost structure?

2. If your compost has turned into humus, how long did this take?

3. If your compost has not yet turned into humus, at what stage is it?



Activity 2 – Test Your Composting Knowledge

Composting is a very important way to reduce the amount of waste in our community. Invite a guest speaker, find someone who composts regularly, or do your own research on composting and present this information to your club members.

After presenting the information on composting to your 4-H Club, give them the following to test their knowledge about composting

Composting Quiz

1. Give an example of composting that occurs in nature.

2. Does your family or anyone you know have a compost pile in their backyard?

3. What goes into a compost pile?

4. What should not go into a compost pile?

5. What causes organic material to decompose?

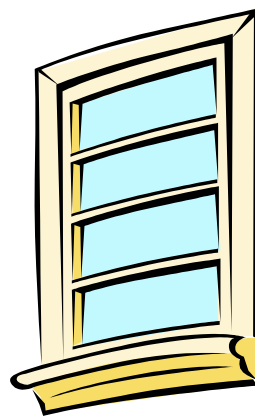
6. What inhibits the decomposition of some materials?

7. What is compost called when it is finished or at its final stage?

8. How long does it take to compost?

Activity 3 – Window Sill Compost

Here is a scaled-down version of a compost pile that you can do indoors or out.



You will need:

- A plastic gallon jug
- Some soil
- A spoon or fork
- Collected leaves and garbage
- Fertilizer (not necessary but it helps)

1. Cut off the upper part of the jug, leaving a 6” high cup (base of the jug)
2. Put a layer of collected leaves and garbage on the bottom of the jug about 1” deep. Put in a 1” layer of soil. Sprinkle with fertilizer and moisten with water.
3. Place another layer of leaves and garbage, cover with soil, fertilizer and water. You should cup the heap to help it hold water.

Composting occurs by anaerobic heat. The inside of the heap will get warm. You do need to keep the pile moist. It sometimes helps to put a pencil or a popsicle stick vertically into the pile to keep the pile moist throughout. Every week or so, you will need to “turn” the compost. You can use the spoon or fork like a shovel to do this.

Answer the following questions

1. What did you do?

2. How did you do it?

3. How many times did you turn it?

4. Tell what you saw each time.

5. What did you do with what you produced?

ENERGY

Take a look around you – how many examples of energy being used can you find? Energy is being used everywhere and in more ways than you can count.

Energy, by definition, is the ability to do work. We use energy by changing it from one form to another. For example, your car engine changes gasoline into motion and a light bulb changes electricity into light energy.

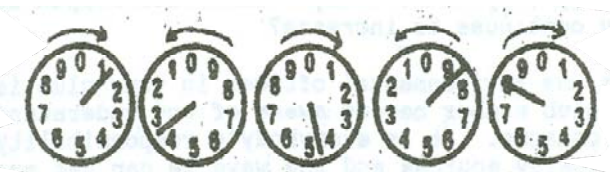
If you had lived in the year 1900, you would have used $\frac{1}{4}$ the energy you use today. The projected energy use for the world is expected to double by the year 2025 (from 1990 to 2025). What will happen if the demand for energy continues to increase?

Your objective as the Environmental Officer in your club is for you to help your club members become aware of and understand how much energy they consume. It is everybody's responsibility to learn more about energy sources and the ways we can use energy more efficiently.

Activity 1 - Reading Your Electric Meter

How much energy does your household use everyday? Every week? Every month? The electric meter, which can be found outside your home, measures the amount of electricity used in your home. If you are able to read and understand the meter you will better be able to cut back on your energy consumption.

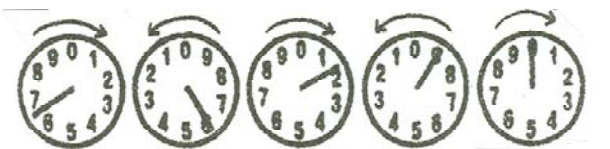
Most electric meters have four or five dials and are organized from right to left. The following drawing illustrates the meter reading for a five dial meter.



Reading 88431

The reading of your electric meter is kind of like the odometer in a car. An odometer records the number of miles traveled, where an electric meter records the number of kilowatt-hours used. Always read the meter from right to left keeping in mind the way each dial turns. Record the number the hand has just passed on each dial.

Now see if you can read a couple meters



Reading _____



Reading _____

To determine how many kilowatt-hours of electricity you used over a period of time you simply subtract the meter reading at the beginning from the reading at the end of the time period. For example, suppose that your meter reads 13491 on Saturday morning and 13501 on Sunday morning. This means you used $(13501 - 13491 = 10)$ 10 kilowatt-hours during that 24-hour time period.

Activity 2 - Ethanol Use Survey

Ethanol is ethyl alcohol (grain alcohol) and is produced as a dry alcohol. It is produced through the mashing, fermentation and distillation of crops. Any crop that produces free starch or sugars can be converted into ethanol. Some of these crops include corn, wheat and sugar beets.

Since 1978, American consumers have driven more than two trillion miles (80,000 trips around the world) on ethanol-blended gasoline. U.S. ethanol production has grown significantly in recent years. In 2004, 81 ethanol plants in 20 states produced a record 3.41 billion gallons of ethanol—an increase of more than 20 percent over 2003 and up an incredible 109 percent from 2000.

Ethanol enriched fuels are safe for engines and good for the environment. Ethanol makes us less dependent on foreign oil, helps reverse global warming, reduces ozone formation and helps clean our air.

Now that you know a little bit more about ethanol, take a visit around the county to the many different gas stations. Take a survey of those that use ethanol and those that do not.

| Station Name | Yes | No |
|---------------------|------------|-----------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

Ask the gas stations why they do / do not use ethanol products. Explain to them the facts about ethanol and how good it is for our world.

1. What are some of the reasons for using ethanol?

2. Why do some gas stations not use ethanol products?

Ethanol is safe for engines and good for the environment so why not use it?



SOIL CONSERVATION

Soil – better known as dirt, is made up of many different parts – minerals, small rocks, living organisms, water and air. It is the top layer of the earth.

Conservation – is the preservation of something, therefore *Soil Conservation* is the preserving of soil.

The conservation of soil is not only the job of land owners – it is important that everyone take part in keeping our land beautiful, as well as, productive.

One of the major concerns we face today is the erosion of soil. Erosion occurs when people remove the vegetation (such as trees and plants) from the land and forces such as wind and water take the soil away.

Your objective as the Environmental Officer in your 4-H Club is to help your club members learn what they can do as “junior soil conservationists” to prevent soil erosion.

Activity 1 – Plant a Tree

Replacing the trees and plants that are removed from the soil will help to rebuild our environment and prevent wind and soil erosion.

As a 4-H Club, obtain tree seedlings from the Ohio Department of Natural Resources, Division of Forestry. After you receive your seedlings, use the following guide for your club’s tree planting project.

1. Best tree growth is achieved by preparing an area rather than digging a hole or pit for planting.
2. Loosen the soil in an area about 18 inches in diameter and 6 inches deep.
3. Clear a spot in the middle of the loose soil, two or three times the root mass.
4. Remove the seedling from the tube, pot or bag.
5. Carefully straighten roots.
6. Place the roots on the soil before they start to dry.
7. Set the seedling at the proper planting depth by placing the root collar (where the seedlings stem meets the roots) at the level of the surrounding grade.
8. Spread loose roots and cover them with soil without kinking or bending them at sharp angles.
9. Lightly pack the soil around the roots with your hands.
10. Apply two to three inches of mulch (wood chips) to the entire area of loosened soil.
11. Protect the seedling from foot traffic, weed eaters and lawnmowers.
12. Be sure to take care of your tree after it is planted. Water it periodically. Add fresh mulch each year, prune and fertilize your tree as it grows.



Ask you club to come up with 10 ways that trees help the environment.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Activity 2 – Mulch Mania

When water impacts the bare soil, it clogs the surface pores. When this happens, the soil cannot take in all the water. By using mulch, the surface pores are protected. As water enters, it moves down through the soil.

Many people mulch around their homes and trees in their yards not only for appearance, but for soil protection as well.

As a club project (a possible community service activity) choose an area in your community for which you could provide mulch. Spend the afternoon mulching around trees and buildings. Not only will the community look better, but it will also be protected from soil erosion.

Possible community sites that could use mulch:

- Church courtyards
- Community parks
- Fairgrounds
- School grounds
- Street curb sides
- Other



Bulk or pre-bagged mulch may be expensive --- try asking the city, township, church or school to provide the mulch while your club provides the labor. Other types of mulch include: straw, grass or shavings.

What other possible materials could be used as mulch?

LITTER CONTROL

Litter is waste, refuse or trash that is out of place anywhere. It is a fast food bag tossed along the highway; a piece of paper that fell out of your school books on the way home from school; or contents of an illegal dump. Litter is any waste out of the proper waste stream.

Litter is a problem throughout much of the United States. The increase of disposable items and convenience packaging over the last 20 years or so has greatly contributed to an increase in solid waste and an increase in litter.

Why do people litter? (results from an Ohio study on littering)

- They do not think they will get caught
- They do not care about the landscape
- They feel “someone’s paid to pick it up”
- There is already trash there
- “Everybody does it.”
- They feel what they do is not littering.



Littering is a conscious act. It is the attitude about litter that has to change before people will change their actions.

Your objective as the Environmental Officer in your 4-H Club is to help your club members learn about the litter problem in our community and to do something about it. This can be accomplished by completing some of the activities included in this section.

Activity 1 – Take a Litter Walk

A walking tour is a chance to see firsthand the many types of litter and where they come from. So go take a walk! And take your club members with you. You will need to make a copy of this activity page for each of your club members.

On your walk, write down the litter you see, what type of litter it is and a likely source of the litter. Also determine if the litter is recyclable. (Refer to the Recycling section for this information.)

Use the following guides to categorize what you find:

Types of Litter

- | | |
|------------------|---|
| 1. Paper | newspaper, bags, boxes, wrappers, diapers, cups |
| 2. Glass | bottles, broken glass |
| 3. Metal | cans, nails, auto parts, old appliances |
| 4. Cloth | rags, old clothes |
| 5. Plastics | jugs, bottles |
| 6. Polystyrene | Styrofoam cups |
| 7. Rubber | tires |
| 8. Miscellaneous | wood, food, anything else |

Sources of Litter

1. Pedestrian – litter dropped by people walking in or through the area.
2. Motorist – litter thrown from cars
3. Open Trucks – litter blown off uncovered trucks
4. Commercial Refuse – trash from business waste receptacles
5. Household Refuse – litter from improperly covered household trash cans
6. Loading / Unloading – litter blown from docks while trucks are being loaded and unloaded
7. Construction – trash from construction sites.



Answer the following questions:

1. Is there a pattern to the litter? (Example: many fast food containers because you are near a fast food place.)

2. Was the litter found of all one type? _____ yes _____ no
If not, how many different types did you find?

3. Did you find any litter to be recycled? Which ones? (please list)

Activity 2 – Roadside and Site Clean Up

For this club activity, you will need to choose either a roadside (preferably a township, county road or non-busy street) or a site (a park, playground or an empty lot).



1. Decide as a club what area your club will clean up and how much time it will take. Plan on three younger members, one older member and an adult per group. An hour per mile is an average time to do a good job – and one mile per group could be enough! Try to choose one concentrated area rather than scattered areas.
2. Set a date and time. Also have a rain date.
3. Determine equipment you will need. Make sure everyone has plastic trash bags. And pick-up trucks would be helpful.
4. Contact local officials. For roadside projects, decide whether the road is maintained by the township, county or municipality. This is usually marked on the road sign giving the name and number of the road.

For site projects, determine who owns the site. This could be city, township, county, state or privately owned property. Your club will need to get permission to clean the area.

5. Everyone should meet at the agreed time and place. All should wear light, bright colors, with long sleeves, long pants, socks and work shoes, boots or heavy soled shoes. No one should have open-toed shoes or sandals. Gloves are recommended. (There is a lot of broken glass out there!)

Discuss safety precautions with the group before starting your clean-up. The groups should work two people on one side of the road and two people on the other. Group members should not cross or walk on the road. If you come across any big items, put them by the side of the road, but never on the road. These items can be picked up later by the pick up crew in the truck.

6. Disposal. Be sure you know where you can legally and safely dispose of the collected trash. Don't forget to recycle any items that are recyclable.

RECYCLING

Recycle: to put or pass through a cycle again; to process items that are separated from the trash and break them down and reprocess them into the same form or as part of a different product.

Homes and businesses in the United States produced 180 million tons of garbage in 2005. Over 85% of it was thrown away. With your help, much of this garbage could be kept out of landfills and recycled back into usable products. People are making a difference by reducing, reusing and recycling.

How do you fit into the recycling picture? You can choose to recycle and help others recycle also! Today's newspapers may be tomorrow's cereal box; today's plastic bottle may be tomorrow's carpet fiber; and food scraps can be composted to help gardens grow more food.

Solid waste recycling is a three-step process:

1. Recyclable waste materials are collected.
2. The collected materials are re-manufactured into new products
3. Products made from recycled materials are purchased by consumers

The activities in this section can help you and your club members learn more about the process of recycling in order to create a safer environment for us all.

Your objective as the Environmental Officer in your 4-H Club is to teach your club members the process of recycling and how it helps improve our environment.

Activity 1 – Recycled Paper

This can be done as a group activity with your club or as a demonstration.

You will need:

- Newspaper
- Warm water in a pot or bowl
- Beater, mixer or blender
- Window screen
- Powdered or liquid laundry starch (optional)
- Food coloring (optional)
- Aluminum or tin can (optional)
- Apple, potato or orange peel, carrot tops, flowers, glitter (optional)



Directions

1. Tear the newspaper into small pieces and place it in the warm water. Let it soak 10 minutes to ½ hour.
2. If you are using starch (which makes the paper strong), add 2 tablespoons of it in the bowl or pot.
3. Scoop the paper into a blender half full of warm water. If you are using a mixer or blender, use 2 cups of water to 2 cups of paper. The paper at this state is called slurry. It is more water than paper!
4. Blend or mix at a moderate speed until you no longer see individual pieces of paper.
5. Set screen over a bucket (do not do this over a sink because it could clog the drain). Pour the slurry over the screen.
6. If you desire, you can help squeeze out the water by rolling over the paper with an aluminum or tin can.
7. Turn the screen face down onto newspaper. Gently peel off the screen. There's your own recycled paper! Don't try to lift it until it's dry (several hours).

You can experiment by using different types of paper; adding food coloring (at step 4); or by adding little bits of vegetable matter, glitter or ribbon (in step 3).

After your paper dries, you can write on it, cut it up or do whatever you want with it. Try to make some very thin paper (facial tissue torn up) or some very thick and heavy paper (cardboard).

Activity 2 – Fast Food Packaging

By yourself, or as a club project, visit several different fast-food restaurants and record the types of packaging they use. Also notice if they have containers for recycling of some of their packaging.

Restaurant Name _____

Type of Packaging _____

Recycling Container _____ Yes _____ Not

Restaurant Name _____

Type of Packaging _____

Recycling Container _____ Yes _____ Not

Restaurant Name _____

Type of Packaging _____

Recycling Container _____ Yes _____ Not

Restaurant Name _____

Type of Packaging _____

Recycling Container _____ Yes _____ Not

Questions:

1. Is the packaging you found excessive? Why or why not?

2. If you were concerned about the impact of solid waste on the environment, would it affect which restaurant you would buy from?

3. Do you think you could influence restaurants to change their packaging policies? How?



Activity 3 – Recyclopedia

You may choose to do this activity as a club report. Have your 4-H Club members answer the following questions at the end of your report. Use the information on Reducing, Reusing and Recycling as reference for your report or as a handout given to 4-H Club members.

Questions:

1. Guess how much trash is put into the landfill each day in Ohio. _____
How much is recycled? _____
2. Have you ever noticed what people throw away on trash day? Do you see items that could be reused or recycled (ex: window frames, old appliances, chicken wire, plastic paint trays, glass bottles)? Why do you think these items are being discarded instead of given away, recycled or reused?

3. List 5 items you see being thrown out and think of an alternative use for each one
Item: _____ Use: _____
Item: _____ Use: _____
Item: _____ Use: _____
Item: _____ Use: _____
Item: _____ Use: _____
4. Which is more important concerning recycling? Why?
_____ Saving Resources _____ Reducing Pollution

Help for answering Question 1

According to the Environmental Protection Agency, a package is excessive if:

- It is made of material in short supply.
- The amount of energy required is great in relationship to substitutable forms of packaging.
- It is made of materials that are difficult to dispose of and more satisfactory alternatives are available.
- It hinders consumer use of a product (for example, by being difficult or hazardous to use).

The results of RECYCLING – Activity #2 would make a good club report.



Reduce, Reuse, Recycle

It takes a heap of recycling to stay out of the dumps! By collecting materials for recycling we reduce the amount of waste going to the landfills. The truckloads of recyclables become payloads of recovered resources. Trash, waste and junk can be remade into new products that can be reused. Here's a "recyclopedia" to help you reduce, reuse and recycle for a safer environment. Start today!

Reduce

Aerosol Cans

- Reduce your use by passing up these cans in favor of the same product in a different package. You pay more for the cans than for the contents, and some aerosol propellants are dangerous to the environment.

Plastics

- Plastic is made from oil, a resource that is getting very scarce. Avoid plastic packaging when you can, or buy larger containers instead of two or three smaller containers. While you're at it, reuse the plastic items you have as long as possible.

What Can You Do?

- For starters: In fast food establishments and grocery stores, request paper bags and wrappings. Bring a reusable shopping bag to the grocery store. Canvas or string bags are available at hardware stores, co-ops and some kitchen specialty shops.

Throwaways

- You can reduce plastic waste by refusing to buy beverages in throwaway containers. If you buy only returnable ones, you will save money, collect the deposit later, cut down on a lot of garbage that's expensive to dispose of and reduce the number of cans that litter the landscape. As ordinary light bulbs burn out, replace them with long-life light bulbs. They're more expensive, but the longer life pays off in more ways than one. You won't be replacing the bulb as often and won't be turning all those extra bulbs into trash.

Reuse

Organic Materials

- Twenty percent of usual household waste consists of organic waste that can be composted. Start a compost pile.
- Both yard waste (grass clippings and leaves) and kitchen waste (potato peels, egg shells, coffee grounds, melon rinds, etc.) can be made into compost, a rich soil conditioner for lawn or garden. No meat products, bones, etc. may be used. Some communities have begun yard-waste collection programs; others prohibit composting. Check your local policies.

Clothes, Fabric & Rags

- Extend the life of your old and outgrown clothing. Give usable items to friends, relatives or community clothing drives. Call Goodwill, the Salvation Army or other charitable organizations that take used clothing. Goodwill sells clothes in its retail stores. It sells the cotton and wool to recyclers and the polyester clothing to Third World countries.

Grocery Bags and Kitchen Wrap

- Reuse the plastic bags from packaged fruits, vegetables and bread to wrap leftovers and lunch sandwiches. The waxed paper inside cereal boxes is clean, fresh and handy too.
- Instead of shampoo in disposable / non-recyclable plastic bottles, try to locate a place in your community where you can refill your shampoo containers. Some co-ops, boutiques and hair salons sell bulk shampoo and conditioners, and some offer discounts on refills.
- And while you're at it ask the dry cleaner not to put your clothing in a plastic bag.

Wire Coat Hangers

- Take a little extra trouble to return them to the cleaners. They will thank you for it.

Recycle

Glass

- Recycle glass jars and bottles. Glass makers use pulverized old glass to make new glass, and this saves lots of manufacturing energy.
- The average American generates 82 pounds of glass per year; the average glass bottle weighs 8 ounces.

Tin / Steel Cans

- Tin is a scarce mineral. The coating of tin on tin/steel cans can be recovered, if the cans are properly prepared. The steel that is left after the tin is removed is sold to steel mills for scrap. This conserves iron ore and uses much less energy in the blast furnace. Not every community recycles tin/steel. Check your local policies before recycling.

Newspapers

- Recycle them. Reused newspapers can help insulate a home, become a new cardboard box or new newsprint. Making newspaper from recycled paper saves 25 % of the energy needed to make paper from a tree. More important, recycling saves landfill space. One-third of all newspaper currently are recycled.

Aluminum

- Using recycled aluminum saves 65 to 70 % of the energy used to make an aluminum product from scratch.

Tired Tires

- Many service stations and tire dealers will take old tires (for a fee) for recycling.

Motor Oil

- Many service stations and auto parts stores now accept used motor oil. Once impurities are removed, used oil can be marketed as industrial fuel oil or re-refined oil, which is as good a lubricant as new oil.



WATER QUALITY

All living things need water. We can't live without it! Water is used for drinking, for food, for cleaning, for recreation, for crop irrigation and many other uses.

Did you know?

- The average person uses about 123 gallons of water each day.
- 55 to 60 % percent of a person's body weight is water.
- You must consume 2 ½ quart of water per day to stay healthy.
- It takes 24 gallons of water to make one pound of plastic.
- You pay less that a quarter a day for drinking water.
- North Americans on average use 1,300 gallons of water per person every day. Yet, nearly half the world's population doesn't have enough water for adequate sanitation. (4/4/2001 Source: Environmental News Network)

The supply of good water is limited and because water is a necessity it is important to keep our water supply clean.

Your objective as the Environmental Officer in your 4-H Club is to help your club members to understand water and its many uses. You will discover new insights on why water is so important in your everyday life.

Activity 1 – Grass or No Grass?

Leaving soil bare or misusing it can cause soil erosion (sediment) to wash into streams and rivers polluting our water. In this activity you will see just how important grass and ground covering are to the quality of our water and the conservation of soil.

Directions:

1. Find two large boxes (preferably wood) about 16 inches long, 12 inches wide and 4 inches deep. Cut a “V” about 1 – 1 ½ inches deep at one end of each box. Line each box with a watertight material such as aluminum foil or plastic. Form a spout at the “V”.
2. Find an area in your yard (or pasture) that is well covered with grass. Cut a piece of the ground the size of box number one. Place that piece of ground in the box.
3. Next, find an area with similar soil type as that in box one but where there is no grass or where the grass is badly worn by walking or playing. Cut a piece of that soil and place it in box two.
4. Put the boxes next to each other on a level surface. Place a brick or two under one end of each box (end without the “V”).
5. Fill two sprinkling cans with water. Pour the water over the boxes at the same time and at the same rate, holding the sprinklers at the same height.
6. Observe and record the results. What color was the water running off the box containing grass?

What color was the water running off the box containing bare soil?

Why do you think there was a difference between the two boxes?

In this activity you should have noticed that the water running off the box containing grass was much clearer than the water running off the bare soil.

The pollution of our surface water caused by soil erosion can become a problem if it is not taken care of. If too much sediment (soil) gets into the water it can block sunlight and kill water life. Bodies of water may become too shallow and flooding may occur.

What can you do to protect your surface water from pollution by soil erosion?

Activity 2 – Clean A Stream

Clean water is important to the livelihood of an incredible amount of plant and animal life. Microscopic plants and animals such as water beetles and plankton are a source of food for small fish. These small fish become food for large fish and, in turn, the large fish become food for birds and animals. All living creatures involved in this food chain depend on the water environment. By keeping the water in streams, rivers and lakes clean you can work to protect the health of both human and aquatic life.

Take a walk along a stream or body of water near your home and pick up any garbage you see. Make this a group activity. Divide up areas of the stream and see who can collect the most garbage.

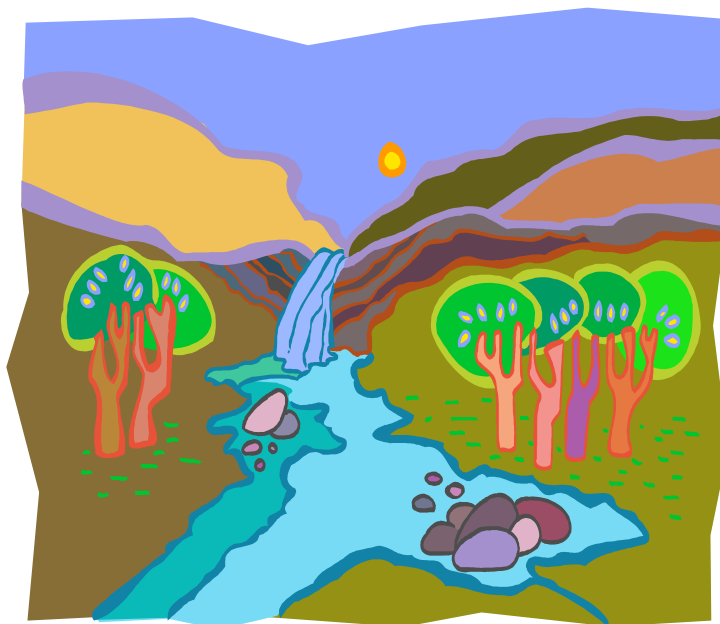
1. Where did you collect garbage?

2. How large of an area did you cover?

3. How much garbage was collected?

4. What types of items were collected?

Remember, you do not have to pick up garbage only during a project or club activity. Always be on the look out for pieces of paper, pop cans, newspaper, etc. When you see garbage – pick it up before it washes into streams or bodies of water and kills aquatic life.



Activity 3 – Test Your Water Knowledge

Did you ever stop to think how much water is used daily throughout the world? Water is one of our most valuable resources.

Give this Trivia Quiz to your 4-H Club and test their knowledge on the most common substance found on earth – water. Offer prizes to those who can answer the most questions.

Water Trivia

1. How much of the human body is water? _____
2. How much water does it take to produce one ton of steel? _____
3. How much does one gallon of water weigh? _____
4. How much of a pineapple is water? _____
5. At what temperature does water freeze? _____
6. Of the earth's water, how much is oceans or seas? _____
7. How much water does it take to make one pound of plastic? _____
8. On the average, how much water is used to hand wash dishes? _____
9. How much water is used to flush a toilet? _____
10. Water is the only substance found on earth naturally in what three forms? _____
11. How much water does it take to make four new tires? _____
12. How much water is used in the average 5-minute shower? _____
13. How much water is used to brush your teeth? _____
14. How long can a person live without food? _____
15. How long can a person live without water? _____
16. How much of the earth's surface is water? _____
17. How much of the earth's water is suitable for drinking water? _____
18. How many gallons of water do you get per acre, when it rains one inch? _____
19. How much of an elephant is water? _____
20. How much water does it take to process one can of fruit or vegetables? _____
21. How much of an ear of corn is water? _____

Water is an amazing substance that is used every minute of the day. If you take the time to make small adjustments in everyday activities such as brushing your teeth, washing dishes, doing laundry, taking a shower, etc. you can reduce water use, eliminate waste and save energy and money.

What do you plan to do to help conserve water in your home?

Water Trivia Answers

1. 66%
2. 62,600 gallons
3. 8.34 pounds
4. 4. 80%
5. 32 degrees F, 0 degrees C
6. 6. 97%
7. 24 gallons
8. 8. 20 gallons
9. 2 – 7 gallons
10. 10. solid, liquids, gas
11. 2,072 gallons
13. 2 gallons
14. 14. More than a month
15. Approximately one week, depending upon conditions
16. 80%
17. 1%
18. 27,000 gallons per more acre
19. 19. 70%
20. 9.3 gallons
21. 21. 80%

Resources available or national associations where you can write for more information:

- Division of Litter Prevention and Recycling: <http://www.dnr.state.oh.us/recycling>
- American Plastics Council: http://www.plastics.org/s_plastics/index.asp
- National Association for PET Container Resources: <http://www.napcor.com/index.html>
- U.S. Environmental Protection Agency: <http://www.epa.gov/kids/>
- National Solid Waste Management Association: <http://www.nswma.org/>
- The Aluminum Association: <http://www.aluminum.org/>
- American Paper Institute, 260 Madison Ave., New York, NY 10016

Resources Used (before revisions):

- At Your Disposal, 4-H Project Book written by Joe Heimlich. (discontinued)
- “The New 3 R’s”, educational supplement provided by the Star Tribune, Minneapolis, Minnesota.
- Litter Control Packet, Handbook developed by OCES
- Ohio 4-H Litter Education Camp Packet, OCES, prepared by Joe Heimlich
- Teaching Soil and Water Conservation, ES USDA Program Aid #341
- “Developing Criteria To Protect Our Nations Water”, EPA.
- “Water Trivia Facts”, The National Drinking Water Steering Committee, ES USDA
- “Ethanol – A Breeze Across America”, Ohio Corn Growers Association
- Energy Conservation, Experiments You Can Do, Thomas Alva Edison Foundation
- Exploring the World of Plants and Soils (SOILS), 4-H Project Book published by National 4-H Council, Chevy Chase, MD (discontinued)
- Composting To Reduce The Waste Stream, Northeast Regional Agricultural Engineering Service, Co-operative Extension

Resources Used When Revised:

- <http://www.epa.gov/epaoswer/non-hw/muncpl/facts.htm>
- <http://www.ferc.gov/>
- <http://www.ethanol.org/pdfs/EthanolCurriculum.pdf>
- <http://www.ncga.com/ethanol/main/production.htm>