4-H Environmental Officer Handbook

Name_____

Address_____

Club_____ Year _____

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Ross.osu.edu

Hi!

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 our world and encourage club members to be better stewards of our environment.

Use your handbook to teach your club about water quality, energy use and conservation, litter control, recycling and composting. Don't limit yourself to just these subjects! Feel free to be creative with your topics and activities as your perform your environmental officer duties.

Remember: there is a county-level top environmental officer award that you can earn. Just complete the requirements listed on the enclosed score sheet and then bring your completed book to General Project Judging Day and participate in the award interview. It's that easy.

Good luck and have fun!

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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 a lot more.

Did you know?

- The average household uses about 146,000 gallons of water per year
- 55 to 60 percent of a person's body weight is water
- You must consume 2 ½ quarts of water per day to stay healthy
- You pay less than a quarter a day for drinking water
- A person uses an average of 10 gallons of water per day to shower and 9.6 gallons per day to flush the toilet

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

Activities

As the Environmental Officer in your club, you can help members understand water & its many uses, encourage water conservation practices, and discover new insights on why water is so important in everyday life.

3 "Water Activities" are included along with a chart of the water cycle to help you get started, or you can create your own activity geared to your club's needs.

- Grass or No Grass
- Clean a Stream
- Test Your Water Trivia Knowledge
- Create Your Own Water Activity

Web Resources:

The following links provide additional information about water

http://ohioline.osu.edu/aex-fact/0480_71.html
Water Resources of Ross County, Ohio

http://www.awwa.org/waterwiser
Measure the amount of water loss from leaks using the interactive "drip calculator" on the American Water Works Association site.

http://wwwga.usgs.edu
Develop your own town of "Dryville" while learning about water usage from the U.S. Geological Survey (NGSG) Water Science for Schools website.

http://www.epa.gov/kids
Explore the U.S. Environmental Agency's interactive "Environmental Club for Kids"

http://www.myhealthmyworld.org
Navigate this site to research environmental issues.

WATER ACTIVITY #1
Grass or No Grass

Leaving soil bare or misusing it can cause soil (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 1-1½ 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. Please 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.
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 results:

    a. What color was the water running off the box containing grass?
    b. What color was the water running off the box containing bare soil?
    c. 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?

WATER 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 involve din 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 litter you see. Make this a group activity. Divide up areas of the stream and see how can collect the most litter.

Where did you collect the garbage?_____

_____

_____

How large of an area did you cover?_____

_____

_____

How much garbage was collected?_____

_____

_____

What types of items were collected?_____

_____

_____

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

WATER 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 weight?
4. How much of a pineapple is water?
5. At what temperature does water freeze?
6. Of the earth's water, how much is ocean 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? How long can a person live without water?
15. How much of the earth's surface is water?
16. How much of the earth's water is suitable for drinking water?
17. How many gallons of water do you get per acre, when it rains one inch?
18. How much of an elephant is water?
19. How much water does it take to process one can of fruit or vegetables?
20. How much of an ear of corn is water?

Water is an amazing substance that is sued 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 ACTIVITY #3
Trivia Answers

1. 66%
2. 62,600 gallons

3. 8.34 pounds
4. 80%
5. 32 degrees F, 0 degrees C
6. 97%
7. 24 gallons
8. 20 gallons
9. 2-7 gallons
10. solid, liquids, gas
11. 2,072 gallons
12. 20-50 gallons
13. 2 gallons
14. More than a month, approximately one week, depending upon conditions
15. 80%
16. 1%
17. 27,000 gallons per acre
18. 70%
19. 9.3 gallons
20. 80%

WATER ACTIVITY #4
Create Your Own Water Quality Activity

Introduction:

Activity:

Summary Questions:

ENERGY USE & CONSERVATION

Take a look around you – how many examples of energy being used can you find? Energy is constantly 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 ¼ the energy you use today.
What will happen if the demand for energy continues to increase?

Activities

As the Environmental Officer in your club you can help members become aware of and understand how much energy they consume.
Each person has a responsibility to learn more about energy sources and the ways to use energy more efficiently.

3 "Energy Activities" are included to help you get started, or you can create your own activity geared to your club's needs.

- Ethanol Use Survey
- Home Energy Audit
- Home Energy Pledge
- Create Your Own Energy Activity

Web Resources

The following links provide additional information about energy

http://www.ethanolrfa.org
Renewable fuels association website
http://www.ef.org
Find out about our national energy policy from The Energy Foundation
http://www.doe.gov/engine/content.do
The Department of Energy's website
http://www.energy.ca.gov
Alternative energy sources
http://www.nyelabs.com
Check out this great site from Bill Nye the 'Science Guy'

ENERGY ACTIVITY #1
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.

In 2001, ethanol production in the US hit a record 1.77 billion gallons. One bushel of corn yields at least 2.5 gallons of ethanol.

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. Ethanol is non-toxic, water solvable and biodegradable component of gasoline.

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.

Ethanol is a clean burning, renewable fuel that helps reduce emissions of carbon monoxide (c0) and smog forming volatile organic compounds. 195,000 jobs created by ethanol directly through ethanol production and indirectly through agriculture, manufacturing, engineering and construction.

Gas Station	Yes	No
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

ENERGY ACTIVITY #2
Energy Home Survey

Name_____

Do this survey twice: once in the morning before school and once just before dinner. It will help you determine how much energy you use.

Appliance **Electrical Appliances**	**Multiply by**	**Subtotal**	**Total per day**
Incandescent Lights: Number of lights on =	1¢ per hour		
Fluorescent lights: Number of lights on =	1¢ per every 4 hours		
Television: Number of sets on =	4¢ per hour		
Radio: Number of sets on =	1¢ per hour		
Stereo: Number of sets on =	2¢ per hour		
Microwave oven: Number of ovens on =	15¢ per hour		
Computer: Number of computers on =	1¢ per hour		
Vacuum cleaner: Number on =	9¢ per hour		
Portable heater: Number on =	15¢ per hour		
Air conditioner: Number on =	55¢ per hour		
	Total for all subtotal usage		
		Total usage in one day	

Add up all the numbers in the Subtotal column. This subtotal is the total cost for these appliances in one hour.

Some of these appliances will be on for more than one hour, some less. Based on what you know about your household, write the total number of hours and the total cost in one day for these appliances in the Total per day columns above.

Example 1: If two stereos are on for eight hours a day, you multiply 2 (stereos) x 2¢ per hour x 8 hours = 32¢ per day. *Example 2:* If you vacuum for ½ hour, multiply by 9¢ per hour x .5 hours = 4.5¢ per day.

Energy Home Survey (Continued)

Periodic Appliances

Some items are not used all the time. They create a cost only when they are used.

Periodic Appliances **Appliance and loads per month**	**Multiply by**	**Total per month**
Dishwasher		
Loads =	10¢ per load	
Washing machine:		
Loads =	5¢ per load	
Electric clothes dryer:		
Loads -	67¢ per load	
Gas clothes dryer:		
Loads =	16¢ per load	
Total usage for one month		

These answers give you the total cost per month, based on how much your family uses these appliances.

Periodic Appliances **Appliance and average use per month**	**Total per month**
Gas water heater:	$13.00
Electric water heater:	$45.00
Refrigerator:	$16.00
Extra freezer:	$18.00
Electric heating system:	
Small home	$85.00
Large home	$250.00
Gas heating system:	
Small home	$28.00
Large home	$120.00
	Total usage for one month

With your teacher's help, try to figure out your home energy costs for one month. Compare it to the bill that your parents receive each month. How do they compare:

My estimate_____

My parent's bill_____

Did your estimate come close to the actual cost? If not, why do you think they differ?_____

_____

_____

_____

_____

ENERGY ACTIVITY #3
Changing Energy Habits

Pledge:
I _____ pledge to make changes in my life to reduce the waste of energy and natural resources. I will select at least five of the following suggestions and start saving energy today!

Place a check mark next to the five actions you will take to conserve energy and save natural resources:

___ Switch from disposable batteries to reusable batteries
___ Encourage my parents to have regular car tune-ups for energy efficiency
___ Make sure my parents recycle used motor oil
___ Use both sides of a sheet of paper before throwing it out
___ Use smaller sheets of paper when I write notes
___ Suggest we get a clean-erase board to reduce paper waste
___ Switch from electric clock to battery-operated clock
___ Recycle paper when it has been used
___ Turn off lights when leaving a room
___ Turn off water while brushing teeth
___ Walk or ride a bike to the store or to school whenever I can
___ Trade books, toys, etc. with a friend, or donate them to Goodwill instead of throwing them away
___ Compost garbage
___ Use cloth napkins at school and home to save paper
___ Use reusable cups instead of disposable ones
___ Use a hand-held can opener instead of an electric one
___ Use a solar-operated calculator instead of a battery-operated one
___ wear a solar-powered watch
___ Air-dry my hair instead of blowing it dry
___ Place a timer in the shower and encourage everyone in the family to take shorter showers
___ Take five-minute showers
___ Put on a sweater and socks when I am cold instead of turning up the heat
___ Suggest to my family that we keep the thermostat at 68 degrees
___ Ask my family to run the washers and dryers at night, when there is less demand for energy
__ Close the drapes in the summer to keep the cool air inside
___ Ask my parents to purchase a water heater insulator
___ Ask my parents to turn down the heat on the water heater from high to medium
___ Install toilet dams or place bottles of water in my toilets to conserve water
___ Recycle aluminum cans, glass bottles, plastic bottles and newspapers
___ Open the refrigerator only long enough to get what I need and not stand in front of the open door deciding what to eat
___ take part in a school-wide effort to save energy and natural resources at school
___ Use a hand-powered lawnmower instead of a motor-powered lawnmower
___ Replace my electric pencil sharpener with a hand-held one
___ Turn the radio, stereo and television off when I leave the room
___ Avoid using portable heaters, if possible
___ Avoid running the dishwasher unless it is full
___ Other things I will do:_____
_____
_____
_____

I pledge to make these changes and help save energy and natural resources for the future!

ENERGY ACTIVITY #4
Create Your Own Energy Activity

Introduction:

Activity:

Summary Questions:

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 the contents of an illegal dump. Litter is any waste that is 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 follow)

- 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. The attitude about litter must change before people will change their actions.

Activities

As the Environmental Officer in your 4-H Club you can help members learn about the litter problem in our community and discover ways to do something about it. This can be accomplished by completing some of the activities included in this section.

2 “Litter Control Activities” are included to help you get started, or you can create your own activity geared to your club’s needs.

- Take a Litter Walk (activity chart page)
- Roadside & Site Cleanup (planning guide)
- Create Your Own Litter Control Activity

Web Resources

The following links provide additional information about litter control

http://www.dnr.state.oh.us/recycling Department of Natural Resources shares helpful hints
http://www.audubon.org/
http://www.recycle.net/recycle
http://www.wastenews.com

LITTER CONTROL 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 explain to your club the different types of litter (listed below) and also make a copy of the "Take a Walk" activity chart page for each of your club members.

Once 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	**Examples**
Paper	newspaper, bags, boxes, wrappers, diapers, cups
Glass	bottles, broken glass
Metal	cans, nails, auto parts, old appliances
Cloth	rags, old clothes
Plastics	jugs, bottles
Polystyrene	styrofoam cups
Rubber	tires
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 Trunks : 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

"Take a Walk Activity Chart"

Name:_____ Place:_____ Date:_____

Item Seen	Type of Litter	Probably Source	Is it Recyclable

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 of litter did you find?_____

3. Did you find any litter to be recyclable? Which ones?

   List_____

   _____

LITTER CONTROL 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). This can be done as a one-time event or on-going club project. Complete the attached "Planning Guide".

1. Decide as a club what area your club will clean up and how much time it will take. Plan on three younger club 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. Pick-up trucks would be helpful.

4. Contact local officials. For county or township road clean-up, contact Ross County Litter Control & Recycling at 740-772-5326. They will furnish your club with safety vests, trash bags and a safety training video. For city streets, contact the local mayor's office. For state highways, contact the Ohio Department of Transportation at 740-773-2691.

   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.

Complete the following “Planning Guide” before doing the clean up activity.

Group - List Names	Road or Site Selected	How Many Bags

After the clean up, answer the following questions:

1. How much trash did you collect? (ex: number of bags) _____
2. How many pounds (Average full bag weights 30 lbs) _____
3. Ask club members how they felt about the clean up activity. Record their responses._____

   _____

   _____

You may want to take pictures and write a news article about your clean up activity.

LITTER CONTROL ACTIVITY #3
Create Your Own Litter Control Activity

Introduction:

Activity:

Summary Questions:

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.

Americans throw away 76 million tons of packaging materials each year. With your help, garbage can be kept out of landfills and recycled back into usable products. People are making a difference by reducing, reusing and recycling. Energy saved by recycling one aluminum can is enough to run a television for three hours.

How do you fit into the recycling picture? You can choose to recycle and help others recycle also. Today's newspaper 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

Activities

As the Environmental Officer in your 4-H Club you have the opportunity to teach your club members the process of recycling and how it helps to improve our environment.

2 “Recycling Activities” are included to help you get started, or you can create your own activity geared to your club’s needs. Also included is “Recycling Basics: Reduce, Reuse, Recycle”.

- Recycling Basics: Reduce, Reuse Recycle
- Recycled Paper
- Fast Food Packaging
- Recyclopedia
- Making Reservations at the Landfill
- Create Your Own

Web Resources:

http://www.epa.gov/recyclecity/mainmap.htm
Learn about recycling in this mock city

http://www.epa.gov
The Environmental Protection Agency site

http://www.dnr.state.oh.us/recycling
Recycling in Ohio

RECYCLING BASICS
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 our 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 cleaner 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 – Americans go through 2.5 million plastic bottles every hour. You can reduce plastic waste by refusing to buy beverages in throwaway containers. 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. Use sponges and rags as opposed to disposable cleaning cloths.

Reuse

Organic Materials – Twenty percent of usual household waste consists of organic waste that can be composted. Start a compost pile.

Both hard 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 composing. 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 clothes to Third World countries.

Grocery Bags & 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/nonrecyclable 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 shampoos 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.

Recycle

Glass – Recycle glass jars and bottles. Glassmakers use pulverized old glass to make new glass and this saves lots of manufacturing energy.

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 paper saves 25% of the energy needed to make paper from a three. More important, recycling saves landfill space. One-third of all newspapers currently are recycled.

Aluminum – Using recycled aluminum saves 76 to 70% of the energy needed to make an aluminum product from scratch.

Tired Tires – Many gas stations and tire dealers will take old tires, recappable or not, 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.

RECYCLING ACTIVITY #1
Recycled Paper

This can be done as a group activity with your club or as a demonstration and always with adult supervision!

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 for 10 minutes to ½ hour.
2. If you are using starch (which makes the paper strong), add 2 tablespoons of it to 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).

   Check with Ross County Litter Control & Recycling (740-772-5326) for availability of borrowing a paper making kit.

Cut out samples of the paper you or your club members made and paste them below. Tell how each was made different.

1. _____

_____

_____

_____

_____

2. _____

_____

_____

_____

_____

3. _____

_____

_____

_____

_____

Questions:

A: Does your recycled paper look like paper you would buy at the store? Why or why not?

_____

B. Which type of paper worked best in making recycled paper?

_____

C. What did you learn from this activity?

_____

RECYCLING 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.

Fast Food Restaurant #1

Type of Packaging:_____
Recyclable/Reusable Container: Yes _____ No _____

Fast Food Restaurant #2

Type of Packaging:_____
Recyclable/Reusable Container: Yes _____ No _____

Fast Food Restaurant #3

Type of Packaging:_____
Recyclable/Reusable Container: Yes _____ No _____

Fast Food Restaurant #4

Type of Packaging:_____
Recyclable/Reusable Container: Yes _____ No _____

Questions:

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

_____

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

_____

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

_____

Help for answering Question A

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

1. It is made of material in short supply
2. The amount of energy required is great in relationship to suitable forms of packaging
3. It is made of materials that are difficult to dispose of and more satisfactory alternatives are available
4. 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.

RECYCLING 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:

A. Guess how much trash is put into the landfill each day from Ross County. _____ How much is recycled?_____
You will need to call the local Solid Waste District at 740-774-3793 and the Ross County Litter Control and Recycling office at 740-772-5326 to obtain these answers.)

B. 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 plant trays, glass bottles)? Why do you think these items are being discarded instead of given away, recycled or reused?

_____

_____

_____

C. 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:_____

D. Which is more important concerning recycling?

_____ Saving Resources? _____ Reducing Pollution?

Why?_____

_____

<u>Benefits of recycling also include</u>:

Conserving landfill space
Reducing pollution in manufacturing
Conserving resources
Providing jobs

RECYCLING ACTIVITY #4
Making Reservations at the Landfill

Most adults create about 5 pounds of garbage each day and most children (under 12) create about 4 pounds each day. Complete the calculations below to determine how much space you will need at the landfill for your family's trash for one year.

A. Determine the number of pounds of garbage your family generates in one year.

1. Number of adults in your family _____ x 5 lbs. = _____ lbs. per day/adults

2. Number of children in your family _____ x 4 lbs. = _____ per day/children

3. Adult lbs. _____ x 365 days a year = _____ family lbs. per year

4. Family lbs. per day _____ x 365 days a year = _____ family lbs. per year

B. Calculate how much space will be required at the landfill for a year's worth of your family's trash (each 1,000 lbs. of material requires one cubic yard of space at the landfill).

5. Family lbs. per year _____ divided by 1,000 = _____ cubic yards per year

C. As a class, calculate how much space will be required at the landfill for a year's worth of garbage from all of the families in your club (show your work below).

6. On the back of this page, draw a picture to show how big of a space it would take to bury the trash figured in Part C above. How would you compare the size of the space with a car, a dump truck, a house, a school, other? Show this building or other item in relationship to the size of the pile of garbage.

RECYCLING ACTIVITY #5
Create Your Own Recycling Activity

Introduction:

Activity:

Summary Questions:

COMPOSTING

Composting: A form of organic recycling that occurs naturally through a slow decomposition process. It incorporates the breakdown of organic materials (leaves, grass clippings, yard waste, kitchen waste, etc.) in combination with varying amounts of oxygen, moisture, carbon-to-nitrogen levels and heat to maintain various populations of microorganisms (bacteria, protozoa, fungi), which facilitate the decomposition of organic matter into soil.

Vermicomposting is a system where worms are used to eat garbage. Vermicomposting is an effective, educational, and environmentally beneficial method of disposing of organic waste. Food waste makes up approximately 7% of the national's waste stream.

In a vermicomposting system, red worms are placed in a bin to digest bedding and food scraps. Undigested material passes through the worm and is known as a worm casting. Vermicompost is a mixture of worm castings, organic material, and bedding in varying stages of decomposition. It contains nutrients and fosters permeability of the soil to water and air which enhances plant root growth.

As the Environmental Officer in your club you can find out more about composting and share the information with the other members in your club. You may want to have a guest speaker from Litter Control to talk to your club (740-772-5326).

Activities

There are four "Composting Activities" included to help you get started, or you can create your own activity geared to your club's needs. Also included is a background sheet on earthworms and their benefits in recycling.

- How Big a Bin?
- Never Underestimate the Power of a Worm
- Build a Compost Bin
- Dirt Cake Recipe
- Create Your Own

Web Resources

- http://www.mastercomposter.com/worm/wormcomp.html
- http://compost.css.cornell.edu/worms/wormhome.html
- http://ohioline.osu.edu/hyg-fact/1000/1189.html

COMPOSTING ACTIVITY #1
HOW BIG A BIN?

With this activity, you will create your own composting worm bin. Use the information below to help construct the bin (directions on back of this page).

Watch Your Step - Following is a checklist to follow when creating your worm bin. Check each step when completed and make comments about your observations and feelings.

___ Weigh food waste for two to three weeks to get the average amount of garbage produced
_____
_____

___ Select size of worm bin needed and purchase or build it.
_____
_____

___ Determine amount of worms you need.
_____
_____

___ Mail order or collect the worms. (Allow 4-6 weeks for delivery of worms.)
_____
_____

___ Prepare the correct volume of newspaper bedding and place in worm bin before the worms arrive.
_____
_____

___ Mix a small amount of soil with the bedding in worm bin.
_____
_____

___ Add worms to bedding.
_____
_____

___ Bury garbage.
_____
_____

___ Maintain worm bin moisture.
_____
_____

___ Observe worms, cocoons, and other organisms in the worm bin frequently.
_____
_____

___ When the worm bin is full of castings, remove castings, and replace with new bedding.
_____
_____

___ Use castings, vermicompost, or castings tea on your plants.
_____
_____

Worm Bedding Calculations – A worm's body consists of about 75% to 90% water. Its surface must be moist in order for the worm to respire (to exchange the gases oxygen and carbon dioxide). When you prepare bedding with about the same moisture content (75%) as the worms body, the worm's home will not be too dry or too wet. It will be just right.

1. Measure the length, width and height of your worm bin:
   Length _____ Inches Width _____ Inches Height _____ Inches

2. Multiply these worm bin dimensions to get the number of cubic inches. (Hint: Cubic inches or feet are measurement of volume.)
   _____ inches (length) x _____ inches (width) x _____ inches (height) x _____ cubic inches

3. Calculate how many cubic feet in your worm bin by dividing the number of cubic inches by 1,728 (the number of cubic inches in one cubic foot).
   _____ cubic inches ÷ 1,728 = _____ cubic feet in worm bin

4. You will need 2.5 pounds of shredded newspaper for every cubic foot in your worm bin. How many pounds will you need? _____ pounds of newspaper

5. To figure how much water you must add to the shredded newspaper to make the worm bedding 75% moist, multiply the # pounds of the newspaper needed by three (3). How many pounds of water you will need? _____ pounds of water

Bonus activity: Complete the five steps above for each of the following worm bins:

- Wooden worm bin (1 foot by 2 feet by 3 feet)
- Worm-a-way® worm bin (20 inches by 24 inches by 12 inches)
- Patio bench worm bin (12 inches by 24 inches by 42 inches)

How Big a Bin? – Worms require a certain amount of space (volume) to work in to process garbage. A rule of thumb is to set up a worm bin with about ¼ pounds of worms for every cubic foot. The ideal worm bin is quite shallow, usually no more than one foot deep. The reason for shallow worm bins with large surface area is to allow more air to contact the bedding. It does not matter whether the bin is square, rectangular, or round, as long as it is not much more than one foot deep.

Directions: This chart shows how big a worm bin should be to handle different amounts of garbage. Each worm bin in the chart is one foot deep. Use the chart to answer the questions below.

Worm Bin Number	Food Waste Per Day (A)	Initial Weight of Worms (B) (Ax2=B)	Surface Area of Worm Bin (C) (Bx4=C)	Food Waste per Week (D) (Ax7 days = D)
1	0.25 lb.	0.5 lb.	2 sq ft	1.75 lb.
2	0.5 lb.	1.0 lb.	4 sq ft	3.5 lb.
3	1.0 lb.	2.0 lb.	8 sq ft	7.0 lb.
4	1.5 lb.	3.0 lb.	12 sq ft	10.5 lb.
5	2.0 lb.	4.0 lb.	16 sq ft	14.0 lb.
6	3.0 lb.	6.0 lb.	24 sq ft	21.0 lb.
7	4.0 lb.	8.0 lb.	32 sq ft	28.0 lb.

1. How many pounds of worms will you need to set up a worm bin if the amount of food waste produced per day is 1.5 lb.? _____

2. How many square feet of surface area are needed to provide a home for 3 lb. worms and 1.5 lb. food waste per day? _____

3. How many pounds of food waste can a worm bin handle per week if it has 4 sq. ft. of surface area? _____

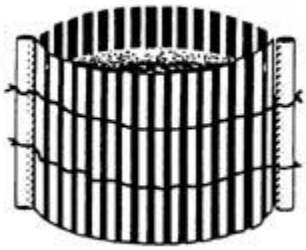
4. If you had a worm bin that was 16 sq. ft. in surface area, how many pounds of garbage could it handle per week? _____

COMPOSTING ACTIVITY #2

Never Underestimate the Power of a Worm

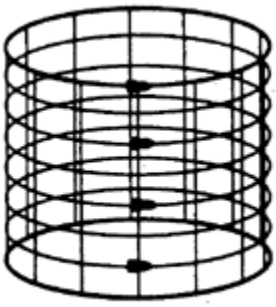
COMPOSTING ACTIVITY #3
Build a Compost Bin

Build a Compost Bin. Below are several examples of compost bins that can be built at home from OSU Extension's Factsheet HYG-1189-99. Include a picture of the bin you complete.



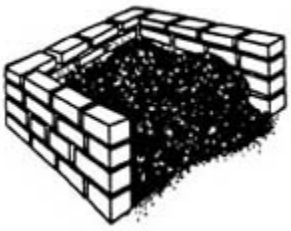
Snow Fence Bin

Bins made with prefabricated snow fencing are simple to make and easy to move and store. To build this bin, buy the appropriate length of prefabricated fencing, and fasten two-by-fours as corner posts to the bottom to form a circle.



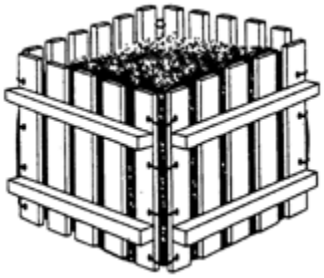
Woven Wire Bin

One easy to make, economical container requires only a length of woven wire fencing. Multiply the diameter you want for the compost heap by 3.2 for the length of fencing to purchase. Fasten the ends with wire or three or four small chain snaps (available at any hardware store) to make a circle.



Block Bin

Compost bins can be made with cement blocks or rocks. Just lay the blocks without mortar; leave spaces between each block to permit aeration. Pile them up to form three sides of a square container or a three-bin unit. This bin is sturdy, durable, and easily accessible. Keep the bin at least 3 inches away from the walls of your house to prevent deterioration of siding.



Wooden Pallet Bin

Covered bins allow convenient protection from pests and heavy rains. Construct bins with removable fronts or sides so that materials can be easily turned. Old wooden pallets can be used for construction. Wire mesh can be substituted for wooden sides to increase air flow.

COMPOSTING ACTIVITY #4
The Dirt Cake Recipe

Materials Needed:
1 3-quart plastic flower pot
3 large mixing bowls
2 measuring cups
3 stirring spoons
3 artificial flowers
Gummy worms

Directions: Have club members help provide the meeting snack with this dirt cake recipe. You can demonstrate how it is made in front of the club, and then dig in and enjoy! The recipe makes approximately 24 ½ cup servings. If you club is larger, you may want to double or triple the recipe. Just make sure you provide for more flower pots, bowls and flowers.

Ingredients Needed:

1 1-lb pkg. chocolate, cream-filled cookies
¼ cup margarine or butter
1 5.9 oz. pkg of instant chocolate pudding
1 8-ounce whipped cream
2 8-ounce packages cream cheese
1 cup powdered sugar
3 cups milk
1 package candy gummy worms

1. Crush cookies into bowl #1.

2. Mix together cream cheese, butter and powdered sugar in bowl #2. (Ingredients should be at room temperature.)

3. Make chocolate pudding with milk in bowl #3. (Hint: Follow directions on package.)

4. Fold whipped cream into pudding in bowl #3.

5. Mix ingredients in bowl #3 with bowl #2. Blend well.

6. In a clean, plastic flower pot, layer 1/3 of the crushed cookies, ½ of the creamed ingredients, 1/3 of the crushed cookies, ½ of the creamed ingredients and top with the final 1/3 of the crushed cookies.

7. Decorate your cake with candy gummy worms and artificial flowers. Eat immediately or refrigerate.

Other ideas: Each club member could bring a small flower pot and make individual dirt cakes. You can also try different cookies or puddings. Include a picture of your club's snack.

COMPOSTING ACTIVITY #5
Create Your Own Composting Activity

Introduction:

Activity:

Summary Questions: