4-H

Recycling

Grades 9-12

4-H Recycling Project

No State Fair Exhibit

Each year, in all levels, the 4-H'er must complete a different recycled article or poster and at least 2 activities for their notebook from the county manual.
Exhibit will be judged by the following guidelines:
Exhibit (75%)

- **Originality of 4-H Exhibit**
- **Choice of Materials (subject of poster)**
- **Workmanship**
- **Usefulness (include in poster)**
- **Creativity of Project/Poster**
- **Information Card Attached**

Notebook (25%)

- **This Manual** (three hole punch)
- **This year and all previous year's work**
- **2 Activities from the manual** in your notebook. You are encouraged to add personal and additional supporting materials, such as photographs, news articles, etc. for each activity.
- **A completed record sheet** for each year in project
- **A description of your recycled project.** You are encouraged to add personal and additional supporting materials, such as photographs, news articles, etc.

ACTIVITIES

1. **Oil Spills**
2. **Oil and Plants**
3. **How Hazardous is Your House**
4. **Biodegradation Rates**
5. **Compost**
6. **Careers**

WHY RECYCLE?

Recycling saves landfill space and energy, thus reducing acid rain, global warming and air pollution.

- Recycling aluminum uses 95 percent less energy than producing aluminum products from raw materials.
- Recycling paper uses 60 percent less energy than manufacturing paper from virgin timber.
- Recycling a glass jar saves enough energy to light a 100 watt light bulb for four hours

Recycling conserves valuable natural resources

- 75,000 trees are used for the Sunday edition of the New York Times each week, yet only 30 percent of newspapers are recycled in the United States.
- Recycling metals minimizes the need for mining new minerals and decreases damage to the wilderness.

HOW TO RECYCLE

- Separate cans, bottles, and newspapers
  Glass: Remove lids from bottles and jars and rinse out well. (Some recycling centers ask that you separate glass by color)
  Cans: Remove labels and rinse well. (Most recycling centers ask that you separate aluminum from other metals)
  Newspaper: Tie newspapers into bundles or put them in a paper bag.

- Contact your local or state recycling division to find out if your community has a curbside recycling program. If so, put out your recyclables the night before the scheduled pickup. If no curbside pickup exists, take your cans, bottles, and papers to the nearest drop off site.

Purchase and consume according to the 4 R's:

Reduce, Reuse, Reject and Recycle
Learn the 4 R's

REDUCE – the amount of waste we produce. ▪ Buy only what you need ▪ Look for the recycle symbol, or the works made from recycled material ▪ Choose boxes with gray interior (recycled paperboard) ▪ Buy economy size or bulk when possible. Saves money and reduces packaging ▪ Avoid disposable products ▪ Bring your own bags when you go shopping	**REUSE** – as much as possible. ▪ Use products that are made to be used many times such as cloth diapers, cloth napkins, towels, rags, sponges, dishes and silverware, rechargeable batteries ▪ Use the blank back sides of paper to take notes and do scratch work ▪ Mend clothes and repair broken appliances ▪ Look into purchasing used goods at second hand stores and junk yards to eliminate unnecessary production
REJECT – over packaging and products hazardous to the environment. ▪ Over-packaged goods ▪ Non-recyclable packaging ▪ Non-recyclable containers ▪ Aerosol containers ▪ Disposable products	**RECYCLE**- the recyclables ▪ Recycling begins in the store where we choose products packaged in recycled and/or recyclable materials, such as: Glass, Paperboard, Aluminum, Steel, Some plastics ▪ Learn where to take your recyclables. Glass, paper and aluminum are the 3 most easily recycled types of packaging. If recycling centers in your area accept plastic soda bottles (PET) and steel cans, also include them in your recyclable packing list.

RECYCLING

Recycling is frequently in the news. We are told that it is the responsible thing to do.

Recycling conserves natural resources, saves energy and reduces the amount of trash going to landfills. Conserving our natural resources doesn't mean not using them, it means using them wisely and sparingly. Recycling involves collecting reusable materials that have been thrown away, processing and distributing them for reuse. In most cases it takes less energy to prepare materials for resuse than to produce new items. Natural resources, such as trees, water, metal ores and oil are conserved through recycling. Materials from these natural resources are recycled and used again. Almost everything can be recycled in some way. Major groupings include paper, aluminum, glass, organic materials and plastics.

To make it easier on recycling centers, they appreciate separating recyclables before arrival. This is easily done in bags or boxes. The following is information for Hamilton County.

Recycling Drop Off Area

The Hamilton County Household Hazardous Waste Center collects all types of household consumer products that are generally considered hazardous or environmentally unsafe to dispose of improperly. Material collected at the center will be recycled, disposed of in a safe manner or be available for reuse in the free swap shop. Other services at the center include recycling containers for glass, plastic, metal, cardboard, and grass clippings. Hamilton County residents only non-business must have driver's license or property tax statement that shows you live in Hamilton County

The Hamilton County Hazardous Waste Center, 1717 Pleasant St., Noblesville, IN 46060

What are the hours of the Hamilton County Hazardous Waste Center?

_____

What days are they closed?

_____

Directions:

The Household Hazardous Waste Center is located immediately west of the

Hamilton County Extension and 4H Fair Grounds on Pleasant Street.

Hazardous Waste

A hazardous waste is waste that poses substantial or potential threats to public health or the environment and generally exhibits one or more of these characteristics.

Ignitable: Ignitable wastes can create fires under certain conditions, and are spontaneously combustible. Examples include waste oils and used solvents.

Corrosive: Corrosive wastes are acids or bases (pH less than or equal to 2 or greater than or equal to 12.5) that are capable of corroding metal containers. Examples include Batter acid.

Reactive: Reactive wastes are unstable under "normal" conditions. They can cause explosions, toxic fumes, gases, or vapors when heated, compressed, or mixed with water. Examples include lithium-sulfur batteries, compact fluorescent light bulbs, peroxides, and explosives.

Toxic: Toxic wastes are those containing concentrations of certain substances in excess of regulatory thresholds which are expected to cause injury or illness to human health. Examples include medicines.

These wastes may be found in different physical states such as gaseous, liquids, or solids. Furthermore, a hazardous waste is a special type of waste because it cannot be disposed of by common means like other by-products or our everyday lives.

Activity 1: Oil Spills

In our recent past, we have heard many reports about the environmental damage caused by oil spills in our oceans, rivers, and other waterways. Many people do research to try to find new ways to clean up an oil spill. This activity is designed to help you learn about what happens when oil is mixed with water and soil, and to get you to think of ways you might try to get the oil out of the water or soil. You may want to take notes and/or photographs to record what happens in each step of your activity.

Vegetable oil will give you the same results and simulate what happens when there is an oil spill in the environment. The waste from this activity can be disposed of in the trash. If you used motor oil, it would be a hazardous waste and require special handling.

Materials:

Glass jar or bowl
Vegetable Oil
Spoon or stir stick
Water
Soil
Other materials of your choice

Oil with Water

What you will do?

1. Fill jar or bowl ¾ full with water.
2. Put several drops of oil in the water
3. Observe what happens
4. Mix the oil into the water
5. Observe what happens
6. Try to get the oil off and out of the water and jar or bowl. Experiment with different materials of your choice to see what does the best job of removing the oil.

What happened:

Did the oil and water mix together?
Describe how it looked

What did you use to remove the oil?
From the Water
From the Bowl
What do you think would happen to animals caught in an oil spill?

Oil with Soil

What you will do?

1 Fill jar or bowl ¾ full with soil.
2 Put several drops of oil on the soil
3 Observe what happens
4 Mix the oil into the soil
5 Observe what happens
6 Try to get the oil off and out of the soil and jar or bowl. Experiment with different materials of your choice to see what does the best job of removing the oil.

What happened:
Did the oil and soil mix together?
Describe how it looked
What did you use to remove the oil?

Activity 2: Oil and Plants

Many scientists are concerned about the effects of the oil on the plant life in the areas where there has been an oil spill. This experiment is designed to help you understand what happens when oil is put on plants. You may want to take notes and/or photographs to record what happens during the experiment.

Vegetable oil will give you the same results and simulate what happens when there is an oil spill in the environment. The waste from this activity can be disposed of in the trash. If you used motor oil, it would be a hazardous waste and require special handling.

Materials:

Flower pot
Soil
Growing weed to transplant
Water
Vegetable Oil
Camera

What will you do?

1. Transplant a weed in flower pot.
2. Water your transplanted weed every few days for about a week or two before continuing with the activity
3. Take a photograph of the weed
4. Put several drops of oil on the weed.
5. Observe and photograph what happens
6. Check the plant again in a few hours
7. Observe and photograph what has happened to the plant
8. Check the plant again in a few days.
9. Observe and photograph what has happened to the plant.

What did you find?

Describe what happened to the plant:

What did the oil do to the plant to cause the results?

How should household products be stored?

Here are several "rules" to follow:

- Follow the storage instructions on the product label.
- Store products out of reach of children and pets. Keep all pesticides and harmful household products locked in a cabinet, a utility area with lots of ventilation or air flow or in a garden shed.
- Store flammable products outside your living area and far away from places where they could catch fire. Keep flammable products away from portable heaters, electric baseboard heaters, around furnaces and outdoor grills.

- Never store pesticides or other household products in cabinets where food is stored, or near food intended for people or animals. Never store pesticides where you keep medicines.
- Always store household products in their original containers so that you can read the label for directions.

Remind your parents to **never** transfer pesticides or other household products to soft drink bottles, milk jugs or other food containers. Children, or even adults, may mistake them for something to eat or drink.

If you see household products in your home not being stored according to these rules, don't be afraid to let your parents know! Storing chemicals safely is for everyone's protection.

If you, or someone you are with, have an accident or are exposed to a pesticide or household product you should tell your parents or other adult in your home immediately. Tell them what happened. Tell them what pesticide or household product it was. If possible, have the container and label with you. Tell them how much you came in contact with and what part of your body came in contact with it (Was it your eyes or skin or did you swallow some?) If an adult is not close by and you are hurt or starting to feel sick, then do the following:

1. If someone splashes a household chemical in the eyes, rinse out the eyes for 15-20 minutes in the shower or under a faucet. Then call your poison control center at 1-800-222-1222. You can also call 911 or your local emergency ambulance number.

2. If someone splashes a household chemical on the skin, take off the wet clothing and rinse the skin for 15-20 minutes in the shower or under a faucet. Then call your poison control center at 1-800-222-1222. You can also call 911 or your local emergency ambulance number.

3. If someone drinks a household chemical, give them half a glass of water to drink. Then call your poison control center at 1-800-222-1222. You can also call 911 or your local emergency ambulance number.

4. If someone inhaled a poisonous gas, quickly get the person to fresh air. Do not breath the fumes yourself. Open all the doors and windows wide. Call your poison control center at 1-800-222-1222. You can also call 911 or your local emergency ambulance number.

5. If someone is not breathing or won't wake up, call 911 or your local emergency ambulance number.

Be prepared for any emergency in your home. Keep your local emergency number, local ambulance number and the local poison control center telephone numbers on or next to your phone. All poison control centers now have the same telephone number. It is 1-800-222-1222.

If you would like more information on poison prevention or want to know about your local poison control center, you can look them up at the State and Regional Poison Control Centers Website.

Activity 3 - How Hazardous is Your Home

Make sure chemicals are properly stored and labeled – Take before & After pictures

Pick 7 chemical in your house and complete chart (see sample label):

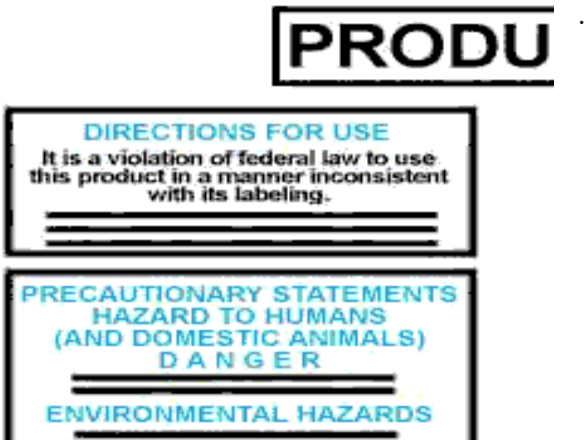
Chemical	Category (Corrosive, Reactive, Toxic)	Precautionary Statement	Storage	First Aid	EPA Registration No.

If you don't have enough room make chart and place in notebook.

Are any of these chemicals expired?

If so how will you dispose of it?

Can any of these be recycled?



CT NAME

KEEP OUT OF THE REACH OF CHILDREN
D A N G E R

FIRST AID
(STATEMENT OF PRACTICAL TREATMENT)

IF SWALLOWED _____
IF INHALED _____
IF IN EYES _____
IF ON SKIN _____

PHYSICAL OR CHEMICAL HAZARDS

STORAGE AND DISPOSAL

STORAGE _____

DISPOSAL _____

ACTIVE INGREDIENTS: _____ %
OTHER (INERT) INGREDIENTS: _____ %
TOTAL: 100.00%

THIS PRODUCT CONTAINS XX LBS. OF XXXX PER GALLON

WARRANTY STATEMENT _____

MANUFACTURER'S ADDRESS _____

NET WT. / NET CONTENTS STATEMENT: _____

EPA Registration No. / EPA Reg. No: _____

EPA Establishment No. / EPA Est. No: _____

Composting

Composting is decayed organic matter created through the act of biodegration. Sounds impressive, doesn't it? It's actually very simple. Biodegradation is "organic" or natural materials returning to soil. In a forest leaves and dead plants biodegrade. So do fallen trees, though much more slowly. Farmers make use of biodegration. They often spread animal manure over their fields it fertilizes the soil by the minerals in the manure returning to the soil. Composting, which is the result of biodegradation, is using this breakdown of organic matter to create a fertilizer for reuse on land. What are some of the things in house hold trash that you can think are biodegradable?

Did you say food waste, paper (paper is made from wood – a natural substance!), wood, and cotton clothing? See the chart on the next page. Human made products, such as most plastics, glass, metal alloys, and fibers (polyester, nylon – clothes), biodegrade very, very slowly. So they are not useful to composting.

Composting on a large scale is not very efficient and can be very expensive Why do think? (Here's a hint: if you were going to compost all your family's trash, what would you have to take out of it?) Since part of our waste stream is not able to be composed, composting could not be a complete way to discard our trash. But it is a way to dispose of some of our waste that cannot be recycled, reused, or easily burned – food waste.

Activity 4: Biodegradation Rates

In this activity you will learn about landfills and how they work. You will also learn about how articles decompose, as well as what types of items decompose faster. You may want to record your results in a notebook and/or take photographs of the activity as it progresses.

Materials:

4 large glass jars or buckets
Soil
Miscellaneous solid waste (examples: lettuce leaf, banana peel, flower petals, glass, paper, foil, plastic)
Crayon or marker
Masking tape or label
Water

What you will do:

1. Fill each year about half full of soil
2. Place one item of waste in each jar on top of soil
3. Cover the item with additional soil
4. Dampen soil with water
5. Classify each waste item as organic, renewable, resource/recyclable, non-renewable resource/recyclable, non-renewable resource/hard to recycle.

6. Label each jar with the date, waste item buried and classification
7. Place jars out of direct sun and away from people and animals
8. Guess what will happen to the solid waste item in each jar. Write down your prediction
9. Stir soil occasionally and keep soil damp with water
10. In 3 weeks, examine jars for the condition of the buried solid waste item.

What did you find?

Describe what you found when checking the buried items after 3 weeks?

Describe what you learned from the activity in terms of the importance of recycling some items, the effects on our environment from not recycling, etc.

Describe any other observations you made from this activity

Activity 5: Making Compost

Choose one of the following or 1 from other information source– Complete the table and include how you made it and photos of you making it in your notebook

Type	Cost	Recycled Materials Used
Pet Waste Compost System		
Composting Bin		
Compost Pocket		

Pet Waste Composting

Materials
Old Garbage Bin
Drill and ¾ inch drill bit
Saw
Rocks
Septic Starter

Drill a ¾ in holes all around the sides of the garbage bin.
Remove the bottom of the bin
Dig a hole large enough for the bin in the back of an ornamental garden, away from any food crops.
Place rocks in the bottom of your hole. This is so it will have good subsoil drainage. You can test this with a hose first and water to make sure it drains.
Place bin into the hole
Add dog waste
Once a month add some septic starter and small amount of water this will help in decomposing
Covered with a plastic lid
Empty my dog's waste in the pit every day so that it will break down as compost
You can also add some chopped yard waste green and brown to hasten the process.
If you bin gets full you can add a few pints of fresh water over the surface and a few composting worms to the bin and sawdust. You don't need too many of them, because they will thrive and reproduce. By the time the entire contents have muttered, you will be able to handle the compost without any worries at all. Then you can use some of that finished compost, which contains now worms and their eggs, to "seed" the next bin.
The finished dog waste compost can be used on ornamental gardens only not on food crops.

Compost Bin

Materials
40 to 50 gallon trash can with locking lid
Drill with ¾ inch drill bit
Concrete block or Bricks
Green and Brown Trash
Water

Drill ¾ inch holes all around the bin and in the top of the trash bin.

Place it on concrete blocks or brick. It needs to be up on something so it can get good air circulation as this is an important part of the composting process.

The other important part is having enough Nitrogen – Green items and enough Carbon – Brown items to make this black gold.

Now you want to alternate green and brown in your bin. You want to chop the green up in tiny pieces and throw it in here with some brown. And the brown could be the leaves that you rake up or straw or anything or pine needles that you have. And so, by layering those, you're adding carbon and a source of nitrogen.

Make sure the lid is locked on and roll it around every 2 weeks. Now you don't want to get too much compost in the bin as it makes it too difficult for you to move around.

Some sources of carbon along with their carbon-nitrogen ratio. You can use these numbers to better determine how much brown and green stuff you should use to make the best mix for composting. Some things, such as sawdust, are very high in carbon compared to their nitrogen content, while others, such as leaves, are not so high.

♦ Dried leaves 60:1

♦ Pine needles 90:1

♦ Newspaper 125:1

♦ Sawdust 625:1

Here are some sources of nitrogen along with their carbon-nitrogen ratio. Once again, you can see that the ratio varies a lot between the different ingredients.

♦ Food Scraps 15:1

♦ Grass clippings18:1

♦ Coffee grounds20:1

♦ Horse manure 25:1

Don't use meat, milk products because pets and other animals may try to dig them up out of your compost bin. Also don't use diseased garden plants. They can spread disease back into the garden later when you use the compost.

♦Meat ♦ Bones ♦ Cheese

♦ Fat ♦ Milk ♦ Oils

♦ Pet droppings ♦ Diseased plants

Compost Pocket

Another way to compost in the garden is by making Compost Pocket. Start by digging a hole about 18" deep. Place fruit, vegetable scraps and coffee grounds from the kitchen in the hole. Don't use meat, fat, milk or eggs because pets or wild critters will try to dig them up for lunch.

Next, cover the scraps with soil to bury them and fill the hole. Now you can make more compost pockets in other areas. After about a month or two you can plant a flower or maybe a tomato plant on the spot where you made the compost pocket. Then stand back and watch it grow!

Careers

With environmentalism efforts on the upswing, the working world is making changes as well. Companies are implementing recycling and community effort programs to clean up. Employers are offering reimbursements for purchasing fuel-efficient vehicles or finding other means of commuting. Recyclable materials are commonly used in the workplace. With all of these changes, finding eco-friendly employment has never been easier.

If your expertise isn't science-related, it doesn't mean you're out of luck. Education, communication, business and most other lines of work all have jobs evolving from society's drive to become more eco-friendly. Science teachers and professors school the public at an early age about environmental well-being. Public health officials keep an eye out for health and environmental safety. Eco-friendly interior designers and architects create buildings and spaces that save energy without losing style. Housekeepers and dry-cleaners are ditching harsh chemicals and processes in favor of more energy- and air-friendly means of cleaning.

So, even if your interests and work history don't involve years of agricultural studies or water conservation, you can still find a job that lets you "go green." Here are just a few jobs with green opportunities out there:

1. Hydrologist: The median annual income is $51,080.*
2. Environmental engineer: The median annual income is $50,000.
3. Pest control technician: The median annual income is $30,500.
4. Conservation biologist: The median annual income is $52,480.
5. Science teacher: The median annual income of kindergarten, elementary, middle and secondary school teachers ranges from $41,400 to $45,920.
6. Toxicologist: The median annual income is $79,500.
7. Pollution control technician: The median annual income is $32,000.
8. Fund-raising director: The median annual income is $45,000.
9. Ecologist: The median annual income is $68,950.
10. Camp counselor: The median annual income is $19,320.
11. Business manager: The median annual income is $50,000.
12. Economist: The median annual income is $72,780.
13. Forester: The median annual income is $48,230.
14. Environmental attorney: The median annual income for attorneys specializing in construction, real estate and land use is $70,000.
15. Community affairs manager: The median annual income is $56,000.
16. Environmental health and safety technician: The median annual income is $35,500.
17. Landscape architect: The median annual income is $53,120. For landscape architects in nonsupervisory, supervisory and managerial positions for the federal government, the average annual income was $74,508.
18. Waste disposal manager: The median annual income is $35,000.
19. Environmental chemist: The median annual income is $51,080.
20. Corporate waste compliance coordinator: The median annual income is $39,000.
21. Urban and regional planner: The median annual income is $45,250.
22. Agricultural inspector: The median annual income is $35,000.
23. Wastewater water operator: The median annual income is $35,000.
24. Wildlife biologist: The median annual income is $42,000.
25. Air quality engineer: The median annual income is $66,000

* Salary information from the Bureau of Labor Statistics and Payscale.com

Activity 6 – My Possible Career

Pick 1 career from the above list or any other career related to the 4 R's and find the following information:

My Possible Career:_____

3 Colleges that has this Career	3 Scholarships Available to Apply for.	How Many Years of College

Do you know anyone in this field?

Who are possible Employers?