

# It *is* Easy Being Green.....

Join Freddy in his efforts  
to reduce solid waste!!!



Division of Solid Waste Management  
Department of Public Works  
City of Springfield, Missouri  
**Recycling Hotline 864-1904**  
[www.springfieldmogov.org/recycling](http://www.springfieldmogov.org/recycling)



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# It *is* Easy Being Green.....

Activity Guide for Solid Waste Management Education

Lessons for Elementary Grades

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# PREFACE

The City of Springfield's Division of Solid Waste Management presents this guide to facilitate solid waste management education for our local students. The City of Springfield utilizes an integrated system which includes many active, successful programs and services.

The Integrated Solid Waste Management System (ISWMS) consists of these various components:

**\*Curbside Recycling** – Curbside recycling is the easiest, most convenient method of recycling. You simply set the recyclables by your curb on your designated collection day. All licensed waste haulers are required to offer this convenient service to their customers.

**\*Household Chemical Collection Center** – Springfield's Household Chemical Collection Center accepts household-generated chemical waste. This facility allows citizens to remain in their vehicles while technicians remove the items from their cars. The average trip through the covered drive-through facility totals five minutes or less. The City operates this center for all Greene County residents.

**\*Information and Education Program** – This is an ongoing program that offers materials, activity guides, presentations, brochures, a web site, etc.

**\*Market Development** – Ongoing efforts continue to develop new markets and to expand existing markets for recyclables as well as encouraging “closing the loop” through buying recycled products.

**\*Springfield Sanitary Landfill** – Non-recyclable solid waste is taken here, and disposal is monitored by sound landfill management.

**\*Yardwaste Recycling Center** – Yardwaste is composted and brush is chipped into landscaping mulch at this center. The facility is “one-stop shopping” for your yard care needs. In just one trip, you can bring your grass clippings, leaves, and limbs and take home compost or mulch.

**\*Recycling Centers** – There are convenient sites offered to Greene County residents which accept aluminum, tin/steel cans, milk jugs, two-liter bottles, colored number one, number two, and number three plastics, newsprint, cardboard, magazines, mixed office paper, etc.

Any one of these programs or services could not stand alone as the answer to the complex challenges facing today's municipal solid waste managers. Yet, when utilized as a part of the Integral Solid Waste Management System, the combined effect on the reduction of our waste stream is significant.

For more information, call the Recycling Hotline at 864-1904  
<http://www.springfieldmogov.org/community/recycling/index.html>

# ***It is Easy Being Green***

*It is Easy Being Green* is a teacher friendly educational resource for teaching the many important concepts about recycling and the environment. Environmental education is a lifelong process that must begin at an early age to instill lasting habits for our future. By introducing these essential environmental concepts to our school children, teachers will build a strong foundation of skills and knowledge that will aid students in making positive and effective decisions for our environment in the future.

The following materials are available for you to check out from the City of Springfield:

- Classroom posters – “How to Recycle,” “Garbage Pizza,” “Milk Jugs to Toys”
- *Rotten Truth* video - Where do smelly old sneakers, sticky soda cans, and other yucky things go after you throw them away? Can you ever make nothing out of something? This entertaining **3-2-1 Contact Extra** takes you on an adventure with cast member Stephanie Yu and some surprise guests - like The Rappin’ Wrapper - to learn **The Rotten Truth** about garbage. Come along with Stephanie as she visits a landfill, leads a tour through the Museum of Modern Garbage, and much more. You’ll find amazing facts, terrific live-action footage, colorful animation, great music, and plenty of fun in this special 30-minute **Extra** from the award winning science series, **3-2-1 Contact**.
- Household chemical kits are available. This can be used for visuals to help the students to identify the signal words.
- Recycled Products Trunk – Samples of several products made from recycled materials are included along with explanatory fact sheets. These include a t-shirt and a carpet sample made from pop bottles; toys made from milk jugs; cat and dog litter made from mixed paper; and others.

Please give one week advance notice prior to needing these items. Because of high demand for these items, we ask they be returned in one week; however, special arrangements can be made.

To request these materials, call the Recycling Hotline at 864-1904.

# *Show-Me Standards emphasized in this activity guide*

## **Goal 3**

**Students in Missouri public schools will acquire the knowledge and skills to recognize and solve problems.**

1. develop and apply strategies based on ways others have prevented or solved problems
2. develop and apply strategies based on one's own experience in preventing or solving problems

## **Goal 4**

**Students in Missouri public schools will acquire the knowledge and skills to make decisions and act as responsible members of society.**

1. identify tasks that require a coordinated effort and work with others to complete those tasks
2. identify and apply practices that preserve and enhance the safety and health of self and others

### Communication Arts

1. comprehending and evaluating the content and artistic aspects of oral and visual presentations
2. participating in formal and informal presentations and discussions of issues and ideas

### Science

1. properties and principles of matter and energy
2. characteristics and interactions of living organisms
3. processes of scientific inquiry (such as formulating and testing hypotheses)
4. impact of science, technology, and human activity on resources and the environment

## Missouri's Frameworks for Curriculum Development in Science

### II. Scientific Relevance A. The Nature of Technology

*By the end of grade 2, all students should know*

2. When people want to build something or try something new, they should try to figure out ahead of time how this might affect all living things and environments.

*By the end of grade 2, all students should be able to*

- a. predict, analyze, and evaluate the potential effects of technological solutions to simple problems on other people or the environment, considering such issues as costs, benefits, and consequences (3.6; 3.7; 3.8)

*By the end of grade 4, all students should know that*

3. Technology extends the ability of people to change the way things work.

*By the end of grade 4, all students should be able to*

- a. develop several alternative strategies to solve existing and potential environmental or technological problems, analyze and evaluate the alternatives by comparing strengths (such as safety or ease of use) and weaknesses (such as cost or appearance), and determine the best solution ( 3.6; 3.7; 3.8)

### II. Scientific Relevance A. The Nature of Technology

*By the end of grade 8, all students should know that*

1. The issues related to science, technology, and society are often complex and involve risk/benefit trade-offs.
  - a. analyze, evaluate, and communicate both benefits and possible risks to health, society, and the environment associated with investigations and technological advances reported in the media (1.1; 1.2; 1.7; 1.9; 2.1; 2.2; 2.3; 3.1; 3.5; 3.6; 3.8; 4.1; 4.3; 4.4; 4.6)
2. Breakthroughs in science often lead to advances in technology, and improved technological equipment leads to more accurate data collection in scientific inquiry.

*By the end of grade 8, all students should be able to*

- a. identify and analyze ways in which advances in science and technology have affected each other and society (1.1; 1.2; 1.6; 1.7; 1.9; 3.8)

### VI. Earth Systems A. Physical Systems

*By the end of grade 2, all students should know that*

2. Earth's natural resources are limited.
  - a. conduct research to develop and evaluate information on the use and abuse of Earth's natural resources (1.2; 1.9)

### **VIII. Ecology B. Changes**

*By the end of grade 2, all students should know that*

1. All organisms, including humans, cause changes in their environments that can be either beneficial or harmful to the organisms in the ecosystem.
  - a. observe and record environmental changes and the reactions of organisms to these changes over time (1.2; 1.5; 2.4; 3.1; 3.5; 4.1)

### **VIII. Ecology A. Interactions**

*By the end of grade 4, all students should know that*

4. Behavior patterns and survival of organisms result from their interactions with a specific environment.
  - a. predict how specific changes in the environment will affect people and other organisms found in this environment (1.1; 1.3; 2.4; 3.2; 3.4; 3.5; 4.1; 4.6)

### **VIII. Ecology B. Changes**

*By the end of grade 4, all students should know that*

2. Organisms that survive in an environment have developed adaptations that allow the organisms to compete for available resources and cope with the physical conditions of their environment.
  - a. identify positive adaptations of organisms to a given environment that increase chances for survival (1.3; 1.4; 2.3; 3.5; 4.1)
3. Human activities can change the environment in ways that affect the health and survival of all living organisms.
  - a. explain how human activities can affect the environment in positive and negative ways (1.1; 1.2; 1.3; 1.4; 1.8; 2.1; 2.7; 3.5)

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# Unit 1

## Solid Waste, Landfills, and Natural Resources

### BACKGROUND

**Solid waste** is trash, garbage, or any other material that we consider worthless or unnecessary. We want to reduce the amount of solid waste in our landfills. When we bury solid waste in landfills, little or no oxygen gets to the waste; therefore, decomposition does not take place (see “**How Long Does It Take**” handout to explain decomposition).

In the past, people only worried about how convenient it was to dispose of solid waste. Much of the waste was thrown in lakes, rivers, and streams, or piled or burned in open dumps. Today, people bury their solid waste in “sanitary landfills.” **Landfills** are an improvement over old disposal methods because the waste is covered with soil each day to prevent odor and pests. They all are required to have liners and other safety systems. These help limit leaching, which is the seeping of rainwater through the waste. In a landfill, rainwater and any liquids in the waste soak down through the layers. If there are hazardous materials in the landfill, they can be washed down as well. The leachate will soak down through the layers until it is stopped by the liner. The leachate is then drained from the landfill and processed to eliminate contaminants.

Landfills don’t last forever. In many areas, they are already full. Building new landfills is difficult. Land is limited and very expensive. It also costs a lot of money to build a landfill. If cities cannot find new sites in which to put landfills, they may have to pay high fees to move the landfills to new places.

Even though we will always need landfills, we can make the lives of our landfills longer by reducing the amount of waste we create.

**Natural Resources** are things in nature that we use to make products and to survive. Natural Resources are valuable because they cost money to obtain and use, and many of them cannot be replaced. Metal ore, for instance, cannot be replaced. Once it’s gone, it’s gone!

What we need to survive:

**Sun** – It gives us light and warmth. We need sun for plant growth.

**Air** – Our bodies must breathe air in order to live. Plants and animals also need air to survive. It’s not good for our bodies to breathe polluted air. We must work to keep the air clean.

**Water** – We need water to drink and bathe, and we also like it for recreation. Plants and animals also need water to survive.

**Land** – People, plants, and animals all need land on which to live. We also need land for plants and animals to use for food.

**Animals** – We get many of our foods and clothing from animals. We also enjoy their companionship.

**Plants** – Animals and humans need plants for food. We need some plants for making clothes, such as cotton. Plants also help keep our air clean. Many of our plants are used to make products, such as trees, which are used to make paper items.

What we need to make products:

**Metal Ore** – This is a metal substance that is taken from the ground to make items such as steel and aluminum. Once metal ore is gone, it's gone!

**Oil** – This is a liquid taken from the ground for energy, like electricity, and is also used for products such as gasoline. Once this resource is gone, it's gone. This why we need to conserve this precious resource.

**Sand** – Sand is a resource that is taken from the earth and is used to make glass.

It is important to conserve (use wisely, not being wasteful) our natural resources.

Suggestions:

1. Turn off lights and the TV when not using them.
2. Don't leave the water running when brushing your teeth.
3. Close the refrigerator door as soon as you get what you need.
4. Plant a tree.
5. Do not use more paper (napkins, notebook paper, etc.) than you need.
6. Do not litter on the ground or in water.
7. Use real plates and cups, and cloth napkins instead of disposable paper ones whenever possible.
8. Recycle any items that you can.
9. Reuse as many items that you can instead of throwing them away (i.e., using both sides of a piece of paper).

# Solid Waste, Landfills, and Natural Resources

## VOCABULARY

**Solid Waste** – trash, garbage, or any other materials considered worthless and unnecessary

**Litter** – material on the ground that is considered worthless and unnecessary

**Landfill** – a carefully engineered site for the safe disposal of solid waste

**Leachate** – the collection of water and liquids that seep to the bottom of a landfill (usually a contamination threat)

**Decompose** – to break down

**Environment** – everything, living and non-living, that surrounds us

**Metal Ore** – a metal substance taken from the ground used to make items such as tin and aluminum

**Oil** – a liquid taken from the ground for energy

**Electricity** – energy used to make heat and light and to operate appliances

**Natural Resources** – things in nature that we use to make products and to survive

**Valuable** – something important and precious

**Conserve** – to use wisely, not being wasteful

## ACTIVITY/ASSESSMENT IDEAS

1. Devise a bingo game where the vocabulary words are on the game cards. The teacher calls out the definition and the students find the word on their card that belongs with that definition (or vice versa).
2. Bring in a sack of “solid waste.” Have the students examine the waste and discuss where the waste will go, if the waste is a valuable resource being thrown away, and what are some good alternatives for the waste.
3. Conduct a litter experiment. Before students enter the room, scatter litter items around the room. Do not mention the litter. Watch students’ reactions and behaviors. Eventually, ask the students how they feel about having their environment littered. Discuss the problems of litter and have the class decide on behaviors to prevent this. Tell them to share these ideas with parents/guardians.
4. Make a litter poster that looks like a calendar. At the end of the day, have the students check the room for litter. If the room is “litter free,” then put a star by that day.
5. Make a mini-landfill. Before this activity, discuss the “**How Long Does It Take**” handout. Students can then see the decomposition process for themselves. **You will need:** small aquarium, soil, metal paper clip, small piece of plastic, newspaper, aluminum foil, and pieces of food waste. **Procedure:** Put a layer of soil in the aquarium and put a few solid waste items on top. Lightly water, and then cover with more soil. Alternate soil and solid waste, ending with a two-inch soil layer. Try to put the solid

waste items close to the sides. You may want the students to eventually dig up the items and observe their changes. Lightly water every day. Have the students devise a hypothesis about what will happen to the waste.

6. Do a leachate activity. **You will need:** coffee grounds, coffee filter, glass jar.  
**Procedure:** Pour hot water over the coffee grounds that are in the coffee filter. Make sure to put this over the jar. Do not burn yourself! You will see, the first poured water is absorbed. As the grounds get saturated, the water leaches through the grounds, and what you collect in your glass jar is leachate. Therefore, you can conclude that leachate is partly water and partly the chemicals it has picked up on the way.
7. As a geography activity, have the students locate the landfill, recycling centers, etc., in their community. (You may obtain addresses for Springfield, Missouri, locations from the City of Springfield by calling the Recycling Hotline at 864-1904.)
8. For a cut and paste activity, divide the class into groups and provide them with poster board, each titled with a natural resource. Have the students bring old magazines from home or provide them with a variety of magazines. Have them find several examples of products which come from that natural resource and paste it on the appropriate board. Have the students orally present their work to the class and display them, if possible.
9. Distribute **Unit1/Exercise 2**. Discuss each scenario as a class to ensure that they understand the need to conserve natural resources and what actions to take to do so.
10. Conduct a plant growing experiment. Have the students plant seeds or small plants in little pots or milk cartons. Have the students plant with each of the following conditions:
  - No sunlight (cover the plant with a box)
  - No air (cover the plant with a plastic bag)
  - No water
  - No soil (plant in sand or rocks instead of soil)
  - Plant under ideal conditionsThis helps the students see how vital our natural resources are to living things. Have students keep records of the growth. You may want to have different groups each choose a condition in which to plant, then give an oral presentation (with graphs, overheads, etc.) on their findings. Then, grow a plant in ideal conditions and make comparisons.
11. Have the students start a conservation campaign by making posters and displaying them throughout the school. They may want to draw a picture of a “conserving behavior.”
12. The pencil/paper test may be given for further evaluation.
13. Plant a tree. It is important that students know the value of trees. We get many products from trees. They provide homes for animals, help clean the air, etc. Students should also know that it takes a long time for trees to grow. This is another reason to conserve trees.

***Learning with Literature***

*Brother Eagle, Sister Sky* Paintings by Susan Jeffers

*Just a Dream* by Chris Van Allsburg

*Once There Was a Tree* by Natalia Romanova

## The Rotten Truth Video

Name \_\_\_\_\_ Date \_\_\_\_\_

- How long does it take each of the following items to disintegrate?

Banana peel	_____
Sock	_____
Plastic bag	_____
Newspaper	_____
Leather purse	_____
Disposable diaper	_____
Wooden chair	_____
Statue of Liberty	_____
Glass jar	_____
- Which item from the above list will take the longest to disintegrate? \_\_\_\_\_
- Approximately how many pounds of trash does a four member family make each week?  
\_\_\_\_\_ pounds
- Where does our garbage go? \_\_\_\_\_
- What is the difference between a landfill and a dump?  
\_\_\_\_\_  
\_\_\_\_\_
- Explain what the “Not in my Backyard Syndrome” is.  
\_\_\_\_\_  
\_\_\_\_\_
- \_\_\_\_\_ is burning trash at a very high temperature. The trash is turned into ash which takes up less space in the landfill.
- What can you add to your compost to speed up the decomposing process? \_\_\_\_\_
- Name at least three materials that were recycled in the Material Recycling Facility.  
\_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_
- Finding ways to make less garbage is called \_\_\_\_\_.

Bonus question: What did the Rappin’ Wrappers mean by “Don’t let the wrapper fool you”?

Answers to **The Rotten Truth** worksheet

1. How long does it take each of the following items to disintegrate?

Banana peel	<b>2-5 weeks</b>
Sock	<b>1-5 years</b>
Plastic bag	<b>20-30 years</b>
Newspaper	<b>less than 1 year</b>
Leather purse	<b>50 years</b>
Disposable diaper	<b>300-500 years</b>
Wooden chair	<b>20 years</b>
Statue of Liberty	<b>1,500 years</b>
Glass jar	<b>1 million years</b>
  
2. Which item from the above list will take the longest to disintegrate? **glass jar**
  
3. Approximately how many pounds of trash does a four member family make each week?  
**100 pounds**
  
4. Where does our garbage go? **landfill**
  
5. What is the difference between a landfill and a dump? **Answers may vary. A dump does not take sanitary precautions while landfills try to protect the environment by covering the garbage each day with dirt. A landfill places a plastic/clay lining at the bottom of the landfill to keep toxins from seeping into the ground.**
  
6. Explain what the “Not in my Backyard Syndrome” is. **Our landfills are filling up fast. New landfills need to be built, but no one wants a landfill to be built by their home or business.**
  
7. **Incineration** is burning trash at a very high temperature. The trash is turned into ash which takes up less space in the landfill.
  
8. What can you add to your compost to speed up the decomposing process? **earthworms**
  
9. Name at least three materials that were recycled in the Material Recycling Facility?  
**glass, aluminum, paper, plastic**
  
10. Finding ways to make less garbage is called **reduction**.

Bonus question: What did the Rappin’ Wrapper’s mean by “Don’t let the wrapper fool you”?

# How Long Does It Take?



**Decompose:** to break down

- Paper..... 1 month
- Tin can..... 100 years
- Aluminum can..... 500 years
- Glass bottle..... 500 years or more
- Plastic milk jugs..... NEVER

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# Unit 1/Exercise 1

Name \_\_\_\_\_

Directions: Match each product with the natural resource from which it comes by placing the correct letter on the line next to the product.

- A. Trees            B. Plants            C. Animals            D. Oil  
E. Metal Ore        F. Sand

\_\_\_\_\_ Wooden chair

\_\_\_\_\_ Gasoline

\_\_\_\_\_ Aluminum can

\_\_\_\_\_ Cotton t-shirt

\_\_\_\_\_ Glass bottle

\_\_\_\_\_ Leather shoes

- 
- 
- A. Trees            B. Plants            C. Animals            D. Water  
E. Land            F. Sun

\_\_\_\_\_ Warmth and light

\_\_\_\_\_ Meat for food

\_\_\_\_\_ Books

\_\_\_\_\_ Vegetables to eat

\_\_\_\_\_ Area for planting food

\_\_\_\_\_ Used for drinking and bathing

# Unit 1/Exercise 2

Name \_\_\_\_\_

Directions: Decide which behavior is the best to help conserve natural resources by putting a circle around the best behavior.

1.    A.    Marsha wanted a drink before she went to bed, so she used a paper cup.  
      B.    Marsha wanted a drink before she went to bed, so she used a glass cup.
  
2.    A.    David wanted to practice writing his name. He wrote his name once on every sheet of paper in his notebook.  
      B.    David wanted to practice writing his name. He filled only five sheets of paper using the front and back.
  
3.    A.    Nancy spilled her soft drink on the kitchen floor, so she used a cloth towel to clean it and then put the towel in the dirty clothes.  
      B.    Nancy spilled her soft drink on the kitchen floor, so she used half of a roll of paper towels to clean it and then put them in the trash can.
  
4.    A.    Albert was getting ready to take a bath, so he ran his bathtub full, and the water splashed all over the floor.  
      B.    Albert was getting ready to take a bath, so he ran only as much water as he needed.
  
5.    A.    When Sherry was finished playing in her bedroom, she turned off her light before she went to the living room.  
      B.    When Sherry was finished playing in her bedroom, she left the light turned on and went to the living room.
  
6.    A.    Lacy and her friends had a picnic, and they had canned pop to drink. When they finished their pop, they recycled their cans at the recycling center.  
      B.    Lacy and her friends had a picnic, and they had canned pop to drink. When they finished their pop, they threw their cans in the trash.

# Unit 1 Test

Name \_\_\_\_\_

Directions: Circle the letter of the best answer.

1. The space in the landfill will last forever.  
A. True  
B. False
2. It takes many items a long time to decompose. Decompose means to  
A. be put in a landfill.  
B. rewrite a song.  
C. break down and become part of the soil.
3. In order to survive, we need all of the following except  
A. sun.  
B. television.  
C. air.
4. It is not important for us to have clean air.  
A. True  
B. False
5. Metal ore is a  
A. plastic jug we use for milk.  
B. liquid used to make soft drinks.  
C. metal substance taken from the ground.
6. Animals provide us with  
A. clothes and food.  
B. glass.  
C. aluminum.
7. Which of the following is not a product made from trees?  
A. a book  
B. concrete sidewalk  
C. wooden chair
8. All natural resources can be replaced.  
A. True  
B. False

9. All of the following are ways in which to conserve natural resources except
- A. turn off the lights and TV when not using them.
  - B. never leave the water running when brushing your teeth.
  - C. always throw your trash on the ground if you are not close to a trash can.
10. It is important to tell our families about natural resources and the landfill and how to conserve them.
- A. True
  - B. False

# Unit 2

## Reduce, Reuse, and Recycle

### BACKGROUND

**Reducing** is a very important way to fight the problem of too much trash. One preventable reason for having so much waste is that we use too much material for packaging. For instance, when you order a new item, you often have to dig through a large box that is full of packing peanuts to get to one tiny object. This is an example of over packaging (having more packaging material than is really needed). This causes us to have more waste to take to the landfills.

Another example of this might be when buying the single serve juice containers. If we would buy the large container of juice instead of the singles, we would produce less waste. We would only have one container to throw away instead of several. This is called *source reduction*. (See “**Pretzel Activity**” #2.) When we pay close attention to buying recycled and recyclable products and how they are packaged, this is called “*pre-cycling*.”

The following are other ways in which to reduce our waste:

1. Buy products that require no or very little packaging when available (for example, purchasing fresh, loose produce instead of produce in unnecessary containers)
2. Buy fewer disposable items
3. Use both sides of a piece of paper
4. Take good care of toys. A broken toy is waste!
5. Reuse any items that you can. (For instance, a jelly jar can be used as a drinking glass.)
6. Recycle any items that you can
7. Give unwanted clothes, books, and toys away or have a yard sale
8. Buy products in larger quantities to reduce wasted packaging materials
9. Use cloth napkins instead of paper
10. Use rechargeable batteries

**Reusing** is another way to help keep waste from the landfill. This means to use items again. There are many items that we throw away each day that can be used again. If we try to reuse as many of these items as possible, we will help to reduce the amount of waste that goes to the landfill.

The following are some ideas to reuse many items:

1. Use both sides of a piece of paper
2. Reuse any plastic bags – storage bags, bread bags, etc.
3. Find new uses for empty containers such as butter tubs, etc.
4. Reuse any cardboard boxes or paper sacks
5. Give away any clothes that no longer fit
6. Reuse old buttons, material scraps, etc., for craft projects
7. Give away any toys that you no longer use

8. Allow for your friends or relatives to read books that you have finished
9. Purchase reusable items instead of disposables (i.e., electric razor versus disposables)

**Recycling** is turning our waste into new products, using what we throw away over and over again in some way or another. That is, turning a product into another product of that material or simply reusing that product for another purpose. We know a product can be recycled if there is a recycling symbol located on the product (see “**Recycling Symbol**”).

The following can be recycled in or around Springfield:

1. **Glass** – Glass can be melted to make new containers and other glass products.
2. **Mixed Paper** – Newspapers and other paper products can be made from recycling paper. In Springfield, Missouri, paper recycling includes: computer paper (green bar, blue bar, multi-color, and all white); photocopies; letterhead; white and colored legal pads; white and colored notebook paper; white and colored envelopes; window envelopes; adding machine tape; colored paper; carbonless forms; manila folders; magazines; paste board (such as paper towel rolls, cereal boxes, shoe boxes, etc.); paperback and hardback books; telephone directories; paper feed bags; slick newspaper inserts; paper grocery sacks; paper egg or produce cartons; catalogs; and junk mail. In Springfield, paper is recycled to manufacture cat and dog litter and animal bedding products.
3. **Aluminum and Tin** – These are usually drink and food containers that can be melted and made into new cans and other metal products. We know that tin is attracted to a magnet and aluminum is not.
4. **Cardboard** – This can be used to make new cardboard and other products.
5. **Plastic** – There are many different types of plastics that can be used to make new plastic products. We know which plastics are the easiest to recycle by looking at the number in the middle of the recycling symbol (see “**Plastic Recycling Symbol**”). There are seven different types of plastics (see “**Plastic**”). The smaller the number, the easier it is to recycle. This means it can be broken down into new products easier. Because of this feature, the need for these low numbered plastics is higher and they are accepted in most Recycling Centers. Check with your community Recycling Centers to see which numbers they accept. In Springfield, Missouri, call the Recycling Hotline at 864-1904 or check the Web site at <[www.springfieldmogov.org/recycling](http://www.springfieldmogov.org/recycling)>.

Curbside is the easiest way to recycle. All you have to do is sort your recyclables, set them at the curb, and your waste hauler will collect them.

Recycling Centers are places where you can take your recyclable items. You will need to find the most conveniently located Recycling Center in your community. In Springfield, Missouri, call the Recycling Hotline at 864-1904 or check the Web site at <[www.springfieldmogov.org/recycling](http://www.springfieldmogov.org/recycling)>.

Recycling is the very best way to reduce the amount of waste we take to our landfills. It also helps to conserve our natural resources, reduce littering, and create jobs.

It is important to know how to prepare your recyclables correctly. Often our recyclables are contaminated (something in the material that lessens its value as a raw material) because they are not prepared properly.

#### Preparing your recyclables

1. Aluminum Cans – Rinse, crush to save space
2. Tin Cans – Rinse, place lids inside cans
3. Glass – Rinse, remove all metal/plastic caps and rings
4. Mixed paper –Place in paper grocery bags, keep them dry
5. Cardboard – Empty, remove tape, staples, and packing material, flatten to save space
6. Plastic – Rinse, remove all caps and rings, flatten to save space, separate #1 (pop bottles) and #2 (milk jugs) and all other plastics accepted in your community.

See “**How to Recycle**” handout for steps to follow in starting recycling in the home.

## VOCABULARY

**Pre-cycling** – buying recycled and recyclable products

**Source Reduction** – practicing behaviors that produce the least amount of solid waste

**Recycling** – to turn waste into new products

**Curbside Recycling** – a service where your recyclables are collected at your home

**Recycling Centers** – a place where you can take your recyclables

**Recyclables** – materials which can be reused in making new products

## ACTIVITY/ASSESSMENT IDEAS

1. Write the three R's on the chalkboard or on chart paper. As a class, create a three column chart of ways to Reduce, Reuse, and Recycle.
2. Demonstrate excess packaging. **You will need:** one large package of pretzels, many smaller pretzel packages that equal the amount of the larger size and two bowls of equal size. **Procedure:** Pour the contents of the larger package into a bowl with the size of the package visibly associated with that bowl. Empty the small packages into a different bowl with the small packages visibly associated with that bowl. This allows the students to see how much more packaging (waste) was created by using the smaller packages while still acquiring the same amount of pretzels. This concept is source reduction.
3. Have the students bring articles of solid waste from home (i.e., glass bottle, coffee can, etc.). Have them explain a way in which their item can be reused. You may want them to do this orally or written. Have the students keep a list of all items discussed in class. They may make a book or poster to display or to take home and share with parents.
4. Start a "Reuse Basket" in the classroom. Have students place any classroom items that they would consider garbage, but has potential for reuse, in this box. What may be garbage to one may be useful to another classmate.
5. Reuse your classroom paper. Gather from your "reuse basket" or other places in the classroom, any used paper (one side must be blank). Have the students cut these into many squares of the same size. Place the squares in stacks and hold them together with clothespins. Have some glue diluted with water ready for their use. The students should glue one side of the stack with a paintbrush, leaving the clothespins in place until dry. They have now made notepads that can be used at school or at home.
6. Have a picnic! Have a classroom picnic where the students prepare a lunch that uses as many reusable items as possible. Have the students explain to the class the items they brought and how they can be reused. Items ideas: reusable lunch boxes rather than paper bags; reusable plastic bags rather than plastic wrap or aluminum foil; drinks in a thermos or a washable container rather than disposable juice containers; etc. See "Picnic Day" letter that can be sent home so that parents can help in packing the lunch.
7. Discuss the recycling symbol (see "**Recycling Symbol**" and "**Plastic Recycling Symbol**"). Explain the significance of the number on the plastic recycling symbols (see "**Plastic**"). Bring in some actual recyclables so that the students can locate the recycling

symbol on the products. (i.e., pop bottle, milk jug, etc.). Bring in other examples to explain what can be recycled. It is important that the students understand that recycling each of these items saves natural resources.

8. Set up recycling in the classroom where the students prepare and sort different recyclables. Plan a field trip to a recycling center in your community and take the recyclables that you have collected and recycle them.
9. Use the “**Garbage Pizza**” to discuss the amount of what we throw away that can be recycled. This could be a good lesson on fractions. Have the students notice that paper is the largest of what we throw away. Students can make a significant difference in this number because of the amount of paper that is used at school.
10. Make your own paper. **You will need:** old paper (anything but newspaper), a piece of screen, a flat dish a little larger than the screen, 4 pieces of blotting paper the size of the screen, a bowl, a blender (or beater), a rolling pin, newspaper and blotter paper, 2 cups of hot water, and 2 teaspoons of instant starch (optional, if you desire stronger paper).  
**Procedure:**
  1. Shred the paper into very small pieces into the bowl. Pour in the hot water.
  2. Beat the paper and water to make pulp.
  3. Mix in the starch.
  4. Pour the mixture into the flat dish.
  5. Slide the screen into the bottom of the dish until it is evenly covered with pulp.
  6. Pull the screen out carefully. Hold the screen level and let it drain the excess water.
  7. Put the screen pulp side up, on some newspaper on a blotter. Put another blotter over the pulp and more newspaper over that.
  8. Use the rolling pin to release any excess water.
  9. Remove the top newspaper. Turn the blotter over so that the screen is on top. Carefully remove the blotter and the screen. Do not remove the pulp because it is your new paper.
  10. Put a dry blotter on the pulp and let it dry.
11. Make recycled crayons. **You will need:** crayon pieces, mini muffin pans, and aluminum.  
**Procedure:** Remove the paper from the crayons. Divide crayons into similar colors. Preheat oven to 200° F. Place aluminum foil in the muffin pans with foil extending over the top. Put the similar colors in each cup and place in the oven for about 10 minutes. Let the new crayons cool for about 30 minutes and then peel away the aluminum foil.
12. Make a recycled log cabin. **You will need:** large carton or box, glue, scissors or craft knife, empty paper towel or toilet paper tubes, paint and brushes (optional). **Procedure:** Turn the box upside down and cut places for the windows and doors. Start at the bottom of the box and begin gluing on the tubes, keeping them close together. If desired, students can paint their log cabins. They can be used in the block area, recess, etc. This gives the students another option for reusing.

13. The paper/pencil test may be given for further evaluation.

***Learning with Literature***

*RECYCLE!* by Gail Gibbons

*The Magic School Bus Inside The Earth* by Joanna Cole

*Hands-on Recycling* by Toni Albert

# Benefits of Recycling



*Reduces your trash*



*Saves our natural resources*



*Extends the life of our Landfill*



*Saves energy*



*Reduces pollution*



*Reduces litter*

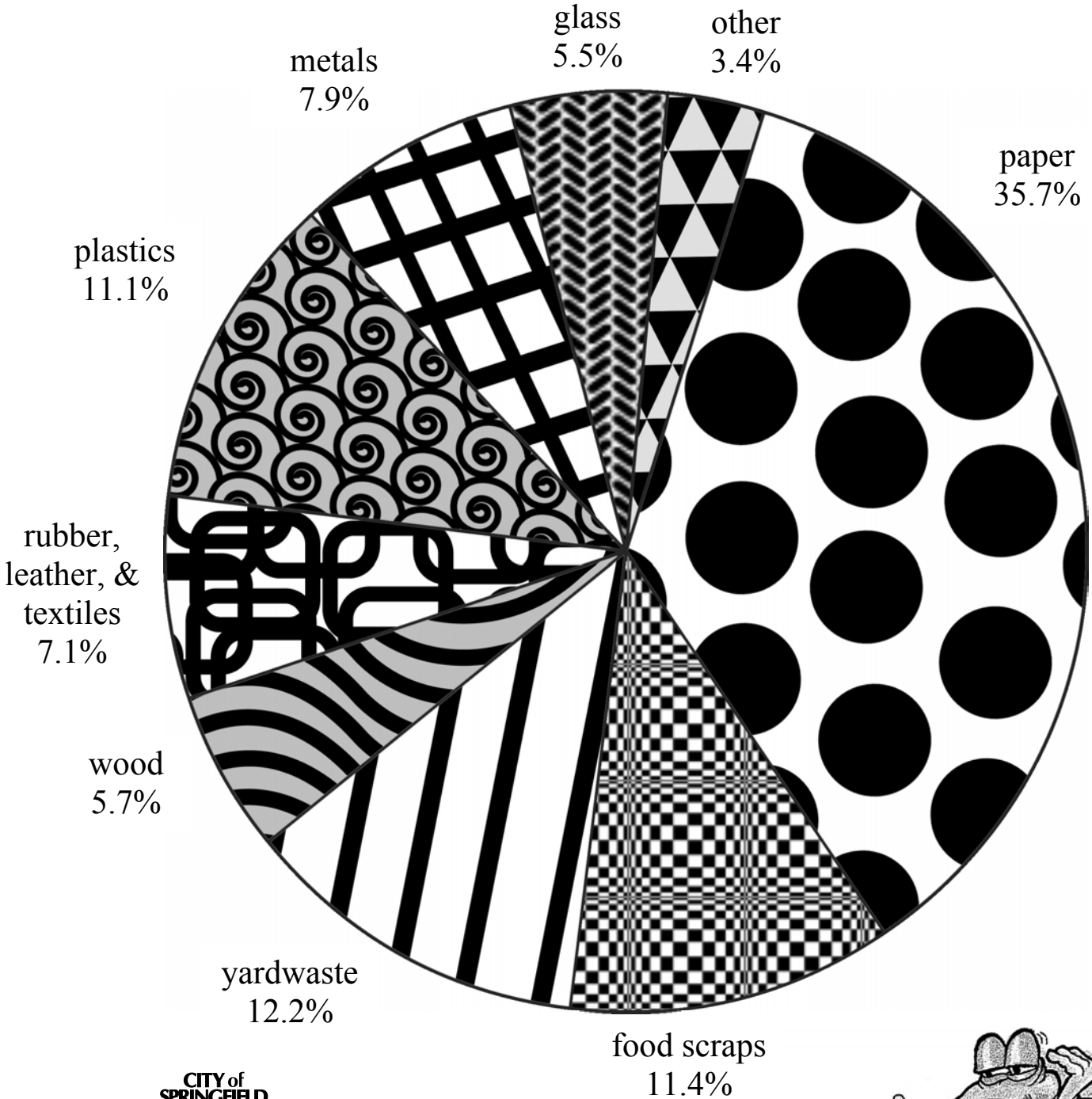


*Creates jobs*


Division of Solid Waste Management  
Department of Public Works  
City of Springfield, Missouri  
**Recycling Hotline 864-1904**  
[www.springfieldmogov.org/recycling](http://www.springfieldmogov.org/recycling)



# Garbage Pizza



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 printed on recycled paper



# Plastic

Plastic products have numbers in the recycling symbols that tell you what type of plastic the product is. The smaller the number, the easier it is to recycle. This means that it can be made into new products easier

The types of plastics range from numbers one through seven. **In Springfield, the City-operated Recycling Centers accept numbers one, two, and three.** Plastics number one and number two represent 92% of all plastic generated. Plastic number three represents approximately 4% of all plastic generated. Therefore, Springfield has the opportunity to recycle approximately 96% of the plastic waste stream.



PETE

*Pop bottles, juice bottles, corn oil bottles*



HDPE

*Milk jugs, laundry detergent bottles, hand lotion bottles*



PVC

*Plastic food wrap, salad dressing bottles, salad and vegetable bottles*



LDPE

*Bread bags, dry cleaning bags, milk bottle caps*



PP

*Cereal box liners, deli containers, snack wraps*



PS

*Plastic utensils, foam cups, foam egg cartons, packing peanuts*



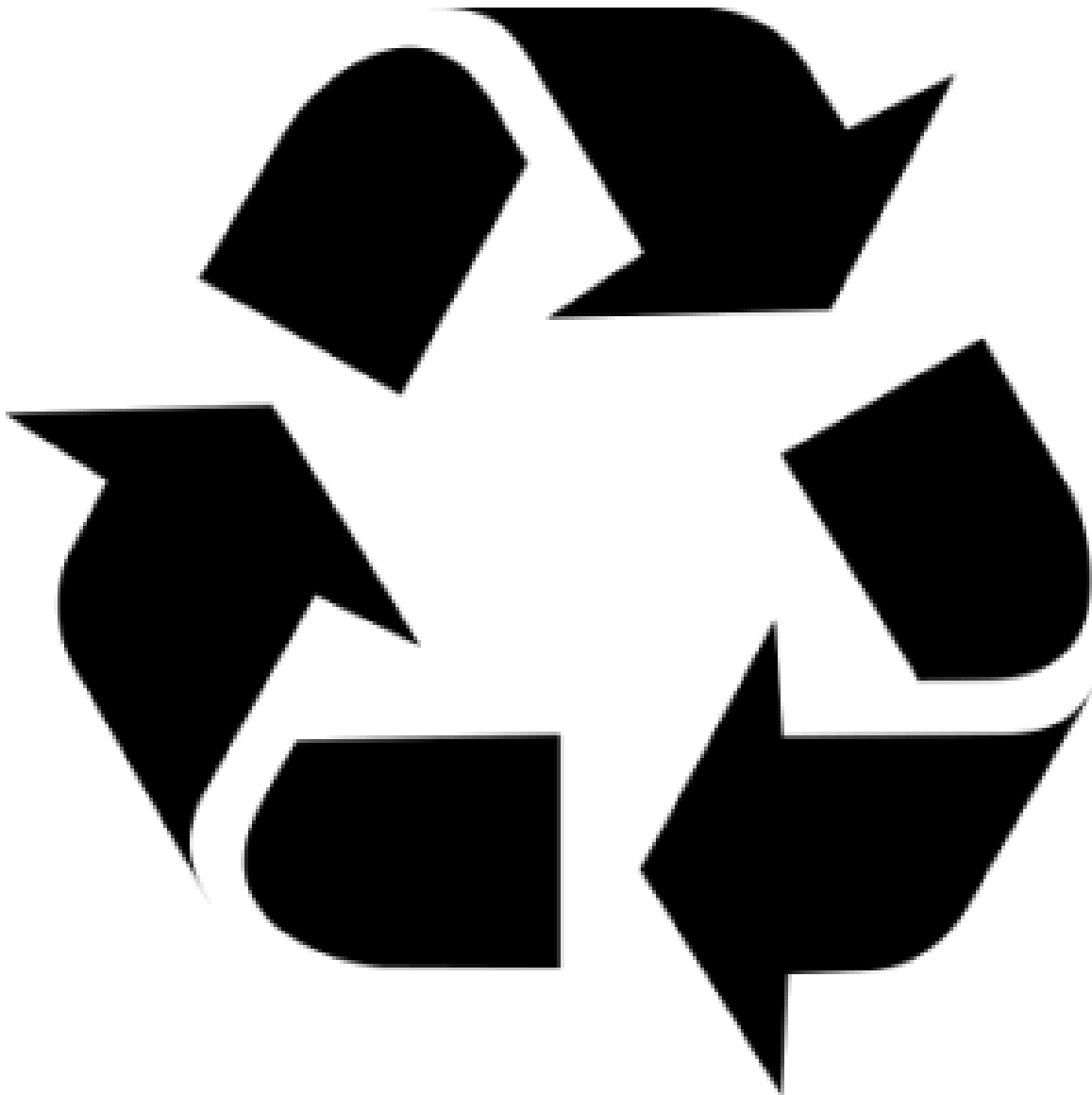
OTHER

*Squeezable condiment bottles, syrup and jelly bottles*

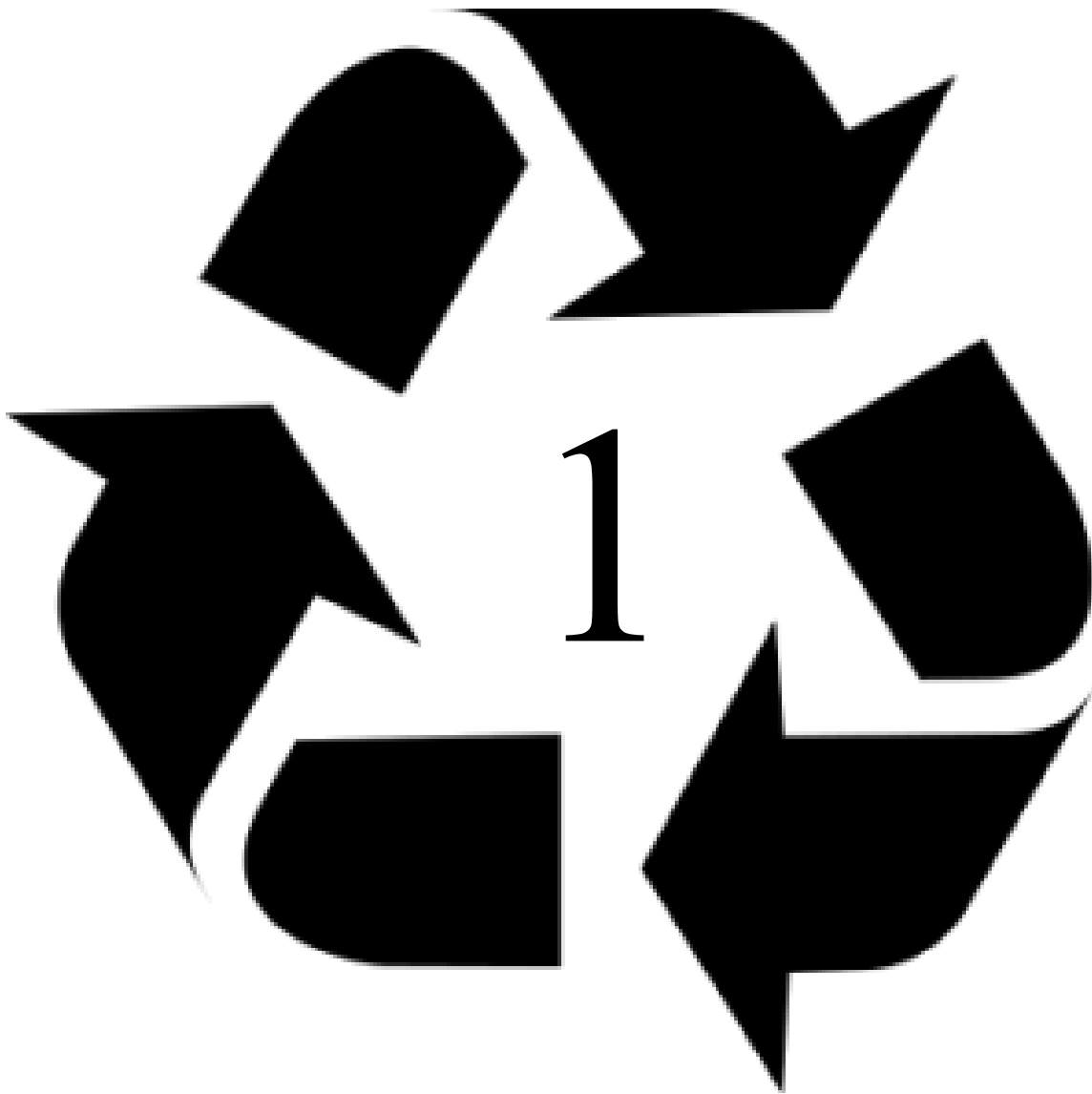


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# Recycling Symbol



# Plastic Recycling Symbol



# How to Recycle

Recycling is fun and easy.

## ***Step 1: Get Ready***

Set aside a place in your home for containers to separate your recyclables.

## ***Step 2: Get Set***

Prepare your recyclables properly. You need to rinse and remove rings and lids from the recyclables, but it is not necessary that you remove labels.

## ***Step 3: Recycle!***

Curbside is the easiest way to recycle. On a specific day, your waste hauler will accept your recyclables at the curb, or you may prefer taking your recyclables to one of the City-operated Recycling Centers.



Division of Solid Waste Management  
Department of Public Works  
City of Springfield, Missouri  
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[www.springfieldmogov.org/recycling](http://www.springfieldmogov.org/recycling)



printed on recycled paper

# Unit 2/Exercise 1

Name \_\_\_\_\_

Directions: Circle the letter of the action that would cause the least amount of waste material.

1.    A.    Sammy took her lunch in a paper sack and used a plastic spoon for her yogurt.  
      B.    Sammy took her lunch in a new reusable lunch pail.
  
2.    A.    When Danny spilled his milk on the kitchen floor, he got his mother's sponge to clean the spill.  
      B.    When Danny spilled his milk on the kitchen floor, he used a roll of paper towels to clean the spill.
  
3.    A.    When April bought pop for her party, she bought a pack of six cans.  
      B.    When April bought pop for her party, she bought one 2-liter bottle to share with everyone.
  
4.    A.    Jan had her morning coffee in a styrofoam cup.  
      B.    Jan had her morning coffee in a washable coffee mug.
  
5.    A.    We bought one large bag of potato chips for our lunch.  
      B.    We bought four single-serving potato chip bags for our lunch.
  
6.    A.    Dad bought a new package of disposable razors.  
      B.    Dad bought an electric razor.
  
7.    A.    When our clothes were too small, Mom threw them out with the garbage.  
      B.    When our clothes were too small, Mom gave them to our cousins.

# Unit 2/Exercise 2

Name \_\_\_\_\_

Directions: Match each item with the correct preparation method. You may use the same answer more than once!

- A. Rinse, crush to save
- B. Rinse, place lids inside cans
- C. Rinse, remove all caps and/or rings
- D. Place in paper grocery bags
- E. Empty, remove tape, staples, and packing material, flatten to save space

\_\_\_\_\_ Newspaper

\_\_\_\_\_ Aluminum

\_\_\_\_\_ Glass

\_\_\_\_\_ Plastic

\_\_\_\_\_ Paper

\_\_\_\_\_ Cardboard

\_\_\_\_\_ Magazines

\_\_\_\_\_ Tin Cans

# Picnic Day

Date \_\_\_\_\_

Dear Parents/Guardians:

As a part of our environmental/recycling study, we will be having a picnic. This picnic will be an exercise in “reusing.” The students are asked to prepare a lunch that uses as many reusable containers as possible and creates little or no waste. Here are a few ideas. . .

*\*Loose fruits*

*\*Lunch box rather than paper sacks*

*\*Thermos*

*\*Cloth napkin*

*\*Real eating utensils*

*\*Chips, cookies, etc., in reusable containers*

The object of this activity is to produce as little waste as possible.

Thank You.

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Department of Public Works  
City of Springfield, Missouri  
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# How to recycle in your school

Just follow these easy steps. . . .

1. Designate an adult to be the “recycling coordinator.” This person needs to get the support of other teachers, administration, and the community and establish a committee.
2. Conduct a waste assessment. Delegate someone on the committee for this task. This person will identify the most frequently thrown away items and the quantities generated.
3. Educate the students. Make sure that each classroom, office, lunchroom, etc., has bins for sorting and that the students know exactly what items are being recycled as well as where to recycle them.
4. Develop a systematic way of collecting your items.
  - a) Who will collect these items and on what specific day will they be collected?
  - b) Develop a budget for any expenses. (You may be able to receive cash for some of your recyclables. Be sure to investigate this possibility.)
5. Get the community involved. Establish sponsors to help with any expenses or apply for grants.
6. Advertise!! Be sure that the community and the entire school know about the project and goals.
7. Do an evaluation of the program periodically.
8. Continue to educate students and staff in the benefits of recycling. Reinforce positive efforts with incentives or special recognition.

Note: Assistance in establishing your school’s recycling program is available from the City’s Division of Solid Waste Management - - call the Recycling Hotline at 864-1904.

# Unit 2 Test

Name \_\_\_\_\_

Directions: Circle the letter of the best answer.

1. One way in which to reduce our waste is to
  - A. take all garbage to the landfill.
  - B. use fewer disposable items and less packaging.
  - C. eat only one meal a day.
  
2. Paper makes up the largest portion of our trash.
  - A. True
  - B. False
  
3. Extra packaging is one of the most common sources of unnecessary waste.
  - A. True
  - B. False
  
4. When we buy items that have or can be recycled and have the least amount of packaging, this is called
  - A. post-cycling.
  - B. pre-cycling.
  - C. bicycling.
  
5. Reuse means to
  - A. throw away all unwanted items.
  - B. give away everything we own.
  - C. use items again in some way
  
6. All of the following are ways in which to reuse many of our waste items except
  - A. using both sides of a piece of paper.
  - B. taking your lunch in a different paper bag every day.
  - C. reusing any plastic bags.
  
7. Recycling means to
  - A. ride your bicycle around the neighborhood twice.
  - B. turn waste into new products.
  - C. dump garbage into the landfill.

8. We know that an item can be recycled if
  - A. it costs a lot of money.
  - B. it is heavy.
  - C. it has a recycling symbol on the product.
  
9. To know if a plastic item can be recycled at your local recycling center,
  - A. we look at the color only.
  - B. we look at the number in the middle of the recycling symbol.
  - C. we see if it has an odor.
  
10. Recycling
  - A. reduces the amount of waste taken to our landfills.
  - B. conserves natural resources.
  - C. all of the above.
  
11. It is very important to prepare your recyclables properly.
  - A. True
  - B. False

# Unit 3

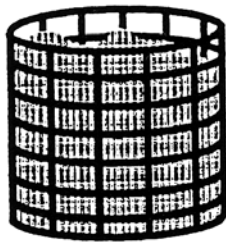
## Composting

### BACKGROUND

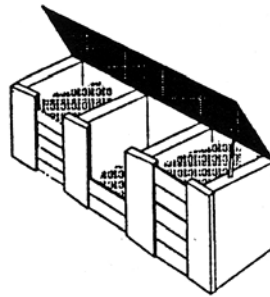
**Compost** is a natural product of recycling organic material through decomposition. Composting requires the use of *organic* material, that is, material that comes from living things. Living things are plants and animals. For instance, grass clippings, leaves, fruits, and vegetables all come from plants, and egg shells come from animals. Therefore, all of these items can be put in the compost.

### How do I compost?

1. Find an appropriate place in your yard for the compost bin. There are several different types of composting bins. There is a holding bin that is closed on three sides with the front open. There is also a turning bin that has three sections. With three sections, the compost can be moved from section to section. Round wire bins also make good composting bins.



Wire Bin



Turning Bin

2. The bin must be filled with organic material.  
**Suggested material:** grass clippings, leaves, small twigs, flowers, fruits and vegetables (banana, apple, orange, potato peels, etc.), food scrap (leftovers – vegetable, bread, etc.), egg shells, coffee grounds, tea bags, etc.  
**Do not fill the bin with:** meat, bones, fatty foods (grease), dairy products.
3. The bin must be maintained. Once you have layered the material, you must turn the material with a stick or pole once a week to circulate the air. It is very important to allow plenty of oxygen in the bin. This helps with the decomposition process. You must also keep the compost pile moist, not soggy. If the pile gets too wet, you may have an odor problem. Often, when you turn your compost pile, the center is heated. This is a natural part of decomposition.

## **What is happening in my compost?**

The only material that we can put in our compost is organic material. This organic material is also biodegradable, which means that when it is buried in soil, it decomposes by the work of microorganisms. *Microorganisms* are “tiny bugs” that use the organic material as a source of food. Other organisms, such as worms and centipedes, may also be found in your compost. They act much like microorganisms in the decomposition process.

Red Wigglers worms are often added to a compost in order to speed up the decomposition process. These worms act much like microorganisms in that they help to break down the organic material or help it decompose. Note: Worms enjoy coffee grounds, but may not care for onions, garlic, leeks, or citrus fruit peelings.

## **Once my compost is “done,” how can I use it?**

Once compost is ready for use, there are several ways in which you can use it.

1. Mixed with soil, the compost can be used to grow house plants and start seedlings. This fertilizes the soil by returning food and nutrients.
2. It can be used as mulch. When used as mulch, it is put around trees, plants, etc., in order to reduce the amount of weeds and help keep moisture in the soil and to stabilize the temperature of the soil.
3. Compost helps to improve the texture of the soil by holding in water and air, improving drainage, and allowing for easier root development.

## VOCABULARY

**Organic** – comes from living things (plants and animals)

**Inorganic** – does not come from natural, living things

**Composting** – a natural way of recycling organic material through decomposition

**Microorganisms** – tiny “bugs” that work to break down organic material

**Biodegradable** – an item that can be decomposed by microorganisms when buried in soil

## ACTIVITIES/ASSESSMENT IDEAS

1. Show the students some types of compost material such as leaves, flowers, fruit, or vegetable waste, etc. Discuss the fact that these are organic because they come from living things. You may want to mention the fact that aluminum, glass, plastic, etc., are not organic. Therefore, they will not decompose and are not biodegradable.
2. Classroom Compost Project. **You will need:** small aquarium or similar container, “greens” (grass clippings), “browns” (leaves, twigs, etc.), bulky material (twigs, tree bark, etc.), or use loose gravel.  
**Procedure:**
  - A. Layer the bulky material on the bottom of the container to allow water to drain and oxygen to circulate.
  - B. Add an equal amount of “greens” and “browns.” The “greens” add nitrogen, and “browns” add carbon to the compost, both of which are essential to the composting process. This will probably be a one to two inch layer of green/brown mixture. The smaller the material, the faster it will decompose.
  - C. Add about a two inch layer of soil to the top.
  - D. The compost will need to be turned at least once a week. When turning, you may notice how the compost is heated in the middle. Have the students measure the temperature and keep records. If the compost seems too dry, moisten it lightly. You do not want the compost to be soaked.
  - E. This compost bin is for yardwaste. Food waste can be put into a compost pile; however, for an indoor, classroom compost we do not recommend this. Food waste may cause unpleasant odor as well as health hazards such as hepatitis A. In an outdoor home compost, food waste is appropriate.
  - F. When the compost is “done,” it will be a crumbly, dark soil with an “earthy” fragrance. The soil should not smell rotten.
3. Have the students plant a seedling in a 50:50 compost:soil mixture and one in plain soil to compare the growth of both. Have them record and graph this information.
4. Have students use this compost as mulch by putting it around the tree they planted. This gives the students an idea of the various uses for compost.
5. Have students decorate a container (coffee can, etc.) to give some of the compost they have made to their parents, the elderly, gardening friends, etc. Not only have the students composted and shared, but they have reused a container that would otherwise be trash.
6. The paper/pencil test may be given for further evaluation.

***Learning with Literature***

*It's A Good Thing There Are Insects* by Allan Fowler

*The Flower* by Chris Baines

*Discovering Centipedes and Millipedes* by Ken Preston-Mafham

For the teacher:

*Worms Eat My Garbage* by Mary Applehoff

*Vermicomposting in the Classroom* by the City of Springfield Division of Solid Waste Management (call 864-1904)

Note: Assistance in starting a classroom vermicomposting project is available from the City of Springfield Division of Solid Waste Management. Call 864-1904.

# Unit 3/Exercise 1

Name \_\_\_\_\_

Directions: Find each of these words in the puzzle and then decide whether or not it can be composted. Place the word under the correct heading.

Apples	Bones	Leaves	Grass	Grease	Chicken			
	C	L	E	A	V	E	S	B
	H	G	G	P	E	G	N	O
	I	L	R	P	M	R	R	N
	C	K	A	L	E	A	L	E
	K	G	R	E	A	S	E	S
	E	U	S	S	J	S	S	E
	N	Y	T	D	S	Q	I	E

The following can be composted:

---

---

---

The following cannot be composted:

---

---

---

# Unit 3 Test

Name \_\_\_\_\_

Directions: Circle the letter of the best answer.

1. Compost means to
  - A. grow flowers in your backyard.
  - B. recycle organic material naturally through the process of decomposition.
  - C. make mud pies.
  
2. There is only one type of bin that can be used for compost.
  - A. True
  - B. False
  
3. A compost bin should be filled with
  - A. dead animals that can be found in the yard.
  - B. water.
  - C. organic material.
  
4. Organic items
  - A. all are orange and brown.
  - B. come from living things.
  - C. are all found in the water.
  
5. Microorganisms in a compost help keep it from having an unpleasant odor.
  - A. True
  - B. False
  
6. Which of the following should not be in a compost?
  - A. grass clippings
  - B. egg shells
  - C. meat
  
7. It is important to keep your compost damp, not soggy.
  - A. True
  - B. False
  
8. It is important to turn your compost in order to keep the oxygen moving.
  - A. True
  - B. False

9. We know that an item is organic if
- A. it smells bad.
  - B. it comes from plants or animals.
  - C. it is found in the backyard.
10. Compost can be used
- A. as a mulch.
  - B. with a mixture of soil to help plants grow better.
  - C. all of the above.

# Unit 4

## Household Chemical Wastes

### **BACKGROUND**

There are many items in our home that should not be put in the trash or poured down the drain or on the ground because they could contaminate the soil and groundwater. These items should be disposed of properly so our soil and water is kept healthy and clean. These items are referred to as being hazardous. *Hazardous* means that something can be harmful to our health and environment if proper usage and disposal procedures are not followed. Residents of Springfield/Greene County, Missouri, are fortunate because they can take their chemicals to the City's Household Chemical Collection Center and be assured their chemicals will be recycled and disposed of safely.

Products that are hazardous are usually identified by *signal words*. Along with the signal words, a skull and crossbones symbol may appear. This tells us that a product is extremely hazardous. See the vocabulary list for a complete list and description of important signal words.

The following are a few examples of items that would be considered hazardous:

- Bug spray

- Household cleaning supplies (bathroom cleaner, oven cleaner, window cleaner, etc.)

- Paint

- Motor oil

# Household Chemical Wastes

## VOCABULARY

**Hazardous** – something that can be harmful to our health and environment if not used and disposed of correctly

**Flammable** – any item that can catch fire easily

**Poison/Danger** – signals that a chemical is extremely hazardous

**Warning** – signals that a chemical is mildly hazardous

**Caution** – signals that a chemical is slightly hazardous

## ACTIVITIES/ASSESSMENT IDEAS

1. Teachers may bring to class some empty, clean containers that held hazardous products. Be sure labels are in tact. (A kit can be checked out from the City of Springfield by calling 864-1904.) Put each of the vocabulary words on the board. Explain that these are signal words that help us know if a product is hazardous. Explain why it is important that we dispose of hazardous products safely. Have the students find these signal words on the product labels. Help the students understand that they do not have to be afraid of these products; they just have to be careful. Suggest they ask an adult for help when handling, storing, and disposing of hazardous waste.
2. Explain that there are alternatives to the use of hazardous products. The following are recipes for safe alternatives to hazardous substances that are frequently used in the home:

### GLASS AND WINDOW CLEANER

1 teaspoon of cornstarch  
¼ cup of white vinegar  
½ gallon warm water

This can be easily applied from a spray bottle. You may ask the students to bring one from home. Be sure the bottle has been thoroughly cleaned and, preferably, was not used to hold cleaners or chemicals.

DESK CLEANER (formica, not wood)  
necessary amount of baking soda  
clean sponge

Scrub the desk with a damp sponge and soda, then rinse with a clean cloth.

### ENVIRONMENTALLY FRIENDLY PLAY DOUGH

2 cups of baking soda  
1 cup of cornstarch  
1½ cups of water

Stir this over medium heat until thick. Spread the mixture on a plate and cover with a damp cloth until cool. Knead the dough. (Add food coloring if desired.) Store in the

refrigerator in an airtight container until ready to use. Let the students mold the play dough into creations. When the students have finished, the dough will take two to three days to air dry. Remind the students that this type of play dough is environmentally safe.

Have the students mix and use the above recipes. Discuss measurements and how to follow recipes.

3. You may want to have the students copy the above and following recipes onto recipe cards to take home. They may even want to make a recipe book.
  1. To eliminate roaches – mix baking soda and powdered sugar
  2. To eliminate ants – use chili powder
  3. Instead of mothballs – use cedar chips, newspaper, and lavender flowers
  4. Furniture polish – 1 part lemon juice to 2 parts olive oil
  5. Disinfectant – ½ cup of borax to 1 gallon of water
  6. Instead of ammonia – use vinegar and water or baking soda and water
4. Have the class design ad campaigns that promote the use of these environmentally safe cleaning alternatives. This can be done through the use of posters that can be displayed throughout the school or on a home refrigerator. They may also want to make commercials, radio ads, etc.
5. The paper/pencil test may be given for further evaluation.

## Simple Lessons To Do In The Kitchen

**Object:** To increase the awareness of household chemicals through observation of various reactions and use this knowledge to survey individual households.

### VINEGAR/BAKING SODA REACTION:

\*This experiment demonstrates the result of the reaction between an acid and a base. Please note that this experiment, as written, uses a weak acid and a weak base. Please do not attempt to try this experiment with other types of acids and bases. Please advise children not to attempt this demonstration without an adult.

**Items needed:** Equal portions of vinegar and baking soda.

\*This demonstration works best if the vinegar is added to the baking soda. For added effect, the vinegar may be colored with food coloring.

**Lesson:** Chemicals can interact in unexpected and possibly dangerous ways. It is not a good idea to mix chemicals together.

### CORNSTARCH AND WATER:

\*This experiment demonstrates the surprising interaction between two common kitchen products.

**Items needed:** Cornstarch and a small amount of water.

\*Place cornstarch in a bowl and gradually add just enough water to wet the cornstarch. The mixture should be mostly cornstarch. You are looking for a consistency that when mixed together quickly, will seem solid and when mixed together slowly, will be more like a very thick liquid. Allow child to mix with fingers. Note that when mixing slowly, fingers can move freely through the mixture. When fingers move quickly through the mixture, the product solidifies momentarily.

**Lesson:** Chemicals can interact in unexpected ways. It is not a good idea to mix chemicals together. The results could be surprising.

### SMELLS GOOD/SMELLS BAD:

\*This demonstration is intended to show children that one should not use the sense of smell to determine the potency of a chemical. Please advise children that it is never okay to attempt to smell a chemical on their own. Please make children aware that an adult chose these chemicals because they are safe to smell. Please help children understand that it can be very harmful to smell certain chemicals. They should never attempt to try this demonstration without an adult.

**Items needed:** Several examples of good smelling “chemicals” such as vanilla, almond extract, peppermint extract, orange flavoring.

Several examples of bad smelling “chemicals” such as buttermilk, vinegar, or liquid from saurkraut.

\*Place unmarked samples of each of the products into a container. Allow child to smell the “chemical.” Ask child if he or she thinks that it would be ok to eat or not.

**Lesson:** The main point of the demonstration is that in most cases, we use the bad smelling products as food itself or in larger amounts for cooking. The good smelling products are usually used in small amounts and are not intended for human consumption in large amounts. The child is most likely to assume that the good smelling “chemical” would not harm them.

### ***Learning with Literature***

*A River Ran Wild* by Lynne Cherry

*In the Pond* by Ermanno Cristini and Luigi Puricelli

*My River* by Shari Halpern

# Unit 4/Exercise 1

Name \_\_\_\_\_

Directions: Find each of the vocabulary words in the puzzle and write them on the line of the correct definition.

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

1. Signals that a chemical is mildly hazardous \_\_\_\_\_
2. Something that is harmful to our health and environment if not used and disposed of correctly \_\_\_\_\_
3. Signals that a chemical is extremely hazardous \_\_\_\_\_
4. Any item that can catch fire easily \_\_\_\_\_
5. Signals that a chemical is slightly hazardous \_\_\_\_\_

# Unit 4 Test

Name \_\_\_\_\_

Directions: Circle the letter of the best answer.

1. Hazardous means
  - A. a product is for sale.
  - B. a product is new.
  - C. a product can be harmful to our health and environment if not used and disposed of correctly.
  
2. When we see the words POISON, WARNING, and CAUTION on a product, we know that the product is
  - A. cherry flavor.
  - B. hazardous.
  - C. safe to throw in the trash can.
  
3. Flammable products
  - A. are very tasty.
  - B. are dangerous only to pets.
  - C. can easily catch fire.
  
4. We can use items in our home to make products that will not harm our health and environment.
  - A. True
  - B. False
  
5. The most hazardous product would have the word \_\_\_\_\_ on the package.
  - A. poison
  - B. sorry
  - C. nutritious
  
6. The skull and crossbones tells us that
  - A. a product has bones in it.
  - B. a product will smell bad.
  - C. a product is hazardous.
  
7. When we find products that are hazardous, we should
  - A. be very afraid and start crying.
  - B. tell an adult who will help us store, handle, and dispose of them safely.
  - C. pour them on the ground.

8. All of the following are hazardous products except
- A. bug spray.
  - B. baking soda.
  - C. bathroom cleaner.
9. It is important for us to know about hazardous products so that we can keep our environment clean and healthy.
- A. True
  - B. False
10. We should
- A. be careless about how we store and dispose of hazardous chemicals.
  - B. share all that we know about the environment and how to keep it clean and healthy with others.

# Unit 5

## What can YOU do to make a difference?

### **BACKGROUND**

The average person throws away more than four pounds of trash each day. Packaging alone makes up 64 million tons by weight or 33% of all our garbage. The family that reduces waste in the home helps protect the environment. Waste reduction is as important as recycling in saving natural resources, energy, disposal space and costs, and in reducing pollution risks.

### **Home**

Set up a countertop or wall holder for reusable sponges, rags, and cloth towels. Place paper towels out of easy reach so that they will be used only when really needed.

Reuse butter containers to freeze foods or pack lunches to reduce the need for foil, plastic wrap, and baggies.

Repair/restore used items before replacing them with new ones.

Reduce the amount of junk mail you receive. Contact the Mail Preference Service, Direct Marketing Association, 11 West 42nd Street, PO Box 3861, New York, NY 10163-3861. Let them know if your name should be removed from commercial lists, non-profit lists, or both.

Cancel magazine subscriptions or newspapers you don't actually read. Give old issues to friends, coworkers, nursing homes, laundromats, hair salons, or libraries, or recycle them.

Many items we throw away could be put to good use by other people. Think about making a trip to the local thrift/donation store where you can donate items that you no longer need. Check with the thrift store or donation center of your choice to find out what they accept. Most thrift stores accept the following items: books, clothing, bedding, carpets, pots, pans, glasses, silverware, sporting goods, shoes, musical instruments, furniture, toys, games, and small appliances

At the recycling centers, keep recycling loads free of contaminants. Know what you can and can't recycle and how to properly prepare your recyclables.

### **At the Store**

Buy items you can recycle locally through curbside collection or recycling centers.

Buy durable items instead of those that are disposable, such as disposable cameras, paper towels, plastic dinnerware, etc.

Avoid excess packaging when choosing products. As an example, some produce items do not require a separate bag (bananas).

For frequently used items, buy in bulk.

Reduce toxic waste by purchasing paints, pesticides, and other hazardous materials only in the quantities needed. Share leftovers with other people.

Buy concentrated products to reduce packaging. Examples are concentrated fruit juice and laundry detergent.

Carry a canvas or other reusable tote bag when you shop. It eliminates the need to use the store's disposable paper or plastic bags.

### **At School**

Use both sides of a sheet of paper before recycling it.

Save scrap paper for art projects.

Bring a waste-free lunch by packing it in reusable or recyclable containers.

Set up a reuse box in the classroom for used pencils, pens, folders, and other items that are still usable. Ask the custodians to place pencils left on the floor in the reuse box.

### **How can I create less hazardous waste?**

Don't use as many hazardous products! There are many safer alternatives, but if you have to use a hazardous product, buy the product with the lowest level of warning on the label. For example, buy "caution" vs. "poison." Buy only the amount you will use so it does not have to be stored or discarded.

The best way to reduce the amount of hazardous waste you create is to use safer alternatives such as:

<b>Potentially Hazardous Product</b>	<b>Safer Alternative</b>
Aphid killer	Spray thoroughly with water. Repeat three times weekly.
Aerosol spray	Use non-aerosol, pump-type sprays.
Ant control	Mix borax, sugar, and water on a cotton ball.
Bathroom cleaner	Mix baking soda and castile soap. Scrub.
Chemical fertilizers	Use compost or coffee grounds, bone meal, and wood ashes.
Copper cleaner	Scrub with vinegar and salt. Rinse well.
Deodorizers/Air fresheners	Simmer cinnamon and cloves.

Drain openers	Baking soda and vinegar, followed by boiling water. Or use a plumber's snake.
Flea repellent	Use a flea comb. Bathe pet weekly.
Floor cleaner	Vinegar and water.
Furniture polish	For unvarnished surfaces, mix lemon juice and vegetable oil.
Glass and window cleaners	Vinegar and water.
Laundry detergent	Use washing soda or a non-phosphate concentrate.
Oven cleaners	Washing soda.
Oil or solvent based paint	Water based or latex paints.
Rat and mouse poison	Snap or live traps.
Rug and upholstery cleaners	Club soda.
Scouring powders	Baking soda or borax. Rinse thoroughly.
Slug/snail bait	Pan with beer or slug hotel.
Toilet bowl cleaner	Baking soda and castile soap.
Weed killer	Pull by hand. Use mulch to prevent weed growth.

There are also a number of non – or less toxic – commercial products available to address these and other situations. For more information, call the Recycling Hotline at 864-1904.

# Recycling Tips

## PAPER

Flatten boxes. Keep paper flat, loose, clean, and dry. Cellophane “windows,” glued on boxes, and papers with tape or staples are okay. It helps to put all brown bags into one brown bag.

**Paper that can be recycled:** Advertising mail, magazines, catalogues, envelopes, packaging for cosmetics or toiletries, all sorts of pasteboard and chipboard boxes, including cereal (without waxed paper liner), dried food, medicine and shoe boxes, phone books, paper egg cartons, paperback and hardback books, newspapers, and paper feed bags.

**Don’t recycle:** Pizza boxes or any box soiled with grease or food waste, paper plates, facial or bathroom tissue, carbon paper, disposable diapers, hardcover books, plastic and wax paper box liners or wrappings, frozen food containers, and paper towels.

## CARDBOARD

Flatten, remove staples

## ALUMINUM AND TIN CANS

Remove labels from food cans and recycle the labels with paper. Empty and rinse all cans. Flatten aluminum cans.

**Aluminum and tin cans that can be recycled:** Beverage cans, like vegetable or fruit juice cans, and food cans (soup, coffee, or pet food cans).

**Don’t recycle:** Aerosol cans, solvent cans, paint cans, hangers, medical wastes or needles, and oil filters.

## PLASTICS

Throw away plastic caps. Empty, rinse, and flatten bottles. You don’t need to remove labels.

**Plastics that can be recycled:** Shampoo and conditioner bottles, beverage bottles (milk, juice, water, pop, liquor), laundry detergent, fabric softener bottles, most cooking oil bottles, salad dressing bottles, window and kitchen cleaner bottles. Look for numbers 1, 2, and 3 on the bottom of the container.

**Don't recycle:** Plastic bags, plastic food trays, plastics not labeled with a number, plastic bottles that have contained motor oil, pesticides, or other hazardous materials, lids, caps, rings, and styrofoam (such as packing material, cups, or egg cartons).

Note: Plastic frozen food trays that are numbered 1 can be recycled.

## **GLASS**

Empty and rinse. Do not break glass. Throw away caps or rings. You don't have to remove labels.

**Glass that can be recycled:** Green, brown, blue, amber, or clear glass bottles and jars.

**Don't recycle:** Ceramics, auto glass, window glass, mirrors, or light bulbs.

## **YARDWASTE COMPOST BIN**

**Items that can be put in compost:** Grass clippings, leaves, flowers, house plants, annual weeds, and twigs.

**Avoid putting in compost:** Sod, food scraps, diseased plants, insect ridden plants, weeds with seeds, dog and cat feces, and unchopped tree branches.

## **WORM BIN**

Rather than filling up your garbage and the landfill with food waste, why not compost it? You can do this in a worm bin, where worms and other critters will break it down into a material that is a great fertilizer for other plants.

**Items to add to worm bin compost:** Vegetable scraps, apple cores, grains and pasta, fruit rinds and peels, breads, coffee grounds and biodegradable coffee filters, eggshells, grease-free paper napkins, and paper towels.

**Items to avoid putting in worm compost bin:** Meat, fish and poultry, cheese, oily foods, butter, onions, leeks, and garlic.

# Home Recycling Activity

Note to teacher:

1. After finishing the Recycling Unit: It is Easy Being Green, instruct the students to collect some of the items listed below.
2. Review with the students the correct way to prepare each of the items for recycling. (Rinse and dry all plastic, glass, and cans before placing them in paper bag.)
3. Bring the class to a field trip to the Recycling Center to meet Barbara Lucks. She will demonstrate how to properly sort the items for recycling.
4. Barbara Lucks will also show the students how their recycled items can be turned into new products.

For example:

Pop bottles can be recycled into a T-shirt.

Plastic becomes carpet.

Milk jugs become toys and plastic lumber.

Glass becomes ceramic tile.

Paper becomes cat and dog litter.



5. If you are not able to take the class on a field trip to the Recycling Center, you may check out the Recycling Trunk. Please contact Barbara Lucks at 864-1904 for more information.

Items to bring from home:

1. aluminum cans
2. tin cans
3. plastic containers marked 1, 2, or 3
4. milk jugs
5. newspaper
6. magazines
7. \*glass jars or bottles (No more than one glass article since glass is heavy and breakable.)
8. cardboard

\*For safety reasons, glass may be optional, depending on the age of the students.

# Additional Resources

## Did You Know?

- Three million cars are abandoned in the United States every year.
- About 70% of the garbage Americans create is compostable, including yardwaste, food waste, wood, and paper.
- If you are an average American, 1/3 of your garbage is packaging that you toss out immediately.
- The average American family produces 100 pounds of trash each week.
- In your lifetime, you will generate about 600 times your weight in garbage.
- Americans buy and throw away 500 million disposable cigarette lighters every year.
- Americans produce enough styrofoam cups every year to circle the earth 436 times.
- Americans throw away 18 billion disposable diapers a year, enough to stretch to the moon and back seven times.
- Over a billion trees are used to make disposable diapers every year.
- We throw away enough office and writing paper annually to build a wall of memos 12 feet high stretching from Los Angeles to New York City.
- According to Save A Tree, it takes a 15-20 year old tree to make enough paper for 700 grocery bags.
- The energy saved from one recycled aluminum can will operate a television set for three hours.
- A large shade tree in your front yard saves \$30 per year in air conditioning cost and absorbs 10 pounds of air pollutants per year.
- By 2005, 150 million computers will have been piled into the American landfills, filling an acre-sized space 3.5 miles deep. Ten million computers are discarded every year.
- Every minute 127,093 cans are recycled nationwide.
- Used aluminum cans are recycled and returned to store shelves as new cans in as few as 60 days after collection. In theory, that means that you could purchase the same recycled aluminum can from a store every nine weeks or almost six times a year.
- Each person in the United States uses approximately 749 pounds of paper a year.
- Plastics -- Americans recycle 46% of their plastic soda bottles and 30% of their milk and water jugs, but overall, we only recycle 5% of all plastics! Surprisingly, over 40% of all plastics are used for packaging. One way to reduce the plastic content in our garbage is by purchasing products with less packaging.
- Today's plastic bags are made with 30 percent less material than the bags made in the late 1990s.
- Compared to paper grocery bags, plastic grocery bags:
  - Consume 40 percent less energy than paper
  - Generate 80 percent less solid waste
  - Produce 70 percent fewer atmospheric emissions
  - Release up to 94 percent fewer waterborne wastes
  - However, in Springfield, paper grocery sacks can easily be recycled; plastic grocery sacks cannot.
- Every year, Americans use more than 90 million tons of paper and paperboard. That's an average of 700 pounds of paper products per person each year.

- Every year in America, more than 2 billion books, 350 million magazines, and 24 billion newspapers are published.
- About 630 steel cans are recycled every second!
- It takes about 45 seconds to shred the average automobile into fist-sized pieces of steel for recycling.
- The automobile is the most recycled consumer product in the world today.
- The steel found in just six cars, when recycled, is enough to build a brand new house, using steel framing.
- What's at the heart of today's biggest skyscrapers? Steel, of course. For example, the Sears Tower in Chicago, North America's tallest building, was built with 74,000 tons of steel!
- Using recycled steel to make new steel saves energy. In fact, the steel industry saves enough energy in one year to electrically power 18 million homes for one year.
- You can't make new steel without recycled steel.
- 27 billion glass containers are thrown away each year.
- 1 quart of motor oil can contaminate 1 million gallons of water.
- Making new paper from recycled paper uses 45% less energy than making paper from trees.

#### Facts about earthworms:

- An earthworm has no arms, legs, or eyes.
- There are approximately 2,700 different kinds of earthworms.
- Worms live where there is food, moisture, oxygen, and a favorable temperature. If they don't have these things, they go somewhere else.
- In one acre of land, there can be more than a million earthworms.
- The largest earthworm ever found was in South Africa and measured 22 feet, end to end.
- Worms tunnel deeply in the soil and bring subsoil closer to the surface mixing it with the topsoil. Slime, a secretion of earthworms, contains nitrogen. Nitrogen is an important nutrient for plants. The sticky slime helps to hold clusters of soil particles together in formations called aggregates.
- Worms can grow a new tail, but not grow a new head if they are cut off.
- Baby worms are not born. They hatch from cocoons smaller than a grain of rice.
- Even though worms don't have eyes, they can sense light, especially at their anterior (front end). They move away from light and will become paralyzed if exposed to light for too long (approximately one hour).
- If a worm's skin dries out, it will die.
- Worms are hermaphrodites. Each worm has both male and female organs. Worms mate by joining their clitella (swollen area near the head of a mature worm) and exchanging sperm. Then each worm forms an egg capsule in its clitellum.
- Worms can eat their weight each day.

#### Facts About Paper Recycling and Recycled Paper:

- Americans throw away enough office and writing paper annually to build a wall 12 feet high stretching from Los Angeles to New York City

- Every Sunday, the United States wastes nearly 90% of the recyclable newspapers. This wastes about 500, 000 trees!
- Every day, Americans buy 62 million newspapers and throw out 44 million. That's the equivalent of dumping 500,000 trees into a landfill every week.
- It takes 75,000 trees to print a Sunday Edition of the New York Times.
- If everyone in the United States recycled just 1/10 of their newsprint, we would save estimated equivalent of about 25 million trees a year.
- The average household can recycle enough newspaper annually to save 1.5 trees.

# Recycling Book List

This is a partial list of the books that the Greene County Library offers on recycling.

Art From Packaging: With Projects Using Cardboard, Plastics, Foil, And Tape / Gillian Chapman & Pam Robson

Art From Rocks And Shells: With Projects Using Pebbles, Feathers, Flotsam, and Jetsam / Gillian Chapman & Pam Robson

Cartons, Cans, And Orange Peels: Where Does Your Garbage Go? / Joanna Foster

Cleaning Up: How Trash Becomes Treasure / Eve & Albert Stwertka; pictures by Mena Dolobowsky

Compost: Growing Gardens From Your Garbage / by Linda Glaser; pictures by Anca Hariton

Compost critters / text and photographs by Bianca Lavies

Cups & Cans & Paper Plate Fans: Craft Projects From Recycled Materials / Phyllis Fiarotta & Noel Fiarotta

Earth-Friendly Holidays: How To Make Fabulous Gifts And Decorations From Reusable Objects / George Pfiffner

Earth-Friendly Outdoor Fun: How To Make Fabulous Games, Gardens, And Other Projects From Reusable Objects / George Pfiffner

Earth-Friendly Toys: How To Make Fabulous Toys And Games From Reusable Objects / George Pfiffner

Eco-Arts & Crafts / Stuart A. Kallen

EcoArt! Earth-Friendly Art & Craft Experiences For 3- To 9-Year-Olds / Laurie Carlson; illustrated by Loretta Trezzo

Every Day Is Earth Day: A Craft Book / Kathy Ross

Grover's 10 Terrific Ways To Help Our Wonderful World / Anna Ross

The Great Trash Bash / Loreen Leedy

Gardens From Garbage: How To Grow Indoor Plants From Recycled Kitchen Scraps / Judith F. Handelsman

How On Earth Do We Recycle Glass? / Joanna Randolph Rott And Seli Groves; illustrations by Art Seiden

How On Earth Do We Recycle Metal? / Rudy Kouhopt with Don Marti, Jr.; illustrated by Art Seiden and Rudy Kouhopt

How On Earth Do We Recycle Plastic? / Janet Potter D'Amato with Laura Stephenson Carter; illustrations by Janet Potter D'Amato

Recyclables Fun: Creative Craft Ideas / Diane Cherkerzian; illustrated by Ron LeHew

Recycle! A Handbook For Kids / Gail Gibbons

Recycling / Tony Hare

Re-cycles / Michael Elsohn Ross; illustrated by Gustav Moore

Recycling: Meeting The Challenge Of The Trash Crisis / Alvin, Virginia, and Robert Silverstein

Recycling Dump / Andrea Butler; illustrated by Jan Spivey Gilchrist

Recycling: Learning the Four Rs, Reduce, Reuse, Recycle, Recover / Martin J. Gutnik

Recycling Glass / Judith Condon

Re-cycles / Michael Elsohn Ross; illustrated by Gustav Moore

Tons Of Trash: Why You Should Recycle And What Happens When You Do / Joan Rattner Heilman; illustrated by Nancy Schill

We recycle [sound recording]: [& other songs for earth keepers] / the Van Manens

Where Does Garbage Go? / Isaac Asimov

Waste, Recycling, And Reuse: Our Impact On The Planet / Rob Bowden

# Recycling Trunk Activities

A Recycling Trunk is available for check out.

Samples of several products made from recycled materials are included along with explanatory fact sheets. These include a t-shirt and a carpet sample made from pop bottles; toys made from milk jugs; cat and dog litter made from mixed paper; and others.

The following activities are designed to utilize the Recycling Trunk:

Recycle It!

Don't Trash It – Recycle It!

For information about the Recycling Trunk and to make arrangements to check out the Recycling Trunk, call the Recycling Hotline at 864-1904.

# RECYCLE IT!

The following items are made from recycled material. Can you match which of the following items are made from which material? Some of the answers may be used more than once.

## Matching

- \_\_\_\_\_ 1. T-shirt
- \_\_\_\_\_ 2. Carpet
- \_\_\_\_\_ 3. Toys
- \_\_\_\_\_ 4. Plastic lumber
- \_\_\_\_\_ 5. Ceramic tile
- \_\_\_\_\_ 6. Cat and dog litter
- \_\_\_\_\_ 7. Cereal box



- A. Box board
- B. Glass
- C. Pop bottles
- D. Milk jugs
- E. Paper
- F. Plastic

Matching Answers

C 1. T-shirt

F 2. Carpet

D 3. Toys

D 4. Plastic lumber

B 5. Ceramic tile

E 6. Cat and dog litter

A 7. Cereal box





# Recycling Glossary

**BIODEGRADABLE:** An item that can be decomposed by microorganisms when buried in soil.

**CAUTION:** Signals that a chemical is slightly hazardous.

**CLOSED-LOOP RECYCLING:** To collect, process and turn material back into the same product. Example: An aluminum can is recycled and made into another aluminum can.

**COMPOSTING:** The process of breaking down yardwaste, such as leaves and grass clippings, and organic solid waste, such as fruits and vegetables, to make a soil-like product.

**CONSERVE:** Do not waste; try not to use as much.

**CONTAMINANT:** Inappropriately placed or tainted material.

**CURBSIDE RECYCLING:** A service where your recyclables are collected at your home.

**DECOMPOSITION:** The process of breaking down.

**ELECTRICITY:** Energy used to make heat, light and operate appliances.

**ENVIRONMENT:** Everything living and non-living that surrounds us such as soil, water and air.

**FLAMMABLE:** An item that can catch on fire easily.

**HAZARDOUS:** Something that can be harmful to our health and environment if proper usage and disposal procedures are not followed.

**HUMUS:** Soil-like material that results from composting.

**INCINERATOR:** A place where solid waste is burned.

**INORGANIC:** Does not come from natural living things.

**LANDFILL:** A facility designed to dispose of trash by burying it in a carefully prepared land without creating hazards.

**LEACHATE:** The collection of contaminating water and liquids that seep to the bottom of a landfill.

**LITTER:** An untidy accumulation of strewn-about material considered worthless and undesirable.

**METAL ORE:** A metal substance that is taken from the ground used to make such items as tin and aluminum.

**METHANE:** A gas formed by the decomposition of wastes.

**MICROORGANISMS:** Tiny “bugs” that work to break down organic material.

**NATURAL RESOURCES:** Things in nature that we use to make products and to survive. Examples: Metal ore, oil, plants, soil, water, air.

**OIL (PETROLEUM):** A liquid taken from the ground for energy, also used in the production of plastics.

**ORGANIC:** Comes from living plants or animals.

**OVERPACKAGING:** Having more packing for a product than is really needed.

**POISON/DANGER:** Signals that a chemical is extremely hazardous.

**POST-CONSUMER MATERIAL:** Material that has been used by consumers or businesses, put into a recycling bin, and remanufactured into new product.

**PRE-CONSUMER OR POST-INDUSTRIAL MATERIAL:** Materials left over from the manufacturing process and re-used in the same plant.

**PRE-CYCLING:** Buying recycled and recyclable items.

**RECYCLABLE:** The material can be recycled into a new product after it is used.

**RECYCLING:** To turn waste or used products into new products.

**RECYCLING CENTERS:** A place where you can take your recyclables.

**REDUCE:** To cut down the amount of items we consume and the amount of trash we make.

**REUSE:** To use a product again, without remanufacturing, for the same or a new purpose.

**SOLID WASTE:** Trash, garbage, or any material that we consider worthless or unnecessary.

**SOURCE REDUCTION:** Practicing behaviors that generate the least amount of solid waste.

**SOURCE SEPARATION:** The practice of separating waste generated within each household or commercial operation into separate fractions such as newspapers, glass, etc., and placing them in separate containers for recycling, composting, and disposal.

**TOXICITY:** The degree to which something is poisonous.

**TRASH:** Dry waste or solid waste.

**VERMI-COMPOSTING:** The process of using red worms to turn organic waste, such as fruits and vegetables, into a nutrient-rich soil additive that helps plants and flowers grow bigger and better.

**WARNING:** Signals that a chemical is mildly hazardous.

**WASTE FREE LUNCH:** Packing your lunch in reusable containers that may be washed and used again and again, and placing it in a reusable lunch bag.

**YARD TRIMMINGS:** Grass clippings, leaves, weeds, and shrub and tree prunings, measuring six inches or less in diameter, generated from a residence or business

# Additional Resources

American Coal Foundation  
918 16<sup>th</sup> Street NW, Suite 404  
Washington, DC 20006

American Paper Institute  
260 Madison Avenue  
New York, NY 10016

American Plastics Council  
1275 K Street NW, Suite 400  
Washington, DC 20005

Department of Natural Resources  
PO Box 176  
Jefferson City, MO 65102  
314-751-4000

Environmental Protection Agency  
Region 7  
726 Minnesota Avenue  
Kansas City, KS 66101

Keep America Beautiful  
9 West Broad Street  
Stanford, CT 06902  
203-323-8987

Missouri Department of Conservation  
PO Box 180  
Jefferson City, MO 65102

Missouri University Extension  
Gaylord Moore  
833 Boonville Avenue  
Springfield, MO 65803  
417-862-9284

National Energy Foundation  
5160 Wiley Post Way, Suite 200  
Salt Lake City, UT 84116

Plastic Bag Information Clearinghouse  
PO Box 2811  
Pittsburgh, PA 15203

Pennsylvania Resources Council  
3606 Providence Road  
Newtown Square, PA 19073

Steel Recycling Institute  
680 Andersen Drive  
Pittsburgh, PA 15220  
412-922-2772

The Learning Works  
PO Box 6187, Dept. NEIC  
Santa Barbara, CA 93160

The League of Women Voters  
Education Fund  
1730 M Street NW  
Washington, DC 20036

U. S. Department of Agriculture  
Mark Twain National Forest  
401 Fairgrounds Road  
Rolla, MO 65401

Watershed Committee of the Ozarks  
Loring Bullard  
Springfield, MO  
417-866-1127

U. S. Geological Survey  
[www.usgs.gov/education/index.html](http://www.usgs.gov/education/index.html)

U. S. Environmental Protection Agency  
<http://www.epa.gov/teachers/>  
<http://www.epa.gov/highschool/>

Top 10 environmental programs tailored to meet your specific needs. Check out the programs that fall into the following categories: Most Popular, Rising Stars, After School, Home School, and Earth Day. Get additional resources, highlights, and request e-mails with links to the latest EE programs at [www.classroomearth.org](http://www.classroomearth.org)

U. S. Geological Survey's web site for kids and teachers at <http://www.usgs.gov/education/index.html>

U. S. Environmental Protection Agency has teacher resources, including links to materials developed by many other organizations at <http://www.epa.gov/teachers/>

U. S. Environmental Protection Agency has a new site targeted at high school students, which may also be just fine for many upper elementary and middle school students at <http://www.epa.gov/highschool/>

## **References used in preparing the activity guide:**

American Plastics Council

*4 Classroom Activities on Plastics and Solid Waste Management*

EPA

*Let's Reduce and Recycle: Curriculum for Solid Waste Awareness (1990)*

Household Hazardous Waste Project (1993)

*Household Hazardous Waste Management*

Keep America Beautiful

*Waste: A Hidden Resource (1994)*

*Waste in Place (1994)*

*Think Earth* Environmental Program (1991)

*Rainy Days and Saturdays* by Linda Hetzer

# **City of Springfield**

## *Integrated Solid Waste Management System*

Curbside Recycling  
Household Chemical Collection Center  
Information and Education Program  
Springfield Sanitary Landfill  
Market Development  
Recycling Centers  
Yardwaste Recycling Center

Programs and activities of the Integrated Solid Waste Management System are funded by the tipping fees generated at the Springfield Sanitary Landfill.

Division of Solid Waste Management  
Department of Public Works  
City of Springfield, Missouri  
**Recycling Hotline 864-1904**  
[www.springfieldmogov.org/recycling](http://www.springfieldmogov.org/recycling)

