Appendix F.1: Recycling Facts

(From: http://www.recycling-revolution.com/recycling-facts.html)

Aluminum Recycling Facts

- A used aluminum can is recycled and back on the grocery shelf as a new can, in as little as 60 days. That's closed loop recycling at its finest!
- Used aluminum beverage cans are the most recycled item in the U.S., but other types of aluminum, such as siding, gutters, car components, storm window frames, and lawn furniture can also be recycled.
- Recycling one aluminum can saves enough energy to run a TV for three hours -- or the equivalent of a half a gallon of gasoline.
- More aluminum goes into beverage cans than any other product.
- Because so many of them are recycled, aluminum cans account for less than 1% of the total U.S. waste stream, according to EPA estimates.
- An aluminum can that is thrown away will still be a can 500 years from now!
- There is no limit to the amount of times an aluminum can be recycled.
- We use over 80,000,000,000 aluminum soda cans every year.
- At one time, aluminum was more valuable than gold!
- A 60-watt light bulb can be run for over a day on the amount of energy saved by recycling 1 pound of steel. In one year in the United States, the recycling of steel saves enough energy to heat and light 18,000,000 homes!

Paper Recycling Facts

- To produce each week's Sunday newspapers, 500,000 trees must be cut down.
- Recycling a single run of the Sunday *New York Times* would save 75,000 trees.
- If all our newspaper was recycled, we could save about 250,000,000 trees each year!
- If every American recycled just one-tenth of their newspapers, we would save about 25,000,000 trees a year.

- If you had a 15-year-old tree and made it into paper grocery bags, you'd get about 700 of them. A busy supermarket could use all of them in under an hour! This means in one year, one supermarket can go through over 6 million paper bags! Imagine how many supermarkets there are just in the United States!!!
- The average American uses seven trees a year in paper, wood, and other products made from trees. This amounts to about 2,000,000,000 trees per year!
- The amount of wood and paper we throw away each year is enough to heat 50,000,000 homes for 20 years.
- Approximately 1 billion trees worth of paper are thrown away every year in the U.S.
- Americans use 85,000,000 tons of paper a year; about 680 pounds per person.
- The average household throws away 13,000 separate pieces of paper each year. Most is packaging and junk mail.
- In 1993, U.S. paper recovery saved more than 90,000,000 cubic yards of landfill space.
- Each ton (2000 pounds) of recycled paper can save 17 trees, 380 gallons of oil, three cubic yards of landfill space, 4000 kilowatts of energy, and 7000 gallons of water. This represents a 64% energy savings, a 58% water savings, and 60 pounds less of air pollution!
- The 17 trees saved (above) can absorb a total of 250 pounds of carbon dioxide from the air each year. Burning that same ton of paper would *create* 1500 pounds of carbon dioxide.
- The construction costs of a paper mill designed to use waste paper is 50 to 80% less than the cost of a mill using new pulp.

Plastic Recycling Facts

- Americans use 2,500,000 plastic bottles every hour! Most of them are thrown away!
- Plastic bags and other plastic garbage thrown into the ocean kill as many as 1,000,000 sea creatures every year!
- Recycling plastic saves twice as much energy as burning it in an incinerator.
- Americans throw away 25,000,000,000 Styrofoam coffee cups every year.

Glass Recycling Facts

- Every month, we throw out enough glass bottles and jars to fill up a giant skyscraper. All of these jars are recyclable!
- The energy saved from recycling one glass bottle can run a 100-watt light bulb for four hours or a compact fluorescent bulb for 20 hours. It also causes 20% less air pollution and 50% less water pollution than when a new bottle is made from raw materials.
- A modern glass bottle would take 4000 years or more to decompose -- and even longer if it's in the landfill.
- Mining and transporting raw materials for glass produces about 385 pounds of waste for every ton of glass that is made. If recycled glass is substituted for half of the raw materials, the waste is cut by more than 80%.

Solid Waste and Landfills

- About one-third of an average dump is made up of packaging material!
- Every year, each American throws out about 1,200 pounds of organic garbage that can be composted.
- The U.S. is the #1 trash-producing country in the world at 1,609 pounds per person per year. This means that 5% of the world's people generate 40% of the world's waste.
- The highest point in Hamilton County, Ohio (near Cincinnati) is "Mount Rumpke." It is actually a mountain of trash at the Rumpke sanitary landfill towering 1045 ft. above sea level.
- The US population discards each year 16,000,000,000 diapers, 1,600,000,000 pens, 2,000,000,000 razor blades, 220,000,000 car tires, and enough aluminum to rebuild the US commercial air fleet four times over.
- Out of every $10 spent buying things, $1 (10%) goes for packaging that is thrown away. Packaging represents about 65% of household trash.
- On average, it costs $30 per ton to recycle trash, $50 to send it to the landfill, and $65 to $75 to incinerate it.

Miscellaneous Recycling Facts

- An estimated 80,000,000 Hershey's Kisses are wrapped each day, using enough aluminum foil to cover over 50 acres of space -- that's almost 40 football fields. All that foil is recyclable, but not many people realize it.
- Rainforests are being cut down at the rate of 100 acres per minute!
- A single quart of motor oil, if disposed of improperly, can contaminate up to 2,000,000 gallons of fresh water.
- Motor oil never wears out, it just gets dirty. Oil can be recycled, re-refined and used again, reducing our reliance on imported oil.
- On average, each one of us produces 4.4 pounds of solid waste each day. This adds up to almost a ton of trash per person, per year.
- A typical family consumes 182 gallons of soda, 29 gallons of juice, 104 gallons of milk, and 26 gallons of bottled water a year. That's a lot of containers -- make sure they're recycled!

These recycling facts have been compiled from various sources including the National Recycling Coalition, the Environmental Protection Agency, and Earth911.org. While I make every effort to provide accurate information, I make no warranty or guarantee that the facts presented here are exact. We welcome all *polite* corrections to our information.

Please also feel free to contact us if you have additional recycling facts to share.

Links to our web site are always welcome. Feel free to use any information listed on our site for your own not for profit educational purposes. A link to our site as your source is appreciated.

For even more information and additional recycling facts, please visit
The National Recycling Coalition

Packaging: Is It a Waste?

Most recycling and waste reduction programs focus on packaging since it is a very large and visible portion of the waste stream. Consumers have the opportunity to significantly reduce the amount of packaging they buy and throw away if they make purchasing decisions with waste reduction in mind. Every day consumers make decisions about what to buy, and how to buy it, based on a number of factors—value, quality and convenience. An increasing number of consumers are also trying to evaluate the environmental consequences of purchasing certain products and the packages in which they are contained. They want to know which package is best for the environment. Unfortunately, there is no environmentally perfect package that fits all situations of use. Consumers need to understand the functions of packaging and have some guidelines for evaluating packaging before they can make sound decisions. With this background, they'll be able to select products with the least amount of packaging for their needs, and in most cases, save money too!

There are four parts to this section. Each part will have it's own list of Learning Objectives, Subjects, WMASs and grades covered.

Part One: Rate That Package!

Part Two: Grocery Store Scavenger Hunt

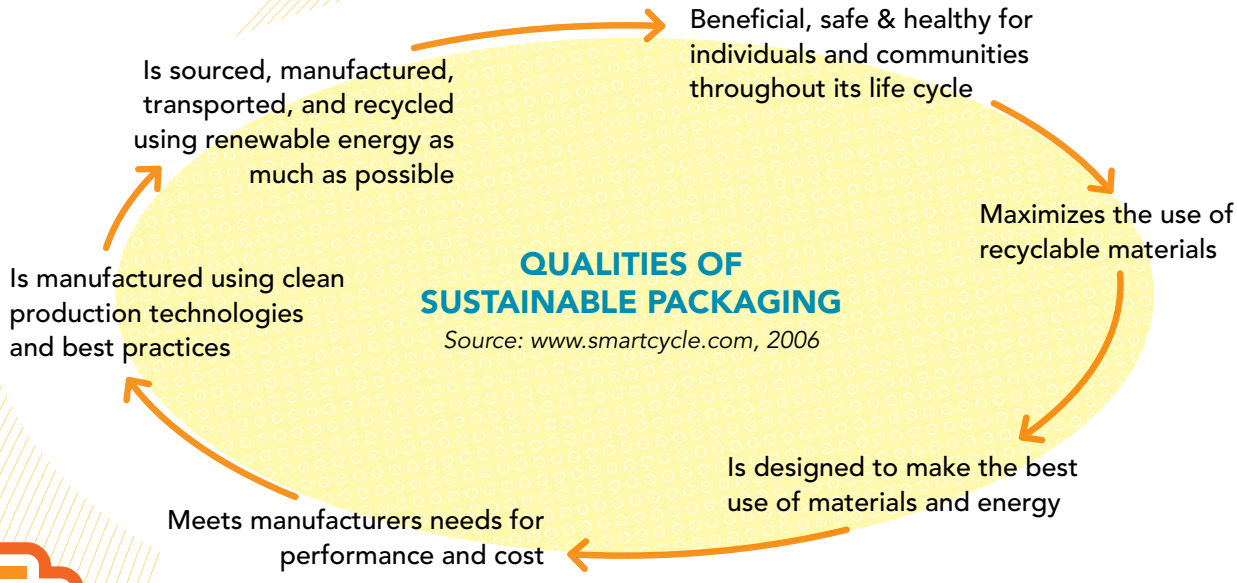
Part Three: Pick Your Potato

Part Four: What's At My House?

Oil saved by recycling 1 ton of plastic packaging: **16.3 barrels**

Landfill space saved by recycling 1 ton of plastic packaging: **30 Cubic Yards**

Number of plastic bottles Americans throw away every hour: **2.5 million**



IN FACT

In 2003, the Environmental Protection Agency estimated that the United States produced 11.9 million tons of plastic packaging. Over 90 percent of this was sent to a landfill after just one use.

Packaging: Is It a Waste?

Rate that package!

Learning Objectives: This activity will help students think about the functions of packaging and will encourage them to give equal consideration to quality, value, convenience, and environmental impact when making purchasing decisions.

Subjects: Science, Social Studies, Environmental Education, Family and Consumer Education.

Wisconsin Model Academic Standards: SC C.4.5, SC C.8.4, SC C.8.2, SS D.4.7, SS D.8.11, EE A.4.1-4, EE A.8.4, FCE introductory A.2, D.2.

Grades: 4-8

Materials: "Rate That Package!" worksheet and a variety of packaged food and personal care products purchased from your local grocery store. Product variety should include items with packaging made from recycled materials (e.g., recycled paperboard in cereal boxes), packaging that is recyclable (plastics marked with #1 or #2), non-recyclable packaging (foam, plastics marked with #7), and convenience items that may have multiple layers of packaging (individually wrapped candy bars, travel items).

Procedure: Divide the students into groups of 4-6. Have each group of students sit at a table with a variety of the packaged products. Give each student a "Rate That Package" worksheet and have them fill it out as they examine several products from their table.

After they have finished with the worksheet, have them complete the following questions to discuss with the rest of their workgroup/class:

1. Which product at your table scored the highest?
2. Which products scored the lowest?
3. Pick a product that scored lower than others and make suggestions on how the packaging could be changed to score higher.

GOING BEYOND

With waste reduction in mind, have students make a shopping list for one of the events below. Have students share their ideas on their list with the class.

- Birthday party of 10 guests
- Family reunion of 100 guests
- Dinner and sleepover at friends house
- Class party for about 30 students

Name _____

PACKAGING: IS IT A WASTE?

RATE THAT PACKAGE!

Student Handout

Closely examine the packaging samples provided by your teacher. For each packaging sample answer the yes or no questions below to rate it.

	#1		#2		#3		#4	
Product:								
Brand Name:								
Types of Packaging:								
	Yes	No	Yes	No	Yes	No	Yes	No
Does the packaging...								
provide useful information?								
protect product during transport & storage?								
protect product from spoilage?								
protect against tampering?								
provide convenience in opening and using?								
provide the right amount of product for me?								
Is the packaging...								
refillable or returnable?								
reusable?								
recyclable in your community?								
made from recycled material?								
using the minimum amount of materials to meet packaging needs?								
Assign one point for each 'yes' answer and add up for the total score. **Total Score:**								

Packaging: Is It a Waste?

Grocery store scavenger hunt

Learning Objectives: Students will consider problems associated with energy and resources expended in food packaging and the complexity of promoting and storing food in our society.

Subjects: Science, Social Studies, Environmental Education, Family and Consumer Education.

Wisconsin Model Academic Standards: SC C.4.5, SC C.8.4, SC C.8.2, SS D.4.7, SS D.8.11, EE A.4.1-4, EE A.8.4, FCE introductory A.2, D.2.

Grades: 6-8

Materials: "Grocery Store Scavenger Hunt" worksheet, packaged grocery product (optional)

Procedure: Use the Pre-activity Questions/Discussion items in class before assigning the "Grocery Store Scavenger Hunt" worksheet. Have students go to the grocery store with the family member in their household that does the shopping. Fill out the worksheet and then complete post-activity questions/discussions in class.

Pre-Activity Questions and Discussion:

1. Name as many types of materials you can think of that grocery store foods are packaged with (paperboard, foam, plastics, etc).
2. What are some reasons products are packaged? (product safety, product appeal)
3. Pick a product example. What do you think the product's manufacturer looks for when they choose the packaging type? What do you think consumers look for with packaging this product?

Post-Activity Discussion:

4. What were some of the products that you found to be over-packaged or had more layers of packaging than necessary?
5. Which did you find more of during your scavenger hunt—recyclable or non-recyclable packaging?
6. Why do you think some manufacturers choose to have their products in multiple layers of packaging?
7. Which products seemed to be more expensive per pound—the ones with lots of packaging or little to none?

Name _____

PACKAGING: IS IT A WASTE?

GROCERY STORE SCAVENGER HUNT

Take Home Worksheet no. 1

Plan a visit to a grocery store to see if you can hunt down all of the packaged items described below. Remember: recycling symbols are normally found on the bottom of a packaged item. Recyclable items include aluminum, paperboard (cereal boxes), cardboard, glass (salad dressing bottles), plastic #1 (peanut butter, water bottles), plastic #2 (detergent bottles, other non-food containers) and steel (vegetable and fruit cans). *You may have to use an additional sheet of paper to complete your scavenger hunt worksheet.*

1. Find an item packaged in a clear #2 plastic and list the product name.

2. Find an item that is wrapped in plastic and cardboard, and list the product name.

3. Find an item that has three layers of packaging and list the product name and describe the packaging.

4. Find an item in the grocery store with no packaging at all and list the item's name.

5. Find a product that is made out of the item (entirely or partially) in question #4, but is packaged. Name the product and describe the packaging (example: apples, applesauce). Which product costs less per pound?

6. Find a grocery item with packaging made from 100 percent recycled material. List the product's name and describe the packaging.

7. Find a product that is packaged in a reusable container. List the product, describe what the container is made of, and list some ideas for reusing the container.

8. Look for a grocery item that is in a refillable container. List the product and describe the packaging.

9. Find an example of a product that is packaged two different ways—one way packaged in a non-recyclable container, and the other in a recyclable container. (example: applesauce in glass jar versus applesauce in six individual, non-recyclable plastic #5 cups)

10. Look for a grocery item that can be bought in bulk, instead of smaller serving sizes that have more packaging. List the product.

11. Take one of the products you found above that had non-recyclable or excessive packaging and redesign the packaging. List how you'd design the package and draw a sketch of how it would look.

GOING BEYOND

Purchase the product you described in question #11 above and bring it to class for a presentation. Show the class the product, share what the packaging consists of and what resources were used to make that packaging. Present the alternative packaging you designed for the product.

Packaging: Is It a Waste?

Pick your potato

Learning Objectives: Students will examine the relationships between the cost of products and the amount of processing and packaging.

Subjects: Science, Social Studies, Environmental Education, and Family and Consumer Education

Wisconsin Model Academic Standards: SC C.4.5, SC C.8.4, SC C.8.2, SS D.4.7, SS D.8.11, EE A.4.1-4, EE A.8.4, FCE introductory A.2, D.2.

Grades: 6-8

Materials: "Pick Your Potato" worksheet

Procedure: Use the Pre-Activity Questions to guide a classroom discussion before filling out the "Pick Your Potato" worksheet. Discuss your conclusions, and answer the Post-Activity Questions afterwards.

Pre- Activity Questions:

1. What functions do the various forms of packaging serve?
2. Which of your favorite foods could you buy with no packaging? Which ones would you have to do without?
3. Why should we be concerned with buying products that have less packaging and less processing?

Post-Activity Questions:

4. What will you look for when you buy products in the future? What criteria will you use for making your decisions about what to buy and what not to buy?
5. How can the packaging of foods be reduced while still addressing health and safety concerns?

GOING BEYOND

1. Working with a partner, select a fresh food item to investigate, such as a tomato or corn. If possible, go as a class to the grocery store (or go independently after school). Calculate and/or record the price per pound of the fresh product as well as 5-10 items that are processed from that product. Make a chart like the one on the "Pick Your Potato" worksheet, for the product you are investigating. Which form of food item is the most expensive per pound? Why? What relationships are there between cost and the amount of processing and packaging? Which form of the food item would you purchase if you were interested in: Reducing solid waste at home? Saving money? Convenience?
2. Contact a food processing company. Find out what percentages of their costs are due to the purchasing, processing, packaging, and shipping of the product. Ask them how they dispose of their production wastes.

3. Conduct a survey of several fast food restaurants and record the types of packaging (e.g., polystyrene, paper, aluminum foil) they use for similar items (e.g., soda, plain hamburger, fish sandwich, french fries, coffee). Is the packaging necessary? What criteria are you using to make your judgment? If you were concerned about the impacts of solid waste on the environment, which restaurants would you go to most? Could you influence the restaurant to change its packaging policies? How?
4. Make informative posters that recommend careful selection of food products. Include such ideas, for example, as: choose products in recyclable, returnable, or refillable containers; avoid excessive packaging, buy products in bulk or in larger sizes, buy unwrapped fruits and vegetables, avoid snack items in single-serving packages, carry products home in cloth bags, support companies that provide minimal and recyclable packaging. Look for local areas (with permission) to post these signs such as grocery stores, laundromats, and community bulletin boards.

Name _____

PACKAGING: IS IT A WASTE?

PICK YOUR POTATO

Take Home Worksheet no. 2

Examine the chart on this worksheet and then answer these questions:

1. Which form of the potato is the most highly processed and packaged?

2. Which form is the most expensive per pound?

3. Which form of potato would you purchase if you were interested in:

a. Reducing solid waste at home?

b. Saving money?

c. Convenience?

4. Which form of potato produced the most waste (packaging and peelings) at home?

5. Which form of potato do you think might produce the most waste at the processing plant?

6. What do food processors do with their vegetable wastes? (spread in fields, compost, sell for animal feed, etc.) Are these really wastes? How can you reduce the amount of waste and not throw away potato peelings?

Product	Package Size	Price	Price per pound
Individual Fresh Potatoes	N/A	.79	.79/lb
Bag of Fresh Potatoes	5 lbs	2.29	.46/lb
Sliced Canned Potatoes	14.5 oz	.99	1.09/lb
Instant Mashed Potatoes	13.75 oz	2.19	2.54/lb
Microwavable Easy Fries	4.25 oz	1.00	3.76/lb
Boxed Scalloped Potatoes	7.5 oz	2.19	4.62/lb
Box of Potato Chips	12 oz	3.19	4.25/lb
Multi-pack Potato Chips	24 oz	8.49	5.66/lb
Fast Food Large Fries	6 oz	1.49	3.97/lb

Price information from Pick and Save in Oconomowoc, WI, and McDonalds in Waukesha, WI, July 2006

Packaging: Is It a Waste?

What's at my house?

Learning Objectives: Students will investigate products in their own homes to learn more about packaging types and making choices as consumers that promote recycling and environmental sustainability.

Subjects: Science, Social Studies, Environmental Education, Family and Consumer Education.

Wisconsin Model Academic Standards: SC C.4.5, SC C.8.4, SC C.8.2, SS D.4.7, SS D.8.11, EE A.4.1-4, EE A.8.4, FCE introductory A.2, D.2.

Grades: 4-8

Materials: "What's At My House?" worksheet

Procedure: Use the Pre-Activity Questions/Discussion items in class before assigning the "What's At My House?" worksheet. Have students go through the activity with the family member(s) in their household that does the grocery, personal care and home products shopping. Fill out the worksheet and then complete Post-Activity Questions/Discussions in class.

Pre-Activity Questions:

1. What are some of your favorite grocery store products? Name some and put them on the board. Describe and list how those products are packaged (i.e., paperboard box, plastic wrapper, etc.) Some items will not have packaging, such as produce items.
2. What is recyclable in your community? (glass, plastic, cardboard, paper, paperboard, aluminum, steel)
3. Talk about what it means for a product to be ***durable***. Why is it important to choose products that are durable?
4. What does it mean when a product is designed to be ***disposable***? Name some products that are designed to be one-time use only and then disposed of. How does this type of product affect how much waste is sent to our landfills?
5. What types of packaging are ***recyclable***?
6. What does it mean when a product is ***reusable***?
7. Why do we choose the products we do? Talk about what influences our purchases such as price, advertising, convenience and durability.

Post Activity Questions:

8. What packaging types did you find the most of in your home?
9. Note any trends within your observations on your worksheet.
10. As consumers, how can we reduce the amount of packaging needing to be recycled and disposed of? List some ideas how to do this.
11. How can you look for ways to reduce the amount of packaging waste in your family?

GOING BEYOND

1. Pick one product from your worksheet that is not recyclable and find an alternative for your family. Alternatives might include picking another brand that has less packaging, more recyclable packaging, or stopping using that product.
2. Pick an item from your worksheet that is not very durable and find alternatives to that the product.

Name _____

PACKAGING: IS IT A WASTE?

WHAT'S AT MY HOUSE?

Take Home Worksheet no. 3

Use items in your home to fill out the chart below. Ask the help of the person(s) in your household that does the grocery shopping. (Reasons for purchasing an item might include: on sale, best value, convenience, preferred brand, best quality, etc.)

Pick a minimum of four products, from each of the following three categories, to fill out this chart.

1. Grocery/food products
2. Personal care items, like toothpaste and shampoo
3. Home products, such as cleaning, storage or household supplies

Product	Durable Y/N	Disposable Y/N	Recyclable Y/N	Reusable Y/N	Reason for Purchasing
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					

WHAT CAN I DO?

Student Handout

Grocery shopping with the four R's in mind

Walking into a grocery store can be an overwhelming experience—there are so many choices: What brand? What size? What flavor? What packaging? By keeping the four R's in mind—Reduce, Reuse, Recycle and Re-buy (or Buy Recycled)—you can reduce waste, and save money, all by the simple process of shopping.

How do you apply the four R's when shopping?

1.

It's easiest to shop with the first R—**Reduce**—in mind. Look for ways to get more product and less packaging for your money. Take dry breakfast cereals for instance, most are available in large, family-sized boxes, which reduces packaging over time. The idea of buying in larger sizes holds true for many products, from detergents to tomato sauces and pastes. Second, don't buy packaged products that don't need it—fruits and vegetables are prime examples. Apples, carrots and other produce can be bought loose (or, if necessary, be put in a plastic bag brought from home). Third, reuse your paper, plastic, or cloth bags. And fourth, carry a shopping list to reduce the amount of impulse shopping you do, thereby reducing unnecessary waste.

2.

The second R—**Reuse**—is also important. Buy groceries like juice, lunch supplies and condiments with reusable containers in mind. Juices can be purchased in concentrate form to be mixed in your own reusable containers. You can reduce a tremendous amount of lunch waste by avoiding single serving containers.

3.

Don't forget to also buy with **Recycling**—the third R—in mind. If you can't reuse an item, or plan to dispose of it, make sure the item is recyclable. Typically, this means it is cardboard, glass, aluminum, tin, or specific kinds of plastic. For example, #1 and #2 plastics are readily recyclable. (If you are not sure whether the plastic container is a #1 or #2 plastic, and therefore can be recycled, ask store management. If they don't know, ask them to find out!). Recycling is important, but it is often more effective to prevent waste before it is generated in the first place. That's why the first R—Reduce—is the top priority.

4.

Finally, **Re-buy** (or Buy Recycled)—buy products made with recycled material. Purchasing these products helps turn waste reduction strategies into economic development opportunities. The packaging on many products lists whether recycled material is used. Buying these products helps "close the loop," and because these products use fewer resources, you will be helping the environment. Buying with the four R's in mind helps reduce unnecessary waste, and can help build up the piggy bank.