



# RECYCLING

Activity M.q  
Grades 7 - 8

Student Handout 1

Name: \_\_\_\_\_

## **What is Recycling?**

“Recycling” means collecting materials from the solid waste stream and processing them into new products for people to buy. Recycling involves three steps:

Separating and collecting materials to be recycled

Processing these materials

Re-manufacturing products from these materials that are then purchased.

The easily recognized recycling logo symbolizes these three steps.

## **The First Step of Recycling: How Does the Separation and Collection Work?**

Recycling solid waste from households typically takes place in one of three ways. All three methods require that people sort their household trash in order to separate those items that can be recycled.

In some cities and towns, individuals must take their items to be recycled to a collection site. Here there are separate bins to collect glass of different colors, various types of plastic, newspaper, aluminum, and steel. This is known as “drop-off” recycling.

In other areas, residents place their separated materials to be recycled alongside the street for pickup by a private or municipal recycling agency on a regular collection schedule. This is called “curbside recycling.” The types of materials collected for recycling vary from city to city.

Finally, some areas have companies that purchase materials for recycling. Typically, consumers bring items like aluminum cans to places where they are given money for the containers. These are called “buy-back” centers.

To make sorting and collection easier, industry has taken some steps. For example, different plastics are identified by codes. These codes have been developed by the Society of Plastics Industries (SPI) and identify seven categories of plastic. They allow consumers to separate plastics according to type. (Student Handout 2 shows the seven SPI codes.)

## **The Second and Third Steps of Recycling: How Do Processing and Re-Manufacturing Work?**

After collection, the materials are processed for reuse. Depending on the material being recycled, processing can mean sorting, washing, drying, grinding, or heating. There are even new ways of recycling some materials by chemical means! No matter what kind of recycling process is used, the recycled material is made into a new product.

### **Plastics**

Some plastics are ground and made into new containers. For example, the plastic used in your family's detergent bottle might have been made from recycled milk jugs. Plastic recycling shows how new technology is constantly being developed to meet the challenge of solid waste. One new technology can recycle a particular kind of plastic in a very different way. This technology takes the plastic apart at the molecular level. All impurities are removed by chemical means. The scientific name for this process is "depolymerization." This process is important for food packaging because only plastic that is absolutely free of contaminants can safely come into contact with what we eat.

### **Metals**

Metals are typically heated until they are red hot and then formed into new products. The average steel can, for example, contains 25% recycled material. The average aluminum can contains 90% recycled material.

### **Glass**

Glass is washed and ground into granules. These are called "cullet." One use for cullet is to be combined with asphalt, to make "glasphalt" to pave streets and roads. A more common use for cullet is to be melted and made into new glass bottles or containers. The high temperatures used in recycling both metal and glass effectively remove all impurities. This means that containers made from recycled metal and glass can safely come into contact with food and beverages.

### **Paper**

Paper is typically ground into fibers and put through a de-inking process. The fibers are then used to make recycled paper and cardboard, technically known as paperboard. Recycled paperboard is used to package many types of products. But recycled paperboard may only safely come into contact with moist foods or foods containing fats when special tests are used to ensure that the packaged products are free of contaminants.

### **Making Recycling Work**

In order for recycling programs to work all three steps listed above need to occur. First, people must participate in separating and collecting materials through curbside, drop-off, or buy-back recycling programs.

Next, following collection and separation, facilities must be available to process the materials collected. Finally, the recycled materials must be re-manufactured into products for people to buy. For a recycling system to be effective, people must buy products manufactured with recycled materials.

Another name for the last step is "closing the loop." Closing the loop is important because if an end market does not exist, there is no place for the sorted and collected material to go. You can personally help to close the loop by buying products that are made from recycled materials.

## **Recyclable and Recycled Materials**

There are two terms that are often used in connection with recycling to describe products, packages and other items: “recyclable” and “recycled.” These two terms are often confused. Since they mean different things, it is important to know the difference.

The term “recyclable” means that the material can technically be processed into another product. There is, however, no guarantee that a recyclable product in fact will be recycled in a particular community. In order for a product to be recycled, the town or city must have a program that collects the type of material from which the product is made, and facilities for processing the material.

The term “recycled” means that the material has been collected and processed into a new product. For example, recycled paper is often used in the paperboard boxes that contain some brand of cereals, macaroni and cheese, and cake mixes. If the inside of a box is gray or brown, it is likely that it is made of recycled paper.



# SPI CODES

Activity M.q  
Student Handout 2

Name: \_\_\_\_\_

Some typical product packages:

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Mayonnaise jars  
Soda bottles  
Salad dressing bottles  
Ketchup bottles  
Peanut butter jars  
Instant coffee jars  
Cooking oil bottles



PETE  
polyethylene  
terephthalate  
(PET)



HDPE  
high density  
polyethylene



Milk jugs  
Water bottles  
Detergent bottles  
Margarine in squeezable containers and tubs



V  
vinyl/polyvinyl  
chloride (PVC)



LDPE  
low density  
polyethylene



Refrigerated pasta packages  
Individual cheese snack packages  
Cooking oil bottles



Squeezable mustard containers  
Most container lids



PP  
polypropylene



PS  
polystyrene



Maple syrup bottles  
Spreadable cheese tubs  
Pasta sauces packages  
Microwavable trays



Yogurt containers  
Sour cream containers  
Cottage cheese containers



Luncheon meat packages  
Salad dressing bottles  
Ketchup bottles



OTHER  
other



# RECYCLING WORKSHEET

Activity M.q  
Grades 7 - 8  
Student Handout 3

Name: \_\_\_\_\_

1. Describe the recycling process using one specific material as an example.

2. Draw the recycling logo and label its three parts.

3. Describe the difference between the terms “recycled” and “recyclable.” In your answer, list some products that contain recycled content. Also list products that are recycled in your community.

4. Using Student Handout 2, match the SPI codes listed below with the different products identified on the right

SPI CODE

PRODUCT

Code 1 \_\_\_\_\_

Code 2 \_\_\_\_\_

Code 3 \_\_\_\_\_

Code 4 \_\_\_\_\_

Code 5 \_\_\_\_\_

Code 6 \_\_\_\_\_

Code 7 \_\_\_\_\_

a. Mayonnaise jars

b. Soda bottles

c. Maple syrup bottles

d. Mustard containers

e. Detergent bottles

f. Peanut butter jars

g. Luncheon meat packages

h. Container lids

i. Salad dressing bottles

j. Microwavable trays

k. Ketchup bottles

l. Cooking oil bottles



## **A VISIT TO A RECYCLER**

Activity M.q  
Grades 7 - 8  
Student Handout 4

Name: \_\_\_\_\_

Questions to be asked during a visit to a recycling facility.

1. From where does the solid waste handled by the recycler come?
2. Why is the recycling center located on this spot? When did it open?
3. Who owns and operates the recycling center?
4. What materials does the center collect and how are they sorted?
5. How much solid waste does the recycling center process per day?
6. How much does the recycling center pay for recyclable solid waste?
7. Does the center handle any hazardous materials?
8. What, if any, processing does the recycler do before selling the collected raw materials?
9. What are the end markets for the collected raw materials?