Trashing the Planet:

Reduce, Reuse, Recycle

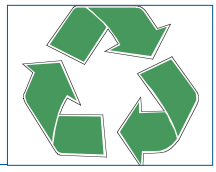
Grades 3–6

Using AIT Products

- *Economics at Work*, "That's a Lot of Trash!"
- *Art History III: Mastery in Three Media*, episode 7, "New Methods and Materials: Twentieth-Century American Sculpture"
- *The Outside Story with Slim Goodbody*, program 6, "It All Adds Up"

Overview

Environmentally aware consumers produce less waste by practicing the "3 Rs": Reduce, Reuse, Recycle. This lesson is designed to help students become more environmentally aware by having them look at each of these three waste-control strategies in turn. They will consider ways to reduce junk mail and excessive product packaging, explore ways to reuse items they would normally throw away, and investigate the reasons why recycling makes less of an impact on the problem than reducing and reusing. They will work together in groups to create trivia games about the problem of dealing with all the trash in the United States.



"Use it up, wear it out, make it do, or do without."

—New England proverb

Objectives

- Investigate contributors to the growing trash problem in America, including excess packaging and junk mail.
- Describe reasons manufacturers continue to create excess packaging and unsolicited mail, and make judgments about which are acceptable practices.
- Explain that the conserving and recycling of natural resources is the responsibility of everyone on the planet.
- Identify ways people can reduce, reuse, and recycle various disposable goods.

Vocabulary

biodegradable
decompose
degrade
energy
landfill
pollution
recycle
reduce
resources
reuse

Preparation

Materials Needed

- AIT video *Economics at Work,* "That's a Lot of Trash!"—CUE the tape to approximate time code 00:25 (two separate video clips, about 2.5 minutes in total length).
- AIT video *Art History III: Mastery in Three Media,* episode 7, "New Methods and Materials: Twentieth-Century American Sculpture"—CUE the tape to approximate time code 06:18 (about 2.5 minutes in length).
- AIT video *The Outside Story with Slim Goodbody,* program 6, "It All Adds Up"—CUE the tape to approximate time code 04:21 (about 1 minute in length).
- Large clay flower pot (at least 10 inches in diameter), with saucer
- Potting soil (enough to fill the pot)
- Assorted fast food trash items, including
  - ✔ Paper sandwich wrapper
  - ✔ Cardboard sandwich or French-fry container
  - ✔ Drinking straw
  - ✔ Paper drink cup with plastic lid
  - ✔ Napkin
  - ✔ Paper sack
  - ✔ Plastic wrapper (e.g., the package of a "kids' meal" toy or plastic utensils)
  - ✔ Empty catsup or mustard pouch
  - ✔ Part of a burger bun
  - ✔ One or two French fries
- Chunk of Styrofoam® (a packing "peanut" or piece of a coffee cup will do)
- (Optional) Rubber gloves
- Plastic wrap
- HANDOUT: **Aluminum Can Recycling** (from the Can Central Web site, found at www.cancentral.com/canc/nontext/l3w.htm —one copy for each student)
- An empty (clean) soft drink can
- A paper clip
- A used kitchen scouring pad (clean)
- Two large rubber bands (one large enough to go around the flower pot)
- An empty facial tissue box
- A large paper grocery sack
- Recycled paper, including scrap construction paper saved from other art projects, worksheets printed on one side, and so on
- Glue or tape
- Paint or markers
- Scissors
- Large selection of assorted recycled materials (see second Planning Note, below)

Planning Notes

- The Preplanning Procedure section (Topic: Where Is "Away"?) should be conducted approximately three weeks before the rest of this lesson, to give the materials time to decompose. The materials will be examined during Day Three: Recycle the Trash.

- At this time, also request that students collect some items from home that might normally be thrown away, which will be used in a craft project on Day Two. Don't explain what you want the items for ahead of time, but create a "wish list" with items similar to the following, and send it home.
  - ✔ Department store clothing boxes
  - ✔ Used file folders
  - ✔ Unwanted magazines and catalogs
  - ✔ Used tissue paper
  - ✔ Used gift-wrap paper
  - ✔ Lids from dried-out markers
  - ✔ Pull tabs from soft drink cans
  - ✔ Plastic caps from drink bottles (e.g., bottled water or milk cartons
  - ✔ Used envelopes
  - ✔ Large caps from fabric softener or liquid detergent containers
  - ✔ Band Aid® (or other adhesive bandage) boxes

- One week before this lesson is to begin, ask students to collect and bring in their family's junk mail for three separate days. This can include catalogs, inserts to bills, credit card offers, sweepstakes offers, and so on. NOTE: Be sure students understand the difference between personal mail and junk mail, and instruct them to remove any private information (e.g., names, addresses, account numbers, and so on) before bringing mail to class. Encourage students to clear all mail with their parents first. Save the junk mail in separate sacks, envelopes, or folders labeled with students' names for the Group Work Activity of Day One ("Junk Mail Math").

Time

This project will take about four 60-minute class periods, in addition to the pre-planning activity and homework time.

Day 1: Reduce the Trash
Day 2: Reuse the Trash
Day 3: Recycle the Trash
Day 4: Group Activity—The 3R Trivia Game

Preplanning Procedure—Three Weeks before Lesson

Topic: Where is "Away"?

Gather the flower pot and saucer, potting soil, fast food restaurant trash, plastic wrap, and rubber band on a table all students can see easily. You'll also need some water.

Ask students to vote on their favorite fast food restaurant, and then their favorite fast food meal. Then have them brainstorm the things that they throw away after eating at a fast food restaurant. List all suggestions on the board. Show them items they list that you've brought in, including the sandwich wrappers, drinking straw, paper sack, and so on. Take a few minutes to discuss what each item is made of.

Then ask students to discuss what happens to this trash when they're finished with it. Where does it go? In other words, when you throw trash away, where is "away"? Encourage any suggestions, but don't provide any instruction at this time. Explain that the class will be discussing the problem of trash in a few weeks, and to get ready for the lesson, you're going to bury some trash items now and dig them up again during the trash unit to see what happened to them. (You may wish to wear rubber gloves.)

In the large clay flower pot, place a layer of potting soil about a third of the way up the side of the pot. On this layer of soil, place the fast food trash items, wadding them up or cutting off smaller pieces if they don't fit in the space without touching. Add the piece of burger bun and one or two French fries. Insert the chunk of Styrofoam® while explaining that, although most fast food restaurants don't use polystyrene foam any more, it still makes up a lot of our trash. Ask students to name some places where they see Styrofoam® being used.

Cover the trash items with more soil, up to one inch from the top of the pot. "Water" the pot so

that the soil is moist but not too wet, and then cover it with plastic wrap, placing the large rubber band around the rim to hold the plastic on. Place the pot in a sunny window. NOTE: The activity will work better if the soil stays warm, so try to place the pot in direct sunlight if possible.

Ask students what they think is going to happen to the trash in the flower pot. Over the next three weeks, add more water to the pot, keeping the soil damp but not drenched.

Procedure—Day 1

Introduce Topic: Reduce the Trash

Remind students that a few weeks ago you prepared something using trash. Have volunteers describe what items were buried in the flower pot. Explain that you will be digging up the trash in a couple of days, but today they're going to be talking about where all the trash comes from, whether any trash is unnecessary, and ways we can reduce the amount of trash we throw away every day. Write the word "Reduce" on the board.

Begin by asking them to name an over-the-counter medicine they have at home. Students might name headache or cold remedies, vitamins, and so on. Ask: Do we usually use up all the medicine, or do we throw aspirins, vitamins, cough syrup, etc., away? If we usually use up all the medicine, does it have any trash associated with it?

Have different students describe the packages these items are wrapped in, and begin a list on the board. Make sure students mention all the parts of the packaging, including cotton padding in pill bottles; plastic-and-foil blister packs with packaged cold tablets; the box, bottle, and cap on liquid medicines; inserted paper instructions; and so on.

Video

Prepare students for watching a clip from AIT's video *Economics at Work,* "That's a Lot of Trash!" by explaining that this short video clip looks at the trash we throw away every day and why some products have so much packaging. Begin the video segment at about time code 00:25, right after the opening credits.

Continue PLAY to approximate time code 02:17, at the onscreen question, "Is all the microwave packaging necessary?" Encourage students to discuss this question. Why do they think microwave popcorn contains so much excess wrapping?

CUE the video to the second, very short, video segment at approximate time code 05:20, as the narrator asks, "Why is the packaging of disposable diapers necessary?" and continue PLAY to time code 06:05, after the aluminum cans are dumped in the recycler.

Create a T-chart on the board, heading one column "Good" and the other "Bad." Ask students to list the good reasons for packaging, based on what they learned in the video and what they already know. (They might mention that packaging keeps items clean, protected, or sanitary; that it provides a place for manufacturers to list important information about the contents; and that it allows manufacturers to advertise their goods and attract more buyers.) Encourage students to thoroughly discuss each advantage so that everyone understands that there are benefits to packaging.

Then have students list the bad things about packaging, including pollution, excess trash, and loss of natural resources for making them. Encourage students to thoroughly explore each of these disadvantages, making sure everyone understands each item.

Group Work: Junk Mail Math

Pass out the junk mail to the students who brought it in, and divide the class into small groups, making sure every group has at least one student who brought in junk mail. Have the groups work together to complete the following activities.

1. Separate and count each individual piece of paper. (Students who brought in catalogs can list page numbers.)

2. Sort the junk mail into types of mail.

3. Discuss why companies send so much mail.
   a. Why do bills come with so many inserted pieces of paper?
   b. What does the manufacturer hope to gain from this practice?

Ask a representative from each group to give you their total count, and add the totals from all the groups on the board. Have groups continue working together on the following math questions.

1. If every class in the school collected the same number of junk mail pieces, how many pieces are there in all?

2. If the answer to No. 1 is the total number of pieces the entire school collected in three days, about how many pieces would be collected in a month (assuming a month equals 30 days)?

3. How many pieces of junk mail would be collected by our school in a year?

When all groups have completed the three math questions, gather the whole class together and discuss what they've learned. Is junk mail a problem? How might manufacturers avoid adding so much junk mail to America's trash problem and still be able to advertise their goods to consumers? What can people do to reduce the amount of junk mail they receive?

Provide students with the following address of the Direct Marketing Association, which can remove their names and addresses from commercial mailing lists, non-profit lists, or both.

Mail Preference Service
Direct Marketing Association
11 W. 42nd St., PO Box 3861
New York, NY 10163-3861

Ask what types of junk mail this will help reduce in students' households, and what types aren't going to be affected. (Students should realize that removing their names from commercial and non-profit mailing lists won't reduce the paper inserts in credit card statements or ads sent by local businesses.)

Homework

Students should discuss what they've learned about excess packaging with their families, and ask for help selecting one item from home that they feel is "over packaged." They should then write a mock letter to the manufacturer of that item. In the letter they should describe the waste problems in excess packaging, the problem this causes for our country, and their feelings about this type of waste. The letter should conclude with suggestions to the manufacturer on how to reduce packaging while still protecting the product and attracting buyers. If possible, students should try to bring in an example of the packaging that they wrote about, to help create a display in the classroom.

Procedure—Day 2

NOTE: Before class begins, place an empty soft drink can, a paper clip, an old kitchen scouring pad, a large rubber band, and an empty facial tissue box into a large paper grocery sack.

Reflection

Have individual students read their homework letters aloud. After each letter is read, conduct a short brainstorming session with the class on

whether any of the product's excess packaging could be eliminated.

Create a bulletin board to display the excess packaging materials students have brought from home along with the letters. Ask students to suggest a clever title for your bulletin board display.

Introduce New Topic: Reuse the Trash

Remind students that they just learned about the number one way to fight the trash problem in this country: reduce the amount of trash we have in the first place. Explain that experts say the second best way to combat the problem is to reuse materials instead of throwing them away. Write the word "Reuse" on the board. Ask volunteers to give an example of how you might reuse something you'd normally throw away.

Previewing Activity

Divide the class into five or six groups and assign one student in each group to be a recorder. Set a timer for 10 minutes, and tell students that when you say "Go," they will have that much time to brainstorm together as many ways as possible to reuse a "disposable" item.

Get the grocery sack full of items you assembled ahead of time. Go to each group and pull one item from the sack and place it where all group members can see it. If you have six groups, give the last group the grocery sack itself. Remind students that they are to brainstorm creative things that could be done with that item instead of throwing it away. Begin the timer.

After the ten minutes elapses, bring the groups together and have the recorder share the reuse ideas each group came up with for their item. Let other members of the class volunteer other ideas.

Video

Prepare students to view the video by explaining that in the twentieth century many artists became interested in creating art from discarded materials. In the video clip they will see the work of two artists, John Chamberlain and Louise Nevelson, who used items you wouldn't normally think of to create art. Tell them to watch closely to see if they can identify the materials in each artist's work.

CUE program 7 from the series *Art History III: Mastery in Three Media,* "New Methods and Materials: Twentieth Century American Sculpture" to approximate time code 06:18 (where the host begins, "John Chamberlain's twisted steel is crushed . . . "). Continue to approximate time code 08:38 (after the narrator says, ". . . strange, haunting, cubist corridors, environmentally correct"). PAUSE the video on this last image by Louise Nevelson, and ask students if they can identify any of the items this artist used in her sculpture. (Although all the items have been painted gold, students may be able to spot table legs, stairway balustrades, chair backs, and other items made from wood.)

Ask students what they think of these works of art. Do they think artists are trained to see everyday objects in new ways? Did any of the groups in the Previewing Activity suggest using their items in works of art?

Class Activity—Computer Lab Investigations

This activity requires you to take students to an Internet-ready computer lab (or have them work in small groups at three to four classroom computers, if you have them). Explain that they will be exploring three Web sites devoted to trash. NOTE: You may wish to follow the suggested times for each Web site, to make sure students see all three in a timely manner. Encourage students to make notes of trivial facts about trash at all of these sites, as they will be used in a homework activity and the next day's Group Work.

NOTE: Teachers should preview all sites to ensure they are age-appropriate for their students. At the time of publication, all URLs were valid.

(Five Minutes) The Oakland Museum of California's **Hello Again** Web site, found at www.museumca.org/helloagain/hello.htm, provides images of many art works created from reused materials. Click on the "Table of Contents" icon, and explore the displays offered there. Encourage students to notice the trivia facts printed at the top of each screen.

(Seven Minutes) Next, **The Garbage Graveyard** is an online interactive activity hosted by the Virtual Courthouse, the official Web site of Larimer County, Colorado, found at www.co.larimer.co.us/solidwaste/kidspages/gravyd.htm. Students predict how long various items take to decompose, and click the image to find out if they are correct.

(Ten Minutes) Another Web site, the U.S. Government's Energy Information Administration's **Energy Kid's Page**, found at www.eia.doe.gov/kids/energyfacts/saving/recycling/solidwaste/primer.html, provides trivia, a timeline of waste collection, and graphs and charts illustrating the problem of trash in this country.

Homework—Trash Trivia

Ask students to write ten trivia questions about trash. Encourage them to use the information they learned in the computer lab as well as the class discussions from the previous two days. They can also ask their family for ideas or research on their own for more facts. The questions may be true/false or multiple choice, and students must include an answer key.

Procedure—Day 3

Reflection

Collect the Trash Trivia homework questions for the Group Activity on Day Four. Explore and discuss the following questions.

- How can buying items in larger amounts help reduce the amount of trash in this country?

- What are some things we throw away here at school that we could be reusing in new ways?

Introduce New Topic: Recycle the Trash

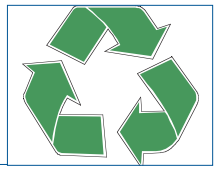
Remind students that the first choice in fighting the trash problem is to reduce the amount of trash. What is the second choice? (Reuse the trash.) Today they're going to be looking at the third way to fight: recycling the trash. Write the word "Recycle" on the board. Ask a volunteer to explain the difference between recycling and reusing materials. (Reused items are taken the way they are, but recycled items must go through some type of process such as melting or pressing in order to create something new from them.)

Video

Prepare students for watching the AIT video from *The Outside Story with Slim Goodbody,* "It All Adds Up," by explaining that Slim Goodbody is a character known for instructional videos about human body systems and health. (They will notice in this video segment that he wears a body suit illustrating the organs, muscles, and bones of a human body.) In this series, however, Slim is looking at the outside world, and the clip from the program they're about to see is all about the trash problem.

CUE the video to approximate time code 04:21, after Slim says, " . . . than the people did long ago." During viewing, ask students to notice the differences in the way people used to package items compared with today. PLAY through time code 05:22, after Slim's line, "We're making permanent garbage."

Ask students what Slim meant when he says some of our garbage today is "permanent."



"People who say it cannot be done should not interrupt those who are doing it."

—Anonymous

Class Activity and Discussion: Digging Up Fast Food Trash

Cover a table in the front of the classroom with a thick layer of newspapers or a large plastic garbage bag to protect it. Make sure all students are able to see, and dump the flower pot in which you buried the fast food trash, spreading the dirt out carefully until you reach the layer of trash items. NOTE: You might want to wear rubber gloves, or use a ruler or wooden spoon to spread out the soil.

Return to the list of trash items you buried, and ask students to come closer in groups to see if they can find each item. Discuss with the class which items were completely or almost completely decomposed, which had begun to break down, and which looked exactly the same as the day you buried them.

- How does this compare to information found during the Computer Lab activity?
- Which items might be labeled "permanent" trash?
- What conclusions can be drawn about the need for recycling or reusing certain items of trash?

Ask students to list items that can be recycled instead of reused or thrown away, and create a list on the board. Pass out the **Aluminum Can Recycling** handout, and discuss the process. Point out that, while aluminum cans are generally recycled into more aluminum cans, and paper is usually recycled into more paper, items made of glass, plastic, and Styrofoam® are often remade into completely new products. Recycled plastic is the most versatile—it can be used to make garbage cans, hair combs, picnic tables, park benches, and even carpet.

Procedure—Day 4

Reflection

Quickly debrief the class on what they've learned about handling the trash problem in America. Ask them to explain the difference between reducing, reusing, and recycling trash, and when each strategy works best for different situations and types of trash. Ask, "If we had added worms and other soil organisms to our flower pot, would the trash have decomposed faster? Why do you think so?"

Group Work—The 3R Trivia Game

Divide the class into groups and tell them that they are going to create a "3R Trivia Game." They will be using their homework trivia questions from Day 2 and designing a board game based on the theme of Reduce, Reuse, and Recycle.

Explain that their challenge is to design and create the game by using only reused items that might normally be thrown away. Place the recycled materials students have brought to class on a table in the back of the room, along with the construction paper scraps and other art supplies you assembled.

Allow 10 to 15 minutes for group members to share their ten trivia homework questions, and then have them come to agreement on what they think are the 20 to 25 best questions—these are the questions they will use in their game.

Discuss with the class several different game formats. You might want to use real games as examples of the types of obstacles players meet on path games, trivia games, challenge games, card games, and so on. Allow groups time to agree on the style of board game they want to create. Then they should assign roles to divide the task of creating the game, such as:

- Game Board designer (determines how many squares from start to finish, how to decorate the board, what colors to use, etc.)
- Trivia Question designer (decides what format to present the questions in, and writes out all questions and the answer key neatly)
- Game Box designer (selects and decorates a box or other container)
- Game Piece designer (selects items to use as game pieces, spinners or number cubes, dice cups, "challenge" cards, and so on)

All students in the group help to design the game, but each individual/pair should work on their own part of the game without interference from others.

When all games have been completed, host a game fair, allowing groups to move around the room playing each of the games. To make this work smoothly, have one student from each group stay behind to teach the next group how to play the game. After each round, another group member returns to serve as game instructor, and so on.

Assessment

1. Group Assessment

Evaluate each group's work in creating a trivia game. Their assessment should reflect evidence of effective participation, collaboration, and consensus, as well as an understanding of the three Rs.

2. Individual Assessment

Have students respond to the following culminating question about dealing with our nation's trash problem. You might ask older students to write an essay defending their position, or have younger students create an illustrated poster or picture book demonstrating their point of view.

QUESTION: *Environmentalists agree that when discussing the three Rs, reduce is the most important, reuse is the second best way to deal with the problem, while recycle is the third choice in the fight against the trash problem in the United States. Explain why the three Rs are ordered in that way.*

References

www.epa.gov/kids
This Environmental Kids Club site, hosted and funded by the U.S. Environmental Protection Agency, provides many activities, stories, games, and interactives for children. It offers fun and painless ways for students to learn more about recycling, pollution, and landfills.

The Blue Crew Web site, at www.cityofchicago.org/streets/BlueBag/BlueCrew, is sponsored by the City of Chicago's Blue Bag program through its Streets and Sanitation Department. It offers a virtual tour of a recycling center. NOTE: The tour is offered in both video and self-guided format. Check the systems requirements on the first screen to determine which format is best for your situation.

www.howstuffworks.com/landfill.htm
Have students extend their knowledge of the waste problem by researching the pros and cons of using landfills to deal with nonrecycled waste. The information found at this How Stuff Works Web site is a good place to begin research.