

Teaching the Three R's: Reduce, Reuse, Recycle

By Emily Morgan and Karen Ansberry

In today's world of shrinking resources and booming populations, recycling is more important than ever. Yet, according to the Environmental Protection Agency, only 33% of the trash and an alarming 8% of the plastic generated in the United States is recycled. This month's lessons focus on the journeys of trash items and how students can affect their paths.

This Month's Trade Books



A Plastic Bottle's Journey
Written by Suzanne Slade.
Illustrated by Nadine Wickenden.
Picture Window Books. 2011.
ISBN 978-1-4048-6267-8
Grades K–4

Synopsis

This book describes a plastic bottle's journey, beginning with the tiny pellets from which it is made to the recycling bin and ultimately back into a new plastic bottle.



Garbage, Waste, Dumps, and You
Written by Connie Colwell Miller.
Capstone Press. 2009.
ISBN 978-1-4296-1996-7
Grades 3–6

Synopsis

In four photo-filled chapters, this book describes the history of waste removal as well as modern trash technology, landfills, recycling, and composting. It includes a "What You Can Do" section on recycling and reusing trash.



Curricular Connections

The National Science Education Standards suggest that at an early age, students should become aware that the supply of many resources is limited but can be extended through recycling and decreased use. In this month's K–2 lesson, students follow the journey of a common plastic bottle and discover that if they place it in a recycling bin instead of a garbage can after use, its journey continues. In the upper elementary grades, the Standards suggest that students understand how the disposal of waste can cause hazards. The book *Garbage, Waste, Dumps, and You* teaches about the hazards associated with landfills and incinerators and presents ideas for reducing the amount of trash that ends up in these places. Both lessons use the Earth 911 website, which helps students locate recycling centers in their area by entering the name of an item and their zip code (there's an app, too).

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Grades K–2: A Plastic Bottle’s Journey

Engage

Place several large sticky notes over the cover of the book, *A Plastic Bottle’s Journey*. Call on a student to remove one of the sticky notes to reveal the words or pictures beneath and have students infer what the book is about. Repeat until all the sticky notes are removed, each time encouraging students to revise their inferences as they see more of the cover. Discuss the title and ask students what they think the book might be about. What kind of journey would a plastic bottle have?

Explore

Tell students you have some clues about a plastic bottle’s journey. Show them an empty plastic bottle, a plastic bottle preform, some plastic pellets and flakes, a paper bag with a recycling symbol drawn on it, and a different plastic bottle. Invite students to examine each item and think about what it is and how all these items could be a part of a plastic bottle’s journey.

Explain

As you read the book aloud to students, have them signal (e.g., touch their noses) when they hear about one of the items they just examined. After reading, ask students to put the items in the order that they appeared in the book: Plastic pellets, preform, bottle, recycle bin, plastic flakes, new plastic bottle. Be sure to point out in the inset on page 19 that recycled bottles can also be turned into other things, such as carpet, park benches, fleece jackets, and fiberfill for coats and sleeping bags. See Internet Resources to watch a video about how plastic is recycled.

Elaborate

Turn back to page 11 of *A Plastic Bottle’s Journey*. Ask students what would happen to the plastic bottle’s journey if the boy in the book just threw it in the trash instead of the recycling bin. Where would it go? (The landfill.) What would happen to it there? (It would not be made into anything new.) Tell students that it takes hundreds of years for plastic bottles to break down or degrade in a landfill, so it’s very important to recycle them. Reread pages 14 and 15 about the different types of plastic bottles. Research your local landfill and recycling centers to find out what types of plastics they recycle. You can use the Earth 911 website (see Internet Resources) to find recycling centers for specific bottle numbers. Give each

Materials

- Clean plastic beverage bottle
- Plastic PET pellets
- PET preform
- plastic PET flakes
- small paper bag with Reduce, Reuse, Recycle symbol on it
- new recycled plastic bottle or another item made from recycled plastic

Note: PET pellets, preforms, flakes, and samples of carpet made from recycled plastic are available for free from NAPCOR (See Internet Resources).

group of students an assortment of clean plastic bottles with various numbers and have them find the numbers and sort them into the different types. Which can be recycled where you live?

Evaluate

Using the items from the explore phase, create a class poster titled “A Plastic Bottle’s Journey.” Use arrows to show how one leads to another: plastic pellets → plastic preform → plastic bottle → recycling bin → plastic flakes → new bottle or other item made from recycled plastic.

Connecting to the Standards

This article relates to the following *National Science Education Standards* (NRC 1996):

Standard F: Science in Personal and Social Perspectives

- Types of Resources (Grades K–4)
- Natural Hazards (Grades 5–8)

National Research Council (NRC). 1996. *National science education standards*. Washington, DC: National Academies Press.

NSTA Connection

Download a student page and answer key at www.nsta.org/SC1203.



Grades 3–6: Where Does the Garbage Go?

Engage

Show students the classroom garbage can. Without touching the garbage, name some of the items you can see in the can. Ask students where they think the garbage goes after each day of school. Who picks it up? Where does it go first? Where does it go next? Give students time to discuss it with a partner. Ask each pair of students to draw a diagram showing where the garbage goes with words or pictures. Use these diagrams to assess prior knowledge about waste disposal.

Explore

Give each pair of students a copy of the *Garbage by the Numbers* student page (see NSTA Connection). Tell students that these numbers and statements are current statistics about garbage in the United States. All of these statistics are from the book *Garbage, Waste, Dumps, and You*. Pairs should cut out the number cards, discuss the statements, and together make their best guess to match the numbers with the correct statements. Tell students that they will have an opportunity to change their answers later when you read the book.

Explain

Show students the cover of the book *Garbage, Waste, Dumps, and You*. Tell students that you would like them to listen for the numbers and statements from the explore activity as you read. When you come to one of the answers in the reading, stop and discuss the number. Were students surprised? Did they guess correctly? What are the implications of that number and statement? Could this statistic be changed? Should it be? As you read each answer, give pairs the opportunity to move their cards and make new guesses. Then give students an opportunity to revise their diagrams from the engage phase of the lesson, adding the new knowledge they have acquired from the book. From the reading, students learn that nearly 20% of U.S. waste is burned in incinerators and 54% is taken to landfills (Check for current rates on the EPA website). They also learn that scientists estimate that nearly 90% of all waste is recyclable. Discuss the four ways presented in the book that we can decrease the amount of trash that

Materials

- One bag containing approximately four lbs. “trash,” including some items that are reusable, recyclable, and compostable, and some that are not. (e.g., a plastic bottle, coffee grounds, plastic shopping bags, used paper, gift bags, ribbon, orange peel, magazine or newspaper, chip bag, etc.)



Avoid unsanitary or sharp items.

ends up in landfills and incinerators: Reducing, reusing, recycling, and composting.

Elaborate

Research your community’s waste disposal programs and sites and compare your community’s programs to the programs and sites in the book. On the Earth 911 website (see Internet Resources), students can enter their school’s zip code and a specific type of item to find out where it can be recycled locally.

Evaluate

Show students the bag of trash that you prepared. Tell them that this is one day’s worth of trash produced by “Wastey Wally.” Pull each item out and discuss what it is. Display all of the items so all students can see them. Have students create a four-column chart with these headings: reduce, reuse, recycle, compost. For each item, they should determine whether or not the item can be eliminated totally from the trash (reduced), used again (reused), made into something new (recycled), or turned into valuable soil or fertilizer (composted). Next, have students use their chart to help them compose a persuasive letter telling Wastey Wally how he could reduce the amount of trash he sends to the landfill. Students should write specifically about the items from the bag and include the terms *reduce*, *reuse*, *recycle*, *landfill*, and *compost* in their letters.

Internet Resources

Earth 911: Find Local Recycling Centers

<http://earth911.com/>

Earth 911 Video: How Plastic Gets Recycled

<http://earth911.com/recycling/plastic/video-how-plastic-gets-recycled/>

Environmental Protection Agency

www.epa.gov/osw/nonhaz/municipal/

NAPCOR—Free PET Preforms, Pellets, Flakes, and Carpet Samples

www.napcor.com/PET/store.html

The 3 Rs of the environment—reduce, reuse, recycle—have been around for some time but many people have grown lax in following them. Perhaps the War Advertising Council said it best in 1944 as they promoted the conservation of gas, rubber, silk, and other scarce resources. Use it up... Reuse. Use a travel mug or reusable water bottle and avoid single-use bags. Recycle. Paper, plastic, glass, magazines, electronics, and more can be processed into new products while using fewer natural resources and less energy. This is the 3 Rs mantra. Why the 3 Rs? This is the most effective of the three Rs and the place to begin. It is also the hardest because it requires letting go of some very American notions, including the bigger the better, new trumps old and convenience is next to godliness. Reduce, Reuse, Recycle. It's a familiar phrase to most, but where did it come from? We have certainly heard of the Three Rs as they relate to sustainability—Reduce, Reuse and Recycle—but do you know where the slogan came from or why? Where did the Three Rs come from? There tends to be a bit of debate about the creation of the "Reduce, Reuse, Recycle" slogan, but the practice of working towards reducing our waste output, reusing what we can and then recycling what we can't has been around for centuries. Inspired by the "teach-ins" held across the country to educate citizens on the Vietnam War, Wisconsin Senator Gaylord Nelson spearheaded the first national Earth Day on April 22, 1970. Reduce. Reuse. Recycle. Called the "three Rs" of waste management, this waste hierarchy is the guidance suggested for creating a sustainable life. You might be wondering as to how can you incorporate these principles in your daily life. They are not hard to implement. All you need is to bring a small change in your daily lifestyle to reduce waste so that less amount of it goes to the landfill that can reduce your carbon footprint. As per Missouri Department of Natural Resources, "The three Rs—reduce, reuse and recycle—all help to cut down on the amount of waste we throw away. They con