L11 Reduce, Reuse, and Recycle: Sorting Through Personal Choices

▸ SEASONS:

▸ SUBJECTS: ▸ EXT. SUBJECT:

▸ PREP TIME: ▸ LESSON TIME:

MATERIALS

For each student: plastic gloves, Venn diagram, Everyday Choices handout.

For each group: two trash bags. (1 cut open)

Description

This lesson shows practical ways to make a positive impact on the environment by reducing, reusing, and recycling trash. Preparation involves gathering gloves and trash bags, copying the two handouts, and finding a suitable location for students to collect trash.

The lesson's activities are designed to help students become aware of their personal impact on their environment. It allows students to quantify their own trash production, allowing it to become a concrete and tangible fact instead of a broad, abstract idea. Students first consider how trash is disposed of and what it does to the environment. Then they go out into the schoolyard to collect and sort the litter they find.

The use of a Venn diagram helps students sort types of trash and analyze ways to decrease the amount of trash in our environment. The Everyday Choices handout can help students think about their personal choices.

Finally, by completing a schoolyard cleanup, students can apply their knowledge of reducing, reusing, and recycling to the outdoors and take pride in keeping their outdoor environment clean.

The mathematics extension provides students with practice representing data in a bar graph.

Objectives

- Understand how their trash directly affects the environment.
- Sort and analyze items using a Venn diagram.
- Understand the meaning and applications of reduce, reuse, and recycle.

Background Information

Most of the time people do not think about what happens to their trash once they have thrown it out. But once it is disposed of, the trash must go somewhere. Often it is buried in a landfill, dumped into the ocean, or burned.

Trash dumped into the ocean can cause a variety of problems. It pollutes the water and can make it unsafe for swimming and fishing because many of the pollutants are absorbed by ocean life. It also causes a hazard to marine animals (e.g., ingested trash is a leading cause of death for sea turtles).

Trash can also be brought to a landfill where it is buried under the ground. Some of the trash will take thousands of years to degrade; other trash begins to decompose immediately and releases toxic substances into the ground. These substances can leak into the groundwater and pollute lakes, rivers, and drinking systems.

In Berkshire County, our trash is either buried in a landfill or burned at the Pittsfield Resource Recovery facility on Hubbard Avenue. Trash brought to this facility is burned to produce steam, which the Crane paper company uses as an energy source.

Important alternatives to trash disposal are the three Rs: reduce, reuse, and recycle.

Reduce:
There are many things we use everyday that we could get along without. Many of us drink coffee out of paper cups everyday instead of using a travel mug, or we use disposable razors or even disposable toilet brushes. Although these conveniences make our lives easier, they increase the amount of trash put into the environment.

Reuse:
In our everyday lives we throw many things out after only one use that could be used again and again: paper used on only one side, plastic beverage bottles, plastic food containers, and so on. Many things around us could be reused with little or no effort on our part, drastically diminishing the amount of waste we produce.

Recycle:
Recycling uses the materials in one product to make a new product. It is usually more difficult than reusing and reducing, especially if there is not a city or town recycling effort. Recycling policies and procedures vary throughout Berkshire County. Like many things in life, people are more likely to develop the habit of recycling if they begin at a young age. If your school does not have a recycling program, you may be able to set one up either schoolwide or in your classroom to help your students learn the importance of recyclable materials. In general, recyclable materials include:

1. Glass (clear and colored)
2. Metal (tin, aluminum, and steel)
3. Paper (cardboard, magazines, newspaper, computer paper, white school and office paper)
4. Plastic

TIPS AND TRICKS

If you cannot take your students outside or they cannot find enough trash for the lesson, they can save their trash from lunch and use it to complete the lesson.

If you have younger students, the Venn diagram and Everyday Choices handout can be completed as a class. Older students can try a more challenging version of the Everyday Choices handout (see Online Connections).

If you have a recycling program at your school, make sure your students know how to use it. See the Online Resources for guidelines on community recycling programs and recycling program support..

Procedure

1. Explain to your students that you will be going outside to clean up the schoolyard and collect and analyze the trash they find. Before you go outside, discuss the following questions with your students: Why is it important to keep the environment clean? What happens to trash when it is thrown away? How can we reduce the amount of trash we create?

2. Introduce students to the terms reduce, reuse, and recycle. Explain to the class that after they have collected their trash they will sort it using a Venn diagram to see how much of it could have been reduced, reused, or recycled.

3. Divide the students into two or three teams, and make sure each team has a trash bag and each student has a pair of plastic gloves.

4. Review Tips for Teaching Outdoors (p. XX) with the class and assign an area on the schoolyard for each group to cover (if you wish, you can take the students on a nature walk and collect trash as you go). Set a time limit for collection (10 to 15 minutes depending on the size of the schoolyard) and a base camp as a meeting place.

5. Once the class is done collecting litter, spread the trash on a garbage bag that has been cut open. Using the Venn diagram at the end of this lesson, each student sorts the trash according to whether it could have been reduced, reused, or recycled. If an item does not fit into any category, it can be listed in the space outside of the diagram.

6. Analyze results of Venn diagram. If most trash is only in one category or none of the categories, discuss why more items cannot be recycled or reused. What are some creative ways to reuse trash (e.g., plastic foam cups make wonderful starting pots for little seedlings)? What do students know about local recycling programs?

7. Discuss the litter they found. Was it more or less than they expected? How did they sort the items they found?

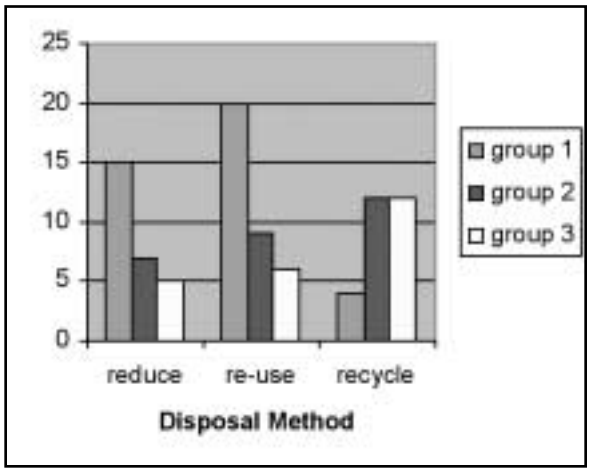
8. Either in class or at home, students complete the Everyday Choices handout at the end of the lesson. Once they have completed the handout, ask students what changes they could make in their daily lives to help reduce the amount of litter and trash in their world.

Assessment

REDUCE, REUSE, AND RECYCLE RUBRIC	4	3	2	1
Venn Diagram	Shows an understanding of the meaning of the three Rs and can sort trash into the appropriate categories	Shows an awareness of what the three Rs are and can sort most of the trash into correct categories.	Shows an awareness of the three Rs and can sort some of the trash into the correct categories.	Does not understand the three Rs and cannot sort trash into correct categories
Everyday Choices Handout	Understands that some everyday choices about trash disposal are better for the environment than others.	Recognizes that some types of trash disposal are more environmentally friendly but cannot apply them to everyday life.	Recognizes that trash disposal is an environmental issue but does not understand environmentally friendly trash disposal.	Does not understand that some types of trash disposal are more environmentally friendly than others.

Math Extension: A Trashy Bar Graph

Take your students out on a nature walk to collect litter on the ground (see steps 1 through 5 of Reduce, Reuse, and Recycle for more detailed instructions). Once each group has collected enough trash, they sort it into trash that could have been recycled, trash that could have been reused, and trash that could have been reduced. Once the trash is sorted, count or weigh the trash in each category and record the data. In the classroom the students share their data and graph it to show how much trash of each type they found. For more practice with graphing, the students sort the trash in a variety of ways: by size, color, location, and so on.



Resources

Gibbons, Gail. Recycle! A Handbook for Kids. Boston: Little, Brown, 1992.

Aimed at students in kindergarten through third grade, this handbook follows the recycling process of paper, glass, aluminum can, plastic, and polystyrene from start to finish.

Harlow, Rosie, and Sally Morgan. Garbage and Recycling. New York: Kingfisher, 1995.

Designed for elementary school students as an introduction to the difference between biodegradable and nonbiodegradable trash.

SERVICE LEARNING

REDUCE, REUSE, RECYCLE: WATER SURVEY

Have students create a home water use survey or find one that is already on line. Survey the entire school population and calculate how much water is used daily. Advertise the results in the school newspaper or on the morning announcements. Create posters promoting water conservation. Redo the survey and see if your efforts helped!

Van Allsburg, Chris. Just a Dream. Boston: Houghton Mifflin, 1990.
After littering, a boy dreams about traveling to the future and experiences what the world would be like if everyone were thoughtless about caring for the earth.

Wallace, Nancy Elizabeth. Recycle Every Day. New York: Marshall Cavendish, 1995.
Storybook for younger elementary students that tells the tale of a family of rabbits taking part in a recycling contest.

Online Connections

Visit the Berkshire Museum's Living Landscapes website at www.berkshiremuseum.org/programs/educators.html for the following online activities or resources:

- Recycling organizations and coalitions
- Waste management information
- Community recycling programs and support for school recycling programs

MASSACHUSETTS FRAMEWORKS		
Science: Life Science: Living Things and Their Environment	Pre K-2	6. Recognize that people and other animals interact with the environment through their senses of sight, hearing, touch, smell, and taste.
Science: Physical Science: Observable Properties of Objects	Pre K-2	1. Sort Objects by observable properties such as size, shape, color, weight, and texture.
Science: Technology/ Engineering: Materials and Tools	Pre K-2	1.1 Identify and describe characteristics of natural materials and human-made materials. 1.2 Identify and explain some possible uses for natural materials and human-made materials.
	Grades 3-5	1.1 Differentiate between properties of objects and properties of materials.
Mathematics: Patterns, Relationships, and Algebra	Pre K-K *For Extension	1. Identify the attributes of objects as a foundation for sorting and classifying. 2. Sort and classify objects by color, shape, size, number, and other properties.
	Grades 3- *For Extension	4. Use pictures, models, tables, charts, graphs, words, number sentences, and mathematical notations to interpret mathematical relationships.
	Grades 5-6 *For Extension	4. Represent real situations and mathematical relationships with concrete models, tables, graphs, and rules in words and with symbols, e.g., input-output tables. 6. Produce and interpret graphs that represent the relationship between two variables in everyday situations.
Mathematics: Data Analysis, Statistics, and Probability	Pre K-K *For Extension	1. Collect, sort, organize, and draw conclusions about data using concrete objects, pictures, numbers, and graphs.
	Grades 1-2 *For Extension	1. Use interviews, surveys, and observations to gather data about themselves and their surroundings. 2. Organize, classify, represent, and interpret data using tallies, charts, tables, bar graphs, pictographs, and Venn diagrams; interpret the representations. 3. Formulate inferences (draw conclusions) and make educated guesses (conjectures) about a situation based on information gained from data.
	Grades 3-4 *For Extension	1. Collect and organize data using observation, measurement, surveys, or experiments, and identify appropriate ways to display the data. 2. Match representations of a data set such as lists, tables, or graphs (including circle graphs) with the actual set of data. 3. Construct, draw conclusions, and make predictions from various representations of data sets, including tables, bar graphs, pictographs, line graphs, line plots, and tallies. The lesson also addresses the Massachusetts Science and Technology Curriculum Framework's Science Skills of Inquiry.

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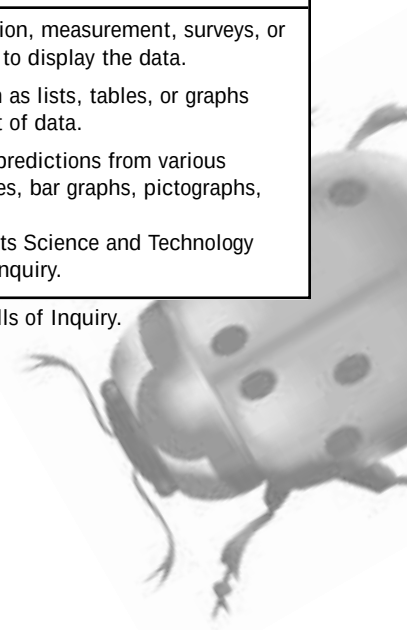
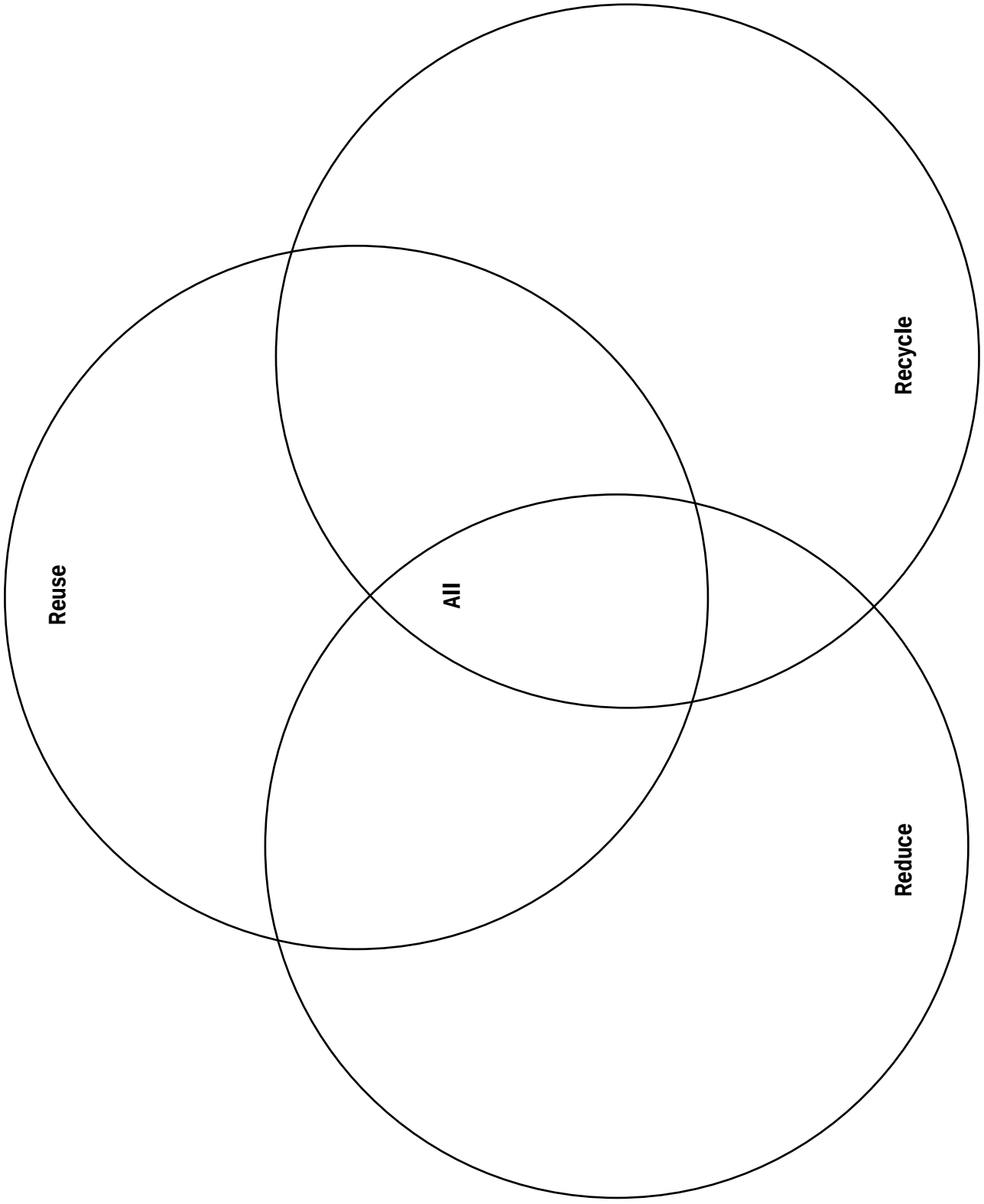


Reduce, Re-use and Recycle by _____



Everyday Choices

Naturalist's name: _____

We all make choices everyday that impact the environment. For each statement, circle yes or no depending on whether or not they are true statements about your everyday choices.

BEFORE SCHOOL

You use reusable cups and silverware at breakfast.	YES	NO
You take the bus or walk to school.	YES	NO

AT SCHOOL

You bring your lunch in a reusable container.	YES	NO
You write on both sides of paper.	YES	NO
You recycle paper when you are done with it.	YES	NO

AFTER SCHOOL

You use reusable cups and silverware for dinner.	YES	NO
You recycle at home.	YES	NO
You throw your trash in a trash can when you are outside.	YES	NO
You pick up litter in your yard.	YES	NO
You buy things at the store that don't use much packaging.	YES	NO

TOTAL _____ _____

If you have more yes's than no's, you are helping the environment. Keep trying to reduce, reuse and recycle as much trash as you can.