



Title: What Are We Wasting?

Grades: 5

Subjects: Social Studies, Science, Math, Language Arts

Time: Collection of trash throughout the day, 30 minute session at the end of the day.

Objectives:

- Identify and describe how an individual's action in regards to waste management can affect change and improve the environment.
- Measure and compare the weight of objects.
- Find the mean (e.g., average) for a given set of data.
- Locate the position of a positive number on a number line.
- Conduct a simple investigation and draw logical conclusions.

Standards:

Geography Standard 16: Understand the changes that occur in the meaning, use, distribution and importance of resources.

- Benchmark # 5: Know advantages and disadvantages of recycling and reusing different types of materials.

Geography Standard 18: Understand global development and environmental issues.

- Benchmark # 2: Know ways in which resources can be managed and why it is important to do so (e.g., conservation practices, recycling non-renewable resources).

Mathematics Standard 3: Use basic and advanced procedures while performing the process of computation.

- Benchmark # 1: Multiply and divide whole numbers.
- Benchmark # 8: Solve real world problems involving number operations.

Mathematics Standard 4: Understand and apply the basic and advanced properties of the concepts of measurement.

- Benchmark # 3: Know the basic standard units (e.g., ounces, pounds, liters, grams) and relationships between them (e.g. between ounces and pounds).

Mathematics Standard 6: Understand and apply the basic and advanced concepts of statistics and data analysis.

- Benchmark # 1: Understand that data represents specific pieces of information about real-world objects or activities

Science Standard 12: Understand the nature of scientific inquiry.

- Benchmark # 3: Plans and conducts simple investigations.
- Benchmark # 4: Use appropriate tools (e.g., scales) to gather scientific data and extend the senses.

Language Arts Standard 8: Use listening and speaking strategies for different purposes.

- Benchmark # 3: Respond to questions and comments (e.g., gives reasons in support of opinions).

Materials:

- Kitchen trash bags, one per student
- Latex gloves
- Old newspapers
- Data Collection worksheet provided
- Pencils



- Scale

Overview: Waste is part of everyday life. As we go about our daily tasks we create waste. The average US citizen generates approximately one ton of trash annually, but seldom gives it any thought once they throw it away. This trash goes into the waste stream where it is collected and hopefully, disposed of in a manner that least impacts the environment. This process is known as solid waste management.

The Environmental Protection Agency has designed a plan for this process, which they refer to as “integrated solid waste management”, and has identified five ways to properly handle waste materials: a) source reduction and reusing, b) recycling, c) composting, d) converting to energy through incineration, and e) burying it in a sanitary, engineered site. The EPA emphasizes that there is no definitive approach to waste management and encourages communities to combine these five methods to effectively address the issue.

In most communities across the country waste materials end up in at least one of three locations: a) a materials recovery facility, b) a waste-to-energy facility, or c) a landfill. While the technologies driving these methods have greatly improved in recent years, they still present a number of environmental problems; so source reduction is, by far, the most preferred method of solid waste management. It uses fewer resources, less energy and is essentially free. Unfortunately, it is also the most difficult concept to communicate to consumers. For manufacturers, source reduction means looking at and reducing the waste they generate during production, and the materials they use in packaging products. For individuals, it means reevaluating current practices, learning to do more with less, using what already exists responsibly, and recognizing the difference between needs, wants and what is ultimately best for the environment and the future of mankind.

Kid’s Speak: Trash takes up space, uses valuable resources and harms the environment. People make a lot of trash. Every day they throw it away without even thinking about where it will go or what will happen to it. People need to understand the consequences of making all that trash, make better choices so the amount of trash they make is reduced, and have a plan to properly dispose of the trash they do make.

Not all trash needs to go in the garbage. There are other things that can be done. Some of it can be reused in a different way, some of it can be recycled so it can be made into something else, and some of it, like scraps of food, leaves and grass clippings, can be composted and added to the garden. But there are also things that people can do so there isn’t as much trash. They can use fewer items that make trash. Instead of using plastic sandwich bags to put snacks in, they can use a reusable container. Instead of a plastic drink bottle, they can use a reusable water bottle. Instead of paper napkins and plastic utensils, they can use cloth napkins and washable forks and spoons. There are lots of things that people can do to make less trash. They just have to think about the choices they have and try to make the best ones for the environment.

Eco-Fact: People living in cities create on average of about 7 pounds of trash per day. The national average according to USA Today is approximately 3.5 pounds per day.

Procedures:

Note: This experiment requires the students to collect data about the waste they produce during the course of a school day. This experiment should be introduced at the start of the school day, as close to arrival as possible, and concluded in the afternoon just before dismissal.

Before Conducting the Lesson:

- Explain to the students they are going to conduct an experiment on waste production by collecting and monitoring their own personal waste throughout the course of a school day. Provide each student with a small, kitchen trash bag. Explain to the students that anything they



want to throw away today must go into their own trash bag. The class wastebasket is off limits for today. Turn it upside down, or place it inside a closet.

Conducting the Lesson- What Do We Waste?

- Explain to students that they are going to inventory their trash. Caution them to take this activity seriously and handle the trash in a responsible manner.
- Introduce the Data Collection Worksheet and explain its purpose. Show the students the sample Data Collection worksheet with only the Waste item column completed.
- Distribute some newspaper, a pair of gloves and a worksheet to each student. Have students cover their desktops with newspaper and put on the gloves. Ask students to empty the contents of their trash bag onto the newspaper. Have them examine the contents of their trash bag and record each piece in the **Waste Item** column of the Data Collection worksheet.
- Students will then weigh their personal waste. Record the weights for each student on a chart. Ask students to find the average amount of waste produced in class by adding the weights together, then dividing the total weight by the number of students in the class. Ask students to create a number line ranging from the lowest weight recorded to the highest weight. Plot a point on the line for the average weight of waste produce and another for the weight of their waste. Ask students to compare the weights to determine if they created more or less waste than the class average? Ask students to consider the conclusions they can draw about their personal waste production.
- Brainstorm ways to reduce waste production. Ask students to suggest some ways they could manage their waste more efficiently, putting less in the trash. Suggestions might include recycling, composting, using less, etc. Add Recycling to the Data Collection worksheet and ask students to organize their inventory list accordingly. (See Sample below.) Have the students review their list of personal waste and decide which items could be recycled and which must still be disposed of in the trash. (If composting is an option for the classroom, have students mark in a C the recycling column next to any item they will compost.)



waste items	disposable	recyclable
empty pudding cup		x
16 oz. water bottle		x
banana peel		C
snack size chip bag	x	
sandwich bag	x	
brown paper bag		x
candy wrapper	x	
paper napkin	x	
two envelopes		x
broken pen	x	
used tissue	x	
dead leaves from a desk plant		C
total number	6	6
	remain in trash	removed from trash



After Conducting the Lesson:

- Students will analyze their Data Collection table to find a way to reduce the amount of waste they are still putting in the trash. Students will decide upon one way to remove at least one item from their disposable list and put it into action tomorrow (e.g., a banana peel can be composted, a Doritos bag can be eliminated by making different shopping choices, a sandwich bag can be reused or eliminated with use of a reusable container.
- Students will place their worksheet in a folder to use with the next lesson.
- If the class is participating in the NGW Reduce Your Trash Challenge, students will put the contents of their personal trash bag into a class trash bag. The trash bag will be saved for use in the Reduce Your Trash lesson for Tuesday.

Adaptation: Have the students collect and examine waste in small groups.

Extension: Students can write a summary of the day's activities in their journal and the conclusions drawn from it.