

## UNIT 7 | PEOPLE AND WASTE

# WASTE A-WEIGH

### METHOD

By weighing and recording their lunch waste every day for a week, students learn how conservation efforts can reduce the total amount of trash generated.

### MATERIALS

- Digital kitchen scale
- Student Worksheet
- Calculators (optional)

## INTRODUCTION

Each American generates an average of roughly 4.5 pounds of garbage every day. As the U.S. population grows, so does the amount of garbage we produce – and all that garbage has to go somewhere. As our **landfills** fill up, it becomes harder and harder to find a place to put all of our waste. We must also be careful that the landfills which store our waste do not leak toxic chemicals into the surrounding soil or water supply. This becomes a more difficult task as we have more and more garbage to store. To combat this problem, people around the world are being encouraged to “reduce, reuse, and recycle” their garbage. The first part of this formula, “reduce,” means that we have to try to find ways to create less waste.



### CONCEPT

In order to lighten our impact on the planet, it is important to reduce the amount of waste that each one of us creates.

### GRADE LEVEL

Lower and upper elementary

### SUBJECTS

Science, Social Studies, Math

### OBJECTIVES

Students will be able to:

- Develop and implement ways to create less waste during lunchtime.
- Record and analyze data to determine the weight of waste produced during a week and the amount of waste saved as result of conservation efforts.
- Identify ways as an individual, a class, or a school, to continue waste reduction efforts.

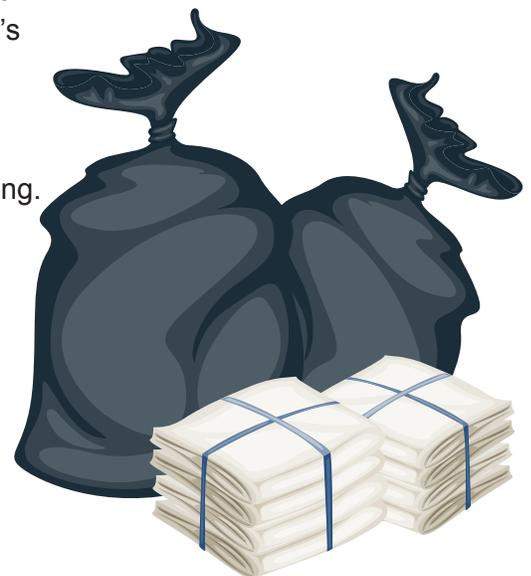
### SKILLS

Analyzing trends, collecting and analyzing data, practicing conservation, measuring weight, calculating averages

# PROCEDURE

1. This activity is an experiment in waste reduction that will last one full week. On the Monday of the week you plan to do the experiment, set up a weighing station in the cafeteria.
2. Explain to the class that they will be taking part in an experiment concerning waste generation and ask that after lunch on Monday, each of them use the kitchen scale to weigh any item that they plan on throwing away: food scraps, packaging, bottles, etc. They should record this weight on a small piece of paper and bring it back to class. (You may want to pre-adjust your kitchen scale to the weight of one cafeteria tray and have students place their trash on the tray.)
3. When back in class, explain that the amount of waste students generate during lunch will be recorded for the entire week. The weight of their waste on Monday will serve as a starting point from which to gauge progress as their awareness of consumption and waste generation grows throughout the week.
4. They should record the weight of their “Monday waste” on the Student Worksheet. Then, as a class, find the average per person. Students should record these numbers on their worksheet as well.
5. Each day of the week, have students repeat the process of weighing any items that they plan to throw away. They should again record the weight of their waste on their Student Worksheet and when back in class, find the total weight for the whole class and average per person.
6. During the beginning of the week, talk as a class about what types of things are being thrown away. Is it mostly packaging? Food scraps? Plastic utensils? Bottles or cans? Then, brainstorm how to reduce some of this waste. Suggestions may include: only buying or bringing as much food as they plan to eat, avoiding items with excess packaging, bringing reusable containers and drink bottles from home, using a lunch box instead of a paper bag, using metal utensils rather than plastics, and recycling glass, aluminum, and plastics.  

Note: You may want to make clear to students that while recycling an item is much better than sending the item to a landfill, recycling also requires energy. So ultimately, it is best to not create that waste at all!
7. You may want to send a note home to your students’ parents, or craft a letter as a class, to let your students’ parents know about the class’s waste reduction experiment.
8. Each day, repeat the process of finding the class’s total “waste weight” and average per person. Note whether the waste is decreasing.
9. At the end of the week, divide students into small groups and instruct them to work together to complete the remainder of the Student Worksheet. For upper elementary students, have them try the Bonus Questions on the Student Worksheet.



10. Then, within their groups, have students discuss the following questions:
- Which conservation methods were the most effective?
  - Which ways of reducing waste were most convenient?
  - Which would be best to implement on a school level? On a community or city level? On a national level?
  - Is there anything that could be done differently in our school cafeteria to reduce waste?
  - Do you think it would be possible to have a “no waste lunch” in your school? Do you think it would be possible to have a “no waste city?” How?

Each talking group should report back to the class.

11. Based on the class discussion, decide on something you can do, either on a classroom or school-wide level, to continue to reduce waste now that the experiment is over. Take a class pledge (or each student could make an individual pledge), or organize a school-wide campaign to reduce your school’s waste.

### STUDENT WORKSHEET ANSWERS

*Bonus Questions (2012): 1,408,500,000 lbs; 514,102,500,500 lbs. 2050: 567,000,000 lbs; 206,955,000,000 lbs. You may want to put these weights into a familiar context by comparing to the weight of a familiar heavy object. (Ex. A male African elephant can weigh up to 15,000 lbs, so how many elephants would this be?)*

### Fun Facts about Trash

- Every year, Americans throw away enough paper and plastic cups, forks, and spoons to circle the equator 300 times.
- Every year, Americans use approximately 1 billion shopping bags, creating 300,000 tons of landfill waste. The average 18-wheeler truck weighs 40 tons, so that’s the weight of 7,500 trucks!
- Not everyone on the planet creates waste like an American. We make up 5 percent of the world’s population but create 30 percent of the world’s waste. If everyone on the planet consumed at U.S. rates, we would need 3 to 5 planets to support our consumption!
- Of the 4.5 pounds of garbage produced by the average American per day, about 1.5 pounds is recycled or composted. This works out to be about 34 percent of our waste. About half of our waste (54 percent) ends up in landfills (the other portion is burned in incinerators).
- In 1994, only about 23 percent of the waste that Americans generated was recycled. So while we still have much room for improvement, our current recycling rate of 34 percent shows marked progress.

Note: In some schools, lunchtime is too limited for each student to weigh their waste. In this case, do the activity as an entire class by weighing one garbage bag after all the students have discarded their waste. Then the class can challenge itself to reduce their waste the next day or challenge another class to see who can create the least amount of waste. You may need to use a bathroom scale to weigh this larger amount of waste.

# MEASURING LEARNING

Have students write a postcard that tells a friend, family member, or local politician about their waste reduction experiment in the classroom. They should include at least two ways that they or their classmates were able to reduce their lunchtime waste.

## FOLLOW-UP ACTIVITIES

1. Extend this activity for another week, and this time, put all leftover food scraps into a class compost bin, rather than throwing them away. Continue to record the amount of waste for each day and determine the total amount saved at the end of the second week (you could compare both to the first day of the experiment and to the end of the first week). For an introduction to composting, try the activity *Scraps Into Soil*. A kid-friendly guide to what composting is and how to set up a bin can be found here: <http://pbskids.org/dragonflytv/show/wormfarm.html>.  
Alternatively, you could save all the food scraps from the week and take them to a local farm or greenhouse.
2. Challenge another class to a competition to see who can average the least amount of waste (or no waste!). The competition could be expanded to different grade levels, or even other area schools. Consider contacting local newspapers to share your students' conservation efforts and tips with the community.
3. A few weeks after the experiment, run a "surprise trash weighing" and compare the class's weight to the original class baseline weight to see if there has been an overall improvement in waste reduction.
4. Reusing old items is another important step for reducing the amount of waste that ends up in the landfill. Try the activity, *Waste Not, Want Not*, to encourage students to think about the benefits of reusing their "garbage."

Data Sources: Environmental Protection Agency, [www.epa.gov/waste/nonhaz/municipal/pubs/msw\\_2010\\_rev\\_factsheet.pdf](http://www.epa.gov/waste/nonhaz/municipal/pubs/msw_2010_rev_factsheet.pdf); Earth911, <http://earth911.com/news/2010/06/21/recycling-to-go-plastics/>; Clean Air Council, [www.cleanair.org/Waste/wasteFacts.html](http://www.cleanair.org/Waste/wasteFacts.html); Alliance for Incinerator Alternatives, [www.no-burn.org/article.php?list=type&type=89](http://www.no-burn.org/article.php?list=type&type=89).

# WASTE A-WEIGH STUDENT WORKSHEET

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

Date: \_\_\_\_\_

	Monday	Tuesday	Wednesday	Thursday	Friday	Week Total
Personal Waste (oz)						
Total Class Waste (lbs)						
Class Average (lbs per person)						

1. At the end of the week, do you have more or less total waste than the class average?

\_\_\_\_\_

2. Did you and your class create less waste as the week went on? How much less?

(Subtract the last day's total from the first day's total to find the amount saved!)

You: \_\_\_\_\_

Your class: \_\_\_\_\_



3. If the whole school followed the same conservation patterns, how much garbage would be avoided? (You will need to know either how many students are in your school or how many classes are in your school.)

In one day? \_\_\_\_\_

One month? \_\_\_\_\_

One year? \_\_\_\_\_

**BONUS:**

Each American creates about 4.5 pounds of garbage each day. The U.S. population in 2012 was 313 million people. How much garbage is created in our country in one day?

How about in one year?

The U.S. population is expected to increase by 126 million people by the year 2050. How much more garbage would be created each day? How about each year?