

Personal Municipal Solid Waste Inventory

Background

Municipal solid waste (MSW) is the name given to ordinary household and office trash: that which is generally disposed of through the usual garbage collection services offered or contracted for by municipalities. Our trash is made of up the things we commonly use and then throw away. These materials range from packaging, food scraps, and grass clippings to old sofas, computers, tires, and refrigerators. It does not include industrial, hazardous, or construction waste.

Much of what enters the MSW stream in the United States is potentially recyclable. Following a dramatic increase in recycling programs in the late 1980s and 1990s, the recycling rate has significantly leveled-out. As of 2012, nearly 50% of the material that people dispose of, destined for landfills, includes metals, plastics, and glass that could have been recycled. In addition to the “potential recyclables” that end up in landfills, another 20 – 25% is comprised of yard, kitchen scraps, and food waste – compostable materials.

Objective(s)

- ✓ to visualize an individual’s daily MSW
- ✓ to quantify the types of MSW produced by an individual over a 48-hour period
- ✓ to study the environmental impact of MSW disposal
- ✓ to explore alternatives to the disposal of MSW in landfills

Materials

- individual trash sample
- large paper placemat
- triple-beam balance

Pre-Lab Questions

Answer the following questions below on a separate sheet of paper. You must either write out the questions, or include the questions in your responses. Be sure to use complete sentences and show your work for math problems.

1. What is municipal solid waste (MSW)?
 2. What is compost? How is it produced/created?
 3. What proportion of MSW in the United States is potentially recyclable? What proportion is *actually* recycled?
- ✓ Use a ruler to recreate the Data Table(s) below neatly on your lab paper, and be sure it is drawn approximately the same size

Safety

★ *There are no special safety precautions for this activity.*

Procedure

1. For a continuous 48-hour period, collect the trash you produce in a large plastic bag. Use smaller, sealable plastic bags for food waste and other trash that may have an odor. ★ Do NOT collect any materials that may be considered dangerous, toxic, or a biohazard!
2. Lay out the large paper placemat on the lab table to make clean-up faster later – keep the waste on the placemat.
3. Sort the individual items in your waste based on the categories found in the **Data Table**.
4. Use the triple-beam balance to determine the mass of the waste in each of the categories and record the value.
5. Without opening the sealed bag(s), again use the triple-beam balance to determine the mass of the food waste and record that value.
6. Assume that the waste collected during the 48-hour period is the typical daily amount for the entire year. Multiply the daily mass in each individual category by 365 to estimate the annual waste produced. Calculate the remaining values in the **Data Table**.

Data Table

Category	Total Mass Collected (g)	Daily Mass (g)	Annual Mass (kg)	Proportion (%)
Food				
Paper				
Plastic				
Glass				
Metal				
Styrofoam				
Other				

TOTALS:

			100
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Clean Up

- ✓ trash: paper placemat
- ✓ dispose of all collected waste appropriately
- ✓ everything else returned to its original location

Results & Analysis

Answer the following questions on your lab paper. For actual questions, you must either write out the questions, or include the questions in your responses. Be sure to use complete sentences and show your work for math problems.

1. Create a complete, appropriately scaled pie chart to illustrate the proportions of each MSW category from the **Data Table**.
2. What was the largest proportion of your personal MSW? What was the smallest proportion?
3. What proportion of your waste was recyclable? What proportion was compostable?
4. Do you think these 48 hours provided an accurate representation of the trash you generate in a year? Explain what factors might have caused this estimate to be artificially low, or artificially high.
5. Do some simple research to find the per capita waste production, per unit of mass, of the typical American. How do you compare?
6. What environmental impacts could you help prevent if all, or nearly all, of the potentially recyclable materials in your waste was actually recycled?
7. What are the environmental and economic impacts (drawbacks) of recycling and recycling programs?
8. Do some simple research and create a chart (do not cut and paste) that shows the 7 plastic resin codes, along with their names, most common original uses, and their recycled uses.
9. Describe a few aspects of this activity that you feel to be significant, or that surprised you about the waste you produced in a 48-hour period. List a few *small* changes that you could make to your daily routine that could reduce your daily waste.