

Waste Production Lab

Objective:

To allow students to see the types and amounts of waste that each of us produces by collecting their own garbage for one day.

Time:

The students will collect their trash for 24 hours on their own. After they have completed the collection, the lab will take approximately 1 hour of class time.

Materials:

- Large plastic bag (such as a kitchen bag)
- Small zip-lock baggies
- Triple beam balances

Procedure:

1. For one day, collect your own trash and put it in a large trash bag. Use small zip-lock baggies for food waste and other trash that might smell.
2. Bring your collected trash into class and record the mass of each type. (Do not open the food trash baggies; just take the mass with the baggie so that you avoid bad smells and any health hazards.)
3. Record your results in the data table that follows. To determine what percentage of total trash each item is, add up the mass of all the types of trash and divide each individual category by the whole. For example, if all the paper, food, plastic, metal and glass have a combined mass of 1000 g and paper has a mass of 100 g, then divide as follows: $100/1000 = 0.1$. Multiply your final answer by 100 to get a percent. In this example, paper is 10% of the total.
4. Throw all food items in the trash and recycle as much as you can. Dispose of non-recyclable items in the trash. You may want to add compost food waste if available.

Data and calculations:

Type of trash	Mass (g)	% of total trash
Paper		
Food (organic)		
Plastic		
Metal (aluminum, etc.)		
Glass		
Other		

Analysis:

1. Add up the total mass of all your trash and then calculate the amount of trash (in kg) you would produce in a year if this were the amount you generate every day. If each person in your family generates the same amount of trash, how much would your family produce in a year?
2. Now, assume you recycled everything that was recyclable in your bag of trash. How many kilograms of trash would you have to throw away? (In other words, what is the mass of the non-recyclable waste?)
3. What environmental impacts would you prevent if you recycled everything that you could recycle?
4. What are the environmental impacts of recycling?

5. How would the mass of your trash differ if you lived in a developing nation?

Name _____

Date _____

Solid Waste Inventory Tally Sheet

Directions: Complete the tally sheet for your solid waste inventory, then complete the questions that follow. Use additional paper if you need more space. After tallying, use scales to mass each category of solid waste materials and record their values in the appropriate spaces. Use the "Other" category for any materials that do not easily fit in those provided.

1. Total **Plastic** = _____ (mass in grams or kilograms) = _____ in a year.

Item category tally: **Plastics**

<u>Item</u>	<u>Number of Pieces</u>	<u>Item</u>	<u>Number of Pieces</u>
Beverage containers/lids	= _____	Straws	= _____
Food wrappers	= _____	Forks/spoons	= _____
Non-food wrappers/packaging	= _____	Other plastic	= _____

Total # of plastic items: _____

2. Total **Paper** = _____ (mass in grams or kilograms) = _____ in a year.

Item category tally: **Paper**

<u>Item</u>	<u>Number of Pieces</u>	<u>Item</u>	<u>Number of Pieces</u>
School-related papers	= _____	Store receipts	= _____
Pages of newspaper	= _____	Mail pieces	= _____
Pages of magazines	= _____	Pages of catalogs	= _____
Paper towels/napkins	= _____	Paper bags	= _____
Toilet paper (squares of or estimate of)	= _____	Other paper	= _____

Total # of paper items: _____

3. Total **Paperboard/Cardboard** = _____ (mass in grams or kg) = _____ in a year.

Paperboard/cardboard pieces = _____

4. Total **Aluminum** = _____ (mass in grams or kilograms) = _____ in a year.

Item category tally: **Aluminum**

<u>Item</u>	<u>Number of Pieces</u>	<u>Item</u>	<u>Number of Pieces</u>
Cans	= _____	Foil	= _____
Other Al containers	= _____		

5. Total **Glass** = _____ (mass in grams or kilograms) = _____ in a year.

Item category tally: **Glass**

<u>Item</u>	<u>Number of Pieces</u>	<u>Item</u>	<u>Number of Pieces</u>
Bottles	= _____	Jars	= _____
Other glass	= _____		

6. Total **Mixed Metals** = _____ (mass in grams or kg) = _____ in a year.

Assorted tin and other metals = _____

7. Total **Styrofoam** = _____ (mass in grams) = _____ in a year.

Assorted Styrofoam pieces = _____

5. Which type of solid waste were you and your classmates collecting?

6. Describe two different methods used to deal with solid waste (not recycling). Also create a Venn diagram that compares the tradeoffs of these two methods, and explain which method you think is better and why.