



B. Trash Removal

You may want to review billing statements from the trash pickup service or interview the school's personnel in charge of waste removal to help find the answers to some of the following questions. This part of the investigation refers to waste that is not recycled or composted. See parts C and D for questions about recycling and composting at your school.

1. How many dumpsters for nonrecyclable waste does your school use?
2. How often are these dumpsters emptied or exchanged? (For example, is it once a week or twice a week?)
3. Typically, how full are these dumpsters when they are emptied? (For example, are they full, 3/4 full, 1/2 full, or 1/4 full?)
4. What size are the dumpsters? (There may be a label on the dumpster that indicates the size. Size is often noted in yards—for example, a 10-yard dumpster holds 10 cubic yards of material. Students may want to verify the size of the dumpsters by taking measurements and calculating volume.)
5. Who collects the school's trash?
 - Town or municipality
 - Private disposal service, company name: _____
 - Other: _____

How much does trash removal cost your school?

Monthly _____

Annually _____

7. If figures are available, what is the volume or weight of waste being thrown away by your school?

Monthly _____

Annually _____





B. Trash Removal (cont.)

8. What facility is the trash taken to? (For example, is it a landfill or an incinerator?)

9. Where is this facility located?

10. Go online to Google Earth to get a satellite image of the facility and to determine its distance from the school.

11. If the trash is taken to a landfill, what is the life expectancy of the landfill? (This information may be posted online by your county government.)

12. **Brainstorm**, and then record a list of ways that the trash removal practices at the school could be improved.





C. Recycling

You may want to review billing statements from the recycling service and interview the school's personnel in charge of recycling to help find the answers to the following questions.

1. Is there a recycling program at your school?

- Yes If yes, continue with question 2 in this section.
- No If no, answer the question below, then go to Part D.

If no, is there a need for a recycling program at your school?

- Yes Yes, briefly explain what your school could recycle.

No _____

2. How many dumpsters for recycling does your school have?

3. How often are the recyclable materials collected?

4. Typically, how full are the dumpsters when the recyclable materials are collected?
(For example, are they full, 3/4 full, 1/2 full, or 1/4 full?)

5. What size are the dumpsters, and are they the same size as the dumpsters used for trash? (There may be a label on the dumpster that indicates the size. Students may want to verify the size of the dumpsters by taking measurements and calculating volume.)

6. If figures are available from the recycling service, what is the volume or weight of items being recycled?

7. How much does the recycling service cost the school?

Monthly _____

Annually _____





C. Recycling (cont.)

8. Does your school receive income from recyclables?

- Yes If yes, approximately how much? _____
 No

9. Which of the following items are recycled at your school? (Check all that apply.)

- Paper Aluminum containers
 Plastic bottles Printer cartridges
 Batteries Copier cartridges
 Steel food cans Glass bottles and jars
 Other _____

10. Who is responsible for collecting recyclables and transporting them to larger recycling bins?

(Check all that apply.)

- Students Teachers
 Custodians Student club members
 Other (describe): _____

11. Where are recycling bins located at your school? (Check all that apply.)

- Classrooms Hallways
 Cafeteria Gym
 Office Copy room
 Teacher workroom Teacher lounge
 Athletic fields
 Other _____

12. Are the recycling bins clearly labeled?

- Yes
 No

13. Are there any training or educational programs to ensure that the recycling bins are properly used?

- Yes If yes, approximately how much? _____
 No





C. Recycling (cont.)

14. Who collects the recyclables from the school and hauls them to a recycling center?

- Town or municipality hauler School personnel
 Club Private hauler, company name _____
 Other _____

15. Where do recyclables go once they are collected from the school?

16. What happens to the recyclable materials after they leave the sorting facility? (For example, can you find out where the bundles of plastic or aluminum cans are shipped?)

17. **Brainstorm**, and record a list of ways that recycling efforts at the school could be improved.





D. Composting

1. Is there a compost program at your school?

Yes

No If no, skip to question 7.

2. If yes, what does your school compost? (Check all that apply.)

Grass clippings

Yard waste

Leaves

Fruit and vegetable waste from food preparation and lunches

Other _____

3. Who collects the materials to be composted? (Check all that apply.)

Students

Teachers

Custodians

Cafeteria staff members

Other (describe): _____

4. Where are the indoor food waste-collection bins located?

5. Where is the outdoor compost bin located?

6. What happens to the compost material after it's created? (For example, is it used to enrich gardens at the school?)

7. Does your school have a vermicomposting program? (Vermicomposting is the process of using worms to compost material.)

Yes

No





E. Waste Reduction, Reuse, and Purchasing

You may want to interview the school's personnel in charge of environmental policies and supply purchasing to help find the answers to the following questions.

1. Does your school or school district have policies regarding purchasing of supplies, waste reduction, and reuse?

- Yes
 No

2. Does your school purchase recycled office paper?

- Yes
 No

If yes, what are the specifications of the paper? (For example, what percent is postconsumer recycled content?)

3. Is the paper certified to ensure that it comes from sustainably managed forests?

- Yes
 No

4. Are any of the following strategies done to reduce paper use at your school?

Storing records electronically?

- Yes
 No

Communicating with staff by email?

- Yes
 No

Communicating with students by email?

- Yes
 No

Communicating with parents by email?

- Yes
 No





E. Waste Reduction, Reuse, and Purchasing (cont.)

Using online tests?

- Yes
- No

Using online textbooks?

- Yes
- No

Using double-sided printing and copying?

- Yes
- No

Reusing paper that has just been used on one side?

- Yes
- No

Reusing scrap paper for art, notes, and so forth?

- Yes
- No

5. Are any of the following done at your school to save resources, reuse items, and reduce waste?

Food in the cafeteria is served on reusable plates rather than disposable.

- Yes
- No

Reusable cafeteria trays are used rather than disposable.

- Yes
- No

Metal utensils are used rather than disposable.

- Yes
- No

Unclaimed "lost" items are donated to a charity for reuse.

- Yes
- No





E. Waste Reduction, Reuse, and Purchasing (cont.)

Gently used clothing, toys, and books are collected and donated to charities for reuse.

- Yes
- No

School holds swap days or an online swap site for exchanging books, clothing, bicycles, costumes, and so forth.

- Yes
- No

Items are collected for reuse when desks and lockers are cleaned out at the end of the school year.

- Yes
- No

6. Does your school or school district purchase items other than paper that are made from recycled content? (For example, tissues or napkins?)

- Yes If yes, briefly explain: _____
- No

7. When classes go on field trips, do they

Recycle cans and bottles they brought with them?

- Yes
- No

Minimize the amount of trash they generate by using lunch boxes or cloth bags and reusable containers?

- Yes
- No

8. **Brainstorm**, and record a list of ways that purchasing practices, reuse of items, and reduction of waste at your school could be improved.





F. Waste Analysis

Complete the waste charts on the following pages to analyze the waste at your school. The data collected will be useful in determining where improvements can be made.

Work with the school administrators, custodial staff members, and cafeteria workers to find a time to conduct the analysis. Make copies of the **Individual Room Waste Chart** on page 22 for each space that will be included in the investigation. Make one copy of the **Schoolwide Waste Chart** and the **Cafeteria Waste Chart** on pages 24-27.

Although it is not essential to calculate the weight, volume, or quantity of items being recycled or thrown away for a day, doing so provides interesting baseline data. That way, if the school implements waste-reduction strategies, the investigation can be repeated to look for changes in weight or volume over time.

If you plan to collect data on weight, volume, or quantity, pick one of the methods that follow, and gather any necessary supplies. Determine the units of measure you will use. Green Team Leaders may want to try the method selected in a couple of rooms to make sure it is appropriate for the amount of trash and recyclables generated.

Method 1. Weight Analysis

You will need a large scale (like a shipping scale used to weigh boxes) and at least one container. Weigh the empty container(s) and record the result. You will also need goggles and protective gloves for each person assisting with the analysis. Wear aprons or old clothing in case of accidental spills.

Sort the waste into categories. Place the sorted material into a container. Weigh the sorted material, subtract the weight of the empty container, and record the results on the waste charts that follow.

Method 2. Volume Analysis

Gather a variety of containers with different sizes. Calculate the volume of each container. Then mark the volume on the outside of each container. You will also need goggles and protective gloves for each person assisting with the analysis. Wear aprons or old clothing in case of accidental spills.

Sort the waste into categories and place the items in the appropriately sized container. Keep track of how many times you fill each container with a particular material. Record your results on the waste charts that follow.

Method 3. Quantity Analysis

For the **Individual Room Waste Chart**, it may be practical to sort and count the number of items because classrooms may not generate very much waste. You should, however, use the same method for all the classrooms and offices so it will be easier to analyze the results and make comparisons. For the **Cafeteria Waste Chart**, use weight or volume analysis.





F. Waste Analysis (cont.)

Method 4. Bulk Analysis

Another way to calculate volume involves help from custodians. Find out when the custodians will be collecting trash and recyclables from classrooms, offices, and the cafeteria. Count how many large barrels of trash versus recyclables they fill in a day. This number will give you a rough estimate of the percentage of waste being thrown away and recycled. Record the results on the waste charts that follow. Although this approach will not provide as detailed an analysis as is possible, it will still serve as a useful comparison.

One more way to get a rough estimate of volume is to observe how often and how many of the dumpsters for trash versus those for recyclables fill up in a week. Check with the custodians to find out when the dumpsters are emptied so you can record the data right before pickup day.

Talk with custodians to find out if what they are observing is typical. If a big event is held at the school right before you analyze the trash and recyclables, it may affect the data.

Graphing Results

You may want to graph the data collected to make it easier to interpret the results. A free online graphing tool is available at <http://nces.ed.gov/nceskids/createagraph/>. This website, sponsored by the National Center for Education Statistics (NCES), allows you to input data and to create and print colored graphs.

Why Recycle?

Here are a few good reasons:

- In 2003, 54 billion aluminum cans were recycled, saving the energy equivalent of 15 million barrels of crude oil—America's entire gas consumption for one day. (Source: <http://earth911.com/news/2007/04/02/benefits-of-aluminum-can-recycling/>.)
- Every ton of paper that is recovered through recycling saves 3.3 cubic yards of landfill space. (Source: http://www.aaatrash.com/Pages/Services_St.aspx.)

To find more examples, go to <http://www.epa.gov/climatechange/kids/index.html>. This U.S. Environmental Protection Agency (EPA) website for students includes a climate change calculator. You can enter what your school pledges to do to help the environment and can see how this effort will benefit our environment.





Individual Room Waste Chart

Use the chart below to monitor classroom and office waste for a day. Check off items that are mainly recycled or thrown away. You can also use this chart at various times throughout the school year to gather comparison data and look for changes. An option is to collect data and calculate percentages for the weight, volume, or quantity of material recycled versus thrown away.

Room #/ Name: _____ **Date:** _____

Average number of people using the room each day: _____

Types of Waste	Recycled	Weight, Volume, or Quantity of Recycled Material	Thrown Away	Weight, Volume, or Quantity of Material Thrown Away
Mixed paper*				
Other paper products**				
Cardboard, posterboard, etc.				
Plastic (#1 & #2)				
Plastic (others)				
Glass bottles and jars				
Aluminum containers				
Printer or copier cartridges				
Milk cartons***				
Other				
Total:				

* Mixed paper includes items such as white and colored paper, magazines, and newspapers.

** Other paper includes items such as towels, tissues, paper cups, and paper plates.

*** Milk cartons may or may not be accepted for recycling; check with the company that collects school recyclables.





Individual Room Waste Chart (cont.)

Calculations:

Total weight, volume, or quantity being thrown away:

Total weight, volume, or quantity being recycled:

Total weight, volume, or quantity being thrown away and recycled:

What percentage of your classroom's waste is being thrown away?

What percentage is being recycled?

Conclusions:

According to your findings, what can you conclude about the waste-management practices in the room?

Which materials are recycled the most?

Which materials are recycled the least?

Why?

Brainstorm, and record a list of ways to reduce waste and improve recycling in this room.





Schoolwide Waste Chart

Use this chart to analyze your schoolwide waste for a day. Identify with a check how the material is mainly disposed. If collected, aggregate the weight, volume, or quantity information from individual rooms, and record the data here.

Please see the separate **Cafeteria Waste Chart** to use for analyzing cafeteria waste.

Date: _____ **Number of students and staff members in the school:** _____

Types of Waste	Recycled	Weight, Volume, or Quantity of Recycled Material	Thrown Away	Weight, Volume, or Quantity of Recycled Material
Section 1. Use data collected on the Individual Room Waste Charts to help you complete this section.				
Mixed paper*				
Other paper products**				
Cardboard, posterboard, etc.				
Plastic (#1 & #2)				
Plastic (others)				
Glass bottles and jars				
Aluminum containers				
Printer or copier cartridges				
Milk cartons***				
Other				
Total:				
Section 2. Interview school administrators and custodial staff members to help you complete this section.				
Computers				
Other Electronics				
Fluorescent light bulbs****				
Total:				





Schoolwide Waste Chart (cont.)

- * Mixed paper includes items such as white and colored paper, magazines, and newspapers.
- ** Other paper includes items such as towels, tissues, paper cups, and paper plates.
- *** Milk cartons may or may not be accepted for recycling; check with the company that collects school recyclables.
- **** Fluorescent light bulbs must be disposed of properly because they contain very small amounts of mercury. For more information, go to <http://www.epa.gov/bulbrecycling>.

Calculations:

Total weight, volume, or quantity being thrown away:

Total weight, volume, or quantity being recycled:

Total weight, volume, or quantity being thrown away and recycled:

What percentage of your school's waste is being thrown away?

What percentage is being recycled?

Conclusions:

According to your findings, what can you conclude about the waste-management practices in your school?

Which materials are recycled the most?

Which materials are recycled the least?

Why?





Schoolwide Waste Chart (cont.)

Brainstorm, and record a list of ways to reduce waste and improve recycling in this room.





Cafeteria Waste Chart

Use this chart to monitor cafeteria waste for a day. Identify with a check what types of waste are found and the method of disposal. The information gathered will provide baseline data for your school. You can use the chart at a later date to gather comparison data and look for changes. An option is to collect data and calculate percentages for the weight, volume, or quantity of material recycled, composted, and thrown away.

Date: _____ Average number of students and staff using the cafeteria each day: _____

Types of Waste	Recycled	Weight, Volume, or Quantity of Recycled Material	Composted	Weight, Volume, or Quantity of Recycled Material	Thrown Away	Weight, Volume, or Quantity of Material Thrown Away
Mixed paper*						
Other paper **						
Cardboard, posterboard						
Plastic (#1 & #2)						
Plastic (others)						
Glass bottles and jars						
Aluminum containers						
Milk cartons***						
Steel food cans						
Styrofoam						
Fresh fruit/vegetable waste						
Other food waste						
Other						
Total:						

* Mixed paper includes items such as white and colored paper, magazines, and newspapers.

** Other paper includes items such as towels, tissues, paper cups, and paper plates.

*** Milk cartons may or may not be accepted for recycling; check with the company that collects school recyclables.

**** Fluorescent light bulbs must be disposed of properly because they contain very small amounts of mercury.

For more information, go to <http://www.epa.gov/bulbrecycling>.





Cafeteria Waste Chart (cont.)

Calculations:

Total weight, volume, or quantity being thrown away:

Total weight, volume, or quantity being recycled:

Total weight, volume, or quantity being composted:

Total weight, volume, or quantity being thrown away, recycled and composted:

What percentage of your cafeteria's waste is being thrown away?

What percentage is being recycled?

What percentage is being composted?

Conclusions:

According to your findings, what can you conclude about the waste-management practices in the room?

Which materials are recycled the most?

Which materials are recycled the least?

Why?





Cafeteria Waste Chart (cont.)

Brainstorm, and record a list of ways to reduce waste and improve recycling in this room.





G. Education, Training, and Community Connections

You may want to interview the school's personnel who manage environmental policies and professional development. Information about academic standards may be available on school websites.

1. Do your school's academic standards include content requirements for waste management, waste reduction, recycling, and composting?

Yes
 No

2. Has your school staff participated in professional development programs and workshops that include waste reduction, recycling, and composting education?

Yes
 No

3. Does your school sponsor any waste education, reuse, or recycling projects that help the community?

Yes
 No

If yes, what are they?

4. Some waste management facilities can be used as educational resources for field trips and guest speakers. Which facilities are found in your community?

Landfill Yes No; Location: _____

Municipal composting site Yes No; Location: _____

Material recycling facility Yes No; Location: _____

Waste-to-energy facility Yes No; Location: _____

Transfer station Yes No; Location: _____

Local solid waste or recycling office Yes No; Location: _____

5. Are community recycle or hazardous waste days offered so that items such as computers, batteries, and cell phones can be properly disposed of?

Yes
 No

If yes, when and where are they offered?

6. What community partners in your region support recycling and waste reduction?

7. Brainstorm, and record a list of ways to reduce waste and improve recycling at your school.





Waste and Recycling Action Plan

Review the list of ideas for improving waste practices that you brainstormed for each section of this investigation. Prioritize the ideas and decide on a few action projects that could be done to improve the waste practices at your school.

List your action project ideas for each section of the Waste and Recycling Investigation:

Solid Waste Regulations and Policies (Section A):

Trash Removal (Sections B & F):

Recycling (Sections C & F):

Composting (Sections D & F):

Waste Reduction (Sections E & F):

Reuse (Sections E & F):

Purchasing (Sections E & F):

Education, Training, and Community Connections (Section G):

Waste and Recycling Action Project Ideas

Here are just a few ideas to help get you started. Students will come up with many more ideas and you can check out what other PLT GreenSchools! are doing too! Visit www.plt.org/greenschools-stories.

- Reduce paper waste—for example, by photocopying and printing on both sides of paper and by saving scrap paper for notes and art projects.
- Reduce cafeteria waste—for example, by using less Styrofoam, by serving food on reusable trays, and by using metal utensils instead of disposable ones.
- Start a recycling program, or increase recycling efforts and the types of items that are recycled.
- Start or increase composting efforts.
- Reuse items—for example, by organizing an exchange day for students to swap items they are no longer using such as sports equipment, clothes, CDs, posters, and so forth.
- Encourage students across the whole school to use refillable water bottles, reusable lunch boxes or cloth bags, and reusable containers.
- Have an end-of-school year locker and desk clean out where students can donate unwanted items to a local charity or needy school.
- Educate others about reducing waste, recycling, and composting through flyers, posters, articles in the school newspaper, skits, assemblies, and school announcements.
- Participate in Recycle-Bowl (<http://recycle-bowl.org/>) and America Recycles Day (<http://americarecyclesday.org/>), both sponsored by Keep America Beautiful.

