Project Learning Tree®

Waste & Recycling Investigation

PLT® GreenSchools

Table of Contents

Third Edition

What Will You Do?

In the Waste & Recycling Investigation you will:

- ✔ **Investigate the waste stream in your school.**
- ✔ **Collect data about the amount of waste thrown away, recycled, and composted during a single day.**
- ✔ **Analyze the data and brainstorm ways to make improvements.**
- ✔ **Develop an understanding of how individual and collective student actions can affect the waste stream.**
- ✔ **Learn about sustainable approaches to waste management and understand why it is important to adopt sustainable practices.**
- ✔ **Generate a plan to improve your school's waste, recycling, and composting practices and overall sustainability.**
- ✔ **Implement one or more of your waste improvement strategies.**

Directions

FOR GREEN TEAM MEMBERS

❑ Gather Documents and Supplies.

If possible, gather the following documents and supplies before the team begins the Investigation:

- Waste pickup and recycling service contracts
- Monthly and/or annual billing statements from the waste pickup and recycling service
- Any written policies that the school may have related to waste management, recycling, and composting

As an *optional* activity, you could sort and categorize waste materials to get baseline data on how much waste and what types of waste are produced at your school. This exercise is particularly helpful if the school's waste removal company does not provide information on the amount of waste they collect. See the full instructions for conducting this activity in Part VI, Waste Analysis, in the Investigation. If you conduct this activity, you will also need: protective goggles and gloves; a scale to weigh waste and recyclables; several large containers; a tarp; extra garbage bags; and aprons to protect clothing.

❑ Review and Conduct the Investigation.

Review the Waste & Recycling Investigation to determine if the questions are appropriate for your school. Also determine if there are additional questions that you'd like to add.

Provide a printed copy of the entire Waste and Recycling Investigation to the Green Team members to use. They should answer the questions to the best of their ability according to the time allotted and materials available.

❑ Develop and Implement an Action Plan.

Using the data collected from the Investigation, prioritize your ideas for action projects and implement one or more of your plans. You can apply for a PLT GreenWorks! grant to help fund your action projects. Find out more at www.plt.org/greenschools.

❑ Celebrate Success.

Communicate your findings and achievements with other students, school administrators, and the community. For suggestions on how to share your achievements, see the Celebrate Success tip sheet available on page 11 of the Adult Leader Guide.

❑ Apply for GreenSchools Certification.

Once you have completed all five PLT GreenSchools Investigations and taken action in at least one area, you can be recognized for your hard work and achievements through this national certification program. Certified schools are eligible for great recognition items, such as buffs and wristbands for students, weatherproof signs and banners for the school grounds, and more! You can view the certification requirements at https://www.plt.org/green-schools/certification-requirements.

Why Investigate Waste?

Our fast-paced society is full of items to make our lives more convenient—from fast-food wrappers and cups to disposable shopping bags. But these convenience items, as well as all the other disposable items we use, can end up in **landfills**. It costs money to dispose of them and creates environmental problems.

Definitions for the words in bold text can be found in the Glossary on page 8.

Finding solutions to waste management problems brings together the fields of economics, environmental science, sociology, political science, health, and engineering. As you investigate the **waste stream** at your school and look for solutions, you'll gain real-world experience in science, technology, engineering, and math (STEM). You'll collect and analyze data on how much waste your school generates, and brainstorm ways to make improvements. You'll also learn how reducing waste, reusing items, recycling, and composting save natural resources, energy, and landfill space. The background information that follows may be useful as you complete the Investigation. It might also give you ideas for action projects.

Reducing Waste and Global Climate Change

Most people don't realize that reducing, reusing, and recycling can help slow climate change. This is because every product has a life cycle, and every step in making the product uses energy—this energy use leads to greenhouse gas emissions. Reducing, reusing, and recycling means you buy (and throw away) less stuff, and that helps reduce the amount of greenhouse gases we're adding to the atmosphere. It also helps to save natural resources.

Reducing Waste Saves Money

In addition to saving energy and natural resources, waste reduction can also save money by lowering collection and disposal fees. For example, St. Michael School in Livermore, CA, received a PLT GreenWorks! grant that enabled them to implement a waste reduction program. In just one year, they reduced their waste removal costs by $1,200 and diverted approximately 40% of their waste from landfills to composting and recycling centers. Learn more at www.plt.org/story/earth-team-reduces-waste.

By the Numbers

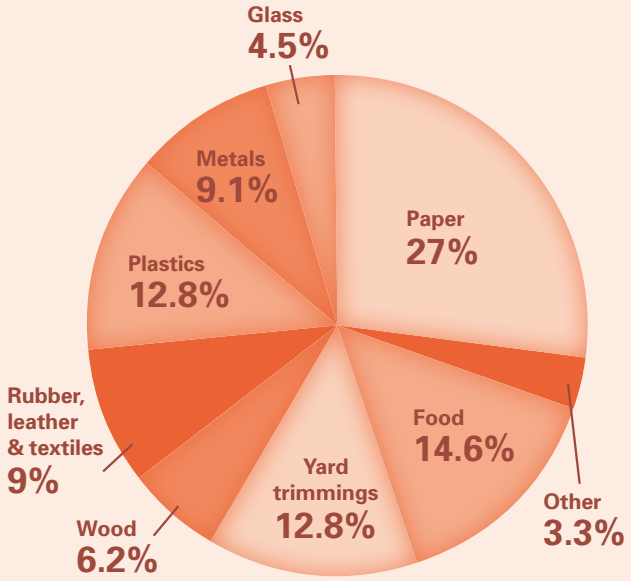
The average person generates over 4 pounds of **garbage** every day—and most of it ends up in landfills where it takes years or even decades to break down. However, many of the things we throw away can be **reused**, recycled, or **composted**. Keeping these things out of the waste stream saves resources and money, and it saves valuable landfill space. (Source: U.S. EPA, https://archive.epa.gov/epawaste/nonhaz/municipal/web/html)

Why Investigate Waste?

In 2013, Americans generated about 254 million tons of trash and recycled and composted about 87 million tons of this material, equivalent to a 34.3 percent recycling rate. On average, we recycled and composted 1.51 pounds of our individual waste generation of 4.40 pounds per person per day. This amount of recycling and composting prevented the release of approximately 186 million metric tons of carbon dioxide equivalent into the air in 2013—equivalent to taking over 39 million cars off the road for a year. (Source: U.S. EPA, https://archive.epa.gov/epawaste/nonhaz/municipal/web/html)

At schools, nearly half the waste that is generated each day is organic material (such as lunch leftovers) that could be composted. Paper—easily recyclable—makes up another third of the waste. Glass bottles, cans, and plastic, also to a large extent recyclable, make up the next highest portion of school waste. (Source: CalRecycle, http://www.calrecycle.ca.gov/reducewaste/schools/Composition.htm)

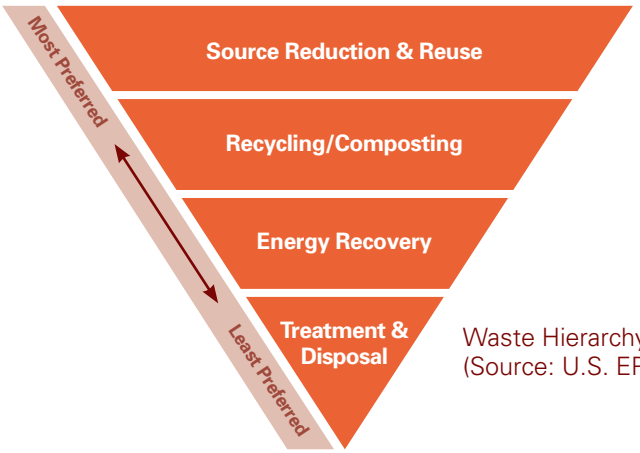
Total Municipal Solid Waste Generation (by Material) in 2013: 254 Million Tons (Before Recycling)



(Source: U.S. EPA)

Waste Hierarchy

The U.S. EPA has developed a waste hierarchy that ranks the most environmentally sound strategies to use with municipal solid waste. According to the hierarchy, it is preferable (least costly) to reduce, reuse, and recycle the majority of wastes, followed by using them for energy recovery and finally treatment and disposal.



Waste Hierarchy (Source: U.S. EPA)

Source reduction and reuse are the most preferred ways of minimizing waste. Source reduction refers to reducing the volume or toxicity of waste at the source by changing the material-generating process. It includes reducing the volume and toxicity of waste in the design, manufacture, sale, purchase, and use of products and packaging. Other terms are often used to mean source reduction, including waste reduction, waste prevention, and waste minimization. **Reuse** simply means using a product again (and again) before it is recycled or thrown away. Most communities and schools use an **integrated waste management** approach. This involves using a variety of practices to safely and effectively handle municipal solid waste.

Why Investigate Waste?

Recycling

Recycling offers many economic, environmental, and community benefits. For schools, recycling can save money. Most waste removal companies charge significantly lower fees for picking up recyclables than other waste. In addition, schools can earn money by recycling certain items such as aluminum cans. Schools also model good citizenship by recycling.

Students at Wyandotte High School in Kansas City, KS (see photo to left), learned about the many benefits of recycling when they conducted the PLT Waste and Recycling Investigation. After completing the investigation, they decided to implement a school-wide recycling program. They secured a PLT GreenWorks! grant that helped their Green Team purchase bins and carts to launch the recycling program. In 2011, students recycled 17,000 pounds of paper, plastic, and aluminum—allowing the school to get rid of one of its dumpsters and saving the school money. Learn more at www.plt.org/story/energy-recycling-gardening-projects-green-kansas-city-high-school/.

Composting

Nationally, the composting of food rose from 1.84 million tons in 2013 (5.0 percent of food) to 1.94 million tons (5.1 percent of food) in 2014. In 2014, Americans recovered over 66.4 million tons of municipal solid waste through recycling (this is 1.1 pounds per person per day), and over 23 million tons through composting for recycling (0.4 pounds per person per day.) Food composting collection programs served over 2.8 million households in 2014. (Source: https://www.epa.gov/sustainable-management-food/reducing-impact-wasted-food-feeding-soil-and-composting)

Composting can be a great way for schools to reduce their waste production. At lunch time, put food leftovers in a composting container rather than in the garbage can. (You can compost fruit and vegetable scraps, but keep meat and dairy products out of compost because they can turn rancid and attract rodents and other pests.) These food scraps can be added, along with appropriate quantities of green and brown material, to an outdoor compost station where they will biodegrade. Generally, a 2:1 ratio of green material (food scraps, grass clippings, fresh weeds) to brown material (leaves, straw, pine needles, shredded newspaper) is recommended. The compost generated can be used on a school garden or around flower beds.

Why Investigate Waste?

Purchasing Sustainable Products

Many schools are implementing sustainable purchasing policies. Sustainable purchasing refers to buying products that are produced in an environmentally sound manner.

The Sustainable Forestry Initiative, for example, gives consumers a way to support and participate in responsible forest management. From furniture to printer paper and packaging, you can find the SFI on-product label on a wide range of items you buy every day for your school, your home, or your office. The SFI label shows that a product has been responsibly sourced or comes from a certified forest that has measures in place to protect water quality, biodiversity, wildlife habitat, and other responsible forestry practices.

Students Making a Difference

Although the problem of waste management may seem insurmountable at first, individual and collective actions can really make a difference!

You can take what you've learned at school to your home to help family members cut down on the amount of waste they generate. For helpful tips, see Green Your Home: Improving Recycling and Reuse found at the end of this Investigation. You can also download it at www.plt.org/activities-for-families/around-your-home/.

PLT GreenSchool Videos

To learn more about why reducing waste at your school is important and to see how other GreenSchools across the country are taking action, watch PLT's short videos **Investigating Waste & Recycling** and **GreenSchools in Action: Waste & Recycling**. These videos are available on PLT's YouTube channel: https://www.youtube.com/user/ProjectLearningTree.

Careers

This investigation may stimulate your interest in a variety of careers related to solid waste management and recycling. Here are a few of the fields that you may discover as you conduct the investigation:

- City recycling manager
- Environmental and landfill engineer
- Environmental health and safety technician
- Environmental law and policy specialist
- Environmental scientist
- Landfill operator and technician
- Recovered materials entrepreneur
- Solid waste manager

Glossary

Compost—decayed organic matter that can be used to fertilize soil. The decayed organic matter is often from leaves, grass clippings, and vegetable scraps.

Composting—the decomposition (breakdown) of food scraps, paper, leaves, and grass clippings into a rich material called compost. This compost can be used to enrich soil.

Garbage—material that is thrown away.

Grasscycling—the practice of leaving grass clippings on a lawn to nourish the grass.

Hazardous waste—solid waste that may cause or pose a substantial hazard to human health or the environment when it is not properly disposed of; a material that exhibits corrosive, ignitable, toxic, or reactive characteristics.

Incinerator—a facility designed to safely burn waste.

Integrated Waste Management—the complementary use of a variety of practices to safely and effectively handle municipal solid waste.

Landfill—a place where waste is buried in the ground. The waste is typically buried between layers of soil and the bottom is lined with an impermeable liner to prevent toxins from leaking into the surrounding soil and water.

Municipal solid waste—material that is unwanted and that has been discarded, including durable goods, nondurable goods, containers, packaging, yard trimmings, and food wastes; many of these waste items have the potential to be reused, recycled, or composted.

Recyclables—waste materials that can be reprocessed and used to manufacture a new product of the same kind or a different kind.

Recycle—to reprocess a used item and make it into a new item. For example, plastic bottles can be recycled into playground equipment. Items that are commonly recycled are aluminum cans, plastic, glass, metals, cardboard, and paper.

Recycled—composed of materials that have been processed and used again.

Reduce—produce less waste.

Reuse—use a product again (and again) before it is recycled or thrown away.

Source reduction—reducing the volume or toxicity of waste at the source by changing the material-generating process. It includes reducing the volume and toxicity of waste in the design, manufacture, sale, purchase, and use of products and packaging. Other terms are often used to mean source reduction, including waste reduction, waste prevention, and waste minimization.

Waste—any material that is thrown away.

Waste Hierarchy—a hierarchy ranking developed by the U.S. EPA that depicts the most environmentally sound strategies to use with municipal solid waste.

Waste minimization—any action that reduces the amount of waste generated and lowers the toxicity and persistence of wastes that are generated. The term is also applied to recycling and other efforts to reduce the amount of waste entering the waste stream.

Waste stream—the flow of waste from generation to final disposal. Actions such as recycling and composting reduce the amount of waste that goes to landfills and incinerators.

Vermicomposting—the process of using worms to compost material.

PART I: SCHOOL INFORMATION

Overview

Through this investigation, you will collect data on your school's waste stream, including recycling, composting, and waste removal. The results will help you see where your school could make improvements, such as increasing recycling, starting a cafeteria composting program, or producing less waste. You'll see the power that individual and collective student actions can have on reducing waste and natural resource use.

School Name: _____ **Date:** _____

GREEN TEAM:

(Please include administrators, teachers, school staff, students, community members, parents, and others involved in this investigation.)

NAME	TITLE/ROLE

SCHOOL POPULATION

Students: _____ Staff: _____

PART II: WASTE REMOVAL

To find the answers to the following questions, you may want to interview the school's personnel in charge of waste removal. You can also look online for school district policies, as well as local, state, and federal regulations regarding solid waste management. Use the sections that follow to record your findings.

Definitions for the words in bold text can be found in the Glossary on page 8.

1. Does your school district have written policies about waste disposal and recycling?
   ☐ Yes ☐ No

2. Who collects the school's waste?
   ☐ Town or municipality
   ☐ Private disposal service: _____
   ☐ Other: _____

3. How much does waste removal cost your school? (This information will provide you with baseline data. After you have taken action to improve waste handling practices at your school, you will be able to determine how much money your actions are saving the school.)
   Month:_____ Cost: _____
   Year: _____ Cost:_____

4. If figures are available on the school's bill, what is the weight or volume of waste that the school throws away? (This information will provide you with baseline data to allow you to assess changes after taking action.)
   Month:_____ Weight/Volume:_____
   Year:_____ Weight/Volume:_____

   If information on the weight/volume of waste removed is not available, you can obtain baseline data by answering the following four questions:
   - How many dumpsters for non-recyclable waste does your school use? _____
   - What size are the dumpsters? (This is often noted on the side of the dumpster.) _____
   - How often are these dumpsters emptied or exchanged? (For example, is it once a week or twice a week?) _____
   - Typically, how full are the dumpsters when they are emptied? (For example, are they full? half full?) _____

5. What type of facility is the waste taken to? (For example, is it a **landfill** or an **incinerator**?)

   _____

6. Where is this facility located, and how far is it from your school?

   _____

7. Brainstorm and record a list of ways that the waste removal practices at the school could be improved.

PART III: 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. Does your school/school district have a written plan and/or policy about recycling?
   ☐ Yes ☐ No

2. Is there a recycling program at your school?
   ☐ Yes. Continue with question 3 in this section.
   ☐ No. Answer the question below, then go to the next section on composting.

   Briefly explain why your school doesn't have a recycling program:

   _____

   Note: In the *Taking Action* section, you can describe how your school could begin a recycling program.

3. Who collects the school's recyclables?
   ☐ Town or municipality
   ☐ Private service: _____
   ☐ Other: _____

4. To what type of facility do **recyclables** go after they have been collected, and how far is it from your school?

   _____

5. How much does the recycling service cost the school?
   Month: _____ Cost: _____
   Year: _____ Cost:_____

6. Does your school receive income from recyclables?
   ☐ Yes. Approximately how much per year? _____
   ☐ No

7. If figures are available from the recycling service, what is the weight or volume of items being recycled?
   Month: _____ Weight/volume: _____
   Year: _____ Weight/volume: _____

   If information on the weight/volume of recyclables picked up is not available, you can get baseline data by answering the following four questions:
   - How many dumpsters for recyclables does your school use? _____
   - What size are the dumpsters? (This is often noted on the side of the dumpster.) _____
   - How often are these dumpsters emptied or exchanged? (For example, is it once a week or twice a week?) _____
   - Typically, how full are the dumpsters when they are emptied? (For example, are they full? half full?) _____

8. Which of the following items are recycled at your school? (Check all that apply.)
   ☐ Paper ☐ Aluminum containers ☐ Plastic bottles ☐ Printer cartridges
   ☐ Cardboard ☐ Copier cartridges ☐ Steel food cans ☐ Glass bottles and jars
   ☐ Other: _____

9. 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): _____

10. Where are recycling bins located at your school? (Check all that apply.)
   ☐ Classrooms ☐ Hallways ☐ Cafeteria ☐ Gym ☐ Office
   ☐ Copy room ☐ Teacher workroom ☐ Teacher lounge ☐ Playground/Athletic fields
   ☐ Other: _____

11. Are the recycling bins clearly labeled?
   ☐ Yes ☐ No

12. Do people place recyclable items in the appropriate bins?
   ☐ Yes ☐ No

13. Are training or educational programs provided to ensure that the recycling bins are properly used?
   ☐ Yes. Briefly describe: _____
   ☐ No

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

PART IV: COMPOSTING

1. Is there a composting program at your school?
   ☐ Yes
   ☐ No. Skip to question 8.

2. What does your school compost? (Check all that apply.)
   ☐ Grass clippings ☐ Yard waste ☐ Leaves ☐ Fruit and vegetable waste from food preparation and lunches
   ☐ Other (describe):_____

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? (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

8. If your school does not have a compost program, explain how your school could start one and what materials could be composted.

   _____

   _____

9. Brainstorm and record a list of ways that composting efforts at the school could be improved.

PART V: WASTE REDUCTION, REUSE, AND PURCHASING

You may want to interview the school's personnel in charge of environmental policies and supply purchasing to 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 percentage of the paper 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 followed 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

   Using online tests . . . . . ☐ Yes ☐ No

   Using online books . . . . . ☐ Yes ☐ No

   Using double-sided printing and copying . . . . . ☐ Yes ☐ No

   Reusing paper that has only been used on one side . . . . . ☐ Yes ☐ No

   Reusing scrap paper for art, notes, and so forth . . . . . ☐ Yes ☐ No

5. Does the school employ any of the following strategies to save resources, reuse items, and reduce waste?

   Food is served on reusable, not disposable, plates. . . . . ☐ Yes ☐ No

   Metal, not disposable, utensils are used. . . . . ☐ Yes ☐ No

   Reusable, not disposable, trays are used. . . . . ☐ Yes ☐ No

   Unclaimed "lost" items are donated to a charity for reuse. . . . . ☐ Yes ☐ No

   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 where families can exchange books, clothing, bicycles, costumes, and so forth. . . . . ☐ Yes ☐ No

   Items are collected for reuse/donation 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 ☐ No

   If yes, briefly explain: _____

7. When classes go on field trips, do they:

   Recycle cans and bottles? . . . . . ☐ Yes ☐ No

   Minimize the amount of waste generated by bringing 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.

PART VI: WASTE ANALYSIS

The purpose of this analysis is to help you determine whether waste items are being placed in the appropriate container (garbage can, recycling bin, compost bin) and whether items are being thrown away that could be reused, recycled, or composted.

Directions: Complete the waste charts and questions on pages 18-23 to analyze the waste generated at your school in a single day. Work with the school administrators and custodians to find a time to conduct the analysis. Plan to conduct it on a typical day; if you do it right after a big event is held, it can affect the data.

- For each room that will be included in the assessment, you will need a copy of the What To Do With Waste Chart, the Individual Room Waste Chart, and the analysis questions (pages 17-19). (Please use the front and back of paper or create an online entry form for paperless data recording.) Try to include as many rooms as possible.
- You will also need one copy of the Schoolwide Waste Chart, Cafeteria Waste Chart, and the analysis questions that follow these charts (pages 20-23).

Measuring Weight (Optional)

Although this is optional, the data collected will provide baseline information that can be used to track improvements after action is taken to reduce waste. This analysis is particularly useful if the company that picks up waste does not provide data on the weight of waste collected.

Materials Needed:

- A large scale (like a spring scale or shipping scale)
- At least one container
- Large tarp
- Goggles and gloves for each participant
- Aprons to protect clothing

Directions: Weigh the empty container(s) and record the weight. For each room, sort the waste on a tarp into the categories on the chart. Place each category of material into a container. Weigh it, subtract the weight of the empty container, and record the results on the waste chart.

WHAT TO DO WITH WASTE CHART

Type of Waste	Recycle It	Compost It	Throw It Away	Comments
Mixed paper	✓	✓		Mixed paper includes white and colored paper, magazines, and newspapers, all of which can be recycled. Most of these items can also be composted if they are clean and in small pieces or shredded.
Used paper products			✓	Includes used paper towels, tissues, cups, and plates. These items should not be recycled or composted because they can contaminate the recyclables and compost.
Cardboard and posterboard	✓	✓		These items are usually recycled, however, clean cardboard and poster board can be shredded or cut into small pieces and composted.
Recyclable plastics	✓			This includes any plastic material that is accepted for recycling by the school's recycling company. Look for recycling symbols on containers. Empty containers before placing them in the recycling bin.
Glass bottles and jars	✓			Glass containers used for food and beverages are recyclable. Empty containers before placing them in the recycling bin.
Aluminum containers	✓			Aluminum containers are recyclable. Empty containers before placing them in the recycling bin.
Styrofoam	✓		✓	Styrofoam may or may not be recycled in your community. Regardless, it should not be included with other recyclables because it can only be recycled at special facilities. Contact the companies that collect your school's waste and recycling to find out how to handle it.
Milk cartons	✓			Milk cartons may or may not be accepted for recycling; check with the company that collects your school's recyclables.
Food waste		✓		Fruit and vegetable waste, as well as coffee grounds, tea bags, and egg shells can be composted. Keep meat, bones, grease, fats, oils, and dairy products out of the compost because they can turn rancid and attract rodents and other pests.
Printer or copier cartridges	✓			Printer and copier cartridges should not be placed in the school's regular recycling bins. They have to be returned to the manufacturer for recycling. Many manufacturers provide pre-paid shipping labels or have partner retailers where you can drop off cartridges.

INDIVIDUAL ROOM WASTE CHART

Directions: Record information on the waste generated in the room at the end of the day. For each type of waste, use a check mark to indicate whether it is mainly recycled, thrown away, or composted. You can do this with a visual inspection. If you measured weight, record the results in the last column. Then answer the questions that follow.

SAFETY: Students should wear gloves and goggles when inspecting the waste. If the bins are too full to do a visual inspection, dump the contents onto a tarp to complete the visual inspection.

Room #/ Name: _____ Average # of people using the room: _____ Date: _____

Type of Waste	Mainly Recycled	Mainly Composted	Mainly Thrown Away	Total Weight Generated in One Day (Include units)
Mixed paper				
Used paper products				
Cardboard and posterboard				
Recyclable plastics				
Glass bottles and jars				
Aluminum containers				
Styrofoam				
Milk cartons				
Food waste (Fruit and vegetable)				
Printer or copier cartridges				
Other				
Total				

Individual Room Waste Chart Analysis

1. Are waste items being placed in the appropriate container (garbage, recycling, or compost)?
   ☐ Yes ☐ Somewhat ☐ No

   Briefly explain your answer:

   _____

2. What was the total weight of all the waste generated in the room?

   _____

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

   _____

   _____

   _____

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

SCHOOLWIDE WASTE CHART

Directions: Aggregate the data from the Individual Room Waste Charts and record it on the top half of the chart. Then complete the bottom half of the chart and answer the questions that follow.

Number of people in the school: _____ Date: _____

Type of Waste	Mainly Recycled	Mainly Composted	Mainly Thrown Away	Total Weight Generated Schoolwide in One Day (Include units)
Section 1. Aggregate the data collected on the Individual Room Waste Charts to complete this section.				
Mixed paper				
Used paper products				
Cardboard and posterboard				
Recyclable plastics				
Glass bottles and jars				
Aluminum containers				
Styrofoam				
Milk cartons				
Food waste (Fruit and vegetable)				
Printer or copier cartridges				
Other				
Total				
Section 2. Interview school administrators and custodians to help you complete this section.				
Computers*				
Other electronics*				
Fluorescent light bulbs*				
Total				

* Most computer equipment and electronic devices contain hazardous materials and fluorescent light bulbs contain very small amounts of mercury, so these items do not belong in a landfill. Check with your local health and sanitation agencies for ways to safely dispose of electronics and fluorescent light bulbs.

Schoolwide Waste Chart Analysis

1. Are waste items being placed in the appropriate container (garbage, recycling, or compost)?
   ☐ Yes ☐ Somewhat ☐ No

   Briefly explain your answer:

   _____

2. If measured, what was the total weight of all the waste generated in Section 1 of the chart?

   _____

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

   _____

   _____

   _____

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

CAFETERIA WASTE CHART

Directions: Use this chart to monitor cafeteria waste for a day.

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

Type of Waste	Mainly Recycled	Mainly Composted	Mainly Thrown Away	Total Weight Generated in One Day (Include units)
Mixed paper				
Used paper products				
Cardboard and posterboard				
Recyclable plastics				
Glass bottles and jars				
Aluminum containers				
Steel food cans				
Styrofoam				
Milk cartons				
Food waste (Fruit and vegetable)				
Other				
Other				
Total				

Cafeteria Waste Chart Analysis

1. Are waste items being placed in the appropriate container (garbage, recycling, or compost)?
   ☐ Yes ☐ Somewhat ☐ No

   Briefly explain your answer:

   _____

2. What was the total weight of all the waste generated in the cafeteria?

   _____

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

   _____

   _____

   _____

4. Brainstorm and record a list of ways to reduce waste and improve recycling and composting in your cafeteria.

PART VII. 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. Have at least two members of your staff participated in PLT professional development? . . . . . ☐ Yes ☐ No

2. Are PLT professional development opportunities available to all teachers? . . . . . ☐ Yes ☐ No

3. Do at least 10% of classes or courses embed environmental education, including PLT? . . . . . ☐ Yes ☐ No

4. Do your school's academic standards include content requirements for waste management, waste reduction, recycling, and composting? . . . . . ☐ Yes ☐ No

5. Have members of your school staff participated in professional development programs and workshops that include waste reduction, recycling, and composting education? . . . . . ☐ Yes ☐ No

6. Does your school sponsor any waste education, reuse, or recycling projects that help the community? . . ☐ Yes ☐ No

7. 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

8. 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: _____

   Transfer Station? . . . . . ☐ Yes ☐ No
   Location: _____

   Local solid waste or recycling office? . . . . . ☐ Yes ☐ No
   Location: _____

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

   _____

10. Brainstorm and record a list of ways for how your school could improve waste education, training, and community connections.

PART VIII: WASTE & 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 you can do to improve the waste practices at your school. See the next page for examples of action projects.

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

Waste Removal

Recycling

Composting

Waste Reduction, Reuse, and Purchasing

Education, Training, and Community Connections

Waste and Recycling Action Project Ideas

Here are just a few ideas to help get you started. You can check out what other PLT GreenSchools are doing by watching PLT's short video GreenSchools in Action: Waste & Recycling (available on PLT's YouTube channel at https://www.youtube.com/user/ProjectLearningTree) and by reading stories posted at www.plt.org/teacher-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.
- As your school reduces the amount of waste produced, dumpsters may no longer be full when waste is picked up. "Right size" the dumpsters by selecting the appropriate size. This will give your school the best value from the waste hauling service.
- Start a recycling program, or increase recycling efforts and the types of items that are recycled.
- Start or increase composting efforts.
- Implement grasscycling, the practice of leaving grass clippings on a lawn to compost and to nourish the grass.
- 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 cleanout and have students 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.

Green Your Home:
Improving Recycling and Reuse

Project Learning Tree®

Our fast-paced society is full of items to make our lives more convenient—from fast-food wrappers and cups to disposable shopping bags. But these convenience items, as well as all the other disposable items we use, can end up in landfills. It costs money to dispose of them and creates environmental problems.

Improving the way you dispose of waste is an important way you can help our environment. Reducing waste, reusing items, recycling, and composting save natural resources, energy, and landfill space. Reducing waste can also save you money by lowering collection and disposal fees.

Use this chart to analyze how you are currently disposing of waste and whether items being thrown away could be reused, recycled, or composted. Place a checkmark √ to indicate what you currently do with each type of waste. Look at the "Comments" to see if there are ways you could make improvements. Finally, record your ideas under "Ways I Can Make Improvements."

What We Do With Waste

Types of Waste	Mainly Recycled	Mainly Composted	Mainly Throw Away	Taken to Hazardous Waste Collection Site	Comments	Ways I Can Make Improvements
Mixed paper Includes white and colored paper, magazines, and newspapers					These items can be recycled. Most can also be composted if they are clean and cut into small pieces or shredded.	
Used paper product Includes used paper towels, tissues, cups, and plates					These items should not be recycled or composted because they can contaminate the recyclables and compost.	
Cardboard and poster board					These items are usually recycled, however, clean cardboard and poster board can be cut into small pieces and composted.	
Recyclable plastics Includes any plastic material that is accepted for recycling by your waste disposal company					Look for recycling symbols to help determine if the item is recyclable. Empty and rinse containers before placing them in the recycling bin.	
Glass bottles and jars					Glass containers used for food and beverages are recyclable. Empty and rinse containers before placing them in the recycling bin.	
Aluminum containers					Aluminum containers are recyclable. Empty and rinse containers before placing them in the recycling bin.	
Styrofoam					Styrofoam can only be recycled at special facilities. Contact your waste disposal company or local sanitation agency to find out how to handle it.	
Milk cartons					Milk cartons may or may not be accepted for recycling; check with your waste disposal company.	

Continued on next page

Green Your Home:
Improving Recycling and Reuse (cont.)

Project Learning Tree®

What We Do With Waste (Continued)						
Types of Waste	Mainly Recycled	Mainly Composted	Mainly Throw Away	Taken to Hazardous Waste Collection Site	Comments	Ways I Can Make Improvements
Food waste					Fruit and vegetable waste, as well as coffee grounds, tea bags, and egg shells can be composted. Keep meat, bones, grease, fats, oils, and dairy products out of the compost because they can turn rancid and attract rodents and other pests.	
Yard waste					Grass clippings can be left on the lawn after mowing to return nutrients back to the soil. Grass clippings, as well as dead leaves, twigs, and branches, can be composted along with food waste.	
Printer or copier cartridges					Printer and copier cartridges have to be returned to the manufacturer for recycling. Many manufacturers provider pre-paid shipping labels or have partner retailers where you can drop off cartridges.	
Computers and printers					Most computers and printers contain hazardous materials so these items do not belong in a landfill. Check with your local sanitation agency for ways to safely dispose of these items.	
Cell phones					Cell phones can be donated to various charities or recycled by returning them to cell phone manufacturers or wireless service providers.	
CFLs (Compact fluorescent light bulbs)					Compact fluorescent light bulbs must be disposed of properly because they contain very small amounts of mercury. Check with your local sanitation agency for the proper disposal method.	
Other: _____						

To learn more about PLT GreenSchools:

- Watch tutorials and videos showing how GreenSchools across the country are taking action by viewing PLT's videos on our YouTube channel (https://www.youtube.com/user/ProjectLearningTree).

- Read stories on GreenSchools posted online at PLT's website (www.plt.org/teacher-stories).

- Subscribe to our e-newsletter for updates and information about new resources, grant opportunities, tips from educators, and stories of students making a difference at school and in their communities (www.plt.org/sign-up)

Project Learning Tree®

Project Learning Tree educates teachers and youth about forests and the environment.

2121 K Street NW
Suite 750
Washington, DC 20037
Phone: 202-765-3641
information@plt.org
www.plt.org

When citing this publication in a bibliography, please use the following reference:
Project Learning Tree 2018, GreenSchools Investigations, Sustainable Forestry Initiative, Washington, DC.

SUSTAINABLE FORESTRY INITIATIVE
SFI-00001

The Sustainable Forestry Initiative Inc. is a sustainability leader that stands for future forests. PLT is an initiative of SFI.

Third Edition
ISBN 978-0-9970806-5-0