

# TRASH FREE SCHOOLS

## Guidebook



Create a  
sustainable,  
environmentally  
aware school  
culture through  
waste reduction



The Alice Ferguson Foundation was established in 1954 as a non-profit organization chartered in the state of Maryland. Our educational programs unite students, educators, park rangers, communities, regional organizations and government agencies throughout the Washington, D.C. metropolitan area to promote the environmental sustainability of the Potomac River watershed.

The Alice Ferguson Foundation's mission is to connect people to the natural world, sustainable agricultural practices, and the cultural heritage of their local watershed through education, stewardship, and advocacy.

Trash Free Potomac Watershed Initiative at the Alice Ferguson Foundation seeks to address the trash problem with a comprehensive, watershed-wide approach that challenges regional leaders to work collaboratively, brings together key stakeholders to research and explore alternative, cost-effective solutions that have long term impact, and improves general education and awareness in order to shift individual behaviors.

2001 Bryan Point Road, Accokeek, MD 20607

Phone: 301.292.5665 Fax: 301.292.1070

[fergusonfoundation.org](http://fergusonfoundation.org)  
[education@fergusonfoundation.org](mailto:education@fergusonfoundation.org)

The Trash Free Schools Guidebook was created by the Alice Ferguson Foundation to support schools in implementing the Trash Free Schools Project.

This edition was updated in September 2015. Visit our website for the most recent version of the Guide-book: <http://fergusonfoundation.org/>

Alice Ferguson Foundation

# Table of Contents

<b>An Introduction to the Trash Free Schools Project</b> .....	3
Trash Free Schools Project's Eight Steps Table.....	6
<b>The Trash Free Schools Project's The Eight Steps</b>	
Step 1. Sign the Trash Free Schools Pledge .....	7
Trash Free Schools Pledge .....	8
Trash Free Classroom Pledge.....	9
Step 2. Form a Green Team .....	10
Step 3. Complete Baseline Assessment and Choose a Tracking System	
Complete a Baseline Assessment .....	11
Choose a Tracking System .....	13
Step 4. Create an Action Plan .....	14
Encourage Community Partnerships.....	15
Grants and Funding .....	15
Step 5. Organize a Kickoff Event .....	16
Step 6. Take Action .....	17
Educate and Inform Students.....	18
Educate and Inform Faculty and Staff .....	19
Organize a Litter Prevention Campaign .....	20
Rethink, Reduce, Reuse, and Recycle (Waste Reduction)	
Classrooms .....	21
Cafeteria.....	22
Trash Free Lunch .....	23
Reduce Food Waste .....	24
Polystyrene and Lunch Tray Alternatives.....	25
Composting .....	26
Facilities and Offices .....	27
Green Purchasing .....	28
Recycling .....	30
Adopt a Litter Can Page.....	32
Step 7. Celebrate .....	34
Step 8. End-of-Year Evaluation .....	35
Trash Free Schools Report Card .....	36

## Resources Section

Trash Tracking Form .....	38
Marine Debris Games and Activities.....	41
Glossary.....	64

# Welcome to the Trash Free Schools Project!

The Trash Free Schools Project was developed by the Alice Ferguson Foundation to address the gap between environmental education and the trash and litter problem in the local watershed. It combines education with action to create a system for K-12 schools to reduce their trash footprint.

This guidebook will help schools reduce waste and litter by educating and empowering the entire school in direct environmental action. **Educators can use this guidebook to engage students while teaching the process of how to recognize, investigate, and take action on an environmental issue.**

We wish you luck and success on your way to becoming a Trash Free School! If you have any questions or need additional information, visit our website or contact us at [education@fergusonfoundation.org](mailto:education@fergusonfoundation.org)

## Project Mission

The Trash Free Schools Project mission is to create a sustainable, environmentally aware school culture through waste reduction and education.

With detailed guidance, resources, and incentives the Trash Free Schools Project aims to:

- Promote a sustainable and environmentally-aware school culture
- Provide educators with resources to engage students while teaching the process of how to recognize, investigate, and take action on an environmental issue
- Integrate environmentally responsible waste management into school curricula
- Encourage student participation and leadership
- Develop a waste reduction plan that involves the entire school body
- Implement successful litter prevention campaigns
- Investigate and implement green purchasing programs
- Educate and inform on issues of marine debris

### Trash Free School, what does that mean?

Trash Free does not necessarily mean that no trash is produced. Being a Trash Free School means that you are actively working towards reducing school waste in a long-lasting, sustainable manner and have signed the Pledge (p. 8).

## What is the problem?

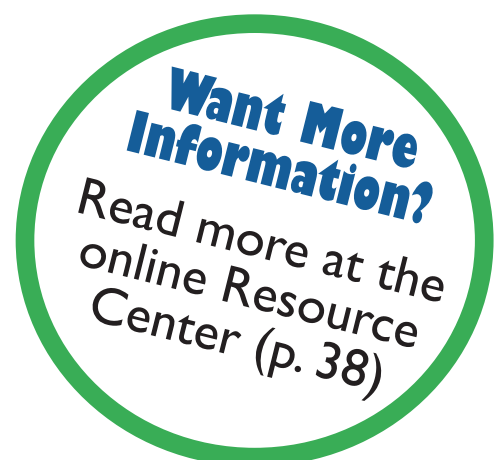
**When we throw something away, “where is away?”** All of our waste goes somewhere. It may become trash, which is typically transported to landfills and incinerators, or litter that pollutes our land and water. Our society is highly consumptive and almost all of what we consume becomes waste. We lose resources and waste energy by transporting trash to landfills, where it has no chance of returning to the manufacturing cycle. Our waste management system requires millions of dollars to maintain, allocating funds away from essential public services. This inefficient system is an example of a negative human impact on the environment that is exacerbated with the ever-increasing amounts of waste we produce.

**When we don’t care about or take control of our trash, it can become litter.** As a behavior, littering affects how people regard their neighborhood and the environment. It also affects the health of our communities by damaging waterways that living organisms (including us!) need to survive. Nobody likes trash in their own backyard, but if this problem continues to grow we may have no choice but to live with our waste. Trash can be overwhelming, but it is also one environmental issue in which **everybody** can be engaged.

The impacts of marine debris include habitat damage, wildlife entanglement, and ingestion of debris mistaken as food. Marine debris can scour, break, smother, and otherwise damage important marine habitats, such as coral reefs. One of the most notable types of impacts from marine debris is wildlife entanglement. Stray nets, ropes, line, or other fishing gear, rubber bands, balloon string, six-pack rings, and a variety of marine debris can wrap around marine life. Animals, such as sea turtles, seabirds, and marine mammals have been found to ingest marine debris, mistaken for food and ingested. An animal’s natural food (e.g. fish eggs) may be attached to the debris as well.



Kensington at Knowles, Photo by Beth Mullen of FORCE, 2009





## Why should we care?

**The solution to the regional trash problem begins with individual responsibility.**

Schools are a unique combination of future leaders and passionate teachers and staff who have a mission to educate and impact the lives of students. The potential for the power of positive impacts on the well-being of communities, citizens, and their families is tremendous. Showing that your school cares about your watershed sets an example for others, who in turn educate and influence more individuals, about how with each action you can make your watershed a better place to live.



Turtle entangled in net, [marinedebris.noaa.gov](http://marinedebris.noaa.gov)



Albatross with ingested plastic, [marinedebris.noaa.gov](http://marinedebris.noaa.gov)

## How can our school help?

**Become a Trash Free School and show that your school cares about the community and the environment.**

The Trash Free Schools Project will give your school ideas, incentives, guidance, and structure to reduce your trash footprint on your watershed. A school enters into a partnership with the Alice Ferguson Foundation by pledging to reduce their impact on the environment and their watershed. A Trash Free School takes steps to decrease waste by reducing, reusing, recycling, and educating employees, students, and others.

Through the Trash Free Schools Project, your school can make a big difference in your community and help create a future with informed and active citizens!



Students at Kimball Elementary collecting recyclables

## How does our school benefit from becoming a Trash Free School?

- Foster an active and environmentally-aware school culture
- Integrate waste reduction and environmental issues into curriculum
- Teach students how their daily actions can positively impact the environment by modeling good environmental practices at school
- Provide great service learning opportunities
- Be recognized as an environmental leader among schools
- Increase community support and resources
- Increase participation and engagement among the school body
- Develop a framework and action items that can also be used for other certification programs (Maryland Green Schools, etc.)
- Cost savings through waste reduction
- Advance booking at Alice Ferguson Foundation's Hard Bargain Farm Environmental Center
- Participate in Alice Ferguson Foundation's Teacher Trainings and workshops

## How can our school become a Trash Free School?

It's easy; just follow the eight steps listed in this Guidebook! View the Trash Free School Project's Eight Steps table (p. 6) provides an overview of the Trash Free Schools Project and documentation for each step. Next, learn each of the Trash Free Schools Project's eight steps and view the resources available to help you along the way. This guidebook will get you started; additional details, resources, and documentation forms are available at [fergusonfoundation.org](http://fergusonfoundation.org).



### Helpful Tips

- Documentation listed in the Trash Free Schools Project's Eight Steps table (p. 6) may also help your school apply for grants and other certification programs, such as Green Schools. Find out more about these programs at the Resource Center (p. 38)
- Review the Report Card (p. 37) to get a better sense of how you will be graded and what you will need to provide

# The Trash Free Schools Project's Eight Steps

Step	Action	Important Points to Remember	Documentation
1.	<b>Sign the Trash Free School Pledge and Learn</b>	Principal and Green Team Leader must sign Recommended to have entire school sign and put it on display	<input type="checkbox"/> Copy of signed Trash Free School Pledge
2.	<b>Form a Green Team</b>	Must have representation of: Teachers                      Students Administration              Parents Janitorial/Cafeteria	<input type="checkbox"/> Completed Green Team Member List
3.	<b>Complete a Baseline Assessment</b>	Try to have as much participation from your Green Team as possible	<input type="checkbox"/> Completed Baseline Assessment
	<b>Create an Action Plan</b>	Make SMART goals: <b>S</b> pecific <b>M</b> easurable <b>A</b> ttainable <b>R</b> ecordable <b>T</b> imely	<input type="checkbox"/> Trash Free School Action Plan with future goals indicated
4.	<b>Choose a Tracking or Monitoring System</b>	Who will be responsible and how? Make sure the system makes sense for the action plan goals you develop	<input type="checkbox"/> Description* of method; may also include tracking data sheets, photos
5.	<b>Organize a Kickoff Event</b>	Make it fun and creative! Involve the whole school Can be combined with other events	<input type="checkbox"/> Description* of event; may include newsletter, flyers, photos <input type="checkbox"/> Submit Renewal Form online (not applicable to new schools)
6.	<b>Take Action</b> Educate and Inform Litter Prevention Campaign Rethink, Reduce, Reuse, Recycle	Review your action plan Start small Track and monitor Keep clear communication Connect with other Trash Free Schools and your community for support	<input type="checkbox"/> Green Team Meeting Notes <input type="checkbox"/> Description* of actions; may include posters, data sheets, flyers, photos <input type="checkbox"/> Action Plan with details on completed items
7.	<b>Celebrate</b>	Make it fun and creative! Involve the whole school or other events Include a reflection or evaluation piece	<input type="checkbox"/> Description* of event; may include flyers, photos, reflection details
8.	<b>End-of-year Evaluation</b>	Submit and review report card Review Action Plan Begin choosing actions for next year	<input type="checkbox"/> Completed Report Card (submit online)

**Steps 1-4: Complete in 1<sup>st</sup> year**    **Steps 5-8: Complete every year**    \* See Report Card for description details



## Step 1: Sign the Trash Free Schools or Classroom Pledge

**What:** The Trash Free Schools Pledge (p. 8) documents administrative approval and pledges your school's commitment to work to become a Trash Free School.\*

**Why:** Administrative support is critical for your school to make changes and motivate others to be part of the effort. Submitting a signed copy of the Pledge to the Alice Ferguson Foundation informs us of your intention to become a Trash Free School. You will then be given access to the Trash Free Schools Project online Resource Center (p.38).



The Green Team Leader at Kimball Elementary signs the Trash Free Schools Pledge.

**Who:** The Principal, classroom teacher for Trash Free Classroom (TFC), and Green Team Leader must sign the Trash Free Schools Pledge and the teacher and Green Team Leader must sign the Trash Free Schools Classroom Pledge. To raise awareness and get everyone on board consider having all staff members at your school sign the Pledge. You could also have your entire school sign the Pledge and put it on display, which is a great way to raise awareness and get everyone involved.

**When:** The sooner the better! The Pledge must be signed and submitted by the end of the first year and before the Report Card.\* If your school's principal changes, the new principal must sign the Pledge as well.

We encourage schools to try and become Trash Free Schools after one year of TFC.

### Environmental Policy or Mission Statement

Developing an environmental policy or mission statement during this step is a great way to make administration support official and **earns you bonus points on your Report Card!**

A good Environmental Policy Statement includes commitments to:

- Specify environmental impacts that are important to your school
- Comply with all environmental regulations
- Prevent litter and reduce environmental impacts wherever possible
- Educate students on key environmental issues
- Train faculty and staff on environmental issues and responsibilities
- Emphasize efficiency and cost savings
- Communicate your efforts internally and externally
- Continually improve over time

*\*Find the Trash Free Schools Pledge (p. 8) and Report Card (p. 37) in this Guidebook.*

# The Trash Free Schools Pledge

We recognize the importance of our watershed to the region. These waters provide vital environmental, cultural, economic, and social benefits to our quality of life. These benefits, however, are severely impaired by the many forms of trash and litter.

We agree that trash and litter in our watershed:

- Is a significant source of pollution
- Severely degrades the visual landscape of our school grounds, as well as property values of nearby homes and businesses
- Severely degrades the quality of life for the residents of the watershed
- Is a major expense for taxpayers and for our local, state, and federal governments
- Is a preventable form of pollution through greater responsibility and stewardship
- Is a major cause of wildlife entanglement and ingestion in the form of marine debris

We are committed to protecting our watershed through a combination of waste reduction techniques that include recycling, composting, litter prevention, cleanups, education, and green procurement activities. By accepting this challenge, we pledge to put our best effort towards vastly reducing waste and encouraging others to do the same.

As a school, we pledge to do the following:

1. Have the support of our principal/administrator to become a Trash Free School.
2. Organize a Green Team consisting of staff and students, led by a Trash Free Schools Team Leader, who embody environmental dedication with the purpose of promoting the goals of the Trash Free School Program and other environmentally sustainable policies that our school chooses to implement.
3. Begin to conduct a waste assessment within ninety (90) days of signing this pledge.
4. Establish a waste reduction program based on the findings of the waste assessment.
5. Create a litter prevention program.
6. Develop a comprehensive recycling program.
7. Integrate environmentally-responsible waste management into the classroom curriculum.
8. Educate students, teachers, staff, and the community of our efforts and successes.
9. Regularly monitor and track our trash amounts to record progress.
10. Communicate with a Trash Free Schools organizer for an annual check-in.
11. Seek and accept technical assistance when needed from the Trash Free Schools program and its partners.

School Name \_\_\_\_\_ Street Address \_\_\_\_\_

Phone number \_\_\_\_\_ City, State, Zip \_\_\_\_\_

\_\_\_\_\_  
Green Team Leader's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Principal's Signature

\_\_\_\_\_  
Date

*\*Submit your signed Pledge to the Alice Ferguson Foundation.*

**Scan and Email to:** [TrashFreeSchools@fergusonfoundation.org](mailto:TrashFreeSchools@fergusonfoundation.org)

**Fax:** 301-292-1070

**Mail:** 2001 Bryan Point Road, Accokeek, MD 20607

# The Trash Free Classroom Pledge

We recognize the importance of our watershed to the region. These waters provide vital environmental, cultural, economic, and social benefits to our quality of life. These benefits, however, are severely impaired by the many forms of trash and litter.



We agree that trash and litter in our watershed:

- ❖ Is a significant source of pollution;
- ❖ Severely degrades the visual landscape of our school grounds, as well as property values of nearby homes and businesses;
- ❖ Severely degrades the quality of life for the residents of the watershed;
- ❖ Is a major expense for taxpayers and for our local, state, and federal governments; and
- ❖ Is a preventable pollution through greater responsibility and stewardship.
- ❖ Wildlife entanglement and ingestion is an impact of marine debris.

We are committed to protecting our watershed through a combination of waste reduction techniques that include recycling, composting, litter prevention, cleanups, education, and green procurement activities. By accepting this challenge, we pledge to put our best effort towards vastly reducing waste and encouraging others to do the same.

As a classroom, we pledge to do the following:

1. Have the support of our teacher/administrator to become a Trash Free Classroom.
2. Organize a Green Team consisting of staff and students, led by a Trash Free Classroom Team Leader, who embody environmental dedication with the purpose of promoting the goals of the Trash Free Classroom Program and other environmentally sustainable policies that our school chooses to implement.
3. Begin to conduct a waste assessment within ninety (90) days of signing this pledge.
4. Establish a waste reduction program based on the findings of the waste assessment.
5. Create a litter prevention program.
6. Develop a comprehensive recycling program.
7. Integrate environmentally responsible waste management into the classroom curriculum.
8. Educate students, teachers, staff, and the community of our efforts and successes.
9. Regularly monitor and track our trash amounts to record progress.
10. Communicate with a Trash Free Classroom organizer for an annual check-in.
11. Seek and accept technical assistance when needed from the Trash Free Classroom program and its partners.

School Name \_\_\_\_\_ Street Address \_\_\_\_\_

Phone number \_\_\_\_\_ City, State, Zip \_\_\_\_\_

\_\_\_\_\_  
Green Team Leader's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Teacher's Signature

\_\_\_\_\_  
Date

*\*Submit your signed Pledge to the Alice Ferguson Foundation.*

**Scan and Email to:** [TrashFreeSchools@fergusonfoundation.org](mailto:TrashFreeSchools@fergusonfoundation.org)

**Fax:** 301-292-1070

**Mail:** 2001 Bryan Point Road, Accokeek, MD 20607

## Step 2: Form a Green Team

**What:** The Green Team will be responsible for activities such as:

- Encouraging participation
- Completing the Baseline Assessment
- Creating an Action Plan
- Organizing events and activities
- Tracking progress of the Project
- Evaluating the Project regularly and providing feedback
- Providing frequent updates to others about the Project
- Educating participants

**Why:** One person cannot do it all. The Green Team is the core of the Trash Free Schools Project and organizes, plans, and carries out many of the actions to reduce waste at your school. To ensure the success of your waste reduction efforts, be sure to include representatives from a variety of groups at your school.

**Who:** Your Green Team should consist of at least one teacher, student, administrative staff, parent, and custodial and/or cafeteria staff. You must also appoint a Green Team Leader.

### Team Roles

#### Green Team Leader

- Organizes and recruits Green Team
- Serves as the main contact for the school's efforts
- Helps facilitate scheduling of events, activities, meetings
- Documents Green Team's efforts

#### Teachers

- Incorporate Environmentally Responsible Waste Management into curriculum
- Encourage student involvement and set example for others to follow
- Oversee waste reduction activities
- Facilitate implementation and execution of the Project, yet allow students to drive the actions involved in the Project

#### Students

- Lead waste reduction efforts and motivate peers to change their behaviors
- Promote the Project and recruit help
- Provide reports and announcements on the Project
- Assist with waste monitoring

#### Administrator, Principal, and Staff

- Convey message to school board and provide support for program
- Plan and actively participate in the program with students, teachers, parents, staff
- Implement changes
- Connect to outside staff and administration for support

**Want More  
Information?**

Read more at the  
online Resource  
Center (p. 38)



## Step 3: Complete a Baseline Assessment

**What:** The Baseline Assessment involves investigating the current state of waste at your school.

**Why:** Better understand the current state of your school's waste system to identify and prioritize actions to improve its waste disposal culture.

**How:** The Trash Free Schools Baseline Assessment worksheet is available on the Trash Free Schools Resource Center (p. 38)

### A good baseline assessment includes:

- 1. Types and amount of waste produced:** Understand the scale and scope of your school's waste by studying it. Begin by tracking your waste (p. 13) and looking at the contents of your trash, recycling, hazardous waste, etc.
  - Begin Tracking your waste (p. 13).
  - Consider doing a Trash Audit with your students (see below).
- 2. Infrastructure:** Locations, labels, signs, and service frequency of bins and dumpsters.
  - Did you know the location of bins and dumpsters can greatly affect recycling rates?
- 3. Information:** Where to look and who to ask about waste services, custodial efforts, cafeteria decisions, etc.
- 4. Connections beyond the school:** Your school's waste impacts the broader world. Do you know where your waste and litter ends up?
- 5. Current and Past efforts:** Recognize the strengths and weaknesses of your current programs to reduce waste and litter and review what you learned from past efforts

### The Trash Audit

**What if we want to measure our trash?** Excellent! A trash audit is a great way to quantify your school's trash and can be connected to in-class lessons.

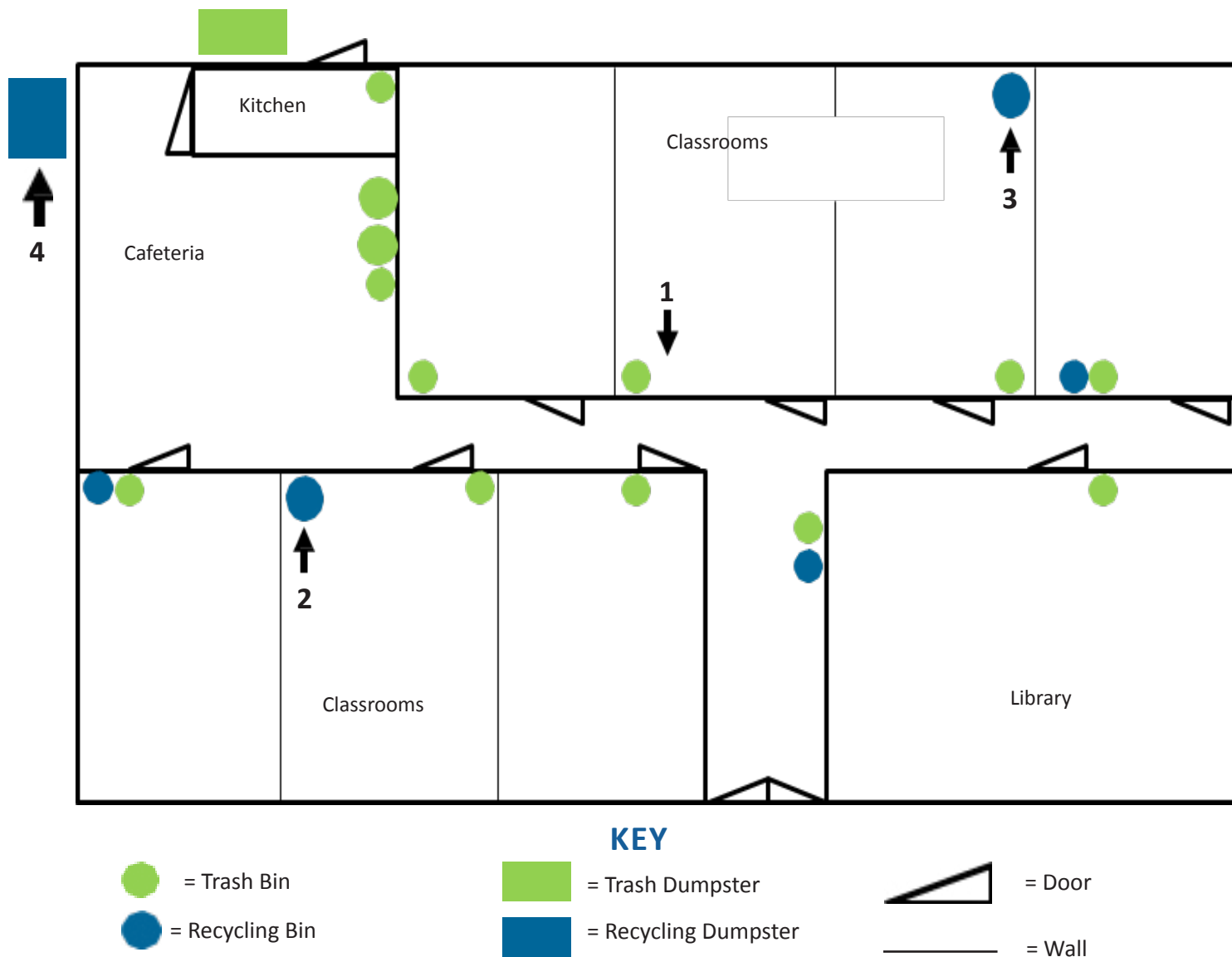
Completing a Trash Audit involves sorting and recording a portion of your school's waste. By investigating the contents of your garbage, you will learn about your school's trash habits. Visit the Resource Center (p. 38) to discover trash audit guides and curriculum.



Sorted trash from a trash audit.

**Example School Map.** Doing an inventory of your infrastructure and mapping it can help you identify ways to improve recycling in your school. In the example school map below, it is easier to notice issues, such as recycling bins missing from classrooms (1), located away from trash cans (2), or in areas where they cannot easily be collected (3). Also, the trash and recycling dumpsters are separated (4), so custodians must walk around the corner to dispose of recycling. When the weather is bad, they may be tempted to put recyclables in the trash.

By collocating collection bins and dumpsters and working with custodians, you can arrange your infrastructure in a way that makes recycling easy for students and staff. Can you spot other ways this school can improve its infrastructure?



### Points to Remember

- **Be resourceful:** Find people that know each area of the school best and involve different members of the Green Team.
- **Try to be as detailed and specific as possible.**
- **Keep a copy of your Baseline Assessment:** Revisit it in the future to see how you have improved.
- **Keep your eyes open:** The Baseline Assessment may not cover everything at your school, so look for additional factors that may affect waste production.

## Step 3: Choose a Tracking System

**What:** A tracking system allows you to look at how much waste your school generates over time. It can be detailed or general.

**Why:** Tracking waste is required because it:

- helps measure change and evaluate the actions of your Green Team,
- is a good indicator of the effectiveness of your Action Plan, and
- can provide insight into your school's waste system.

**When:** It is recommended that you monitor waste at least twice a year to measure changes, although more regularly is preferred. Ensure that tracking is spread out throughout the year to be consistent, such as once every other month or once during fall and spring semesters.

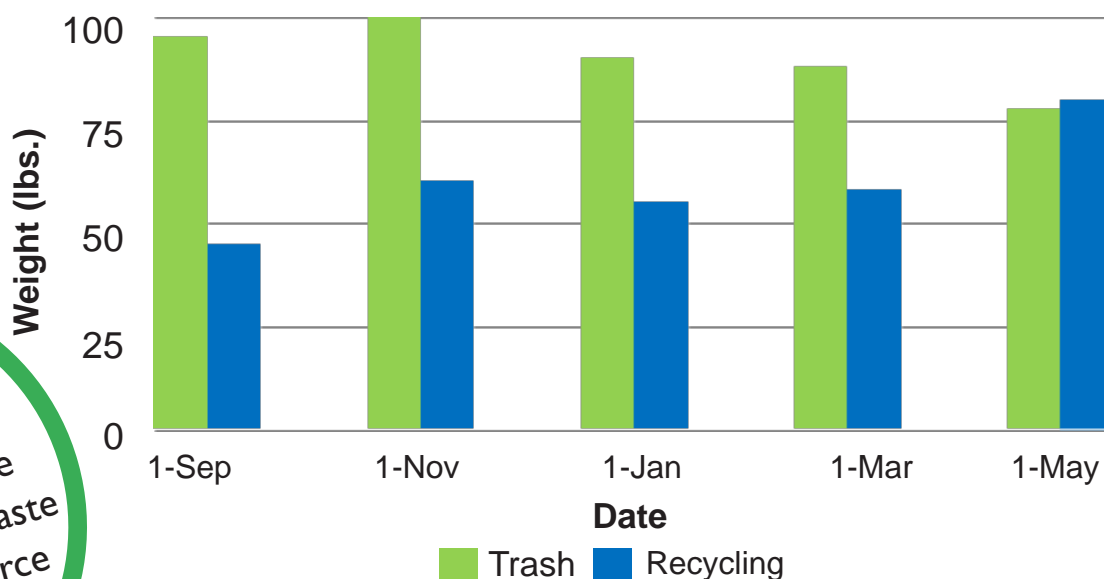
**How:** Use our recommended tracking method; create your own system, or use one you already have in place. However you choose to track, make sure your methods are consistent and comparable over time.\*

**Recommended Method:** To start out, we recommend you use our tracking sheet, which has figures of receptacles to estimate fullness of dumpsters and track litter. It does not go into detail about specific waste, nor does it look at specific waste streams, but it is easy and quick to complete. You can use this method in combination with a waste audit to get a better sense of what kinds of items are being thrown away and recycled. Find our tracking form in the Resources Section (p. 39-40).



Using a fish scale to weigh trash from a Trash Free Lunch at Hard Bargain Farm Environmental Center

**Trash and Recycling Weights  
Throughout the Year**



**Get Started**

Access the full tracking sheet and explore other ways to track waste at the online Resource Center (p. 38)

\*Find an abbreviated version of the tracking sheet in the Resource Section (p. 39-40) or download the entire version from the online Resource Center (p. 38).

## Step 4: Create an Action Plan

**What and Why:** The Action Plan will organize your Green Team and school for the actions you will take to reduce waste. It can be used to educate others about your Project and help students involved understand the importance of goal-setting.\*

**How:** Your Action Plan should be based on your Baseline Assessment findings and should include setting goals and identifying the actions needed to achieve them. Visit Step 6 (p. 17) for ideas and make sure to set SMART goals:

**Specific**  
**Measurable**  
**Attainable**  
**Relevant**  
**Timely**

**Specific:** Avoid goals that are too general, instead specify goals you will work toward.

- What will we accomplish?
- Why will we accomplish this?
- Who will be involved?
- Where will this take place?

**Measurable:** Having measurable goals helps your team stay on track and feel satisfaction in completion.

Ask questions like:

- How much?
- How many?
- When will it be accomplished?

**Attainable:** Focus on creating goals that are achievable. Avoid goals that are either too easy and require little effort to achieve, or too extreme that they would not be possible. Once you look at possible action items more closely, you will be able to realistically define the steps and requirements to fulfill that action. This, plus good judgment from your Green Team, will help define what is attainable.

**Relevant:** Is this action item important and interesting to you and your Green Team? Is it worth pursuing?

**Timely:** This will help give structure to your goal and set start and end times. Depending on your goal, your timeline will vary. Some Action Plans will contain goals that are extensive and long-term, whereas other Action Plans may contain numerous short-term goals.

**Involve your students  
in the Action Plan!**



*\*More details and ideas for action items and goals can be found in Step 6, "Take Action" (p. 17).*



## Encourage Community Partnerships

Partnerships create a network of support between your school and the outside community. Partnerships can help enhance your educational and waste diversion resources and efforts. They can also aid in forming connections for students between their school and the outside world. Partners want to see your school succeed and care about the future of the students, their role in the community, as well as the future of their watershed.\*

### Who should we partner with?

Your school is most likely already connected to a wide variety of businesses and organizations that may be interested in supporting your Trash Free Schools Action Plan. Reach out to parents, alumni, and others to identify potential partners for your school. Consider posting your Action Plan on your school's website or publishing it in the school newsletter. Find additional organizations at the online Resource Center ([p. 38](#)).

**Find a List  
of Organizations!**

at the online  
Resource Center  
(p.38)

## Grants and Funding

Many actions in the Guidebook can be completed for little to no cost. Thinking resourcefully and creatively can help cut spending, yet when big projects need a boost of funding grants and other fundraising activities can help your cause. Visit the online Resource Center for a list of grant and fundraising opportunities ([p. 38](#)).

## Fundraising Ideas

- Organize a litter cleanup where students find sponsors to donate money (per bag of litter or set donation). Find more information about School Yard Cleanups and an example schedule at the online Resource Center ([p.38](#)).
- Organize a school-wide rummage sale of donated old books, clothing, toys, gear, games, etc. Donate the profits to the school or use it to implement your Action Plan.
- Hold a Walk-A-Thon, where sponsors donate per mile walked or a set amount.
- Make and sell trash free lunch kits.
- Review the Take Action links at the online Resource Center for fundraising opportunities related to recyclables, including ink cartridge, paper, and electronics collections.
- Contact local businesses and organizations about forming partnerships and donations.

## Step 5: Organize a Kickoff Event

**What:** A Kickoff Event marks the beginning of your Trash Free Schools Project. Think of it as a Grand Opening of becoming Trash Free; it sets a big impression of what your program will be like.

**Why:** The Kickoff Event ensures that everyone is familiar with the Project, generates excitement for the initiatives you plan to implement, and should:

- Inform students, faculty, staff
- Introduce your Green Team
- Set expectations
- Motivate, energize, empower
- Solicit and address suggestions, concerns, and ideas
- Create momentum

**When:** Ideally, near the beginning of a term or school year when people are refreshed and energized, or plan it around other events, such as Earth Day or Arbor Day. It would not be a good idea to have a Kickoff Event scheduled right before summer break.

**How:** There are three general phases to a Kickoff Event: organization, developing content, and execution.

**1. Organization** This phase should include all of the planning, logistics, roles and responsibilities.

**2. Developing Content** Not everybody will require learning about the same material. Make sure everybody gets the same big picture message, but break down content to adapt to the different needs of your audiences. Fun activities such as competitions, games, or plays are great ways to present content creatively.

**3. Execution** This is where content and organization come together. Create a post-Kickoff summary for classrooms and hold an informal event assessment with your Green Team to measure the success. Also, review and clearly communicate the next steps for your Project's Action Plan with your school.



Montgomery County Division of Solid Waste Services 2010 Recycling Poster Contest. Debbie Huynh, Albert Einstein High School, First Place, Ninth-Twelfth Grade Category, May 27, 2010.

### Tips for your Kickoff Event

- Make the event completely trash free
- Have a week-long event such as classroom waste reduction competition
- A recycled art competition
- Throw a fundraiser: collect e-waste or packaging or have students sell Trash Free Lunch kits. See the Resource Center for ideas ([p. 38](#))
- Use the Student Survey found at the Resource Center ([p. 38](#)) to get students thinking about waste reduction, collect information on their attitudes and behaviors, and start a discussion

## Step 6: Take Action

### There are many things you can do at your school to reduce waste.

This section outlines the major components of a good Action Plan and provides suggestions for what you can do, but be creative to find solutions appropriate for your school. Start small and build up to more difficult projects as the momentum and buy-in for your Trash Free Schools Project grows. [Step 7 continues on page 34.](#)



Fort Foote Elementary School students collected litter at the Potomac Watershed Cleanup in 2010.

### Three Major Elements for a Comprehensive Action Plan

The next set of pages contains ideas and tips for how to implement each of these elements at your school. The more you implement, the more points you will receive on your Report Card. Visit the online Resource Center ([p. 38](#)) for additional ideas and resources to help put them in action.

#### 1. Educate and Inform

- Students..... p. 18
- Teachers and Staff ..... p. 19

#### 2. Organize a Litter Prevention Campaign ..... p. 20

#### 3. Rethink, Reduce, Reuse and Recycle Separated into two main sections

- Rethink, Reduce and Reuse:\*
- In Classrooms ..... p. 21
- In Cafeterias ..... p. 22
- Trash Free Lunch ..... p. 23
- Reduce Food Waste ..... p. 24
- Styrofoam lunch tray Alternatives ..... p. 25
- Composting ..... p. 26
- In Facilities and Offices ..... p. 27
- Green Purchasing ..... p. 28
- Recycle: ..... p. 30

\***NOTE:** Rethink, Reduce, and Reuse action items receive more points on the Report Card than Recycle action items.

### Rethink?

Rethink means to stop and think about alternatives with less trash.

- Avoid disposable items that create trash. Choose reusable and recyclable items
- Say no to items you do not need or will not use
  - At a store, say no to a bag when you buy one item.
  - At a restaurant, say no to extra napkins or condiments that you will not use.

# Step 6: Take Action

## Educate and Inform Students

### Outside the Classroom

#### Why:

- Make learning fun!
- Students make connections between in-class materials and the real world
- Inspire students to go further, learn more, and get involved
- Excellent way for students to receive service learning hours

#### How:

- Go on a field study trip! In the Potomac River Watershed, [Hard Bargain Farm Environmental Center](#) (preK-8th grade) and [Bridging the Watershed](#) (6-12th grade) offer many opportunities. Visit the Resource Center ([p.38](#)) to find one near you
- Accept the Trash Free Lunch Challenge
- Form an environmentally-focused club
- Celebrate Earth Day, Week, Month
- Organize a field trip to your local landfill, recycling facility, or wastewater treatment plant
- Have students organize special collections. Find out how at the Resource Center ([p. 38](#))
- Educate people about waste through letters, newspapers, and announcements
- Have students organize a trash audit
- Plan a fun assembly that highlights why and how people can help with the Trash Free Schools Project
- Make a sporting event or extracurricular activity trash free
- Organize a Schoolyard Cleanup\*
- Organize A Take Home Challenge\*

### In the Classroom

#### Why:

- Fulfill environmental literacy requirements by integrating and investigating Environmentally Responsible Waste Management
- Help students make connections about how their daily actions impact the environment and what choices they make
- Form connections between topics and allow students to understand the full scope of the problem and its solution
- Modeling responsible environmental practices in the classroom is an excellent way to integrate practices into students' lives

#### How:

- Use activities and lesson plans found on the Alice Ferguson Foundation website
- Create a Trash-themed bulletin board
- Survey students about their attitudes on trash and litter and then ask students to discuss their answers. Repeat after conducting waste reduction and see if their attitudes have changed. Find the survey in the Resource Center ([p.38](#))



### \*Earn Bonus Points on your Report Card!

**Schoolyard Cleanup:** Clean up litter on or near your school grounds. This activity can be led by teachers or students.

**Take Home Challenge: Solid Waste Reduction:** This activity challenges students to apply solid waste reduction measures at home. Take-home challenges have been shown to increase participation, long-term commitment to waste reduction, and get parents and families involved and thinking more about trash.



## Step 6: Take Action

### Educate and Inform Faculty and Staff

**What:** Part of your Project must include plans to introduce the Project to your entire faculty and staff. **This is a required item on the Report Card (p.37).**

**Why:** Faculty and staff participation are essential to the success of your Trash Free Schools Project.

**Who:** Teachers must know details of the Project so they can set an example to help educate students. Staff, including janitorial and food services, must be included and informed because they have a large part in the correct disposal and general waste management operations in your school.



Teachers peer at macro-invertebrates during teacher training with Hard Bargain Farm Environmental Center, summer 2012

**When:** The sooner, the better. This step may coincide with the Kickoff Event or may occur earlier. You may decide to first inform staff about the Project in general and then discuss it further after the Baseline Assessment and Action Plan have been developed.

#### How:

- Outline the reasons for participating in the program as well as the intended outcomes and action points at the next faculty meeting or via a school-wide memo or email. Share your Action Plan with staff members and let them know how to participate in the Project
- Give teachers and staff the opportunity to comment on the Trash Free Schools Project and your Action Plan.
- Make sure teachers understand how simple environmentally responsible waste management can be.
- Explain the Project's beneficial impacts to both your school's culture as well as to the environment.
- Participate in environmental education training opportunities and other professional development programs.

### Professional Development for Teachers

The Alice Ferguson Foundation holds workshops and professional development throughout the year for educators within the Potomac River Watershed. Workshops increase content knowledge, cover multiple topics, and provide teachers with curricula to use with their students. For more information visit our website: <http://fergusonfoundation.org/for-teachers>.

For professional development opportunities, including those outside the Potomac River Watershed, visit the Resource Center (p. 38).

## Step 6: Take Action

### Organize a Litter Prevention Campaign

**What:** A litter prevention campaign is an awareness and action based campaign focused on education and mitigating littering on school grounds and in the community.

**Why:** Piece by piece litter adds up making the places we go everyday unsafe and unhealthy. By working to change littering behavior, you will be fostering a culture of environmental stewardship and protecting your community and local watershed from the harmful effects of litter.

**Where:** The campaign should be an ongoing effort that is extended school-wide. Encourage students to spread their message beyond school grounds and further into the community, showing that people care about this issue and recognize the problem.

#### How:

1. Form a committee
2. Research and gather information to educate your school. Learn about your school's littering habits and target them. Is there often trash around the schoolyard? Have you witnessed people litter around your school?
3. Develop a catchy slogan or message to grab people's attention and make them care about the issue.
4. Present information so that people can relate to it. Campaigns that involve people in an event or activity can be more successful in making people care about litter.



Web Banner from the Trash Free Potomac Watershed Initiative's Litter Prevention Campaign.



#### Ideas and Activities

- Host a Schoolyard Cleanup to remove litter on your school grounds or in your local community. Detailed instructions and lesson plan on schoolyard cleanups are available at the Resource Center (p. 38)
- Participate in the Trash Free Potomac Watershed Initiative. Visit [TrashFreePotomac.org](http://TrashFreePotomac.org) to learn how you can get involved.
- Organize a Litter Patrol team for your school grounds.
- Hold a contest including videos, posters, songs, slogans, or trash can or decoration.

### Trash Free Potomac Watershed Initiative's Litter Prevention Campaign Materials Available Online!

The Litter Prevention Campaign Toolkit contains a variety of resources that can help you set up a fun and effective campaign in your school or community including: poster and jingle contest guidelines, book bag flyer with word scramble, scripts for talking with clubs and sports teams, and letters to send to your local elected officials. A variety of resources are available for free at: [TrashFreePotomac.org](http://TrashFreePotomac.org).

## Step 6: Take Action

### Rethink, Reduce, Reuse in Classrooms

In classrooms, there are many options to rethink, reduce, and reuse creatively. Set a good example for students and teachers by drawing attention to the actions you pursue.

#### Rethink, Reduce, Reuse:

You will find some ideas below. Review this list and come up with your own options, checking the ones you would like to implement in your school.

- Implement a double-sided paper policy
- Discourage print-outs and utilize online or computer-based assignments, activities, newsletters
- Start a reusable water bottle campaign
- Create a reuse station for used durable classroom products (bulletin board materials, binders, storage boxes, hall passes, decorations, fabrics, art supplies, magazines)
- Wash and reuse plastic cups and other disposable items (ex. for parties or art projects)
- Use overheads and PowerPoint presentations instead of making individual student copies
- Have a vermiculture (worm) composting bin.
- Use mini whiteboards or chalkboards for mathematics, writing lessons
- Have competitions on waste reduction between grades or classrooms
- Organize book, clothing, and toy swaps
- Donate books, clothing, and other used items to local charities
- Save transparencies for future use
- Make bins to collect misprints and used paper and reuse them as scratch paper
- Use a cloth or sponge instead of paper for wiping the white/blackboard
- Use dust cloths and towels for cleaning instead of paper towels
- Cut paper towels in half to use less
- Use push-pins instead of staples for hanging items

**What are your ideas?**

**Get Help!**

*Discover ideas, tools,  
and activities at the  
Resource Center  
(p.38)*

#### Tips for Classroom Recycling

- No money for collection bins? Use old cardboard boxes to collect recycled paper. Turn it into an art project by decorating them
- Place recycling bins next to trash bins and post clear signage about where to put items
- No recycling service? Gather volunteer teachers, students, and parents to take recyclables to their local facility or home for curb-side pick up

## Step 6: Take Action

### Rethink, Reduce, Reuse in Cafeterias

Much of the waste produced in schools comes from the cafeteria. Rethinking, reducing and reusing methods can be effective in drastically reducing the waste stream from the cafeteria. Everybody contributes to the trash here so everybody can help reduce it.\*

#### Rethink, Reduce and Reuse

Here are some ideas. Review this list and come up with your own, checking the ones you would like to implement at your school.\*

- Implement an 'Offer Versus Serve' program (p. 24)
- Compost- excellent for teaching science lessons (p. 26)
- Organize a recurring Trash Free Lunch day (p. 23)
- Organize recurring Tray-less Tuesdays
- Switch from polystyrene trays to reusable or compostable trays (p. 25)
- Eliminate single-serving items (individual food wrappers, straws, condiment packets)
- Use bulk dispensers for things like condiments and milk
- Switch to reusable items (utensils, cups, trays)
- Use wax pickups for items instead of paper plates or trays
- Provide dish soap, sponges and rags
- Organize a food waste challenge to see which lunch period or class can produce the least
- Monitor napkin use and change to individual distribution where appropriate
- Start a food-swap table for unopened or clean items such as milk, chips, snacks, and fruit
- Encourage staff to bring their own lunch and use reusable containers
- Donate leftover non-perishable items to shelters or donate food wastes to livestock operations
- For the staff kitchen, organize a dish rack so reusable mugs, utensils, and dishes can be washed and dried

**What are your ideas?**

#### Tips for Cafeteria Recycling

- Ensure recycling containers are next to trash bins
- Clearly label all containers
- Provide a container for excess liquids from bottles to decrease contamination and increase recycling
- Student, parent, or teacher monitors can help others recycle properly
- Make sure cafeteria staff are on board with changes and decisions, and understand their responsibilities



Lunch waste sorting station at Hard Bargain Farm Environmental Center.

*\*Additional ideas can be found at the Resource Center (p. 38).*



# Trash Free Lunch

Throw away less trash, eat healthier, and save money by packing Trash Free Lunches! This is a great habit to cultivate in both students and adults.

## Remember to Rethink, Reduce, Reuse, Recycle!

Do this...



...instead of this



## What is the difference?

**Bag:** choose a reusable, durable bag that doesn't have to be thrown away.

**Drinks:** avoid disposable (or even recyclable) bottles, cans and boxes; choose reusable bottles made of non-BPA plastics or stainless steel. Use a thermos for juice and milk.

**Chips, cookies, yogurt, snacks:** skip the individual packaged items, and buy items in bulk to save money and packaging. Use reusable containers and snack bags.

**Sandwiches:** Keep sandwiches from getting squashed by switching to reusable containers or reuse sandwich bags instead of throwing them away.

**Utensils and napkin:** Choose a cloth napkin and stainless steel utensils

It's easy to pack a Trash Free Lunch and it can help you make healthier choices too!

## Tips and Resources

The Alice Ferguson Foundation has an online interactive Trash Free Lunch activity and lesson plan, called [Take Out the Trash](#) (K-8).

Have classes or lunch periods compete against each other to see which can produce the least amount of lunchtime trash.

Visit the Resource Center ([p. 38](#)) for additional activities and ideas for Trash Free Lunches.

# Reduce Food Waste

## Rethink the Vending Machine

Vending machines can provide revenue for schools, but also provide drinks and food with poor nutritional value and a source of trash and litter. Junk food in vending machines often requires high amounts of processing, packaging, and transport that is more wasteful than foods with less ingredients and simpler packaging, such as fruits and vegetables. There are many campaigns working to improve vending machines contents or eliminate them altogether. Investigate alternatives at your school.

## Farm to School

Farm to School is a network of state programs with a mission to connect local food and farms to school cafeterias. By participating in a program in your state, your school can work to receive healthier, fresher food that requires less waste of natural resources to transport, package, and preserve. Information on school gardens, composting, and other food-related materials are also available on the Resource Center (p. 38)

## Offer Versus Serve

Food waste accounts for approximately 12% of a school's waste stream and is partly due to the way food is distributed. To meet nutritional standards,

many school districts implement a traditional planned program in which a set-portion meal is provided to students. However, many students do not finish all of their meals due to time constraints, appetite, or dislike of the items served. This type of program is wasteful in both trash and actual costs and is why the Offer Versus Serve program is becoming more popular in middle and elementary schools and is required in high schools. Offer Versus Serve programs:

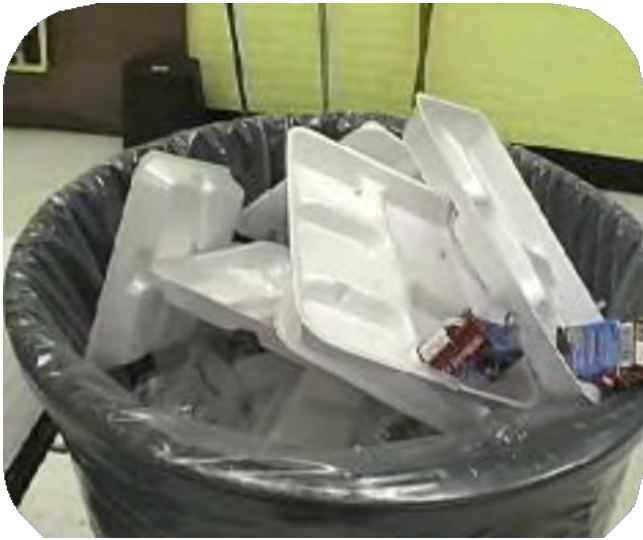
- Generate less packaging and waste
- Meet nutritional standards
- Require a selection from certain food groups
- Are comprised of five items, students choose between 3-5
- Are set at one unit price
- Take less time and less clean up
- Keep meal prices low
- Increase school lunch participation
- Kids learn about eating smart
- Kids can try new foods or eat what they like

## What can you do at your school?



Feeding chickens at Hard Bargain Farm Environmental Center

# Polystyrene and Lunch Tray Alternatives



Polystyrene (also known as Styrofoam) is made of by-products from petroleum and gas, both limited natural resources. Polystyrene does not biodegrade, instead it photo-degrades, meaning sunlight breaks it into smaller and smaller pieces. These pieces never go away, but stay in our environment where they can be mistaken for food and cause harm to wildlife. In landfills sunlight does not reach buried trash, so polystyrene neither bio- nor photo-degrades. While polystyrene is light in weight, its large volume takes up space in landfills and few facilities are able to recycle it. In 2010, the US disposed of over 2 million tons of polystyrene (2010 EPA Municipal Solid Waste Report). Consider an alternative at your school.

## What are some alternatives?

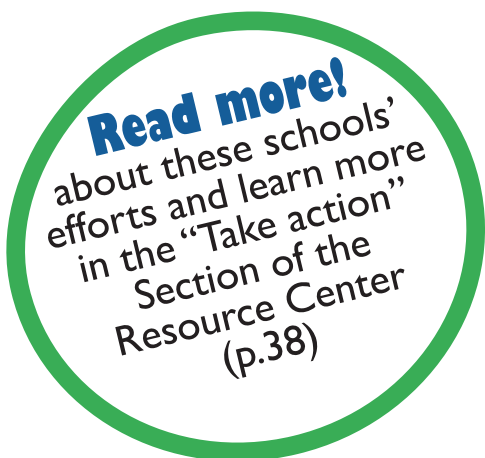
**Reusable, durable trays** will reduce waste from your school and the impact on landfills. This can be cost-effective in the long term for schools that have dishwashers and proper facilities in place.

- The Young Activists Club at Piney Branch Elementary School in Takoma Park, Maryland started a No Styrofoam Campaign to ban polystyrene food service ware from all city schools and switch to reusable trays.

**Compostable materials.** However, it is important that the materials actually get composted. Schools can form partnerships with farms or other organizations that will pick up compostable trays to add to their composting facilities.

**Trayless Tuesdays.** Create a schedule to use paper sacks or plates instead of polystyrene trays each Tuesday. Some recycling programs accept paper products even when soiled.

- New York City schools estimate diverting 3 million trays per month (about 20% of their polystyrene tray use) by switching to Trayless Tuesdays.
- Bonner Springs Elementary School (Bonner Springs, Kansas) estimates saving \$904 per year for their school and \$4,518 per year if the entire school district implements this action.



# Composting

**What:** Composting is a contained and accelerated decomposition process. Decomposition refers to the break down of organic material, via bacteria and other living organisms, to make nutrient-rich material. This material is not 'new' soil; it is dead organic matter called humus.

**Why:** Composting can significantly divert landfill waste. Of the total waste stream, 30% is organic waste and 20% is paper both of which can be composted.

**Where:** Composting can occur inside or outside, on a small or large scale, on-site or off.

**How:** Find compost and vermiculture guides and activities at the Resource Center ([p.38](#)).

## Benefits of Composting

- Significantly divert waste from landfills
- Excellent educational tool
- Revitalize the soil
- Makes excellent fertilizer for gardens and yards
- Helps soil retain water during droughts
- Helps prevent erosion and runoff
- Can prevent plant pathogens
- Reduce emission of pollutants like methane
- Close the waste loop

### Yes

- ✓ Fruit, vegetables
- ✓ Paper products (shredded)
- ✓ Tea, coffee
- ✓ Grass, leaves

### No

- X Meat and dairy
- X Oil-based products
- X Diseased or insect infected plants
- X Coated or printed paper (glossy, waxy, foils, plastics)

## Composting Types

**Composting:** This type is popular for materials like grass clippings and can be kept outside in a pile or a container. For fastest decomposition, it should be aerated and kept at a proper temperature and moisture level.

**Vermicomposting:** This involves feeding worms paper and food scraps. The worms can be kept in a bin inside or outside. It is important to monitor moisture levels and make sure they have enough food scraps. Once your population of worms is established, they convert food into soil faster than composting.

## Busting the Myths of Composting

**Does it stink?** No. If a compost pile has proper ventilation and composition, it does not smell. A healthy compost has an earthy smell. While meat, dairy, and oil-based products are compostable, they stink when they decompose and can attract pests.

**Is it hard to maintain?** No. Composting requires very little labor once the initial set up is complete. Depending on the size of the operation, it typically only needs to be rotated once every few weeks. The only other maintenance needed is adding new material to be decomposed.

**Is there a health risk?** No. Composting does not cause the spread of disease if the correct ingredients are added.

**Does it attract pests?** No. If the system is properly maintained and protected pests should not be a problem. The addition of meat, dairy, and oil-based products can attract pests.

**Is it expensive?** In most cases, no. Small scale composting can be extremely cheap, and even free depending on your creativity.

## Step 6: Take Action

### Rethink, Reduce, Reuse in Facilities and Offices

Here are some suggestions. Review these lists and come up with your own ideas, making a note of which ones you would like to implement at your school by checking their boxes.\*

#### Office Suggestions

- Put incentives in place to use less paper by creating printing and copy dollars that give them the choice to use their budget on paper or towards other things
- Implement a double-sided printing and copying policy
- Turn off automatic function on fax machines
- Create a reuse station for office supplies (folders, notebooks, staplers, etc.)
- Print in black and white, not gray scale or color
- Make bins to collect misprints and other paper that can be reused as draft paper
- Instill 'Young and Only' memo policy (youngest child receives form for all siblings)
- Promote "paper free" or "no print" days during the school year (ideally on a recurring schedule)
- Eliminate junk mail and unwanted newspaper subscriptions
- Modify the layout of your school newsletter to use less paper
- Start a donation cart for clothing
- Share magazine subscriptions with co-workers; ask for used magazines from parents to use in projects

#### Facility-Wide Suggestions

- Make trash bins smaller than recycling bins
- In restrooms, switch to foam soap dispensers (use less water, more efficient)
- In restrooms, install air dryers instead of paper towels
- Reuse packing peanuts
- Replace plastic liners in trash and recycling bins only when soiled
- Keep refuse collection container lids closed and secured to reduce litter
- Create a posting policy, encourage use of billboards (reduce damage to walls, paper)
- Make sure your collection company cleans around the collection area if materials spill out of the containers when the containers are emptied (write this requirement into your service contract)
- Develop a take-back policy for pallets, boxes, and other items from deliveries
- Use mowed grass as mulch

#### What are your ideas?

### Tips for the Office and Facilities

- Use information from the Baseline Assessment to determine placement of trash and recycling bins.
- Ensure waste materials are placed in the correct location by regularly communicating with colleagues.
- Promote waste reduction efforts through signage and staff memos.

Utilize the help of students to consolidate collected materials.

*\*Additional Resources: Recycling (p. 30-32), Green Purchasing (p. 28-29).*



# Green Purchasing

## Earn Bonus Points on your Report Card!

**What:** Green, or environmentally friendly, purchasing involves buying products or services that do not effect human health and the environment to the same extent as other products or services. This can include simply buying “only what you need” or doing bulk purchasing with other schools. Examples of green or environmentally friendly products and services include:

- Those with recycled content
- Bio-based products
- Energy- and water-efficient products
- Renewable energy
- Environmentally preferable products
- Alternatives to hazardous or toxic chemicals
- Alternative-fuel vehicles

**Why:** Green purchasing helps prevent waste before it is generated, reducing overall consumption. It also improves environmental health by reducing toxic or hazardous materials, conserves water and energy, and decreases greenhouse gas emissions, while creating an outlet for collected recycled material.

**How:** Talk to your administration and purchasing office to determine feasibility and to implement a policy. This will take some research into what is currently being purchased, finding alternatives, tracking green purchases and implementing cooperative purchasing.

## Tracking Green Purchasing

Establish a record keeping system to monitor the success of your green purchasing program. Track information by commodity or service to determine how much your Green Purchasing program is costing or saving your school. More guidance on green purchasing may be found in the Resource Center (p. 36).

## Cooperative Purchasing

A cooperative purchasing program is an excellent way for public agencies to save time, money, and resources when purchasing products and contracting for services. Cooperative purchasing is another way to reduce waste and utilize green purchasing.

The U.S. Communities Government Purchasing Alliance is a national structure for agencies to use their collective purchasing power to improve the overall effectiveness of their purchasing processes. The U.S. Communities Program pools the purchasing power of public agencies, achieves bulk volume discounts, competitively bids quality products, and provides a purchasing forum for public agencies nationwide.

### Pre- vs. Post- Consumer Recycled Content

Pre-consumer recyclable material is generated by manufacturers during the production process.

Post-consumer recyclable material is generated by consumers and separated from the waste stream through recycling collection then remanufactured into new products.

Look for products made with the highest possible percentage of post-consumer recycled content.

**Make Your  
Money Count!**  
Get started  
at the  
Resource Center  
(p.38)

## Adopt a Green Purchasing Policy

Guidance and an outline of what defines green purchasing for your school or district is essential. Talk about your interest in developing a policy with your principal, who can discuss the possibilities with the purchasing office.

Lay the groundwork for environmentally friendly purchasing by establishing a buy-recycled policy. Your policy should include some of the following:

- A preference or requirement for products made with (a certain percentage of) recycled content; the more Post-Consumer content the better. Look for the acronym “PCW” for Pre- or Post-consumer recycled waste.
- An environmental purchasing preference, whereby your school is willing to pay a higher price (such as 5-10% more) in order to maximize the recycled content in products.

### Things to Consider:

- What is the impact of the product?
- Is the product certified compostable?
- What kind of packaging is used? How could the packaging be minimized?
- What are the primary raw materials used?
- Is the product’s life appropriate to its task? Is the product durable?
- Are wastes minimized during its life cycle?
- At the end of the product’s life, can the materials and components be reused, recycled or recovered?

## Determine Products That Fit Your School’s Needs

1. Review current purchases to determine recycled products that are already being purchased.
2. Examine products to determine if the maximum percentage of recycled materials (and postconsumer waste) is being requested.
3. Examine product and contract lists to determine where you can substitute or include recycled products in future bids. See below for a list of products often made with recycled content.

### Products Often Made with Recycled Content

- |  |                                |                                   |
|--|--------------------------------|-----------------------------------|
| • Paper  | • Refurbished office equipment | • Carpet                          |
| • Tissue and towel products  | • Compost and mulch            | • Aluminum siding and metal doors |
| • Office supplies (bulletin boards, calendars, folders, trays, pens, pencils, push pins, rulers, scissors) | • Vehicle fleets               | • Building insulation             |
| • Trash can liners   | • Re-refined motor oil         | • Composite lumber                |
| • Trash and recycling containers   | • Antifreeze                   | • Wallboard                       |
| • Toner cartridges   | • Retread tires                |                                   |
|  | • Auto parts                   |                                   |
|  | • Solvents                     |                                   |
|  | • Construction materials       |                                   |

## Step 6: Take Action

### Recycling

**Recycling has many benefits** including protecting the environment, saving energy and natural resources, and reducing solid waste collection and disposal fees. Recycling can occur on many levels, from a basic paper or e-waste collection program to a fully comprehensive recycling program. Most local jurisdictions provide assistance to school districts to set up or improve recycling programs, and some have mandatory recycling requirements for schools.

**The Trash Free Schools Project awards higher scores on the Report Card to rethink, reduce, and reuse actions**, prioritizing them over recycling, because they can help reduce your waste stream considerably. Recycling is an effective tool for diverting waste from landfills and incinerators, but many materials can only be recycled a certain number of times before they become trash. Remember to rethink, reduce, and reuse before you recycle.

### Key Elements to a Successful Recycling Program

**Communication** Speaking with students, teachers, and administrative staff is essential. If they don't know where to put different materials, or do not even know that recycling is being organized, your hard work will not pay off. Buy-in is important as well; if a person doesn't understand why they should recycle, they are less likely to participate.

**Visibility** Make it easy for people to recycle by making recycling bins easy to spot. Investigate where people create trash, where they want to throw it away, and place your bins accordingly. Do not put recycling bins in a separate location from trash; this will make it more difficult for people to recycle, increase contamination rates (inclusion of non-recyclable materials in the recycling bins), and reduce visibility of the recycling bins.

**Easy** Clear labels are extremely important. Use clear images and words, openings that match the type of material that goes in the bin, and short yet descriptive signs.



Members of the Green Team at Kimball Elementary take out the recycling

### Tips to make your recycling efforts successful!

Bins should be in convenient, visible locations and the sorting process should be simple.

Here are some tips:

- Place a recycling container in every classroom
- Place a recycling container in each office and next to photocopy, fax, and printing stations
- Make sure bins are located next to trash containers
- At each bin, post easy-to-read signs that clearly list what can and cannot be recycled
- Regularly empty bins so they do not overflow and become unusable
- Monitor recycling containers for contamination (trash, unrecyclable material) and make a note of it on your tracking forms (p. 12 and 39-40)
- Announce recycling efforts and encourage students to monitor each other

## Know What Can Be Recycled

Recycling varies by jurisdiction; contact your jurisdiction to find out what it accepts. Most schools generate the following recyclable materials:

- Mixed paper: corrugated cardboard, white and colored office paper, newspapers, magazines, catalogs, unwanted mail, shredded paper
- Commingled materials: metal cans, aluminum foil, glass containers, plastic bottles, lids, buckets, and flower pots
- Yard trimmings: mainly grass and brush
- Scrap metal: appliances, metal office furniture such as desks and filing cabinets, pipes, wiring
- Pallets
- Food waste (compostable)
- Plastic packaging or shipping materials
- Automotive motor oil, antifreeze, car batteries
- Electronics and computer equipment

Learn about local recycling rules and specialty item recycling in the “Take Action” section of the Resource Center (p.38).



### Designate Collection Areas for Containers

Work closely with your custodial service provider when setting up a recycling program. Explain that they are handling the same amount of materials, but now they are emptying regular trash and recycling containers. Check with your property manager to identify locations for central collection containers and determine if they will provide recycling bins.

## What does this symbol mean?



The symbol of the three chasing arrows in a triangular format is the international sign for recycling. Items with this symbol are usually recyclable, but ***be aware that not all city or county recycling programs are the same!***

Some jurisdictions collect all types of recyclables but others may not. It is important to check with your local jurisdiction's solid waste division to find out what is collected in your area. Visit the Resource Center's “Take Action” section to learn your local recycling rules (p. 38).

Traditionally, paper and containers made of glass, metal (steel, tin, and aluminum), and plastic are collected.



## What does the number within the recycling symbol mean?

This number is known as a plastic resin code and indicates the type of plastic (or plastic family) used. The families of plastics include:

- Ethylene: PETE (indicated by the #1), HDPE (#2), & LDPE (#4)
- Vinyl: including V and PVC (#3)
- Propylene: PP (#5)
- Styrene: a.k.a. Styrofoam (#6)
- Other: (#7) do not have a traditional plastic family; can include acrylic, nylon, or the new corn plastic (also called PLA or Polylactic Acid).

## Steps for Recycling

### 1. Get permission and support from involved decision-makers

This includes custodial staff, principal, and food services. Make sure that others will support your efforts, and are willing to help.

### 2. Choose what to recycle

It is a good idea to start small and build up. If your school does not currently have any recycling, try starting with one item, such as paper or plastic bottles. After you have established your collection system and taught people how to use it, add more items.

### 3. Decide where items will go to be recycled

The market for recyclables depends on your location, but here are a few suggestions:

- Depending on your support and budget, you may have a contractor come and haul your recycling.
- Communicate with your haulers to confirm that they will participate.
- Investigate the possibility of using the residential curbside collection around your school and have teacher, parent, or student volunteers take recyclables to facilities to be recycled or to their homes for curbside pickup
- Consider a partnership with a local business that has a recycling hauler as they may be available to haul yours as well.
- Talk to your county recycling coordinator for details on services. They may be able to direct you to local haulers and businesses that also collect recycling.

### 4. Collect and store materials

- Choose locations for collection sites that are appropriate for the type of recyclable you are collecting. For example, with paper recycling it is recommended to have a bin in every room, while plastic bottle and can containers could be placed in high traffic areas like the cafeteria or main hallways.
- Choose the kind of container to use. A simple cardboard box is fine for paper, but you will need something bigger and more durable for other items. Consider using old trash cans for recycling bins.
- Choose where to store items before they are hauled. There may be health and safety codes to abide by; coordinate this with your custodians and facilities manager.

### 5. Advertise your program

Make sure people know what is happening! Put up signs and make announcements to explain the importance of recycling. Make sure that collection bins are visible and clearly labeled.

### 6. Track\*

Be sure to monitor bins for contamination (of non-recyclable materials) and keep track of how much you are recycling (p. 12). Tracking forms for our recommended method can be found at the online Resource Center (p. 38) and a shorted version is included in this Guidebook (p. 39-40). Keeping monitoring records can be helpful for future endeavors, including grant money or environmental certification programs. Find these opportunities at the Resource Center (p. 38).

*\*Additional information Tracking waste can be found in step 3 (p. 13).*





## Adopt a Litter Can

Take Control at your school by adopting a litter-can for your school and community! Engage the whole school by having a friendly art competition. Litter-cans can be personalized by having students create their own designs and paint the barrels.



The Alice Ferguson Foundation continues to offer Best Management Practices to address litter in our communities and schools. Through partnership with Sam's Carwash, they have donated soap barrels that are transformed into community litter cans. Litter cans are free for any partners who wish to adopt them, and take ownership of properly disposing of its content.

## Step 7: Celebrate!

**What:** A celebration event is mandatory for the Trash Free Schools Project. It should be a fun event that celebrates the accomplishments of your school.

**Why:** Celebration events are important because they provide conclusion, reflection and recognition.

**Where:** The event could be held during school in the gymnasium or cafeteria, or could be individual classroom-based events.

**When:** Celebration events can coincide with the anniversary of signing the Trash Free Schools Pledge and commitment to become trash free, or they can be organized to match up with the end of the semester or school year.

### How:

- Set a date (or week!) for the event, and let everyone know it is happening
- Make announcements over the loudspeakers, in newsletters, on bulletin boards
- Inform parents and invite them to attend or volunteer
- Meet with your Green Team to develop committees and organize the activities of the event
- Decide whether it will be an assembly-type event or class-based
- Ensure that some sort of recorded reflection is established for your Green Team to evaluate and utilize to plan for the future

### Goals for Your Event

- Recognize the accomplishments of your school
- Gain input
- Invite the entire school body
- Reach out to parents and the local community
- Be trash free!
- Set the tone for the next year of the Project



### Event Suggestions

- Have waste reduction themed activities: Who Polluted the Potomac (p. 41) and Trash Timeline (p. 56), and Landfill in the Bottle (p. 61)
- Make posters (using reused materials!) or a slideshow highlighting the successes of your school
- Ask for donations of healthy, trash free foods from parents and the local community
- Show an environmental-themed film and facilitate a discussion
- Make a collective art project with used supplies. See the Resource Center for ideas (p. 38)
- Ask for suggestions and reflections on a community comment white board to help guide the future of the Project

## Step 8: End-of-Year Evaluation

**What:** Review the year and plan for future years of being a Trash Free School. This step is orchestrated by the Green Team Leader, but should involve other Green Team members.

**Why:** Conclusions and evaluations, based on a review of past actions, are important in order to make plans to improve for the future.

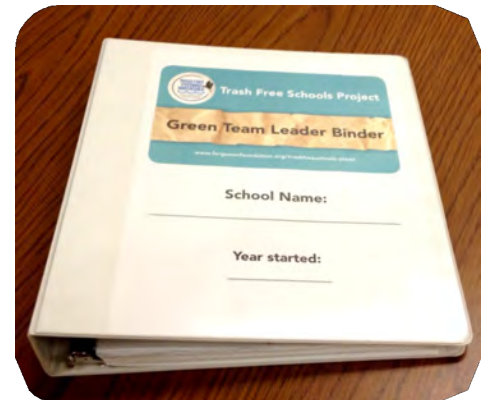
**How:** The Green Team works to do the following.

- Complete the Trash Free Schools Report Card and calculate your grade (p. 37). This helps visualize all of your actions, and can be used for comparison with future Report Cards and actions.
- Use your Celebration Event as a measure of success, feedback, and to review actions in the past year.
- Consider using the Student Survey found in the Resource Center (p. 38) to gauge students feelings and behaviors towards trash.
- Review your Action Plan. Did you accomplish all your goals? Why or why not? How will you add to or change your Plan for the next year? Use this year's Action Plan to move forward with future actions and change your approach.
- Review your tracking or monitoring system and results. Is the system working well for your school? Can you see any changes?

### Keep your Trash Free School Alive

The Trash Free Schools Project intends for schools to implement actions that will be continued long-term. Turn over of staff and students will make it necessary to introduce new Green Team members. To keep your efforts ongoing in your school:

- **Create a Green Team Binder:** a great way to track your school's efforts and progress, store useful resources and information, and easily update a new Green Team member, Green Team Leader, or principal. Materials and instructions are available at the Resource Center (p. 38).
- **Recognize good work:** be sure to give your school body regular updates on your efforts and accomplishments. Consider by making it a permanent addition to your school newspaper and announcements.
- Adopt and add an **Environmental Mission Statement** to your handbook (p.7).
- Make being a Trash Free School part of your **School Improvement Plan**.



**Find Green  
Certifications!**  
at the  
Resource Center  
(p.38)

### Applying for a Green School or similar certification?

The Trash Free Schools Project can help! Use documentation collected in your Green Team Binder during our eight step process to keep track of efforts for other certification programs. Review the Trash Free School Project's Eight Steps Table (p. 6) for documentation information and the Resource Center (p. 38) to learn about certifications and how to make a Green Team Binder.

# Trash Free Schools Report Card

**What:** Schools will use the Report Card to record and assess their progress as part of the End-of-Year Evaluation.

**Why:** The Report Card is an easy way to examine your school's performance in its efforts to become a Trash Free School. It also documents all of your school's actions and may be used for grant or other certification programs applications.

**When:** The Report Card must be submitted online at the end of each school year. After submitting the Report Card, each school will receive an official grade.

**How:** Submit the Report Card online at the end of each year and receive an official grade. A self-evaluation Report Card should also be used to keep track of your actions for your own records.

Schools are expected to self-monitor and make adjustments to their approach when necessary. The tracking and monitoring system you chose will help evaluate progress along the way. Informal check-ins and assessments throughout the school year also help to gauge success.

**Remember!** A Trash Free School does not necessarily mean that no trash is produced; **Trash Free is used here to describe any school actively working towards reducing their waste in a long-lasting manner.**

## Report Card Guidelines

- Review the Report Card for details on documentation to keep for each step.
- A school may only count points for action items implemented in the complete scope of the school. For example, a school will not receive points for only one classroom that has a scrap paper bin; all of the classrooms must have a scrap paper bin.
- A school does not have to complete all of the actions in any one technique. This gives flexibility and room for improvement and growth.
- Notice that the Educate and Inform section has four mandatory points; these must be completed as part of your Trash Free Schools Action Plan by the end of your first year. If you do not complete these-mandatory actions, you may not be considered for some benefits.
- Note the point scale; higher point values are given to items with more impact in creating a sustainable waste reduction system.

## Resources

- The Trash Free Schools Report Card is in this Guidebook (p. 37) and in the Resource Center (p. 38)
- Fill out your Report Card online at: [www.surveymonkey.com/s/TFSReportCard](http://www.surveymonkey.com/s/TFSReportCard)
- Documentation needed for the Report Card and useful for Green Certification programs can be found on the 8 Step Overview Table (p. 6)
- Find a list of Green Certification programs at the Resource Center (p. 38)



# Trash Free Schools Report Card

Category	Action Item	Point Value	Points Earned		
<b>Step 5: Kickoff Event</b>	<input type="checkbox"/> Kickoff Efforts (mandatory) Describe your actions	2	___/2		
<b>Step 6: Take Action</b>  <b>Educate and Inform</b>	<input type="checkbox"/> Track/Monitor Trash and Recycling	4	___/40		
	<input type="checkbox"/> Litter Prevention Campaign (mandatory)	4			
	<input type="checkbox"/> Inform All Faculty And Staff (mandatory)	4			
	Lesson Integration- percent student body reached. <i>Choose one.</i>				
	<input type="checkbox"/> 1-25% (10 points) <input type="checkbox"/> 51-75% (22 points)				
	<input type="checkbox"/> 26-50% (16 points) <input type="checkbox"/> 76-100% (28 points)				
	<b>Bonus:</b> Additional Actions:	1 each			
<b>Step 6: Take Action</b>  <b>Rethink, Reduce, and Reuse</b>	<input type="checkbox"/> School-wide Trash Free Lunch Challenge	3	___/30		
	<input type="checkbox"/> Double sided printing policy	3			
	List any other action items you have taken to rethink, reduce, and reuse waste in your school: 1. 2. 3. 4. 5. 6. 7. 8.	3 each			
	<b>Bonus:</b> Additional actions:	1 each			
<b>Step 6: Take Action</b>  <b>Recycle</b>	<input type="checkbox"/> Recycling picked up regularly	2	___/20		
	<input type="checkbox"/> Bins in all classrooms	2			
	<input type="checkbox"/> Clear signage at bins and in visible location	2			
	<input type="checkbox"/> Monitor contamination of trash	2			
	List any other action items you have taken to recycle in your school: 1. 2. 3. 4. 5. 6.	2 each			
	<b>Bonus:</b> Additional items:	1 each			
<b>Step 7: Celebrate</b>	<input type="checkbox"/> Celebration Event (mandatory)	2	___/2		
<b>Step 8: End-of-Year Evaluation</b>	List two modification or additional actions you would like to add to your Action Plan for next year: (mandatory) 1. 2.	3 each	___/6		
<b>BONUS</b>	<input type="checkbox"/> Create an environmental mission statement	2	_____		
	<input type="checkbox"/> Create a green purchasing policy	2			
	Describe your policy:				
	<input type="checkbox"/> Conduct School Yard Cleanup	2			
	<input type="checkbox"/> Complete Student Take Home Challenge	2			
<b>TOTAL points:</b>		<b>100<sup>+</sup></b>	_____		
49 and below = C	50 – 59 = B <sup>-</sup>	60 – 69 = B <sup>+</sup>	70 – 79 = A <sup>-</sup>	80 – 89 = A	90 – 100 = A <sup>+</sup>





# Trash Tracking Sheet\*

Draw a line on the dumpsters to indicate how full each is. Look inside the dumpster to see if any recyclables have made it into the trash and check on the ground around the dumpster for any litter, checking the appropriate boxes if either are present. Consult the Trash Free Schools Guidebook (p.12) for more information on tracking waste.

Cut here

	<b>Container 1</b> Size: Location:	<b>Container 2</b> Size: Location:	<b>Container 3</b> Size: Location:	<b>Container 4</b> Size: Location:
Date:  Notes:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:
Date:  Notes:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:
Date:  Notes:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:
Date:  Notes:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:
Date:  Notes:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:	 <input type="checkbox"/> Recyclables in Trash <input type="checkbox"/> Litter Time:






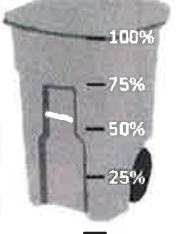



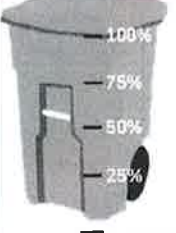
This sheet is adopted from King County's Green School *Custodial Garbage/Recycling Tracking Form*. King County, WA.

\*A complete form is available at the online Resource Center at [fergusonfoundation.org](http://fergusonfoundation.org). Step 3 has information on tracking (p.12)



# Recycling Cart Tracking Sheet\*

Draw a line on the recycling cart to indicate how full each is. Look inside the carts to see if any non-recyclables have made it into the recycling and check on the ground around the carts for any litter, checking the appropriate boxes if either are present. Consult the Trash Free Schools Guidebook (p.12) for more information on tracking waste.

	<b>Cart 1</b> Size: Collection Type: Location:	<b>Cart 2</b> Size: Collection Type: Location:	<b>Cart 3</b> Size: Collection Type: Location:	<b>Cart 4</b> Size: Collection Type: Location:
Date: Notes:	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling
Date: Notes:	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling
Date: Notes:	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling
Date: Notes:	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling
Date: Notes:	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling	 Time: <input type="checkbox"/> Litter <input type="checkbox"/> Trash in Recycling

Cut Here

This sheet is adopted from King County's Green School *Custodial Garbage/Recycling Tracking Form*. King County, WA.

\*A complete form is available at the online Resource Center at [fergusonfoundation.org](http://fergusonfoundation.org). Step 3 has information on tracking (p.12).



# Who Polluted The Potomac?

*An Interactive Story of Our "Nation's River"*





## Acknowledgments

The development and publication of this activity resource booklet would not have been possible without the support (generosity of ideas, time and money) of many individuals and organizations. Major funding for the project was provided by the National Park Service and Eastman Kodak Company, with additional support from the Chesapeake Bay Trust through a grant sponsored by the Ronald E. Perry Memorial Fund.

The Interstate Commission on the Potomac River Basin (ICPRB) supplied background information and maps. We are grateful to Curtis Dalpra of the ICPRB for reviewing the manuscript, and offer thanks to Patricia McGlashan for assistance in writing, and Jane Klemer for editing. Teacher Martha Franklin and her students (Melissa Dye, Gerry Mahan, Devin Robinson, David Reynolds, William Wasson, Joseph Waters, Erica Waxman) at Henry Ferguson Elementary School participated with good humor in photographic sessions.

While the story of the Potomac is original, the idea of using a story and canisters containing simulated pollutants is not. Susan Haynes and Christine Turnbull shared the idea at a workshop. Since that initiation the naturalists at Hard Bargain Farm have helped refine the activity for use at our environmental center on the Potomac—so that thousands of students and teachers might learn to identify ways they can help preserve and protect the environment. Versions of this lesson are now being taught by the Maryland Department of Natural Resources and the National Park Service, as well as by environmental educators much farther afield—in Japan and Australia.

We hope that all future users will take the liberty of adapting “Who Polluted the Potomac?” to suit their special needs. By working together and sharing ideas and resources we all *can* make a difference!

—Katherine Powell, *Executive Director*

—Seliesa Pembleton, *Director of Environmental Studies*

## CONTENTS

Overview and Background . . .	1
Materials and Procedure . . .	2-3
The Story . . . . .	4-5
In Conclusion . . . . .	6
Potomac River Profile . . . . .	7-8
Labels . . . . .	9
Watershed map . . . . .	10-11
People and the Potomac .	12-13
About Hard Bargain . . . . .	14

### The Hard Bargain Farm Staff:

Jodie Abbott	Doris Sharp
Tracy Bowen	Brent Steury
Barbara Kirkconnell*	LeEtta Townsend
Sam Lyon	Eileen Watts
Sharon Rabie	Brenda Wright
Amy Relyea*	Henry Xander, Jr.
Carolyn Sanford	
Jean Settle*	

*\*former naturalists who saw the initial presentation and brought the idea back to Hard Bargain Farm.*

### Cover Photographs:

National Park Service—Bill Clark  
Edward Pembleton



## WHO POLLUTED THE POTOMAC?

### Overview

This lesson is an interactive story dramatizing how, as populations increase and as use changes, a river can become so polluted that it is transformed from a valuable natural resource into a repugnant and even toxic wastewater. This graphic example demonstrates that we are all part of the problem—and that we all must be part of the solution as well.

### Objectives

- Students will become aware of the many different ways pollutants can enter the water.
- Students will discuss the positive actions they themselves can take to help prevent pollution.
- Students will realize that protecting the environment is not a one-time event, but that it requires ongoing changes in some of their daily habits.

### Background

**About the Activity:** Although this activity conveys the story of the Potomac River, situations in the nation's river probably parallel those in the watershed *you* call home. You may wish to use the story of the Potomac as an example for comparison with your local river or lake, or you may want to adapt the story to special concerns within your watershed.

The activity is designed to involve a group of 15 to 32 participants. By using labels with pictures, the lesson has been used with students as young as second grade. It has also been successful in adult presentations. Educators in Japan and Australia found that the story of the Potomac was basically the story of their rivers, too.

**About the River:** People along the Potomac appreciate the scenic vistas, but they also depend on the river for food, recreation, transportation—and for an abundant supply of drinking water. Unfortunately, the river is not always treated like the invaluable natural resource it is. Cities use the flowing waters to carry away sewage and factory wastes. Chemicals leach from residential lawns and agricultural fields. Soil erodes from earth scraped bare by bulldozer or plow. Oil drips from engines; acid rain falls from the skies or seeps from abandoned coal mines. Toxic household chemicals, unsightly litter and tangled fishing line (all of which may be fatal to wildlife) are discarded by thoughtless citizens.

From a small fresh-water spring in the mountains, to the thundering Great Falls, to the mile-wide river flowing past Washington, DC, to its salty,



Great Falls

Ed Pemberton



Ft. Washington  
NPS—Bill Clark



Ed Pemberton

ten-mile-wide mouth at the Chesapeake Bay, each section of the Potomac River has a special personality—and special problems.

Because the Potomac River is the second largest tributary of the Chesapeake Bay, pollution in the Potomac takes its toll on the Bay, too. Fifty years ago it was not safe to go near the water along some stretches of the Potomac. Today, the picture is brighter. Working together, citizens and governmental agencies are cleaning the river. Sections are still polluted, but the actions of each individual can make a difference.

This activity is designed to help individuals examine their daily habits and to visualize their impacts on the river. Then they can decide what actions to take to improve and protect the Potomac.

### **Materials Needed for a Group of 30-32 Participants**

- 2 clear, gallon jars of water (one jar needed for 15-16 students).
- 1 labeled film canister per student (see labels on page 9).

There are 16 characters (one is optional) in the story, so you will need to prepare two sets of canisters for a group of 30-32. The following is a description of the substances necessary for the canisters. All substances are safe for students to handle.

*Note: It is best to use small amounts of each substance for a realistic effect.*

### **Getting Ready**

1. Prepare and label the film canisters as described in the materials section, one canister per student.
2. Fill two clear, gallon jars with water nearly to the top.
3. Divide the class into two groups, and seat each group around one of the gallon jars of clean water.

### **Procedure**

1. Distribute one set of canisters to each group of students. Ask them to keep the canisters closed, and not to reveal the identities of their character or contents yet.
2. Explain that you will tell a story about the river, and that each of them will play a part in the story. When they hear the name of their character mentioned in the story their job is to open the canister and empty its contents into the “river” (represented by the jar of clean water in the middle of their group).
3. Then read the story on pages 4 and 5. Pause after questions and allow students time to think and respond.





Sharon Rabie

## Character

## Substance in Canister

- construction site..... 1/2 tsp dry clay soil (not sand)
- trees..... dry leaves, crumbled
- motorboat..... 1/8 tsp vegetable oil
- beach party (optional character)..... assorted litter (pull-tabs, Styrofoam, etc.)
- family picnic..... assorted litter
- people fishing..... tangle of nylon fishing line
- farmer..... 1/4 tsp baking powder
- barn yard..... 1/2 tsp brown liquid (coffee or food color mix)
- homeowner..... yellow food color + water  
(a full canister is most effective) + toilet paper
- coal mine..... 1/4 canister vinegar
- electric power plant..... 1/4 canister vinegar
- commuters..... 1/4 canister vinegar
- gardeners..... 1/4 tsp baking soda
- antifreeze..... 1 tsp of blue/green food color + water
- washing the car..... 1/2 canister of soapy water
- mysterious liquid..... 1/8 tsp diluted red food color  
+ water



Blue Ridge Mts.—Ed Pembleton

# THE STORY

## WHO POLLUTED THE POTOMAC?

For many thousands of years people have lived on the banks of the Potomac River. They hunted in the great forests, harvested food from the wetlands and fished the river.

*Question: Imagine that the jar of water in front of you was taken from the Potomac River by a Native American child about 500 years ago. Describe how it looks to you. Would you drink this water? Eat fish that came from it? Swim in it?*

In 1608 Captain John Smith explored the Potomac for settlement by European colonists. He kept a journal of his discoveries, and in it he wrote about the Native American villages, the forests and the river itself. He described tributaries of “sweet waters” and the river so full of fish that he and his crew tried to scoop them up with a frying pan.

Soon colonists began to arrive. They found fertile land for farming, forests teeming with game and a river that provided ample food and water. It was an outstanding environment for settlement, and the colonists prospered.

*How do you think the colonists used the river?*

*Do we use the river in the same ways today?*

The river has changed a lot in the past 400 years. This is the story of the changes. **Listen for the name of the character printed on your canister. When you hear your character named, open the canister and dump its contents into the river.**

Imagine now that everything in the story is happening in the present—maybe even while we’re sitting here today.

A sudden downpour drenches the area. The pounding rain is washing loose soil from a nearby **construction site** into the river. High winds whip through the **trees** and blow leaves into the water, too.

*Is this water safe to drink? (If the response is “no” ask if the river had leaves or soil in it when Capt. Smith drank it?)*

*Would you swim in it? Boat on it? Is it safe for wildlife?*

In a short while the storm passes over and the sun comes out again. People head for the river to have fun. Some zoom up and down the river in **motorboats** and don’t notice that a little engine oil leaks into the water. A group of friends have spread blankets on the shore for a **beach party**. Lots of families are **picnicking** in the parks, too. Some of these people have left trash on the shore. At the next high tide that trash will wash into the river. On the dock a **person fishing** snags the hook on a log and breaks the nylon fishing line.

*Would you drink this water now? Would you swim in it? Go boating? Is it safe for wildlife? What litter is most dangerous for wildlife? Why?*

Not everyone is out playing today. A **farmer** has been fertilizing cornfields close to the shore. The rain washed some of the fertilizer off the land and into the nearby river. The farmer also keeps pigs and other animals in the **barnyard**. As the rainwater drains out of the barnyard it carries some of the manure into a little creek behind the farm. The creek flows into the river.

Out in the country, high on a hill overlooking the river is a big old house. It is not connected to the city sewer system. Waste water from the house goes into a septic tank under ground.

The **homeowner** has not maintained the septic tank and poorly treated sewage is seeping into the river.

*Would you drink this river water now? Would you swim in it? Go boating? Is it safe for wildlife?*

Upstream is a **coal mine**. Rain water drained down into the shaft and soaked the piles of wastes and scraps from mining. This made the water become acidic—sort of like a strong vinegar. Then the acid water trickled back out into the river.

The **electric power plant** on the river burns coal to produce electricity. The gasses coming out of the smokestacks combine with moisture in the air to form acids. The pollution falls back to earth as acid rain or snow or smog.

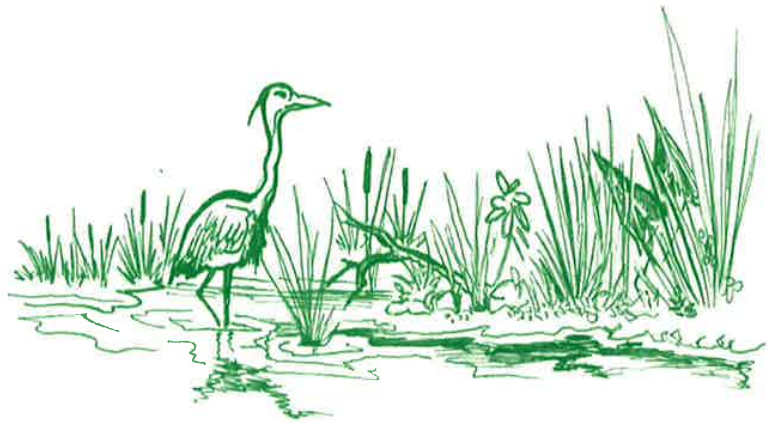
Many **commuters** drive their cars to and from work. Car exhaust fumes (just like the power plant fumes) cause more acid rain. If a car is not kept in good repair it might also leak oil or other fluids which will be washed off the pavement and into the river with the next rain.

*Would you drink this water now? Swim in it? Go boating?*

*Could fish or other wildlife live in water that was like vinegar?*

Let's look in on some typical activities around the neighborhood. Lots of **gardeners** are out working in their yards today. Many of them are using weed killers and insect sprays to keep the lawns pretty. The next rainfall will wash these poisons into a little creek nearby, and then into the river.

There's a father teaching his daughter how to change the **antifreeze** in her truck. They pour out the used antifreeze on the driveway. Antifreeze is sweet tasting and can poison an animal that licks it. It can also get into the nearby creek and poison fish. Later, father and daughter **wash the car**. The soapy water rushes down the driveway into the storm drain; the storm drain empties into the river.



Phosphates in detergents used to be a pollution problem because they acted like fertilizer, making too much algae grow in the river. Laws were passed to stop the use of phosphate soaps in order to help solve the algae problems. But the grease and grime on a car contain asphalt from the roads, asbestos from the brakes, rubber particles from the tires, heavy metals and rust. If the man and his daughter had gone to the local car wash the water would have been treated before it was returned to the river.

Next door a family is cleaning out their garage. They find an old rusty can with a tattered skull and crossbones label still stuck on it. What could it be? It looks dangerous and they want to get rid of it before someone gets hurt. But how? Junior gets the idea: "Let's pour it down the drain out by the curb. Hurry up!" So the **mysterious liquid** goes down the storm drain. The poison is out of sight—but it is headed for the river.

*Question: Who polluted the Potomac?*



## In Conclusion

Bring the activity to closure with a brief discussion. Here are some questions to guide the discussion:

- *Think about the pollution contained in your canister. Could something be done to prevent that type of thing from entering the water? How?*
- *Once pollutants have entered the river, how can we get them out? How can we clean up the river?*
- *Do you think it is easier to prevent pollution or to clean it up? Explain your ideas.*
- *What could you start doing today to help improve the health of our river by preventing some of this pollution?*

*Note:* This last question is the most important! Students tend to think of very practical things they can do, such as: riding bikes or Metro or car pooling to reduce acid rain from auto exhaust; turning off the TV to cut electric usage; turning off water while brushing teeth; picking up litter; recycling; pulling weeds; spreading the word about preventing pollution.

## Going a Step Further

- At the end of the lesson students may ask how you are going to dispose of the jar of polluted water. Everything has to go somewhere. The solids such as litter can be easily removed, but pouring oil and soil down the drain is not a wise idea. Where should the water go? Have the group decide on an acceptable "disposal site".
- Challenge students to clean the water in their jar. They may want to try using strainers, funnels, filters, sand, paper towels, or cotton balls. Students will be able to remove most of the solid contaminants easily, but they will discover that others—such as the food coloring and the vinegar—will be very difficult.
- **Water Quality Testing:** Collect samples of rain water, river water and tap water for testing. With younger students, begin the discussion of pH indicators by thinking back to the activity. Discuss the pollutants that made no observable change when poured in the water (acid runoff and rain). Then, use this experience as background for discussion of chemical indicators and how they can be used to identify the presence of substances that may not be visible to us.



Tidal  
NPS—Bill Goss



White-tailed deer  
—Ed Pemberton



Yellow-crowned night heron  
—Ed Pemberton



## POTOMAC RIVER PROFILE



*Ft. Washington  
NPS—Charlie Pierera*



*Mt. Vernon  
—Ed Pemberton*

### Definition

A river basin or watershed is a natural formation that includes the entire area of land drained by the river and its tributaries. The Potomac River drainage area covers approximately 14,670 square miles and includes four states: Maryland, Virginia, West Virginia, Pennsylvania, and the District of Columbia. The Potomac River is the second-largest tributary in a much larger watershed that drains into the Chesapeake Bay.

### Length and Character

The river stretches for approximately 383 miles from its headwaters on the North Branch Potomac (a small fresh-water spring at Fairfax Stone high in the Appalachian Plateau of West Virginia), to its wide, salty mouth on the Chesapeake Bay at Point Lookout, Maryland. The Potomac is also a “flashy” river and can vary greatly in flow from several hundred million to billions of gallons per day and flooding may occur.

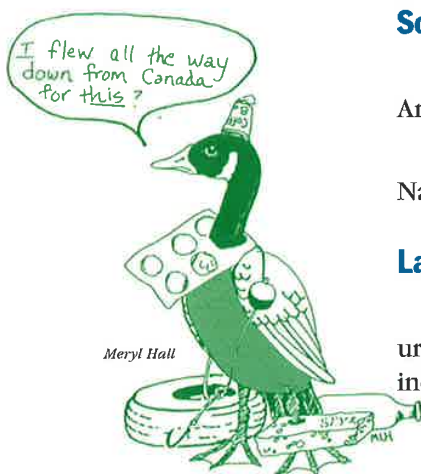
### Some Major Tributaries of the Potomac

The Rivers: Shenandoah, South Branch, Monocacy, Savage, Cacapon, Anacostia, Occoquan, Wicomico, St. Mary’s.

The Creeks: Antietam, Conococheague, Rock, Piscataway, Mattawoman, Nanjemoy.

### Land Use Within the Watershed

From the Appalachian Plateau to the Coastal Plain, the terrain and natural resources within the watershed vary greatly. Thus, land usage and industry also vary within each sub-basin of the watershed: forestry, coal





## POTOMAC RIVER PROFILE

mining, paper production, chemical manufacturing, farming, military and government services, metropolitan services, tourism and fishing.

### Water Supply

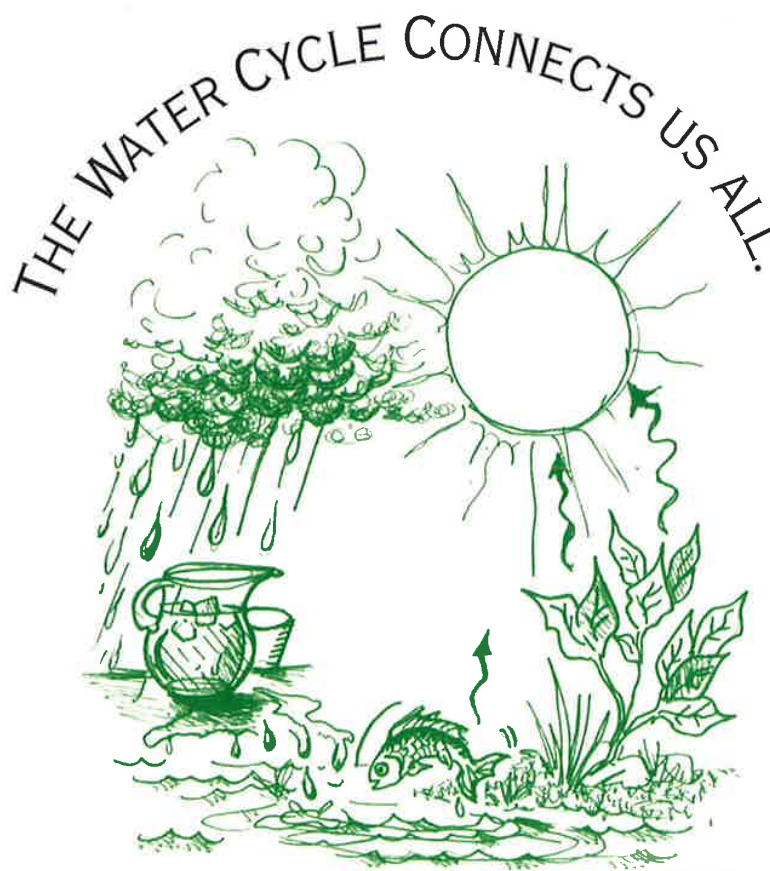
Many cities within the watershed depend on the Potomac, both to supply drinking water and to carry away wastewater. The more than 3.7 million people of the metropolitan Washington, DC area use about 477 million gallons of water from the Potomac, Patuxent and Occoquan rivers every day. Use can increase appreciably during the summer.



National mall  
—Ed Pembleton

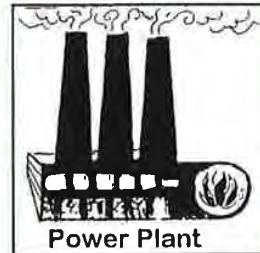
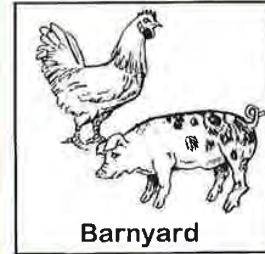
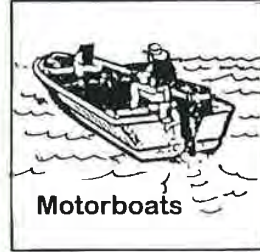
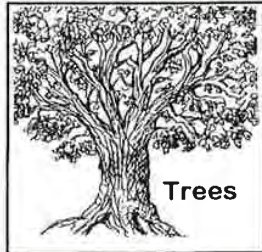


St. Mary's  
—Ed Pembleton



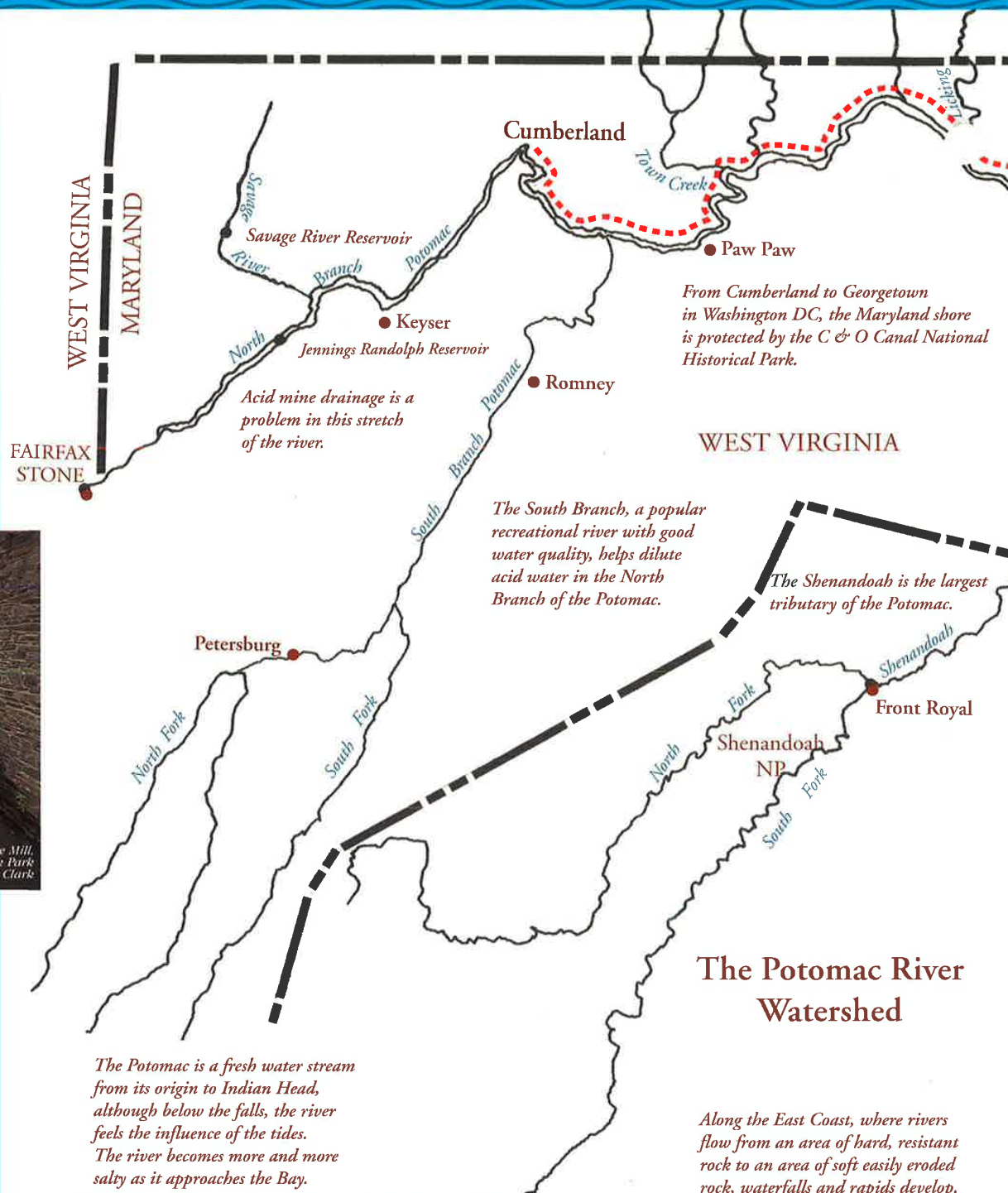
Sharon Rabie

## CANISTER LABELS



**Canister Labels:** Make two photo copies for a class of 30-32 students, trim out each label and apply to canisters with tape.





Pierce Mill,  
Rock Creek Park  
NPS—Bill Clark



Great Falls

## The Potomac River Watershed

Along the East Coast, where rivers flow from an area of hard, resistant rock to an area of soft easily eroded rock, waterfalls and rapids develop. This is the limit of navigation—and major cities developed along this Falls Line.



**P**eople have been attracted to the river for centuries. In fact, archaeological evidence indicates that bands of hunter-gatherers roamed the area as far back as 9,500 B.C. When Captain John Smith arrived in 1608, he sailed upstream as far as present day Alexandria and marveled at the Native American Indian villages thriving along the river banks. The river was their source of drinking and wash water, as well as their highway and “grocery store.” Riparian wetlands and woodlands were rich with game and wild plant resources. The Indians planted corn, tobacco and other crops in the rich soil.

However, as European colonization expanded the Indian populations were displaced or decimated. In the mid-1700s a growing number of colonial farms and settlements dotted the river banks. As population increased, technology advanced and land was cleared, the Potomac began to feel the impact.

Over the next 200 years the Potomac watershed experienced enormous growth—and the river suffered as pollutants from human activity poured in. In the Appalachian headwaters region acidic runoff from coal mining contaminated long stretches of the river. Farther downstream farming had a major impact. Forests were cut and the bare soils eroded—especially from numerous tobacco fields. Deep-water ports at Bladensburg on the Anacostia and further downstream at Port Tobacco were ultimately silted in—victims of the very crop the sailing ships had transported back to Europe. Fertilizer, pesticides and runoff from large scale poultry farms are more recent threats to water quality in some rural areas.

Metropolitan areas offer a similar threat. By the early 1900s the Potomac River around Washington, DC was an “open sewer” and pollution was reaching crisis proportions. In the 1950s the Surgeon General declared the river unfit for human contact. It was unsafe for drinking without treatment throughout its entire length, unsuitable for swimming in most areas, and choked with algae blooms and fish kills in the summer months. In 1965

## FROM HEADWATER



*Fairfax Stone where the river begins  
—St. Pemberton*



*Piney Point  
—Ed Pemberton*



*George Washington Memorial Parkway  
—Ed Pemberton*



*Piscataway Park  
—Ed Pemberton*

# THE POTOMAC

## S TO TIDEWATERS...



*C & O canal—Ed Pembleton*



*NPS  
—Bill Clark*



*—Ed Pembleton*



*Point Lookout where the river  
meets the Chesapeake Bay  
—Ed Pembleton*

President Johnson declared the river “dead”, and vowed to begin cleaning it up.

Today, although the Potomac is still polluted the picture is much brighter. Local, state and federal agencies—together with citizen activists—have been working to clean up the river. Their combined efforts are making a real difference. New wastewater treatment plants, stronger regulations on industrial and mining discharges, better erosion control, modern farming practices and recycling are all part of the improvement program. Stormwater run-off control remains a major issue in the metropolitan area where increased water flow from buildings, concrete, and asphalt becomes apparent.

In the tidal fresh-water section of the river below Washington, DC, there is especially strong evidence of improved water quality. Submerged aquatic vegetation has returned. Bass fishing is superb. Herons, waterfowl, ospreys and bald eagles are abundant. And people are enjoying the river once again.

Still, much remains to be done. We can all contribute to the effort in our everyday lives in real and practical ways. The goal of “Who Polluted the Potomac?” is to help people recognize those many ways we can make a big difference in the health of the river and thus help restore and preserve the Chesapeake Bay.

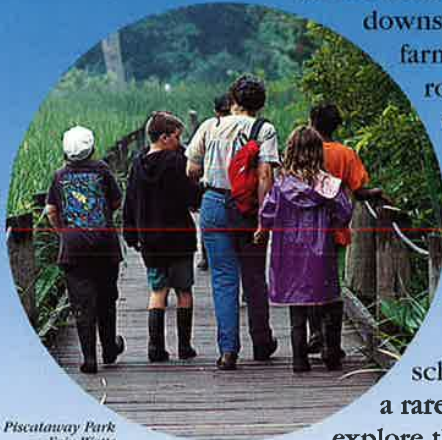


*Potomac—Western Maryland  
—Ed Pembleton*



## Hard Bargain Farm... Environmental Education on the Potomac

Hard Bargain Farm Environmental Education Center, operated by the Alice Ferguson Foundation, occupies a unique 330-acre site on the Potomac within Piscataway Park—just ten miles downstream from Washington, DC. The working farm is dedicated to teaching students their vital role as stewards of the earth's natural resources. In addition to curriculum-based educational activities, the center's award-winning program integrates watershed protection and partnerships to help mobilize citizens to protect the Potomac River and its environs.



*Piscataway Park  
—Erin Watts*

Each year thousands of school children are given a rare opportunity to explore the natural world.

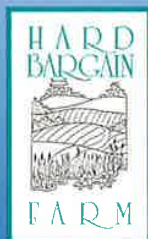
When they wade in the wetlands and river they discover their connections to the Potomac River and to the Chesapeake Bay. They also learn where their food comes from by helping with farm chores such as shelling corn, gathering eggs or milking the cow.



*Mother Earth  
—Doris Sharp*

Hard Bargain relies on the “ripple effect” to increase the number of students touched by its programs. A two-credit teacher workshop is offered each summer and an interactive homepage will soon be available to bring the Potomac River into the classroom.

In addition, the center coordinates the Annual Potomac Watershed Cleanup, a multi-state event involving citizens, organizations, scouts, school groups, and governmental agencies from the headwaters to the tidewaters every Spring.



For more information or to schedule a one or two-day field trip for a school group contact:

**Hard Bargain Farm Environmental Center**  
**Alice Ferguson Foundation**  
2001 Bryan Point Road  
Accokeek, MD 20607

Phone: (301) 292-5665  
Fax: (301) 292-1070  
E-mail: [ferguson@radix.net](mailto:ferguson@radix.net)



Printed on recycled paper

## 3.1 Trash Timeline

### Exploring the Biodegradability of Trash

#### Overview

Students will use common household objects to create a visual timeline depicting the rate of biodegradation of different materials.

#### Lesson

Use the table below for lesson planning purposes.

#### Characteristics

Time Required	15-30 minutes
Key Concepts/Terms	Decompose; Biodegrade; Nutrient Cycling; 4 R's: Rethink, Reduce, Reuse, and Recycle
Prerequisites	None
Setting	Indoors or Outside; Small Groups

#### Learning

#### Objectives

After completing this lesson, students will...

- Understand that some materials biodegrade much more quickly than others; and
- Recognize trash items that can be recycled, reused or composted as alternatives to sending them to the landfill.

#### Materials

#### Needed

The table below lists the materials needed to conduct this activity.

Items Needed for the Whole Class	Items Needed for Each Group
Trash Timeline Display Board (to make a Trash Timeline Display board, attach one of each of the items you choose to put in student kits in the order in which they decompose, from fastest to slowest. Draw a line to connect these items in your "timeline.")	One Trash Timeline Kit composed of up to 10 items from the <b>Biodegradation Rate Table</b> below in a large, zip closure plastic bag.
Tape/Glue (hot glue works well)	
String/Twine	

*Continued on next page*



### 3.1 Trash Timeline, Continued

#### Background Information

#### Decomposition vs. Biodegradation

We generally use the words decompose and biodegrade interchangeably to mean “rot” in our society. Decomposition can also be used as the following: to break down into smaller pieces (physically). This is VERY different from rotting, and any claims of decomposition times by various industries should be researched carefully to understand how the word is being used.

#### Why Do We Care?

Nature recycles by breaking down organic (once living) material into nutrients to be used again by new plants. Humans interrupt this cycle when they use and discard non-biodegradable materials. This activity helps students make more “environmentally-friendly” choices in their daily lives.

#### Trash Timeline Kits

For the Trash Timeline Kits, choose 10 items from the list below and put them in a large, zip-closure plastic bag (one for each group of students).

BIODEGRADATION RATES	
Material	Time Required to Biodegrade
Paper Towels	2-4 weeks
Apple Core /Orange Peel (Add this in at the last minute. Do not store these in the plastic bag.)	2-4 weeks
Newspaper	2-4 weeks
Plain Cardboard (unwaxed)	3 months
Cotton cloth	3-6 months
Rope	1 year
Waxed Milk Carton	5 years
Cigarette	1-5 years
Disposable Diaper	10-20 years
Steel Can	80-100 years
Aluminum Can	200-400 years
Ziploc™ Bag	300 years
6-pack Ring	400 years
Plastic Bottle	450 years
Monofilament Fishing Line	600 years
Glass Bottle	Thousands to millions of years
Styrofoam™	?????

*Continued on next page*





### 3.1 Trash Timeline, Continued

#### Procedure

Follow the steps in the table below to conduct the activity. *Items in italics are possible student answers to questions.*

Phase	Step	Action
Engage	1	<b>Prepare</b> one completed Trash Timeline display, mounting the same materials that the students receive in their kits on the display board. Use the string as your “timeline” to show the order in which materials decompose, from fastest to slowest. Hide this “answer key” until students have completed their own Trash Timelines.
	2	Break a Styrofoam cup into pieces. Then cut an apple into pieces. Ask students to explain what will happen to these items over time.  <i>The Styrofoam can break into small pieces, but will never biodegrade/rot, like the apple.</i>
	3	Ask students if they have ever heard the terms <b>BIODEGRADE</b> or <b>DECOMPOSE</b> .  Discuss what they think these might mean and lead them to understand that these terms are synonymous with <b>ROT</b> .
	4	<b>Explain</b> that students will be completing an activity to learn about how different materials BIODEGRADE/DECOMPOSE/ROT.
	5	<b>Pass out</b> one Trash Timeline Kit (that you have prepared ahead of time) per group of 4-6 students.

*Continued on next page*



### 3.1 Trash Timeline, Continued

Procedure (continued)

Phase	Step	Action
Explore	6	Give students 10 minutes to sort the items in their Trash Timeline Kit (including the large, re-sealable plastic bag) into a “timeline,” from the item that they think will take the shortest amount of time to biodegrade to the item that they think will take the longest.
	7	Once all groups are ready, have each group present their predictions/hypotheses to the class.
Explain	8	Show your prepared Trash Timeline Display Board. Allow students to compare and rearrange their items to match the real timeline.
	9	Discuss the actual times that each material takes to biodegrade. For each item, discuss what natural resource was used to make it. Have students classify items are renewable/non-renewable.
	10	Ask students if they can think of items that are composites – items made of more than one material. What happens to these?  <i>Examples could include diapers with plastic linings, milk cartons/juice boxes with wax/foil linings, etc.</i>
	11	Discuss which materials are reusable (plastic bags, rope), recyclable (plastic bottles, aluminum or steel cans, glass), or compostable (orange/apple, cotton, rope, paper). Compost is most likely a new concept for students and may need further explanation before they can identify which items can be composted.
	12	Discuss why we buy and use non-biodegradable products.  <i>Answers include convenience, low cost, etc.</i>  Explain that we all make choices and we need to consider the consequences of our actions.

*Continued on next page*



### 3.1 Trash Timeline, Continued

---

Procedure (continued)

Phase	Step	Action
Elaborate	13	<p>Use any of the following suggestions to elaborate on this activity:</p> <ul style="list-style-type: none"><li>• Have students research different materials to understand why they decompose at certain rates.</li><li>• Have students create a “trash time capsule” where they collect different items and bury them. Later, dig up the capsule and examine the decomposition/biodegradation process.</li><li>• Students can create different experiments to test the rate of decomposition/biodegradation by varying the materials, or the experimental setting (moist vs. dry; exposed to light/dark, etc.).</li><li>• Visit a local landfill and discuss the rate at which it is filling with the manager.</li><li>• Visit a local recycling center or start a recycling project at school or home.</li></ul>

---





# Our Ecological Footprint Activities

ASSOCIATION  
OF ZOOS &  
AQUARIUMS

## Landfill in a Bottle

### Audience/Group Setting

This activity is geared towards a classroom setting where students will be able to observe their projects over a period of time.

### Goal

To understand the impact that waste has on the environment and how to make responsible decisions about what is done with waste.

### Objectives

By the end of this activity, participants will:

- Understand how household/school waste breaks down in a landfill.
- Recognize the impact of waste on the environment.
- Be informed and empowered on ways to reduce, reuse and recycle.

### Big Idea/Main Message

Decisions that individuals make when purchasing goods and foods as well as how individuals dispose of materials has a large impact on the environment.

### Environmentally Responsible Behavior Addressed

Make wise purchases of goods and food.

### Background Information

Consumers can make a significant impact on the environment simply by the choices that they make at the store. For example, according to The Environmental Paper Network organization, research conducted by the Alliance for Environmental Innovation found that if 1 ton of 30% recycled content paper was purchased by consumers instead of paper made from virgin trees, it would save the equivalent of 7.2 trees, 2,100 gallons of water, 1, 230 kW of electricity, and 18 pounds of air pollution.

Much of what we buy quickly becomes waste and is thrown away. Approximately one-third of this waste comes from packaging according to the Clean Air Council. All of this waste requires armies of dump trucks (burning fossil fuels) to collect it in towns and cities all over the world and take it away. According to a report by Environmental Defense called “Trash and the City,” Manhattan uses diesel trucks to carry garbage 7.8 million miles every year. That would be the equivalent of circling the earth 312 times every year. The Clean Air Council estimates that Americans throw away an average of 230 million tons of garbage per year and about 2.5 million plastic bottles every hour. Some of this waste gets recycled, but most of it ends up in landfills or the ocean. The good news is that you and your students can do something right now to reduce your impact on the environment and protect its inhabitants.



## Materials Needed

- 2 liter pop bottle per student
- Paper bags
- Dirt (from a yard, not a bag)
- Newspaper to cover the tables
- Spray bottle with water
- Pieces of trash (i.e. aluminum, lint, paper, orange peel, plastic bag)

## Staff

This activity will require a teacher to facilitate.

## Length of Activity

The initial set-up of this activity will take about 30 minutes. The entire project will require a month. Throughout this month it is up to the teacher how often they would like to have the students spend observing their landfills.

## Set Up

Gather all of the materials. Have the student bring different trash items from their home. Encourage them to bring a variety of different materials.

## Procedures

1. Before beginning the project get students thinking about waste by asking some or all of the questions below.
  - a. *What do people throw away?*
  - b. *What do you throw away?*
  - c. *Can pollution come from the trash that you throw away?* Yes, pollution to the environment can come from many sources.
  - d. *What can pollution affect?* Pollution affects both plants and animals, including humans. It can even affect the way an ecosystem functions. Pollution, such as carbon dioxide emissions, also affects the earth's climate.
  - e. *How does pollution affect humans and animals?* List specific ways such as causing plants and animals to become threatened or endangered or even decreasing biodiversity by causing plants or animals to become extinct from specific areas (*extirpated*).
2. To help students gain a better understanding of how household/school waste breaks down in a landfill have students bring a few pieces of trash from home (such as paper, plastic, tin, aluminum, cardboard, etc.) or collect trash from your own school. Be sure to include a few food items. *Provide students with exact lists of garbage to bring to class so as to avoid any health concerns.*
3. Explain to students that they will be creating a miniature landfill using a few pieces of garbage and a 2-liter bottle.
  - a. Cut the top off of a 2-liter bottle (1-liter bottles may also be used).
  - b. Cover the sides of bottle with a light eliminating shield (such as a paper bag or other opaque item). This will keep any extra light from getting into the 'landfill' and only allow it to hit the surface (as the sun naturally would).
  - c. Alternatively layer dirt (from the yard, not from a bag) with the pieces of garbage.

- d. Mist the top of the dirt with approximately 1/8 cup of water.
- e. Set the bottle near a window so that it will receive exposure to the sun or if possible set bottles outside.
- f. Be sure to add water to your landfill daily or as necessary to keep the soil lightly moist.
4. Ask students, *where do items in the landfill come from?* Answers should include that people generate the waste, including themselves.
5. Have students make and record observations about their landfills at least once a week. You may also consider having students hypothesize about which items may break down the fastest or not at all.
6. Once students have made a few observations ask them the following questions.
  - a. *What simple changes you can make in order to keep items that don't break down out of landfills or ways to keep harmful items out of landfills?* Answers might include: recycling, produce less trash, produce trash that will not stick around as long, use cloth shopping bags, etc.
  - b. *How can you reduce trash and pollution by making wiser purchases?* Have the students brainstorm different ideas and write them down. You might choose to make copies of the list for the students to take home. Below are some examples ways that you can help.
    - i. Buy products with less packaging or products that have reusable or recyclable packaging.
    - ii. Buy products that are packaged in materials that are made with recycled products.
    - iii. Purchase organic foods, which are grown without the use of pesticides and synthetic fertilizers which are harmful to the environment.
    - iv. Take a reusable lunch box and containers to work or school instead of paper lunch bags and wrappers that get thrown away.
    - v. Check out books from the library instead of buying your own.
    - vi. Purchase items in bulk. This usually uses less packaging and is cheaper.
    - vii. Buy or make your own household cleaners that are environmentally friendly.
7. After 1 month have students take apart their landfill to see how the items have changed. *If possible make this a quarter or semester-long project with students recording their observations over the course of many months and finally taking apart the landfill for further observations at the end of the quarter or semester.*

## Extensions

Arrange a field trip with your class to waste management facility. Before your trip, brainstorm different questions to ask. While you are there, have the students write about their experiences and thoughts in a journal. You may also choose to include photos and drawings.

## National Science Education Standards

Science as Inquiry

Nature of Science

Science and Technology in Society

Populations, Resources and Environment

Evidence, Models and Explanation

## Resources

Environmental Paper Network

[www.environmentalpaper.org](http://www.environmentalpaper.org)

Clean Air Council

[www.cleanair.org](http://www.cleanair.org)

## Glossary

**“Burning and Burial:”** The term “Burning and Burial” refers to incinerating and landfilling refuse. These two methods do not include recycling or reuse and are unsustainable, linear methods of processing refuse.

**Commingled recyclable materials:** Two or more recyclable materials collected together (i.e. not separated), such as glass bottles, aluminum cans, and plastic containers mixed together in one recycling bin.

**Compost:** The stable, decomposed organic material resulting from the composting process. Also referred to as humus.

**Composting or “Organics Recycling”:** The controlled biological decomposition of organic materials in the presence of oxygen and heat into a stable product that may be used as a soil amendment.

**Contaminant:** Foreign material that makes a recyclable or compostable material impure; for example, food scraps on paper products.

**Diversion Rate:** The amount of material being diverted from landfilling and incineration, compared to the total amount that is buried or burned.

**Dump vs. Landfill:** A dump is an un-engineered area that is used as a ‘depository’ for refuse while paying no mind to odor or environmental controls. Most dumps are illegal but still the term is applied loosely to landfills. A landfill is an engineered repository for refuse. Today, landfills are accountable to environmental and odor regulations. While incorrect, the term “dump” is often used to refer to “landfills.”

**Environmentally Responsible Waste Management:** The act, process, and idea of considering human impacts on the natural world when disposing of waste. This includes activities such as composting, recycling, and not littering.

**Generation Rate:** The amount of waste that is produced over a given amount of time.

**Hazardous Waste:** Waste material that exhibits a characteristic of hazardous waste as defined in the Resource Conservation and Recovery Act (ignitability, corrosivity, reactivity, or toxicity).

**Inorganic Waste:** Waste composed of matter other than plant or animal, such as glass or metal.

**Incineration:** The burning of refuse. Sometimes incineration includes energy capture. Facilities that capture heat energy while burning refuse are called Waste-to-Energy (WTE) or Energy from Waste (EFW) plants.

**Litter:** Improperly placed trash that is free-floating in the environment, and directly impacts our communities and nature.

**Manufacturing Cycle:** The cycle of consumer products which includes placing an order, producing the item, and delivering the item to the consumer. The item itself does not form the cycle, the ordering of the products does.

**Municipal Solid Waste (MSW):** MSW means common household waste, commercial solid waste, nonhazardous sludge, conditionally exempt small quantity hazardous waste, and industrial solid waste.

**Pallet:** A wooden platform used with a forklift for moving bales or other large items.

**Post-Consumer Waste:** Materials that have been used by consumers then recycled (such as plastic containers), and then re-processed into raw materials for new products.

## Glossary

**Pre-Consumer Waste:** During the manufacturing process, lots of excess material is recycled before it is made into products and distributed to consumers. Items made with this material are considered to be made using Pre-Consumer waste.

**Processing:** The operations performed on recycled materials to render them reusable or marketable. Processing can include grinding glass, crushing cans, or bailing newspaper. Processing has two distinct functions: a separation function and a processing or beneficiation function. Processing generally results in adding value to a particular material.

**Recyclables:** Materials that still have useful physical or chemical properties after serving their original purpose. Such materials can be remade into new products.

**Recycling:** The process by which materials are collected and used as raw materials for new products. There are five steps in recycling: collecting waste materials, separating them by type (before or after collection), processing them into reusable forms, marketing the “new” materials and using it to manufacture new products.

**Reduce:** To bring down to a smaller extent, size, amount, number.

**Refuse:** A general term which applies to all things that are disposed, whether it be trash or recycling.

**Reuse:** Using items again by repairing, donating, salvaging, or selling.

**Single-stream Recycling:** When many types of recyclables are collected together in the same bin or dumpster and separated at a single-stream recycling facility which uses many types of fast-paced separation techniques. This is different from “Dual-stream” (paper and commingled recycling in two separate bins) and “Multi-stream” (different bins for different types of recyclable materials).

**Source Reduction:** The design, manufacture, acquisition, and reuse of materials, so as to minimize the quantity and/or toxicity of waste produced. Source reduction prevents waste either by redesigning products or by otherwise changing patterns of consumption, use, and waste generation. (See also, ‘Waste reduction’).

**Trash:** Term that describes “placed” waste, or waste that is properly disposed of.

**Vermiculture or Vermicomposting:** The use of worms to breakdown organic matter, such as food, into compost.

**Waste:** Also known as refuse, waste is the overall arching term which covers both trash and litter. It refers to any material which is disposed of, including recycling.

**Waste Reduction:** Waste reduction is a broad term encompassing all waste management methods, including source reduction, recycling, composting, donation, that result in a reduction of waste going to a landfill or incinerator.

**Waste Stream:** A term describing the total flow of solid waste from homes, businesses, institutions, and manufacturing plants that must be recycled, processed at incinerators, or buried in landfills.

**Yard Trimmings:** Leaves, grass clippings, prunings, and other natural organic matter discarded from yards and gardens.



## Notes Section

Use this page to keep notes and ideas for starting the Trash Free Schools Project at your school.



2001 Bryan Point Road, Accokeek, MD 20607

Phone: 301.292.5665 Fax: 301.292.1070

[fergusonfoundation.org](http://fergusonfoundation.org)

[education@fergusonfoundation.org](mailto:education@fergusonfoundation.org)