



**Maryland**  
Department of  
the Environment

Wasted Food Minimization and Related Activities

# *A Toolkit for Maryland Schools*



**MARYLAND DEPARTMENT OF THE ENVIRONMENT**  
**LAND AND MATERIALS ADMINISTRATION**

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# 1. INTRODUCTION TO THE WASTED FOOD TOOLKIT

Maryland schools have an opportunity to shape the way children think about edible food and **wasted food** (see glossary in [Appendix A](#)). The school building should be filled with learning, both inside and outside of the classroom. The cafeteria is a place where the school community can practice proper principles of nutrition and wasted food prevention, including measuring and tracking of wasted food by performing waste audits, food recovery via the use of share tables and/or donation to local food recovery programs, and food recycling through composting. Practicing these routines in the cafeteria can be a focal point of an environmentally friendly school atmosphere and a basis for hands-on educational activities.

The Maryland Department of Environment (MDE) created this toolkit in 2020 and revised it in 2023 to reflect the efforts Maryland has been working towards in reducing wasted food. This toolkit is a summary of tools to assist schools to reduce, donate, and recycle surplus food to avoid waste, provide an avenue for connecting food to people, and promote healthy soils. Maryland has taken steps to encourage businesses and institutions to address the problem of food going to waste by passing [House Bill 264 Solid Waste Management – Organics Recycling and Waste Diversion – Food Residuals](#) law in 2021. This law requires facilities (including schools) that generate 2 tons/week of food residuals (1 ton/week starting in 2024) to divert these residuals from disposal in a landfill or incinerator if the facility is within 30 miles of an organics recycling facility, such as a composter or anaerobic digester. This toolkit gives information on different avenues for diversion such as donating excess food for people or for animal feed. The kit contains information and resources to help administrators, educators, and staff plan curriculum and policies for their students to learn about and engage in environmentally sound approaches to daily living. There are immediate actions individuals at any age can take to make positive changes, especially revolving around the enormous problem of wasted food in the U.S. Here we highlight what actions the school community can take at school, and knowledge they can share at home.



One-third of all food produced for human consumption is lost or wasted. Photo by Foerster/Wikimedia Commons

## Background: The Wasted Food Crisis

In 2021, [ReFED](#), a non-profit working to end wasted food, estimated 38% of the US food supply goes unsold or uneaten – that’s 91.6 million tons of food, which equals roughly 149 billion meals valued at \$444 billion - roughly **2% of the US GDP**. The majority of this wasted food ends up in landfills, where it produces harmful greenhouse gases – 20 percent of total U.S. methane emissions come from landfills - and contributes to states and localities running out of landfill capacity. MDE estimated that in Maryland in 2017, more food was disposed of than any other single material in our everyday trash, at 17.9 percent of waste disposed.

While one part of the food crisis could be considered an environmental problem, another part of the problem is food insecurity, where someone is unsure about their ability to obtain enough healthy, nutritious, and culturally appropriate food to ensure an adequate daily caloric intake. The Maryland Food Bank (MFB) reports that 1 in 3 Marylanders have experienced food insecurity at some time of their life. Maryland, with a total population of over 6 million, is home to over 650,000 people, including over 200,000 children, who don’t always know where they will find their next meal. Of the estimated 91.6 million tons of food that goes to waste every year in the U.S., much of it is perfectly edible and nutritious. By diverting wholesome food to places where food insecure people can gain access to it, we can support our nation’s food crisis.

In adopting better habits to refuse, reduce, reuse, rot, repair and recycle in our daily lives, people of all ages can help the earth by lowering the amount of greenhouse gases that contribute to climate change, conserving energy and natural resources, creating green jobs and protecting public health and the environment. Children are demonstrating all over the world that they want to grow up on a healthy planet. They are changing everyday behaviors that add up to big improvements in society; for one, they are tackling an enormous issue adversely affecting land, water, and air, humans, and animals – the food crisis.

With Maryland’s new food residual diversion law, it’s good practice for any facility that generates food residuals to be aware of the amounts of wasted food that are being disposed of each week, not only to see if they have any requirements under the law but also to understand what types of wasted food are being created and how it could be reduced. To assist facilities in determining if they are regulated under the law, MDE has created a document called [Determination of Applicability](#). This document will review the criteria for determining if a facility generates the threshold amount of food residuals to be subject to the law. It also explains different methods for determining each facilities food residual amount.

## Why Food Recovery is Important for Schools



Schools provide an ideal setting to begin to tackle solutions for wasted food. Schools both generate food that can be recovered and present the opportunity to instill an awareness of wasted food issues among students and their families.

The typical American student disposes of 67 pounds of food from lunch every school year. That equals around 18,700 pounds of wasted food per year at an average-sized elementary school. In Maryland there were nearly 900,000 students aged pre-kindergarten through high school enrolled in school. That extrapolates out to almost 30,000 tons of wasted food a year. In the U.S. alone, an estimated \$1.24 billion in food is wasted annually in schools. This wasted food could instead be used to feed students or others in the community or to create compost, and much of the single use packaging waste can be avoided altogether.

Wasted food minimization and recovery are also excellent ways to teach students about a variety of environmental and social science topics. For example, composting is a great topic of study for students because it is hands-on, inexpensive to demonstrate on a small scale, can be tailored to any age group, and incorporates a number of topics in science such as chemistry, biology, waste and resource conservation, soil and water quality, and climate change. Additionally, describing the social science from a historical, archaeological, economic, and psychological avenue avails

### *Did You Know?*

- The average U.S. household produces 650 pounds of animal or plant-based waste a year. In fact, 40% of all available food in the U.S. is wasted and sent to a landfill. That's enough to fill an American football stadium every day!
- Wasted food has an impact on the economy; cost of disposal, over-purchasing, and lost energy cost us more than \$100 billion annually. A person wasting food is throwing away about \$2,000 a year on average.
- Organics release methane in landfills, which is 72% more powerful than carbon dioxide per ton of emissions in terms of its climate change impact. Composting a five-gallon bucket of food scraps prevents greenhouse gas emissions equal to burning a gallon of gas.

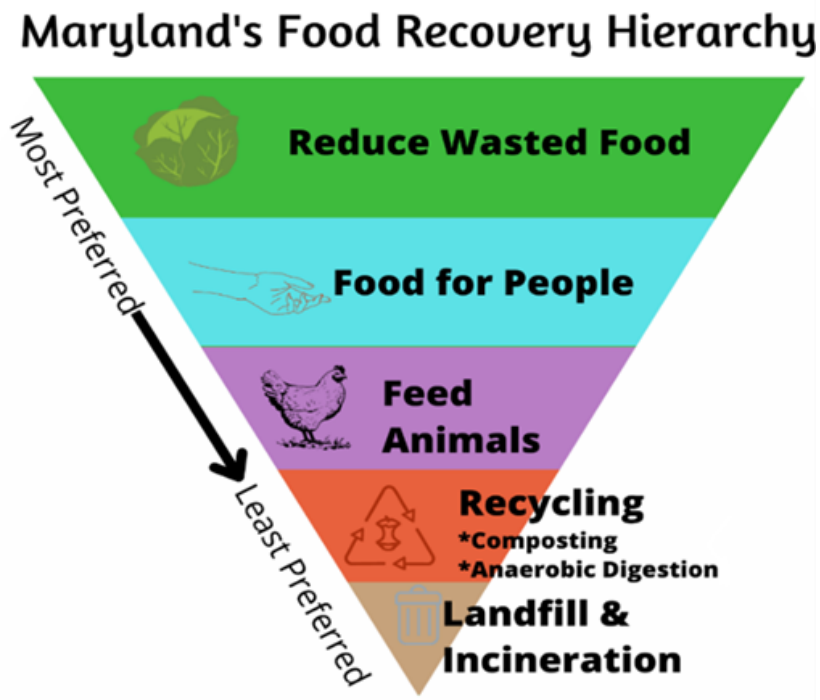
integration into social studies and mathematics courses. We offer this toolkit to administrators and teachers to help create an environmentally conscious culture at schools, and to help tailor a program that your students will be proud to embrace.

## How to Use This Toolkit

The first part of this toolkit will explain how to design and plan a food recovery program at your school. The parts that follow contain descriptions and resources for specific actions that you may choose to incorporate into your program. In developing your food recovery program, you should feel free to tailor it to the particular needs of your school and community. Some of the actions described in this toolkit may be a good fit at your school, while others may not or may be longer term initiatives. Additionally, while food recovery programs can and have been successfully implemented with students of all ages, some resources and activities in this toolkit are targeted to particular age groups, where so noted.

## 2. THE FOOD RECOVERY HIERARCHY

In planning food recovery programs, schools should consider the following hierarchy, which lays out the most to the least preferred ways of dealing with food. The state endorses this hierarchy in its effort to alleviate unnecessary waste, conserve resources, and improve the health of students.



**Reduce Wasted Food** – As a county district, discuss with county food and nutrition program to coordinate within the school cafeteria staff to determine if any food items can be cut out or reduced due to too much wastage. This step may be difficult for schools due to mandated buying programs and the federally-mandated nutrition guidelines found in the [National School Lunch Program](#) (NSLP) and the [School Breakfast Program](#) (SBP). For individual schools, consider hosting a poll of the students to determine which food choices are favorable to others and why. The students provide a voice in their potential choices and meet the social and cultural needs of the school community. This also serves as an educational opportunity should it be determined certain foods are culturally inappropriate.



**Food for People** – This is the second tier of the Maryland Food Recovery Hierarchy. Many times, food disposed of in school cafeterias is wholesome, edible food that is perfectly fine to eat. Schools can be leaders in their communities by collecting unspoiled, healthy food from meal service and allowing share tables, where other students can take extra food if they want, or coordinate with community for personal use, or to donate to local food rescue organizations. Let’s feed people, not landfills.

## Donation Protection Law

### BILL EMERSON GOOD SAMARITAN FOOD DONATION ACT

Passed 1996 - Encourage donation of food and grocery products to non-profit organizations for distribution to individuals in need. This law:

- Protects donor from liability when donating to a non-profit organization;
- Protects donor from civil and criminal liability should the product donated in good faith later cause harm to the recipient;
- Standardizes donor liability exposure. Donor or donor legal counsel do not need to investigate liability laws in 50 states; and
- Sets a floor of "gross negligence" or intentional misconduct for persons who donate grocery products. According to the new law, gross negligence is defined as "voluntary and conscious conduct by a person with knowledge (at the time of conduct) that the conduct likely to be harmful to the health or well-being of another person."

Revised 2022 - Updated liability protections to include donations of an apparently fit grocery product or apparently wholesome food

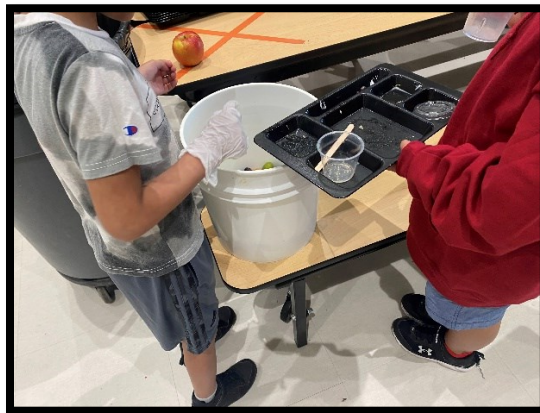
- For which the recipient is charged a good Samaritan reduced price that is no greater than the cost of handling, administering, harvesting, processing, packaging, transporting, and distributing the food or product; or
- That is donated directly to a needy individual at zero cost by a retail grocer, wholesaler, agricultural producer, agricultural processor, agricultural distributor, restaurant, caterer, school food authority, or institution of higher education.





SHARE TABLE AT KENWOOD HIGH SCHOOL

**Feed Animals** – After providing food to people, the next-best diversion method for food residuals is to donate to locations where animals can use as feed (e.g., farms, animal sanctuaries, etc.). Many components of school meals are acceptable for animals to consume, just be sure to follow all federal and state laws concerning donating food residuals for animal feed. Check the webpage for the [State Chemist](#) at the Maryland Department of Agriculture for more information.



Students at Greensboro Elementary in Caroline County collect food scraps for a local farmer

**Recycling** - Food residuals can be sent to compost or anaerobic digestion to be recycled into a new product that can be sold or distributed.

**Composting** – Composting, or controlled aerobic digestion, is a great way to divert food residuals if they cannot be sent for human consumption or animal feed. It releases less methane than a landfill and it converts food scraps into a great fertilizer for new plant growth. The compost process is easy to understand (see [Appendix F](#)) and can be a great scaffold for teaching about math, chemistry, history – just about any subject can use composting as an educational support. In recognition of this, Maryland passed [SB0124](#) “Public Schools – Grant Program to Reduce and Compost School Waste”, a grant program to provide financial support of schools to develop and implement programs for reducing

wasted food and establish composting of food residuals. The [Maryland Association for Environmental and Outdoor Education](#) (MAEOE) reviews applications and selects awardees under this program.



Turn wasted food and carbon  into beautiful compost.

*Anaerobic Digestion* – Food residuals diverted to an anaerobic digester on a farm or commercially to digest the residuals for methane gas, which can be used as a fuel for electrical generation, and for soil amendment material to be used to increase soil fertility.



Anaerobic digester at Kilby Farm, Colora, MD

*Industrial Applications*- Certain food material, such as fats, oils, and greases, can be processed for biofuel (like biodiesel).



Used oil converted to biodiesel [inhabitat.com](http://inhabitat.com)

**Landfill/Incineration** – Landfilling (burying underground) or incineration (burning in a furnace as fuel) should be the last resort for disposing of wasted food. Landfills are expensive to maintain, take up valuable land, and, as food scraps decomposes anaerobically, release large amounts of the greenhouse gas methane into the atmosphere. Incinerators can produce large amounts of air pollution as the food is burned along with other solid waste. In general, we should work to reduce waste going to landfills with all of the things we use in everyday life, from reusable water bottles to recycling cans.



[HTTPS://PL.WIKIPEDIA.ORG/WIKI/WIKIPEDYSTA:CEZARY\\_P](https://pl.wikipedia.org/wiki/WikipedySta:Cezary_P)



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## Sustainability

Sustainability is the concept that is receiving great attention these days. It is important that students know what this term means and how it is a useful concept for living an environmentally friendly way of life. [Greenly](#) defines sustainability as “fulfilling the needs of the current generation without compromising the needs of future generations, while ensuring a balance between economic growth, environmental care and social well-being.”

In its simplest form, sustainable practices look to reduce the amount of waste, reuse materials when we can, and recycle materials that cannot be reused. This is called the **Three “Rs”**:



*This simple inverted pyramid is a good visual of the main concepts of sustainability for younger grades. Most of what we want to do is **reduce** the amount of material we use, next best is to **reuse** as many things as we can, and finally we want to **recycle** the things we can't use.*

For higher grades, it's good to delve more deeply into the concepts behind sustainability. We want to think about the things we use and how we affect our planet. As students grow older, they are able to make better individual choices on how they can practice sustainability. These students should understand the **Six “Rs”**:



***Rethink** the way you use things  
**Refuse** what you will not eat  
**Reduce** the amount of material you use or take  
**Reuse** things by donating them when you are done with it  
**Repair** things that can be fixed instead of throwing it away  
**Recycle** things that can be recycled, either by dropping off at a central location and/or being put into your curbside recycling bin (check with your local jurisdiction).*

### **3. PLANNING A FOOD RECOVERY PROGRAM**

So now that we know the problems with the wasted food crisis and some ways to divert your food residuals from a landfill, let's look at some steps to take at your school to implement a sustainability program to try and solve the wasted food problem at your school. (see [Appendix C](#))

#### **Identify and Establish a Green Team**

To ensure that a school food recovery program is successful, it is important to identify a team to be its champion. This "Green Team" will take the lead on planning, establishing roles and responsibilities, communicating the benefits of food recovery, and troubleshooting any issues. Best practices for establishing your green team include:

- Connecting with the community where the school exists as this will allow long term stability of the team.
- Where it exists, an environmental club can make a good green team by involving students and faculty with an existing interest in environmental issues.
- Make sure to involve a passionate adult at the school to help guide the students and be the team leader!
- Science teachers are great members of the green team because they can help communicate the environmental benefits of reducing and recovering wasted food, as well as help explain the science of composting.
- Ask your School Food Service Director and cafeteria staff for support. They can share information about food management strategies used in the school food programs.
- Remember to include facilities staff, and parent volunteers.
- You can invite MDE to visit for outreach or hands on programming events.
- Contact your local government, including the Health Department and Department of Waste Management. They can provide guidance and local regulations for your area.

#### **Make your School a Green School**

While you're at it, why not make your entire school a Maryland Green School! The [Maryland Green School Program](#) is run through the Maryland Association for Environmental and Outdoor Education (MAEOE). The goals of the program are to enrich student education with hands-on, inquiry-based instruction and increase sustainability in schools and communities. There are currently 680 certified Green Schools in Maryland. Many of the objectives required for application include waste reduction and recycling activities and by encouraging student and community connection fulfill additional metrics of the Green School application.

The Maryland Green Schools award program provides statewide and local county/city recognition and is supported by a network of Green Centers and partners. All Maryland PreK to 12th grade public and independent schools are eligible to apply. Funding and educational assistance is available.

To find out more and apply, please visit MAEOE's [Green School webpage](#).

Once you have assembled your schools “Green Team”, hold a kickoff meeting to discuss the goals of the program and why wasted food diversion is important.

- For inspiration, show your green team [“The Extraordinary Life and Times of Strawberry” video](#) to follow the journey of one extraordinary strawberry from vine to plane to palette to grocery aisle and all the way to the bottom of a garbage bin.
- See what other schools are doing with food residuals by showing [“Don’t Throw it Away!”](#), a video that explores how students at an upstate New York school are using their food scraps to make biogas in the classroom.
- For younger students (k-5), show PBS’ [“Kids Go Green: Reducing Food Waste”](#) video for a short explanation of how wasted food impacts the environment and what can be done to prevent it.
- Also for younger grades, you can print out the [Food is too good to waste!](#) activity book.

## **Identify the Waste**

In order to develop a good plan, your school must first understand the scope of the problem. Conducting a waste assessment (audit) in your school cafeteria before you begin your food residual diversion program will help answer many questions as to why and what types of food are being wasted and sets a baseline for the school. A waste audit is just an activity where you measure the amount of food not eaten during a school day. The audit can take place for a single day or for a longer period, such as a week. This will help the students and everyone involved to visualize and be able to compare before and after results so they can see their successes, plus they are a quick way to learn which kinds of foods go uneaten by students in a school cafeteria.

To prepare for a waste audit, coordinate ahead of time with school administrators, cafeteria staff, janitorial staff, and any teachers, parents, or community members willing to help. The goal of this activity should be to identify the amounts and types of waste that the school generates on a daily or weekly basis. Conducting waste audits can be a hands-on educational tool as well, providing learning opportunities in project planning, data collection, analysis, and display, and may even offer an opportunity for students to earn community service credits.

There is no one specific way to conduct a waste audit; each school has its own unique situations. In general, though, a waste audit should include the following: (see [Appendix C](#) for more information)

- A dedicated, manned station that is the only place where all waste, including food residuals, will be disposed for that breakfast/lunch period;
- Several labelled bins or containers where different foodstuffs can be disposed of (including a bin just for liquids), as well as trash cans for any non-recyclable, non-compostable material;



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- Observers/Volunteers who monitor the station to make sure materials are being distributed into the correct bin/container;
- A place within the cafeteria where unopened/non-damaged fruits/vegetables, drinks and other packaged foods can be placed for the share table;
- A way to measure the amount of food residuals for each period (usually done by weight) and a way to record the results of each type of diverted grouping for later calculations.

The EPA, USDA, and University of Arkansas have created [a step-by-step guide](#) for conducting a school waste audit with great ideas on obtaining accurate, thorough data. All schools should be performing a waste audit in accordance with the Food Residuals Diversion law. You can modify the suggestions in the guide to fit the conditions in your particular school, or use MDE’s guidelines found in [Appendix C](#). Locally, [Lunch out of Landfills](#) has toolkits and data tracking programs that may be useful. [Grades of Green](#) has produced worksheets that can be used during a waste audit ([Appendix E](#))

In addition to measuring how much food is wasted, try to identify why the food was wasted. Conduct a survey of some of the kids who seem to leave a lot of food uneaten; ask them why they didn’t eat a particular item or two and record their responses. The step-by-step guide above contains sample questions to ask. After studying the data, your “green team” can develop suggestions for potential waste reduction strategies that make the most sense for your school.

You might want to take pictures during the process to use in your school newsletter, social media, and 100% for the Green School application/reapplication. We would love it if you shared photos with us at MDE – we have our own social media accounts! Send to [lisaajones@maryland.gov](mailto:lisaajones@maryland.gov).



The World Wildlife Fund's Food Waste Warrior School Program has a brief video of schools performing a waste audit on its [YouTube channel](#).

A follow-up waste assessment (audit) after a few months of an implemented program is underway can reveal how successful your school is at wasted food reduction or if there are additional changes necessary to further curb or reduce wasted foods.

### **Create Your Action Plan**

Once you have the results of your waste audit, you can create a plan for how to address the waste that you observed. In developing your plan, you may wish to contact your district's facilities management division with a combined effort with the [local government recycling coordinator](#) to understand what, how, and when your school could be recycling, since this can vary by locality.





Your event action plan should include:

- What actions the school will take to reduce wasted food, donate uneaten food, and recycle food that cannot be eaten.
- How you will track and chart your progress.
- How and when you will communicate with parents, staff, and students.
- Who will be responsible for each aspect of the action plan.
- How to evaluate success and troubleshoot any issues that arise.

For examples of other school's action plans, see the following:

- *Westernport Elementary School's* [cafeteria waste reduction plan](#)
- Minneapolis Public Schools' [food waste action plan](#)

For those obtaining lunch at school, cafeteria workers should note what is being wasted, so they can procure foods henceforth that will yield less waste.

*The following are additional resources to help with a waste-free lunch:*

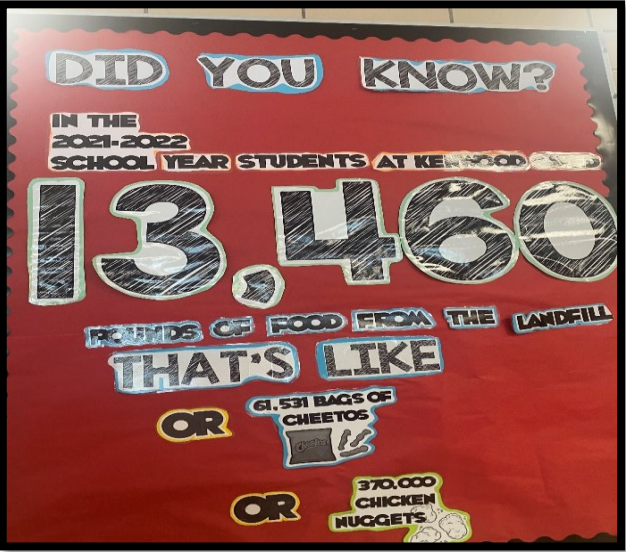
- [Environmental Protection Agency's \(EPA\) Guide on How to Pack a Trash-Free Lunch](#)
- [Wholefully.com's guide on preparing waste-free lunches](#)

Show Your Progress! Collect data on your activities and display how well your school is doing at reducing wasted food. It's a great way to visualize your impact.



Make it a fun activity

Label receptacles clearly



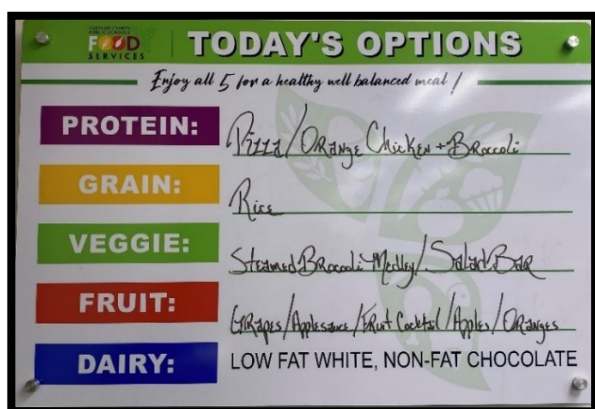
Keep a tally of the food saved from landfills

## 4. WASTE REDUCTION STRATEGIES

The United States Department of Agriculture (USDA) has published [strategies for reducing wasted food at schools](#). These may be useful to implement at your school.

### Offer versus Serve (OVS)

OVS is a provision of the National School Lunch Program (NSLP) and the School Breakfast Program (SBP) that allows students to decline some of the food that is offered in a reimbursable lunch or breakfast (see [Appendix B](#)). The goal is to reduce wasted food by allowing students to choose food that they would eat, while still maintaining the meal reimbursable for the school through the [USDA](#) (e.g., in senior high school, lunch for students must select 3 of the 5 components in the planned serving size). Illustrative signage should be provided in the food line that clearly indicates which items make the meal reimbursable, so that students will be aware of items that meet this criteria and understand what options they are required to select for a ‘complete’ reimbursable meal.



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### Share Tables

Share tables are used as a place where students can place whole or unopened foods that they do not want to eat, and other students can take food from the share table for consumption. Food left on the share table can be used for students during the lunch period, or for afterschool snacks for clubs, sport teams, study groups or other activities. Additionally, with the expansion of the Bill Emerson Good Samaritan law, food may be provided to any person who will ultimately consume it. Make sure any perishable food (such as milk) is stored immediately after lunch in a cooler to maintain a proper temperature. Share table items are not counted against a reimbursable meal, and the items can be used again in a new reimbursable meal. USDA encourages the use of share tables and offers [implementation guidance](#). Some school systems may have requirements that food placed in share tables must only be from materials obtained from the cafeteria and not “from home”

items. Be sure when executing a share table this information is relayed in the cafeteria and to the student body.



SHARE TABLE AT KENWOOD HIGH SCHOOL



SHARE TABLE AT GREENSBORO ELEMENTARY SCHOOL

### Extend Lunch Periods

Lunch periods are often very rushed, with students having to come in, find their seat, stand in the service line, and then sit and eat before the period is over. This can lead to rushed eating where food is wasted. [Polls](#) have shown that 20% of parents of elementary-age students surveyed report that their child gets 15 minutes or less to eat lunch. Providing a longer lunch period helps improve the dietary intake for students and helps reduce wasted food. It would also make any food separation activities more effective with students not rushing to eat and get to class.

### Prioritize Food Served After Activity

If allocation of time is a scheduling issue, consider modifying schedules so that recess is before lunch. The National Food Service Management Institute determined that “when students go to recess before lunch they do not rush through lunch and tend to eat a more well-balanced meal”. [Additional research](#) determined that if recess is before lunch, students: waste less food (as much as 27 to 40%), consume as much as 35% more calcium and protein, are calmer and ready to get to work immediately instead of needing a cool-down time, have decreased discipline referrals, litter less on school grounds and inside the school, and have decreased number of nurse visits for headaches and stomachaches after recess.

### “Market” Your Food

Create colorful and descriptive labels for your food line. Highlight any new menu item or a known favorite. Provide a way for students to provide feedback on menu items and suggestions for new items. If you have a school newsletter or webpage, you can promote upcoming menus and share recipes from school staff and/or parents. Have students anticipate their next breakfast and lunch. Less food will be wasted if the students are excited to eat!



USDA



St. Mark Lutheran School, Kane'ohe, Hawaii

## 5. FOOD FOR PEOPLE STRATEGIES

Use food as a source for good deeds! *Reuse or repurpose food* products and materials – set up a **share table or pantry**, or **donate** to the community. Redirecting excess food to people provides immediate benefits to public health and the environment. Federal law provides certain civil liability protections for a person who donates, prepares, dispenses, or serves food in good faith and without “gross negligence” for use or distribution by a nonprofit corporation, organization, or association. Review the Harvard Law School Food Law and Policy Clinic published [legal fact sheet from December 2023](#) with the updated liability protection for donating and distributing food.

### **Start a Food Donation Program**

Watch a [video](#) about donating food. [Find a food pantry](#) in your area to donate to. Perhaps your school can partner with a food pantry or nonprofit in your area. Sustainable America hosts a nationwide “[Food Rescue Locator](#)” where you can type in your location to see who in your area can accept food donations. Many food pantries accept fresh food, so explore those avenues first before throwing food out.

Consider starting a food pantry in your school. The [Maryland Food Bank created a guide](#) to help schools create and maintain a pantry program. There are now at least [200 school pantries](#) in Maryland! Find out if your school district already has a school food pantry program!

Check with your local government, including the health department to see if there are additional resources for donating or sharing food in your area.

## **6. FEED FOR ANIMALS**

You might discuss the possibility of donating food residuals to feed animals within your community or local agricultural centers. Just make sure that you follow any regulations concerning donating food to animals. The State Chemist is responsible for certifying animal feed in Maryland. The [Leftovers for Livestock: A Legal Guide for Using Food Scraps as Animal Feed](#) has more information on donating for animal feed. Check with your local county and the [Maryland Farm Bureau](#). The USDA also regulates animal disease prevention, which includes regulations concerning the feed fed to different animals.

- [Maryland Department of Agriculture State Chemist](#)
- [United States Department of Agriculture Animal Disease Information](#)

## **7. COMPOSTING (It's a form of recycling!)**

The average American throws out 1,200 pounds of organic material (mostly food) that could have been [composted](#) instead of putting into a landfill or incinerating it. Climate change, public awareness of food insecurity and recent changes to legislation, composting is gaining public interest. About two-thirds of our waste could be composted. Composting is a controlled process in which organic materials, including food scraps, are allowed to decompose with the right amount of oxygen and moisture, creating compost. Compost is a cost-effective, simple-to-make, nutrient-rich soil amendment for household and garden plants. Food scraps can be saved and naturally processed to eventually become a rich soil additive that is great to grow vegetables! At schools, composting can help to reduce disposal of inedible food scraps that cannot be donated, and also makes a great topic for science classes.

### **Beware of “Greenwashing”, a deceptive marketing practice.**

Don't confuse the terms “Compostable” and “Biodegradable”. All compostable products are biodegradable, but biodegradable products may not be compostable. Make sure that any material put into a compost bin is a food product or certified compostable. Some manufacturers may label their packaging as biodegradable as there is no certification required. Products labelled this way may take years to fully break down in the environment, instead of being compostable, which must be backed by scientifically verified evidence of decomposition into natural, non-toxic material in a timely manner.

In 2022, the Maryland General Assembly passed [Senate Bill 24 – Grant Program to Reduce and Compost School Waste](#). Under this law, a public school, or an entire school board, can apply to receive funding to develop and implement programs for reducing wasted food and to establish composting of pre- and post-consumer waste. The MAEOE creates, reviews and selects grant applications; then awarded grants by the State Department of Education (MSDE). Read an article describing the student movement behind this law [HERE](#).

There are two approaches schools can take to start composting programs. First, a school can compost organic materials on site. The benefit of this option is that it allows students to be involved in the composting process, providing a hands-on learning opportunity. On-site composting also provides a compost product that the school can use, such as in a school garden to grow vegetables. This is a great example of “closed loop” recycling. Composting on site will require planning, space, and attention. The longevity of a well-maintained compost site is important as schools are typically occupied only 10 months out of the year. Some school systems may not allow for food scraps included in the composting bins to reduce potential vectors for this shortened on-site timeframe. Additional information below describes simple and low-cost ways to compost on site at a small scale.

Second, a school can collect food scraps and send them off site to a commercial or community composting facility to be composted. This option may not be available in all areas of Maryland yet, but can be a good opportunity for schools that aren’t ready to delve into on-site composting for space or other reasons.

Below are some tips on implementing a composting program using each of these two approaches.



## Compost On-Site



There are many great guides to composting at a small scale, including at schools specifically. These resources are included at the end of this section, but for any composting method, it is important to understand the basics of how composting works.

During the composting process, microorganisms (tiny living things, like bacteria or fungus) consume and decompose the food scraps and other material to create compost. In order to support those microorganisms to allow composting to happen, a compost pile needs the following things:

- Carbon-rich material (“brown” materials shown below)
- Nitrogen-rich material (“green” materials shown below)
- Air
- Water (moisture)

Browns
<ul style="list-style-type: none"><li>• Leaves</li><li>• Hay or straw</li><li>• Wood chips and twigs</li><li>• Sawdust</li><li>• Shredded cardboard</li></ul>

Greens
<ul style="list-style-type: none"><li>• Cafeteria scraps</li><li>• Fruit and vegetables</li><li>• Coffee grounds</li><li>• Green plant trimmings</li><li>• Animal manure</li></ul>

**Note:** Before starting your on-site composting program and selecting the materials to be composted, check with your local government to see whether there are any restrictions on what materials can be composted. Under state law, composting of any of the materials above, if done properly, is allowed on an area of up to 5,000 square feet without the need for a permit. However, local governments may have additional requirements or limitations, so it is important to consider



that in advance. Your [local soil conservation district](#), department of agriculture, or [county recycling coordinator](#) are good contacts to start with.

States and organizations have created step-by-step guides for school composting. Because there is so much great information on this topic, it can be difficult to know where to start. We recommend beginning with one of the following guides:

- Connecticut Department of Energy and Environmental Protection's [School Composting...the Next Step in Recycling](#)
- The Institute for Local Self-Reliance's [Composting on Site at Schools](#)

If you are interested in trying **vermicomposting** (composting with worms), then check out EPA's website on [How to Compost at Home, including vermicomposting. Local to Maryland, Baltimore County Public School, Dundalk ES](#) runs an in-classroom vermicomposting program.

Additional guides and information on school or small-scale composting include:

- Green Mountain Farm to School, [A Guide to Starting a Composting Program in your School](#).
- [Composting School Cafeteria Food Scraps](#). A how-to video on YouTube (9:29)
- [Construct A Compost Pile](#). Tips from the Chesapeake Bay Program
- [Composting for Kids](#). An animated teaching guide on YouTube (5:56)
- [Center for EcoTechnology, Composting in Restaurants and Schools](#). This toolkit provides simple step-by-step instructions for planning and implementing a composting program at a restaurant or a school, complete with the estimated time needed to carry out each step.
- [University of Maryland, Campus Sustainability](#). The University of Maryland website shows a brief video and photos of the school's bins and signage for collecting recyclables and compostables at the dining halls and student union. Similar methods could be adapted for a K-12 school setting.
- [Northeast Recycling Council, Composting School Food Scraps and Soiled Paper](#). This concise guide outlines the steps and considerations to planning a composting program for typical cafeteria scraps.
- [Northeast Recycling Council, School Composting Options](#). This presentation is a companion to the above guide by Northeast Recycling Council. It describes in more depth (and with pictures) the planning and siting process, options for composting bins, and methods of collecting the food. Troubleshooting tips are also included.

### **Worried About Odors and Pests?**

A well-maintained composting pile ordinarily will not cause significant odor problems. If you notice excessive odors, your pile may be too wet, have too much nitrogen-rich (green) material, or have too little oxygen (browns). Try turning the pile to add oxygen or adding fluffy, dry, carbon-rich material. If your pile is attracting pests, make sure that all food scraps are mixed into the pile rather than on the surface, consider covering the pile with finished compost or other cover, and consider keeping meat scraps out of the compost pile.

For tips on integrating the science of composting into lesson plans, see the following resources:

- [Cornell Waste Management Institute, Composting in Schools](#). This website includes information on school composting, classroom activities, labs, projects, background on the basic science of composting, and a composting quiz.
- [CalRecycle, Vermicomposting Classroom Activities](#). This selection of activities is designed to be used in conjunction with a class vermicomposting project. It includes worksheets for students to record their observations about the worms, games, and experiments. composting and recycling (e.g., how to correctly source-separate various items).
- [Central Vermont Solid Waste Management District, Do the Rot Thing: A Teacher’s Guide to Compost Activities](#). This guide provides compost-related activities grouped into categories, including basic composting, worm composting, and spreading the word (compost marketing and publicity). Each activity has a recommended grade level range.
- [Connecticut DEEP, Composting Video Downloads](#). These free videos show how to compost at home and also show how yard trim is processed at a larger-scale composting facility.
- [Trautmann, Nancy and Marianne Krasny, Cornell University, Composting in the Classroom: Scientific Inquiry for High School Students](#). This extensive guide was developed through the combined efforts of high school science teachers and scientists at Cornell University. It provides teachers the scientific background on composting that is necessary to support their students in conducting composting research. It also provides a guide to composting research projects, including example experiments. This guide would be useful in preparing for a science fair or similar program.
- [Cornell Cooperative Extension, Composting: Wastes to Resources](#). This guide is designed for teachers and 4-H leaders and explains the basics of how composting works and how to get started. It includes ideas for composting “investigations” and templates for students to record their observations.
- [“Best Ever” Compost Recipe](#) from Cornell Cooperative Extension.



LAHS ECO ENGINEERING

## Send Food Scraps for Composting Off-Site

Another option for schools is to contract with a private hauler or composting facility to collect school food scraps for composting elsewhere. If you choose this option, be sure to ask your contractor where the food scraps are taken for composting. Some composting facilities may allow field trips for students to see the composting process, even if the school does not have on-site composting.

MDE maintains a list of [food scrap haulers](#) on its website (inclusion on the list does not constitute endorsement and the list may not be exhaustive). A growing list of the composting facilities in Maryland can also be found on MDE's website [HERE](#).

Local Farms also generate compost from food scraps, so consider reaching out to your local [farm bureau](#) to see if they can pair your school with a local farmer.



WASTE360.COM

## Use Your Compost! Grow a School Garden!

*Growing-Minds.org* offers tips on setting up a school garden:

**1. Start early.** Make plans for your spring garden in January. Think about where and what you're going to plant, as well as resources in your community. Who might donate a few seed packets? Who could help with preparing the seed bed if your students aren't old enough? You may want to contact your local high school or community college. Students in agriculture programs could potentially offer labor, plants and/or planting advice. Local Garden Club members or [Master Gardeners](#) might also offer their time to give you an extra hand.



AT CRELLIN ELEMENTARY IN GARRETT COUNTY, ALL STUDENTS GARDEN. PHOTO BY MAEOE

**2. Start small.** The first year that you garden with your students, don't feel pressure to have a big harvest. Start with a small space, turning over the soil with a shovel. To reduce weeds, remove grass and roots as you turn the soil or cover it with cardboard for a month beforehand. Most soils that sustain grass are fine for growing vegetables. Incorporate your compost, if available. You don't have to plant lots of different edible crops. Classroom gardens should be more about the experience and magic of growing rather than what is produced. A small successful project is something you can build on each year. Note: If you're choosing a non-food-based garden, consider using native eco-type plantings as they require less maintenance long term.

**3. Send home a wish list with your students.** Many community members have old tools lying around that they don't use or would be happy to donate seeds, gloves, compost, mulch, etc. With proper assistance, students connect with community to request these items, practice leadership and public speaking, and enrich community strength by collaborating with those outside the school. You may even consider cross-educating with the local garden club on how to maintain tools or create a donation seed bank. Be considerate that not all seeds should be grown, check your local [Check](#) to ensure this you don't accidentally plant an invader or noxious weed plant.

**4. Tell teachers and administration about what you are doing.** Showing your school's administration and other teachers how you are tying the garden into curriculum will build support and encouragement. You might even inspire others to get involved!

Here are some [great examples of different kinds of school gardens](#), brought to you by City School Yard Garden.

How about [a grant for Kids and School gardens](#)? The [Whole Kids Foundation online School Garden Resource Center](#) offers a guide and grants whether you're working to build a new school garden or support an existing one.

[Big Green](#) is a school garden program headquartered in Colorado that works with schools to produce "learning gardens" that can help boost kids' nutrition and academic achievement with healthful produce kids grow themselves! Big Green gardens are located currently in seven U.S. Cities and the program involves more than 100,000 students a day.

## Buy Locally and Partner with a Farm



“Farm to School” means bringing locally produced foods into school cafeterias; other related aspects include hands-on learning activities such as farm visits, farmers visiting schools, school gardening, culinary classes, and the integration of food-related education into the standards-based classroom curriculum. Farm to school includes all types of producers and food businesses including farmers and waterman as well as food processors, manufacturers, and distributors. Implementing farm to school programs in conjunction with wasted food reduction, donation, and composting programs can help students understand the entire food cycle and how recovering surplus food helps to “close the loop.”

Maryland schools spend **\$19 million** on local food served in schools according the [Maryland Department of Agriculture](#). Maryland was the first state in the nation to have every public school system participate in the Maryland Homegrown School Lunch, an element of the Maryland Farm to School program.

Contact the [Maryland State Department of Agriculture Farm to School Program Director](#), and the [Maryland State Department of Education Farm to School Specialist in the Office of School and Community Nutrition](#) Programs for more information and resources. Visit the [Maryland Farm to School website](#) for details of Maryland Homegrown School Lunch Week that takes place every autumn, then check out the [National Farm to School Network](#) for more resources.

## **8. CELEBRATE YOUR ACHIEVEMENT!**

Once you have implemented your food recovery program, it's time to evaluate and celebrate your success. Consider conducting a follow-up waste audit to measure how much wasted food your school has avoided. A follow-up waste audit can also reveal foods that are still being wasted, so that you can continue to make progress.

Throw a school wide event celebrating your waste minimization and food recovery success! Choose a meaningful day like [Food Waste Prevention](#) Week, America Recycles Day, Earth Day, or Arbor Day. The principal can award certificates to the class or the lunch table that recycled the most, and present certificates to members of the team involved with the success of the program. A starter kit for home composting would be a great incentive reward!

Another way to recognize your success is to consider certifying as a [Maryland Green School](#).

- Founded in 1999, the Maryland Green Schools Program (MDGS) is a sustainable schools program.
- Nationally recognized, the MDGS allows schools and their communities to evaluate their efforts in environmental sustainability. Participating schools empower students to make changes that will reduce environmental impact, encourage sustainability, and foster environmental literacy.
- Maryland Green Schools benefit from the instructional support and partnership of Green Centers and Green Leaders. Green Schools have access to an extensive network of partners in their community and statewide resources.
- The program is administered through the MAEOE and funds to help run the program are included in the State Budget, approved by the Legislature and the Governor.
- The MDGS was developed by a diverse team of educators.
- The Maryland Green Schools Award Program recognizes Maryland schools that practice good environmental stewardship and include environmental education in the curricula.
- A new Maryland law (took effect 7.1.19) provides more resources for schools who certify as “green.”



[Visit the Maryland Green Schools Program Website](#)

Perhaps you can begin with the waste reduction and diversion project, and then see if your school can keep going to be the next certified Maryland Green School! For information about becoming a Green School, please visit: [www.maeoe.org](http://www.maeoe.org). A timeline for becoming certified can be found in [Appendix D](#).

## Maryland Green Schools

- ☀ Currently there are more than 660 Maryland Green Schools, 36% of all schools in the state. For a full list of schools click here, [Green Schools by county](#).
- ☀ This Maryland community of sustainable green schools is creating leaders and stewards for protecting Earth's natural resources.
- ☀ The application process is simple and straightforward, and a great way to motivate your students to contribute to the school and the local community.

## 9. SOME GOOD EXAMPLES

### Chapel Hill Elementary, Charting a Green Future

As part of its 'Waste-Free Lunch' school outreach campaign, MDE staff visited Chapel Hill Elementary during lunchtime in the spring of 2019. The students enthusiastically embraced



recycling, and listened about how to reduce their trash output overall by remembering the 3 R's: Reduce, Reuse, and Recycle. They are now going forth with environmental awareness and sensitivity!

Teacher Jason Shaw leads a green team of elementary students at Chapel Hill (from 4th and 5th grades) and the school now regularly recycles on Wednesdays. Mr. Shaw said, "Before our first Waste Reduction Day, we measured our waste. Our before totals were an average of 17 bags of trash each Wednesday. After we started doing our Waste Reduction Wednesdays, our average total dropped to an average of 14, (but we've gotten down to 9 bags.) We will be implementing an expanded program with selected students manning the liquid/trash/recycle stations this year." The school also received a promo code from a company that makes Bento boxes. Chapel Hill has placed the code on their supply list so that students can get a discount and start bringing lunches that lend themselves to less waste.

Chapel Hill took it a step further by starting its own composting. They began with just two worm bins, one in each of 2 classrooms.

Ms. Shaffer and Mr. Shaw spearheaded the program so they used their rooms as guinea pigs to see how the bins would do in classrooms, i.e., smell, flies etc. The experiment worked so well that eventually they were able to install worm bins into 23 classrooms, making 45 pounds of nutrient-

#### CHAPEL HILL STUDENTS CHECKING OUT THEIR COMPOST PILE

rich compost during the school year. Mr. Shaw said, "We will be adding our compost to the pollinator garden that we built at the end of the year."

- Cassidy S: "The worm bins were a little smelly, but they were also really cool because we got to see the worms squiggle around and turn our old food into good soil for our garden."
- Venessa P: "The best thing about the worm bins was that I was able to name all of the worms, at least the ones that I saw. It was fun to see all my new friends turn food into stuff for a healthy garden."

## **Greensboro Elementary School, Caroline County, MD**

MDE personnel visited Greensboro Elementary School in Caroline County in the Spring of 2023 to observe their food residual separation and collection activities during lunch periods. Heather Darr is in charge of the food diversion program at Greensboro and showed MDE some of the activities that students participate in during lunch.

Greensboro Elementary has an agreement with a local farmer who comes to the school and picks up discarded food scraps to take back to his farm where he uses the food as feed for animals on his farm. Students separate plates, trays and cutlery from food scraps and place them into separate,





labelled bins. Student volunteers monitor the bins to make sure that everything goes into the correct bin and contamination is kept to a minimum. Any food that remains wrapped or fruit that hasn't been bitten into can be placed on a share table where other students can take the food to eat.

Here's Heather explaining the student's process during lunch:

“So other than having one child from each class be the designated "grabber" each day, I also have some fourth graders that come to me after lunch to help weigh the buckets, do the math of subtracting the weight of the buckets and then adding up to get our total, then they help me clean up and put the buckets either in the refrigerator or outside to be picked up for the farm. Before, when we were collecting the apples from breakfast, they would count those up also.”

“Since we started weighing the food waste on Nov. 28th, 2022 (we had collected a week or so before we started weighing) up until today we have saved 6,438.3lbs of food from the trash and either delivered or had it picked up for animals.”

“Since our meeting (with MDE) we have eliminated the gloves we used to give our grabbers and switched to tongs for all except 1st grade who just aren't able to use the tongs yet.”

Tongs are a great sustainable solution in lieu of single use plastic gloves. They can be washed and used again and again. They also help reinforce dexterity and hand-eye coordination.

## 10. ADDITIONAL RESOURCES

[Maryland Food Bank Hunger Map](#)

[Maryland Department of Environment \(MDE\) flyer: Waste Free Lunch](#)

[Wasting Less Food in K-12 Settings: Best Practices for Success](#)

[USDA Creative Solutions to Ending School Food Waste](#)

[Great Tips and Nifty Tools for Saving Food from Going to Waste](#)

[Food Waste Warrior Toolkit](#)

<http://www.foodrescue.net/> For grades K-12 [State Farm to School Network toolkit](#)

[Guide for Starting Farm to School](#)

[Further with Food](#) (Center for Food Loss and Waste Solutions) – Sort by topic

[USDA tips on How to Grow a School Garden](#)

[Edible School Yard Project](#) (Hundreds of free lesson plans and materials)

# **Appendix A**

## **GLOSSARY**

## GLOSSARY

Aerobic Digestion – a microbial process (such as decomposition) which occurs with the availability of oxygen. Composting is an aerobic process.

Anaerobic Digestion – a microbial process which occurs in the absence of oxygen.

Biodegradable – capable of being decomposed by bacteria or other living organisms. Biodegradable material may not be compostable if the decomposition occurs over an extended period of time.

Climate Change – long-term shifts in temperatures and weather patterns. Such shifts may be natural, but man-made processes have increasingly become the main driver of this change.

Compost – the product of the controlled, aerobic decomposition of organic materials into a nutrient-rich soil amendment or mulch. Compost is usually a dark, crumbly, earthy-smelling material.

Compostable – biodegradable material able to be decomposed and converted into compost within the time and temperature profiles found at commercial composting facilities.

Culturally Appropriate Food – food that is suitable for donation based on a community’s dietary needs, culinary traditions and historical background.

Food Recovery Hierarchy – A tiered listing of food recovery preferences based on prioritizing processes that have the most environmental benefits to the least environmental benefits.

Food Security (Food Insecurity) – having, at all times, both physical and economic access to sufficient food to meet dietary needs for a productive and healthy life. Food insecurity thus is having a lack of this access.

Greenhouse Gas – an atmospheric gas that acts to absorb infrared radiation, in the form of heat, and prevent it’s escape into space, causing the Earth’s surface temperature to increase.

Greenwashing – a marketing technique that uses false or misleading statements about the environmental benefits of a product or practice.

Offer vs Serve – a program of offering schoolchildren a choice of whether to take a menu item for a meal rather than serving them a required item that they may not want to eat, thus becoming wasted food.

Organic Waste – biodegradable material produced mainly from living organisms, either plant or animal. This type of waste can be decomposed by bacteria or other living organisms.

Share Table – a space set aside in a cafeteria where students can place unopened or otherwise edible menu items that they don’t want to eat, so that other students can take and consume the items if they want. Items can also be distributed for afterschool activities or taken home by students.

Soil Amendment – any material added to a soil to improve its physical properties, such as water retention, permeability, water infiltration, nutrient load, drainage, aeration and structure.

Sustainable Food Systems - a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised.

Vermicomposting – a process that relies on earthworms and microorganisms to convert organic materials into a valuable soil amendment such as compost.

Waste Audit – a procedure where material that is no longer wanted is categorized (such as recyclable, compostable, trash, etc..) and quantified to collect data on the types and amounts of material being discarded.

Wasted Food – Food that is fit for consumption but consciously discarded either at the pre- or post-consumer phase.

Zero Waste - Designing and managing products and processes to reduce the volume of waste and conserve or recover all resources so no trash is sent to landfills, incinerators, or the ocean.

# **Appendix B**

## **Offer versus Serve (OVS) Guidelines**

## **Offer versus Serve**

*From USDA's [Offer vs Serve Guidance](#)*

Offer versus serve (OVS) allows students to decline some of the foods offered in a reimbursable lunch or breakfast. The goals of OVS are to allow students to decline some of the foods offered and to reduce wasted food.

### **Definitions**

- Food Component: One of the food groups that comprise a reimbursable meal (examples: fruit, grains, milk)
- Food Item: A specific food offered within the food components (example: muffin, apple, burrito)

### **General Requirements**

- Students have the option to decline item(s)
- Meals are priced as a unit, even if a component(s) or item(s) is declined.
- Full amount of each component must be available to choose

### **Lunch OVS Requirements**

- Student must select 3 of the 5 components, in the planned serving size
- Student must select at least ½ cup serving of fruit and/or vegetable as one of the components selected

### **Breakfast OVS Requirements**

- Menu must include at least 4 food items
- Student must select at least 3 food items
  - For grains (or meat/meat alternate offered as grains) and milk, the student must select the planned serving size
- Student must select at least ½ cup fruit as one of the items selected

# **Appendix C**

## **MDE's Waste Audit Template Assessment for Schools**



## **Waste Audit Template Assessment for Schools – Recover & Divert**

This document is a tool to assist with executing a baseline waste audit in a school cafeteria and food service areas. There are many detailed guides available online and are linked in the Maryland Department of the Environment's (MDE) [Toolkit for Schools](#).

### **Organize a Team**

Who: Cafeteria staff, Parent Teacher Association (PTA), Janitorial/Facilities Staff, Administration Staff, “Green School” leaders and students. You could also consider asking community members who can support food diversion to help you with your efforts.

What: You'll need the assistance of several people. Some will need to direct the students to specific discard stations, some to assist with sorting and others to help with tabulation. You'll also need people to answer questions (inquiring minds make future changes!), and to assist with setting up and cleaning up. Students will be needed to analyze the data, make recommendations and work towards action items. Funds will need to be secured for future programming so that may require another team of helpers.

### **Create a Short Plan for Data Collection**

- Keep an honest account from the start. If your school does not routinely have “zero waste” lunch days, do not try to hold one on the day of your audit. You want an accurate reflection of your typical cafeteria day. Remember, no one is ‘wrong’ this is all to develop a stronger plan of action.
- Plan for members of the team to help facilitate the signage, station for data collection and recording, and disposal at the end of data counting. If the assessment is performed over many days, plan for the extra hands and consistent setups daily. Take photos and document the process.
- What materials are necessary to collect?
  - Sanitation – reusable metal tongs are great for scraping food off plates and moving items.
  - Sorting station(s) – tables with signage directing students where to place what. Keep signs at student eye level. Use images instead of lots of words. Tarps will help protect flooring and keep everything together, bins are necessary for separating all of the different items needed in the count.
  - Count and weighing – score cards (see page X) and if possible, a scale
  - Disposal post collection
    - Food Residuals: Unless you have an organics diversion (compost or anaerobic digestion) lined up, unfortunately this will need to be put in the trash.
    - Liquids: Pour down drain

- Recyclables: If the school already recycles, then the separated recyclables can be processed as usual (note, plastic film wrap CAN be recycled outside of school!)
- Recovered Food (unopened) – SHARE TABLE
- Data collection – pencil, paper, and later spreadsheets

## Collect Data

All hands-on deck for this activity!! This may be a day that dismissal from the cafeteria takes a little longer as this is an initial sort and divert. Clear explanations, well placed and labeled sorting stations, and a clear plan will help students and staff with the transition.

Set up a station with great signage, provide notice during morning announcements and follow up with a reminder prior to students moving into the cafeteria.

- Count the number of whole food items recovered (fruits, vegetables, yogurts, cheese sticks, etc.) that could be used as edible foods (aka share table or donation). Keep a separate column for milks recovered. Use these numbers to estimate how many milks and whole food items are thrown out in one day. For example, if you sorted one-third of total cafeteria trash from a day at school, multiply the number of items three times for the totals for one day.
- Weigh and record each separated waste: trash, recycling, compostable materials (if possible, keep food serving trays separate and weigh/count them separately), and the liquids bucket(s). Also weigh all the perfectly good unopened, unpeeled food that was recovered. Note, don't forget to subtract the weights of the empty containers used when collecting the materials (i.e., 5-gallon bucket) from the recorded weights.

Note: Don't forget to quantify back of house food preparation residuals, trash, and recycling!

## Analyze Data

Why: Understanding the reasons items were discarded is very important. To begin this process your team would have to identify the sum of the data collected. If accounting occurs over a series of days or week it may present a better picture. If you are performing an extended study, avoid "count" days on the same days of each week (ex: don't always do the audit on pizza day if that's a very popular day for students to buy lunch, be sure to capture less popular school lunches so you have an accurate reflection of waste that is actually produced).

How: Encourage a grade or a class to analyze the data using graphs and charts. Visuals for all ages are important to assess what concerns and what solutions may arise.

What else: Once you've quantified the types of foods that are discarded, you may want to determine why. Surveys are a great tool to accomplish this and depending on timing and participation, this can be as simple as a hand raising, pen and paper essay or online selection tool.

Example questions may include (with either fill in the blank or circle examples):

- Why was only ½ of a food item eaten?

- Why are there so many of one type of food item uneaten?
- Why are there so many types of “x” wrapper? Why is that food so great?

## Report the Data

Sharing what is observed with the students and community will help to determine the next steps. How this information is presented can be through a variety of methods.

- Use this as a part of classroom lessons to generate presentations, reflection essays, summary analysis and data analytics.
- Share through social media, community fliers, school newsletters, morning school announcements and present at community public speaking events.

## Next Steps

Now that you’ve shared the data you can begin to form plans for the next steps. In these plans, make sure to include identifying who will be involved, who is responsible for each of the necessary actions, and what is their required staffing commitment. How will reporting be handled? How long will the planning time take for this “action item” and how will each be funded?

- What are the opportunities that could begin within the school in a short time frame (within a month to a school quarter)?
  - Sharing results of collection
  - Sharing results of survey
  - Setting up a food recovery (aka: share) table
  - Collecting liquids separately
  - Education in class on what is wasted food and what is source reduction.
- Moderate time frame (by end of school year or beginning following school year)
  - Establishing a community free food market
  - Collaborating with agricultural partners for animal feed distribution
  - Diversion for organics recycling (compost or anaerobic digestion)
  - Finding avenues for all types of recycling collected (note: identification of the material types is essential along with where those materials can be sent to)
  - Reuse or upcycling of materials collected (packaging or serving materials)
  - Report diversion information to county
- Long term planning
  - Identify meal changes to align with demographics of the school community.
  - Modify schedules to ensure students have exercise prior to lunchtime (recess or physical education)
  - Host a ‘healthy snack’ at days end (move the share table(s) at the exit for a grab and go available for all students)
  - Reassess to see if there have been behavior changes and where improvements can be made.
  - Inclusion in all subject curriculum
  - Host community workshops on food residual diversion opportunities

### Example of a Waste Assessment Data Sheet

Make sure to list the units – for trash and recycling you may want to include the weight in pounds (lbs.) and for other items, a unit count (ea.) may be easier. Just be sure to be consistent and include it in your notes. For future audits consistency will be key.

NOTES: \*Recycling varies from county to county, so don't add recycling of items that can't be recycled. You can also separate this column into school recycling and plastic film if plastic film recycling is realistic option for your school (e.g., [NexTrex](#)).

^^Consider separating serving materials and itemizing trays, cutlery, etc. as that provides forecasting for future changes – make sure to not double count or add a “subtotal” for trash and compost (if the trays are BPI certified compostable).

#Milk counts as ‘recoverable’ if it is stored properly.

Date	Time/Class Period	Trash	Recycling	Compost	Serving Materials	Liquids	Recoverable		
		Wrappers, etc.	*Only what CAN be recycled at the school	Organics: unwrapped food materials	^^Trays, cutlery, cups, lids, etc.	Poured into a bucket	Packed Materials	Whole Fruits/Veg	#Milk
<b>TOTALS</b>									

If there's no scale available for actual weight, the following can be used for best estimates:

- Liquid Weights (full containers, estimate based on fullness the fractional weight)
  - 1 gallon = 12 lbs.
  - 2 gallons = 24 lbs.
  - 5 gallons = 60 lbs.
- Most food scraps generally weigh about 3-6 lbs. per gallon
  - Estimate a full 5-gallon bucket to weight 30 lbs.
  - Estimate a full 32-gallon gray wheeled cart at 140 lbs.



# **Appendix D**

## **MAEOE Green Schools Application Timeline**

## **YEAR 1**

### **1. Create a Green School Committee**

This committee can include teachers, students, administrators, parents, or other staff. This will make it easier for you to put the application together. During the first meeting evaluate what you have in place and what you need to plan. This [Green Schools Pre-Assessment](#) is available to determine where your school is in the process.

### **2. Attend a Green School Training**

Attend a training session(s) to learn more about the application, the program, and the process. Look for training announcements on this website.

### **3. Create your Green School Account**

Create an account using this online portal and immediately start uploading information and documentation during this first year (if applicable).

### **4. Schedule a School-Wide Meeting**

Arrange a school-wide meeting with all staff to inform them about the application process and to discuss strategies for completion.

### **5. Contact Local Support**

- Green Centers and Green Leaders help provide local support for schools interested in becoming Green Schools. Check out this current list of [Green Centers](#).
- Email [applications@maeoe.org](mailto:applications@maeoe.org) if you need more information about connecting to a Green Center or Green Leader.

### **6. Celebrate!**

Celebrate being green with a school-wide celebration. This can occur during spirit week, Earth Day, Arbor Day, or any day you pick!

### **7. Attend Professional Development**

A minimum of 10% of your teachers must attend environmental education professional development (EE PD). Check the [MAEOE calendar](#) for a variety of EE PD opportunities for staff

## YEAR 2

1. **Update Staff on Progress in a School-Wide Meeting**  
Arrange a school-wide meeting with all staff to update them on the application process and to discuss further strategies for completion.
2. **Green Center/Leader Check-In**  
Check-in with your local Green Center/Green Leader. Make sure they have an online account and can view your progress to date.
3. **Submit an Intent to Apply**  
Submit an Intent to Apply by the December deadline.
4. **Continue to upload information in all application fields**  
Continue to populate all fields of the application with information and documentation. The Metrics Survey is integrated into the application.
5. **Complete a Mock Review**  
Consider one of the following options:
  - Attend the MAEOE conference for a Mock Review Session of your application.
  - Meet with your Green Leader or Green Center to do a one-on-one Application review.
  - Attend an online review session - typically scheduled in February after the MAEOE conference.
6. **Submit your application**  
Complete the final touches and submit your application.
7. **Look for the Results**  
Schools will receive an email from MAEOE in April announcing the Green Schools for the year.

# **Appendix E**

## **GradesOfGreen.org Food Recovery Program Resources**



## Food Rescue Newsletter/Announcement

“Attention \_\_\_\_\_ (school name) students!”

“Starting \_\_\_\_\_ (date) our school is going to start a Food Rescue Program and here’s how you can help!”

*(For Food Donation Program)* “After eating your lunch, separate and add any uneaten whole foods to the food donation box that will be placed \_\_\_\_\_ (campus location). Items that can be donated are whole fruits, packaged unopened items like bags of carrots, chips, crackers and granola bars and unopened milk and juice cartons.

After lunch the food donations will be picked up by \_\_\_\_\_ (organization to receive food) and distributed to people.

*(For Share Box Program)* “After eating your lunch, separate and add any uneaten whole foods to the food share box that will be placed \_\_\_\_\_ (campus location). Items that can be donated are whole fruits, packaged unopened items like bags of carrots, chips, crackers and granola bars and unopened milk and juice cartons.”

“If you would like an extra snack, you can take from this box as well.”

“By doing this, we can keep healthy nutritious foods out of our landfills!”



## Campus Food Rescue Pre-Project Audit

**Instructions:** Before you begin your food rescue collection site, it is important to know how much food is currently wasted. During lunch, students will observe how much edible/donatable food is wasted. Using this worksheet, students will tally how much edible food is thrown away based on each category. Students should also use this as an opportunity to find a location for food collection!

School Name: \_\_\_\_\_

Location of Observation: \_\_\_\_\_

	Tally of Edible Food, Wasted	Total
Unopened packaged meals (sandwich, salad, chicken nuggets, etc.)		
Unopened packaged snacks (chips, cookies, apple sauce, etc.)		
Fruits (apples, bananas, oranges, etc.)		
Vegetables (carrots, corn, etc.)		
Dairy (milk, chocolate milk, etc.)		
Juice (orange juice, apple juice, etc.)		
Condiments (ketchup, ranch, etc.)		
Other (fill in)		



## Campus Food Rescue Project Audit

**Instructions:** Using this worksheet, students will tally how much edible food is donated based on each category. When finished, compare the total amount of food donated with the total amount of wasted food from the “Pre-Project Audit.”

School Name: \_\_\_\_\_

Location of Observation: \_\_\_\_\_

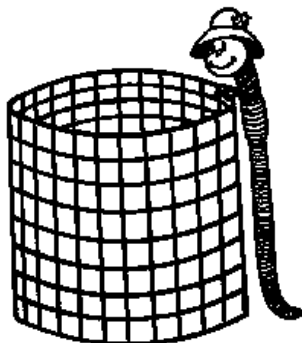
	Tally of Edible Food Donated	Total
Unopened packaged meals (sandwich, salad, chicken nuggets, etc.)		
Unopened packaged snacks (chips, cookies, apple sauce, etc.)		
Fruits (apples, bananas, oranges, etc.)		
Vegetables (carrots, corn, etc.)		
Dairy (milk, chocolate milk, etc.)		
Juice (orange juice, apple juice, etc.)		
Condiments (ketchup, ranch, etc.)		
Other (fill in)		

# **Appendix F**

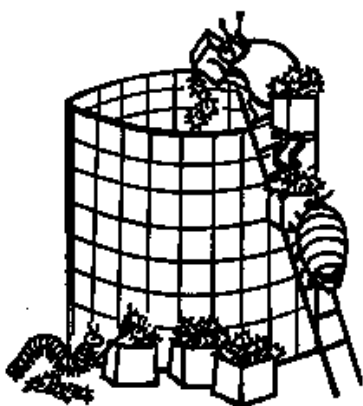
**Best Ever Compost Method from  
Cornell University, from *Composting:  
Wastes to Resources***

## Directions

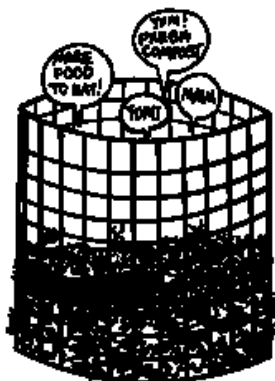
1. Choose a "pot" for baking your compost. Any type of composting bin will do.



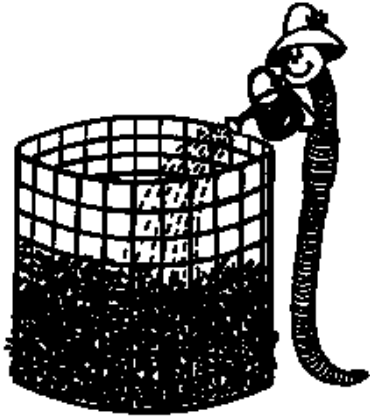
2. Place kitchen or yard wastes into the composting bin. Chop or shred the organic materials if you want them to compost quickly.



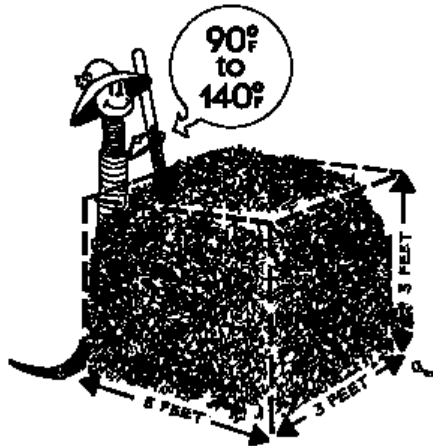
3. Spread soil or "already done" compost over the compost pile. This layer contains the microorganisms and soil animals that do the work of making the compost. It also helps keep the surface from drying out.



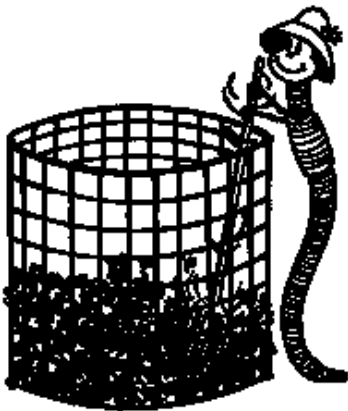
4. Adjust the moisture in your compost pile. Add dry straw or sawdust to soggy materials, or add water to a pile that is too dry. The materials should be damp to the touch, but not so wet that drops come out when you squeeze it.



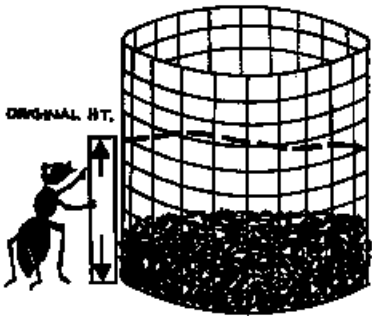
5. Allow the pile to "bake." It should heat up quickly and reach the desired temperature (90° to 140°F, or 32° to 60°C) in four to five days.



6. Stir your compost as it bakes if you want to speed up the baking time.



7. The pile will settle down from its original height. This is a good sign that the compost is baking properly.



8. If you mix or turn your compost pile every week, it should be "done," or ready to use, in one to two months. If you don't turn it, the compost should be ready in about six to twelve months.

9. Your "best ever compost" should look like dark crumbly soil mixed with small pieces of organic material. It should have a sweet, earthy smell.



10. Feed compost to hungry plants by mixing it with the soil.

