



ONE COOL EARTH PRESENTS...

MARINE DEBRIS PREVENTION

BEST PRACTICES MANUAL



**DEVELOPED IN COLLABORATION
WITH THE NOAA MARINE DEBRIS
PROGRAM**

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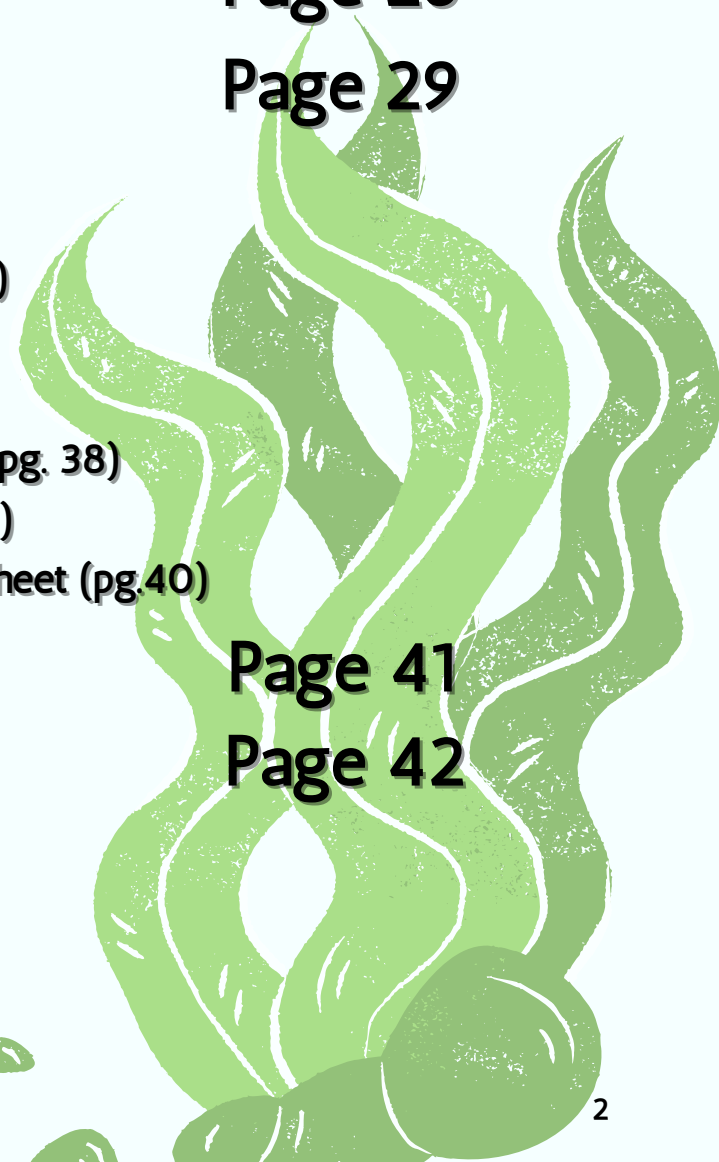
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INTRODUCTION



Marine Debris is human-created waste that has deliberately or accidentally been released into a waterway or ocean. The connection between school campus waste and marine debris is one we may not always consider, but is central to making impactful changes toward a more sustainable future. When school administrators do their purchasing, design their waste infrastructure, and educate students on waste sorting methods, every decision has an impact that goes far beyond the school itself. For example, purchasing single-use plastics ultimately contributes to landfill mass, and even recyclables get shipped overseas to recycling facilities, some of which have few regulations. Litter on campus can make its way into local waterways and ultimately, the ocean. The methods of waste management implemented by school administration will inherently affect local watersheds and coastal and marine ecosystems. For this reason, considering marine debris prevention when it comes to your school or district's environmental impacts, is a great way to get to the core of your campus's sustainability practices and goals.

Right now, schools across the country are taking initiative to more sustainably manage their waste and institutionalize environmental stewardship as part of their school culture. Luckily, there is no shortage of resources available to get started and keep busy in overcoming waste related issues. When considering the resources available you might wonder, why is it so challenging to make change? Why are we still seeing campuses with little to no waste management infrastructure? Why do we still find litter entering our storm drains from blacktops and grass fields at schools? The answer is not a matter of caring, it is a matter of initiating administrative commitment for a campus cultural shift. We know that tackling waste issues can be daunting, but we also know it is possible.

Let us introduce ourselves. We are One Cool Earth, a community-based 501(c)3 nonprofit organization operating on the Central Coast of California. Founded in 2001, **we create awesome school garden programs that power happy, healthy, and smart youth.** Using evidence based strategies, our gardens have educational impacts on student well-being, health, and academic achievement, as well as sustained benefits to our environment. **We believe every child deserves a place to grow.**



INTRODUCTION



Beyond our direct work with students, One Cool Earth works to aid public educators by providing professional development opportunities that increase skills and confidence in utilizing school gardens as outdoor classrooms; particularly, to teach environmental subjects while maintaining a thriving educational garden. These events are open to any educator and provide extensive resources, such as: teaching materials, curriculum and lesson activities, demonstrations, planting guides, funding sources, and follow-up support from our staff. These trainings also work to create a network of like-minded individuals who wish to effectively engage students in garden-based education and can continue to support each other in this growing movement. Offered in-person and virtually, we encourage you to visit [our website](http://onecoolearth.org) (onecoolearth.org) to learn more about these opportunities.

Many schools that we have worked with are sustainability champions and can be identified as inspirational examples as to how many of the following marine debris prevention practices can be implemented. They have gone beyond just school-wide waste audits, and are now auditing their own decisions related to procurement choices on school sites. From a curriculum standpoint, they connect English Language Arts (ELA) and Next Generation Science Standards (NGSS) into a Project Based Learning (PBL) opportunity with marine debris and ocean-friendly principles at the forefront. This is a win-win for teachers, students, and the environment. This integration also provides opportunity for Positive Behavior Intervention Systems (PBIS) because these issues go beyond encouraging 'being a good kid' and promote 'being a responsible global citizen.' School leaders found that students are eager and capable to help make change, if only we provide them the opportunity. Preventing marine debris on school campuses requires a joint effort from Facilities, Food and Curriculum Departments and Superintendents. Together, and further stewarded by principals and school faculty, a school district has the ability to make Earth-friendly, sustainable practices the status quo.

This Marine Debris Prevention Best Practices Manual is a comprehensive guide to assist you in establishing lasting change on your school campus. We have done the legwork of pulling together the resources, using trial and error to find the best results, and communicating with administrators to share with you what really works. With 20 years of experience working with schools and school districts to make sustainability achievable on campus, we know that you can utilize this informational resource and prevent marine debris. Keep in mind our methods are not one-size-fits-all, but rather a starting point from which you can build your own campus culture of sustainability. **We wish you luck on this journey to create a brighter future for your school and students.**



GOING WASTE-FREE ON YOUR CAMPUS CAN:

Empower Youth:

Students take on leadership roles and develop pride in a clean campus as they work together as a team. Zero waste efforts connect campuses to the world at large and foster civic responsibility.



Promote Environmental Stewardship:

Most schools can easily divert up to 75% of waste from the landfill. Our school custodians have noticed cleaner campuses, which means less marine debris and a cleaner watershed.



Provide opportunities for hands-on STEAM:

Support Science, Technology, Engineering, Arts and Math curricula with real-world projects that teach basic skills that students can develop to enrich career pathways.



Create Savings:

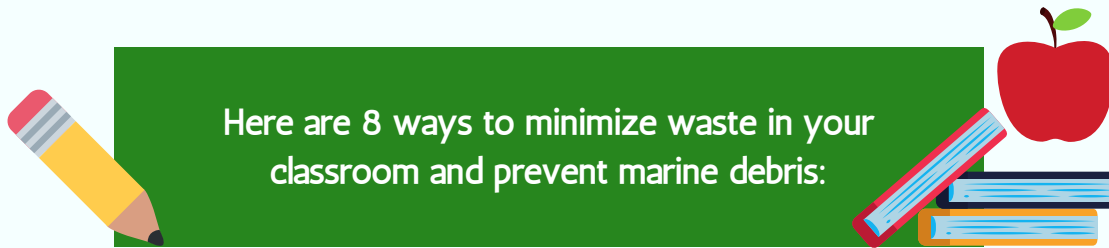
Based on data collection during schoolwide waste audits, we have found that schools can save up to \$3,000 per year in waste hauling costs by properly sorting and reducing waste. That's money that can go back into the classroom instead of the landfill.



IN THE CLASSROOM



Minimizing waste in the classroom is the first step to minimizing waste schoolwide. This is where students will learn about the importance of waste management, and then independently apply techniques outside of the classroom.



#1

Exhibit informational signage

Displaying informative signs about the places that our waste goes after it is thrown away, can help students to better understand the importance of appropriately sorting their waste. Sequentially, this minimizes what materials ultimately end up in the landfill. You can also encourage students to make their own signs!

Refer to pg. 29 to find a waste sorting sign for your classroom

#2

Create a waste sorting station inside of your classroom

By using informational signage as a guide, encourage students to sort their own waste within the classroom.

Waste Sorting: Sometimes, school campuses will treat **all** waste as landfill waste because it can be difficult to sort through. However, with help from students, it can be done very easily! Here are three steps to creating your classroom waste sorting station.

1. Label three separate containers for Landfill, Recycle, and Compost.
2. Lead a training with students on how we will sort waste, what goes where, and what will happen when the container gets full.
3. Have a plan for where the recycling and compost waste will go once it is sorted.

Recycling from classrooms can be accumulated in a larger recycling bins on campus that the custodian can take to the recycling dumpster. Students can be in charge of taking the recycling can from their classroom to the larger receptacle on campus when it gets full.

Composting can be a great way to dispose of the organic material that is collected in classrooms (*see page 20 for more information*).

If municipal composting services are available in your area/school, you can also dispose of your compost into the green waste bins on campus. Again, students can be leaders in taking the container to its appropriate location when it gets full.



IN THE CLASSROOM



I think our best success was the year I went around to each classroom with all the parts of the school cafeteria lunch, and packaging from home lunches. As a group, we sorted everything into what could be reused or recycled, and what would need to be thrown in the trash. It was helpful to show the difference between aluminum and the mylar plastic that is used for so much packaging (chips, granola bars, etc.) because they both look shiny and silver. We did the crush test: if it stays crushed up in a ball, it's aluminum, and recyclable. If it pops back open after you crush it, it's plastic and has to go in the trash. It was great to have visuals of the actual packaging from the cafeteria (paper trays, aluminum trays, napkin, spork, milk cartons, etc.) and from home (reusable tupper ware/containers, recyclable drink containers, chip bags, granola bar wrappers, etc.) The kids loved the sorting, and I hope it got them thinking about changes they could possibly make so we create less garbage.

-Alexandra Baele, 1st grade teacher at Los Ranchos Elementary School, San Luis Obispo

Click [HERE](#) for some waste-free campus inspiration

#3

Incentivize waste reduction

Kelly Ward, the Principal at Kermit King Elementary in Paso Robles, enlists herself and her teachers to reward students with experiences instead of objects that inevitably create more waste. We can reward students with visits to the garden or a game of basketball on the playground with their favorite teacher.

Mr. Black, the Principal at C.L. Smith Elementary in San Luis Obispo, rewards students by letting them dress him up in their favorite baseball teams' attire.



#4

Act as a role model in the classroom by practicing your own techniques for reducing waste

Model using the backside of papers, not taking more than you need, refraining from grabbing a new sheet of paper if you made a mistake, using all of something before going to get more, etc. You can assign an art project or host a contest using scraps of paper and other 'waste' items to create something new. You can also make a collage from scraps of paper, old pamphlets, books, or magazines!

IN THE CLASSROOM



#5

Conduct a Waste Audit annually

Students are capable of making good choices when they are equipped with the knowledge to do so. Waste audit projects improve student understanding of material waste management, consumption of resources, and environmental best practices that can be extended beyond the classroom to their homes. Additionally, student implemented compost systems at each school will divert approximately 2 tons of food waste, and 20 cubic yards of recycling per school from the landfill (this is based on monitoring waste hauling costs at our partner schools who have successfully implemented the program), which reduces carbon emissions and resource use from avoided extraction of raw materials. Other benefits produced by the project include: linking watershed health to preventable causes such as debris; supporting student education and motivation to participate in restoration and recycling projects at school sites and in the community; encouraging students to reduce greenhouse gas emissions; instilling a sense of pride through their accomplishment of a school wide improvement project; and revitalizing waste management awareness at a district level. Additionally, by providing opportunities for youth to create real world impacts on their campus and the environment through student-led projects, they are able to gain both the skills and the necessary confidence needed to be future active members of their community. Check out an excerpt of our 'Waste Audit' lesson below! The full lesson can be found on pg. 30.

Lesson Overview:

Students will learn about the impact of school waste on the environment. They will use math to measure some/all of the waste produced in one day on campus, and brainstorm ways to reduce that waste. Additionally, teachers can expand on this lesson by encouraging students to take on leadership roles to organize a campus-wide waste audit to collect more data and design and implement solutions for reducing waste on campus

Summary of Activity:

Set up a sorting station with tarps and three different buckets to sort waste along the perimeter of the tarp. Typically, we suggest bringing 6 students from the class into the sorting area at a time. All students must wear gloves while sorting waste! Open a bag of trash and let students sort waste into the different containers. Once all students have participated in sorting, calculate the weight of each bucket and collect the data on a Waste Audit Sorting Sheet (pg. 33). Students can share their findings with their peers, school administration, and families to further support environmental literacy in their school community!



**Tip: trash really can be gross, so how do you convince students to dive in? Explain that while it can be gross, it's important to have an honest perspective of what goes to the landfill. What makes trash yucky? Usually rotting food waste. But if we reduce our food waste or properly compost our unwanted food, then trash wouldn't be so gross!*

IN THE CLASSROOM



Refer to pg. 30 to find the full Waste Audit lesson plan



Before our waste audit at school, I would see a lot of trash around campus and after there was less trash and litter around.

- 4th grader at Monterey Road Elementary School



Our waste sorting station and vermicomposting system have just taken off and really the adults are involved but the kids run everything

- JulieAnn Davis, Principal at Monterey Road Elementary, post school-wide Waste Audit



#6

Get involved with your school garden

Students can learn about how eating healthy foods and composting can reduce waste. Our Carbology lesson (full lesson on pg. 34) dives into the essential differences between waste that is biodegradable and waste that is not. It is a great activity to do in the garden and then bring into the classroom.

Lesson Overview:

In this lesson, students will learn about which types of matter can and cannot decompose by conducting a simple experiment. Materials will be sealed in a bad with soil for one month, observed, and weighed. Students will: observe changes over time due to decomposition, notice patterns and classify materials based on their ability to decompose, and explain how matter changes throughout decomposition.

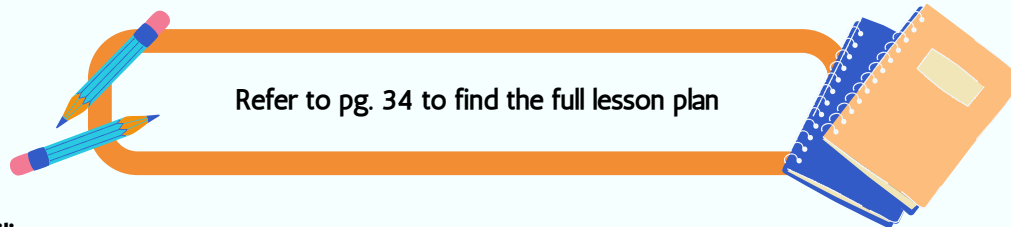


IN THE CLASSROOM



Summary of Activity:

Instruct students to look around the garden and pick one item to add to the experiment. Each student will add their item to a 5-gallon bucket which has soil (maybe even worms) in it already. Make sure there are some items in the experiment that will not decompose (ex. wrappers, packaging, paper clips). Then, make predictions as to what will and what will not decompose. Students can then take turns adding small amounts of water to the bucket. Finally, attach a lid that will allow some air flow inside the container. Place your bucket in a shady spot and return in a month to observe the results!



#7

Utilize your resources

There are all kinds of educational resources readily available to support teachers with waste management education. Here is a list of just a few of our favorite resources:

- **Virtual field trips.** There are various organizations that offer virtual experiences that kids can enjoy. We've had great success with virtual lessons from the [NOAA Monterey Bay National Marine Sanctuary Exploration Center](#)*9
- **NOAA (National Oceanic and Atmospheric Administration) Marine Debris educational resources** (<https://marinedebris.noaa.gov/activities-and-curricula>)*11:
 - [Annual Marine Debris Art Program](#)
 - [Understanding Marine Debris Activity Book](#)
 - ['Be an Ocean Guardian' Activity Book](#)
 - ['Trash Shouldn't Splash' Toolkit](#)



More Marine Debris Prevention resources can be found at [NOAA's MDP website](#): MDP > Our Work > Education

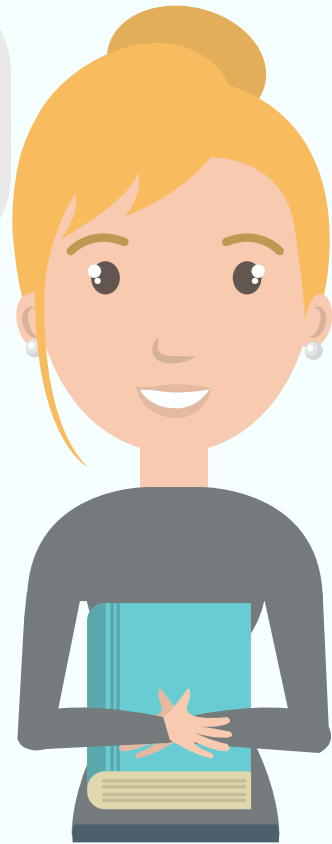
- **Check in with your local chapter of the U.S. Green Building Council** to see if they have opportunities for enhancing green infrastructure on school campuses. They often offer mini grants for environmental projects!
- **IWMA (Integrated Waste Management Authority)*8** has a great selection of educational programs for kids. In San Luis Obispo, they offer field trips to the recycling center and to the anaerobic digester facility. They will also come to your classroom and provide a lesson in waste management! Marine Debris Prevention videos can also be found on their website.
- **Obtain Green Ribbon School Status via the Green Ribbon Schools Award Program.** [The U.S. Department of Education's Green Ribbon Schools](#) (ED-GRS) recognition award honors schools, school districts, and Institutes of Higher Education for excellence in resource efficiency, health and wellness, and environmental and sustainability education.

IN THE CLASSROOM



San Benito is proud to be a Gold Level, Green Ribbon school. Thanks to our One Cool Earth Garden Educator, Gloria, our waste audits, the waste sorting program, and our vermicomposting system, our scholars' eyes have been opened to their impact on the world around them.

-Kathryn Holmes, Principal of San Benito Elementary School in Atascadero, CA



#8

Encourage students to take these practices home

Keeping in mind that it is often a privilege for families to incorporate environmental concern into their home life, we can encourage students to share waste reduction strategies with their communities. Here are a few ways to do so:

- Include EcoTips in your parent newsletters. This could include a challenge to collect and properly compost/dispose of green waste or use reusable water bottles!
- Set up a waste sorting station at home. Have students take photos and share with the class.
- Pack a school lunch together! Have students help parents pack their lunches with zero waste concepts in mind.

According to the U.S. EPA, packing a waste-free lunch saves an average student \$250 and 67 pounds of trash per nine-month school year.*5



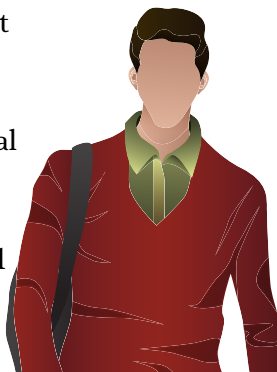
One Cool Earth Garden Education Manager, Madeline Schecter, about to lead a Waste Audit at Kermit King Elementary School!

CASE STUDY

What does a sustainable school look like?

Tips from Oceano, CA local green guru, Jim DeCecco

Mr. DeCecco is a 6th grade teacher who taught at Oceano Elementary for over 30 years. He was named K-12 Educator of the Year by the North American Association for Environmental Education and the PG&E Solar Schools Inspirational Educator of the year in 2012. In his programs at Oceano, Mr. DeCecco focused on three main areas: transportation, energy use, and waste reduction.



#1

TRANSPORTATION



Oceano Elementary has monthly walk to school and bike to school days. Students learn how to bike safely in Physical Education class and practice their skills on a playground bike track complete with stop signs and a roundabout.

Mr. DeCecco also started a Bike Posse that rides after school to get ice cream.

Partnerships with local businesses and SLO County Bike Coalition help make the bike program a success.

#2

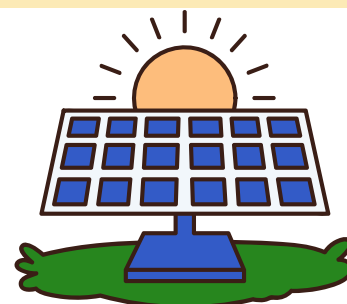
ENERGY USE

Oceano Elementary has saved taxpayers hundreds of dollars on electricity through behavioral change- no building renovations required.

Students monitor classrooms to ensure lights are turned off when not in use and make sure campus refrigerators are full because a full refrigerator uses less electricity than an empty refrigerator.

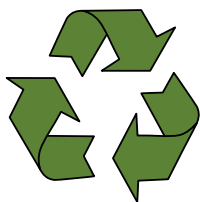
Mr. DeCecco's class went on a fieldtrip to California Valley Solar Ranch.

Students also built **solar ovens** and **solar balloons** to learn about passive solar energy.



#3

WASTE REDUCTION



Mr. DeCecco's students work together with the custodian to sort lunchroom trash, recycling, and compost.

Lunch trays are stacked before they are thrown away, which maximizes space in the dumpster.

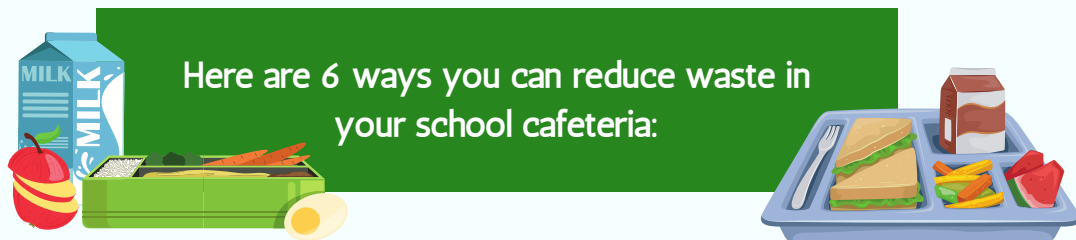
Oceano Elementary was able to cut the size of its dumpster in half, reducing pickup costs.

Compost bins behind the cafeteria produce soil that is used in the school garden.

IN THE CAFETERIA

Reducing waste in the cafeteria requires support and involvement from a variety of stakeholders including the Food Service Staff, Food Service Directors, Custodians, and eager students. Requiring a group effort, the implementation of sustainable waste practices here can bring about the most impactful change since cafeterias tend to produce the bulk of waste on school campuses.

In the U.S., food loss and waste is about 30 percent of the food supply at retail and consumer levels. Americans waste enough food every day to fill a 90,000 seat football stadium. While the amount of food wasted in Child Nutrition Programs (CNPs) has not increased during recent years, there are many ways that everyone can help reduce, recover and recycle food before it goes to waste and teach students about the impact it has on the environment and in their community.*12



Here are 6 ways you can reduce waste in your school cafeteria:

#1

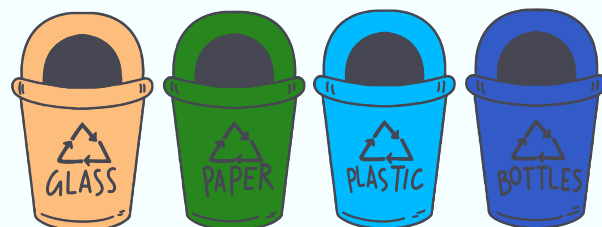
Host a school-wide waste audit

Follow our 'Waste Audit' Lesson plan (pg. 30), but instead scale up the activity to accommodate all the classes in the school. Kindly ask the custodians to save all waste items from the entire school campus from the previous day. Using the 'Waste Audit Sorting Form' (pg. 33), students will then work to compile data to track the amount of waste collected in a single school day.

#2

Set up a waste sorting station in the cafeteria

Once you have completed the Waste Audit, students will be familiar with waste sorting methods and understand the importance of proper waste management. By having this station, we will begin to divert waste from landfills, save food scraps for your garden compost systems or green waste bins, and make sure that recyclables get to a recycling center.



IN THE CAFETERIA



Download image at <https://www.onecoolearth.org/zero-waste.html>

Waste sorting station tips:

- Set up your waste stations by labeling waste cans. Keep the language and set up consistent in order for habits to form.
- Make zero waste meaningful by integrating marine debris curriculum in the classroom. Refer to our lesson 'Pollution Solutions' here: (<https://www.onecoolearth.org/curriculum.html>)
- Your waste hauler will be especially helpful in communicating best practices and may even partner with you on the following: extra containers, grants, training staff, and bin labels.

Click [HERE](#) for a How-To Video on setting up a Waste Station

Our food system is complex, but it doesn't need to be complicated. Cross-sector partnership engagement deepens our foundational knowledge to better align resources and develop processes for real structural change. As eaters, we are food system leaders and food is our catalyst for change. We are stewards of the indigenous lands that we occupy and on which we cultivate food. Together, we can be intentional about our food as an ecosystem, from its first to last mile.* 2

-Christine Tran, Executive Director of the California Food Policy Council



A Successful Green Team Includes...



#3

Organize a Green Team to manage the waste sorting station

A Green Team is a group of students who are committed to building a greener school environment by volunteering during lunch and recess to help other kids sort their lunch waste. If the school has a compost system, the Green Team will bring food waste to the compost bins. Otherwise, they will make sure that food scraps make it to the organic waste bin. The team works with the principal, teachers, custodians, and other students to help reduce the amount of food waste that goes into the landfill. They also work to inspire other students to adopt sustainable practices.



Green Team at One Cool Earth partner site, Kermit King Elementary School

Step 1: Getting Started

The first step to getting a Green Team going for a particular school year is to connect with the school's principal. If the school does not yet have a Green Team, you can share some of the benefits of starting a Green Team: it teaches kids about composting, reduces waste at the school, and gives students an opportunity for leadership and environmental stewardship. An added benefit is that a successful Green Team can help a school to become a Green Ribbon School (refer to pg. 10). If a principal is interested, the next step is to make sure all infrastructure is in place.

IN THE CAFETERIA



Step 2: Building Infrastructure

Does your school have a functioning compost system? If so, food scraps can be collected during lunch and brought to the compost system (refer to pg. 20 to learn how to set up a compost system). Students will need 10 one-gallon buckets to collect scraps, 1 flat-headed spade (small enough to easily fit in and out of your bucket). Some schools might like to provide uniforms to distinguish green team members. These can be as simple as a green lanyard with a clear plastic card sleeve in which you can insert a card that reads 'GREEN TEAM'. Sometimes yard duty individuals also have extra yellow-neon vests that they can loan to Green Team members during their shifts.

Step 3: Selecting Students

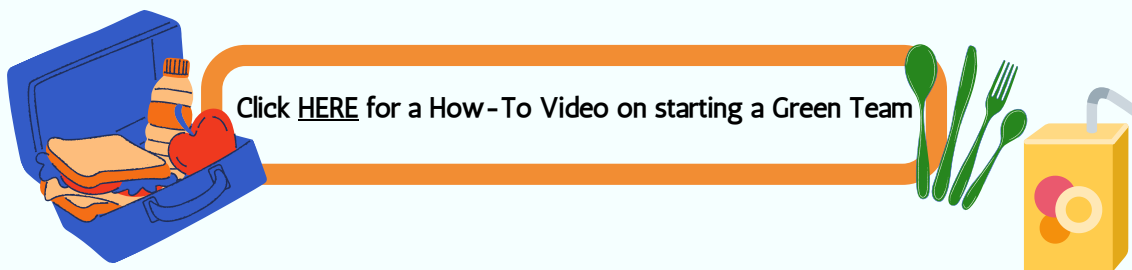
We recommend selecting 4th and 5th graders for Green Team as they tend to be ready for the responsibility. Send out an email to all 4th and 5th grade teachers requesting that they select the Green Team students with five being a maximum number of students (per grade) who can participate on a given day. This will make scheduling easy! Having teachers in charge of selecting students helps to ensure that the students chosen for the Green Team will have shown themselves to be responsible and committed in the classroom.

Step 4: Green Team Shifts

The frequency of Green Team shifts will vary from school to school; they can either be assigned for one week of the month or for one/multiple days of each week. Note: on a given day, you may have kids from 4th and 5th grade classrooms assigned to Green Team duties. Some schools like to always have some 4th and 5th grade students on the Green Team at the same time so the younger kids can have guidance from the older kids.

Step 5: Training

A great time for training Green Team members and initiating a Green Team for a given school year is at your Waste Audit. Try to set a slot aside for Green Team training, ideally during one of the school lunches or snack periods so that you can show students what to do. Training is also a good time to go over agreements for how to conduct oneself when on Green Team duty. It is also an opportunity for students to discuss sustainability goals they have for their school. While you are training your Green Team, you also need to train the student body to understand what the Green Team is. If you are able, join in on every grades' lunch to make a quick, introductory announcement about the Green Team, or introduce the Team on morning announcements. Better yet, have the Green Team students introduce themselves and explain the importance of their job!



IN THE CAFETERIA



Tips for Maintaining a Green Team:

Green Team is hard. It involves bad smells, giving up a valuable recess, and sometimes dealing with yellow jackets that are attracted to the food. To keep up regular attendance and commitment among your Green Team try the following:

- Participate alongside the Green Team on the days you are on campus to help them with the whole process.
- Create fun activities to do afterwards, such as something special in the garden.
- Track the compost over time. Write notes or take photos of how the compost looks to see how it decomposes. Have the Green Team help you to add completed, decomposed compost to the garden beds. Engaging students in the entire process of decomposition gives them a better understanding of how food breaks down and what it looks like in compost form.
- Create something that unifies the team such as a Green Team "badge" they can make & wear during Green Team or a Green Team t-shirt.
- See if you can participate in a school awards ceremony to publicly acknowledge Green Team members.
- Host an end of the year Green Team party! "Mud" pudding cups with gummy worms might be a fitting treat.



#4

Responsible procurement

Ultimately, this is an ongoing challenge for Food Service Directors and District Leaders. It involves changing policy that has been in place for a long, long time and also taking the time to pursue cost effective yet environmentally friendly products. It's not easy, but a necessary challenge to overcome in the efforts to minimize waste.

Purchasing thoughtfully: Guiding questions for school administrators

Purchasing directors and other school administrators can reduce waste on campus through prioritizing sustainable practices when purchasing materials for schools or whole districts. The California Department of Education has outlined several questions to consider when implementing thoughtful purchasing practices*12:

- Is there an option with less packaging?
- Will some of this product spoil before it is all used?
- Is there a less-perishable product that is available in bulk?
- Can reusable food service items be purchased instead of disposable items?
- Are there recycled or other environmentally preferable products available?
- Is the product recyclable or compostable?
- Which meals or food items do students prefer to eat?

*Find more information and helpful guidance on their website!
(<https://www.cde.ca.gov/ls/nu/sn/platewaste.asp>)*



IN THE CAFETERIA



#5

Include produce from your school garden or local farms

Fresh fruits and veggies often require less packaging than other pre-made food items. When possible, incorporate garden produce on the cafeteria salad bar. Whatever isn't consumed can then be composted!

Refer to pgs. 37 and 38 to find our Garden Harvest Checklist and Recording Sheet



#6

Get involved in waste reduction incentive programs

There are many regional, state-wide, and national programs that offer support for establishments to successfully adopt zero waste methods. Below is a list to get you started!

- Green Ribbon School Certification:
(<https://www.cde.ca.gov/ls/fa/sf/greenribbonprog.asp>)
- The EPA Food Recovery Challenge: Applicants for this award aim to reduce wasted food in their operations, communicate the importance of reducing wasted food, and conserve resources through prevention and diversion activities.*5
- Waste Recovery Programs: With the passage of AB 1826 in 2016 (and depending on the amount of weekly generation), CA schools are required to recycle organic waste via edible food recovery, composting, vermicomposting, and anaerobic digestion.*3
- Visit <https://www.calrecycle.ca.gov/recycle/schools/models#Organics> to find incentive programs for your area.

A Waste Reduction Challenge from CalRecycle

Challenge #1: Accommodating student taste test preferences and unfamiliarity with menu items

- Obtain feedback on menu items
- Implement the offer vs. serve options across all applicable Child Nutrition Programs
- Provide more food choices
- Serve foods with familiar flavors
- Serve ready-to-eat fruit
- Invite school staff and teachers to eat meals with students
- Use kid tested menus

Challenge #2: Helping students deal with early meal schedules and insufficient time to eat

- Encourage principals to schedule recess before lunch
- Encourage students to keep food items for snacks
- Offer grab and go items
- Serve breakfast in the classroom

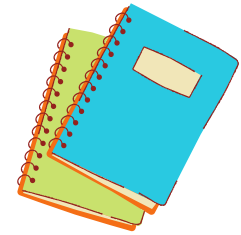
Challenge #3: Redistributing uneaten, intact items

- Offer share tables (carts or tables for unconsumed food and beverage items)
- Donate intact items to eligible local food banks or charitable organizations

*These challenges are from the CalRecycle program sponsored by cal.gov
(<https://www.calrecycle.ca.gov/recycle/schools/food>)*



CASE STUDY



Snapshots from the Regions

San Luis Obispo County Food System Coalition

Throughout the COVID-19 pandemic, [San Luis Obispo County Food System Coalition](#) member agencies have adapted and innovated in order to bolster healthy, fresh, and local food security through collaborative networks and cooperatives.

Erin Primer, Food and Nutrition Services Director at the [San Luis Coastal Unified School District \(SLCUSD\)](#), began procuring local food for students in 2017. Since then, SLCUSD has doubled local buying and encouraged other districts to do the same through a cooperative buying group comprised of 12 Central Coast school districts. When Covid-19 forced students to learn from home, Erin persuaded both regional and state management to permit weekly food boxes, rather than daily, which allowed for less pre-packaged food and more healthy food options. Additionally, Erin and her team continue to provide nutrition education through virtual "bitmoji" classrooms, video tutorials, and drive-through demonstrations during weekly meal pick-ups (pictured). Erin presented at the SLO County Food System Coalition virtual meeting in November 2020, sharing all the pivoting she has done during Covid-19 to keep the focus on local food and child nutrition.

[SLO Food Bank](#) created an innovative voucher program as a response to the pandemic. Through the use of CARES Act Coronavirus Relief Funds, SLO Food Bank purchased client vouchers for produce boxes through a local vendor, Talley Farms. These vouchers provided clients with four to five deliveries on the requested box size. Informational flyers and vouchers, created in English and Spanish, explained the program and enrollment process.



**SLO
FOOD
BANK**

County Partnership for Hunger Relief



*Erin Primer,
Food and Nutrition
Services Director San
Luis Coastal Unified
School District*

Emily Hansen, Operations Director of SLO Food Bank, described the benefits of the program; "Our clients had access to fresh, local, in-season produce. Boxes could be picked up or delivered to 14 different regions throughout our county. While many clients have chosen to pick-up the boxes themselves, the delivery options have been particularly helpful for those with transportation or mobility issues. The boxes allowed us to put funds back into our local economy and support many of our agriculture producers." Such programs have the potential to strengthen local emergency food systems further creating powerful pathways to fight hunger, improve community health, and drive local economic activity. The success of this voucher program highlights the continued need for sustainable resources for fresh and local food aid.

The work that has been done so far by the Food System Coalition and its partners is an example of just how existing and well established networks of trusted community

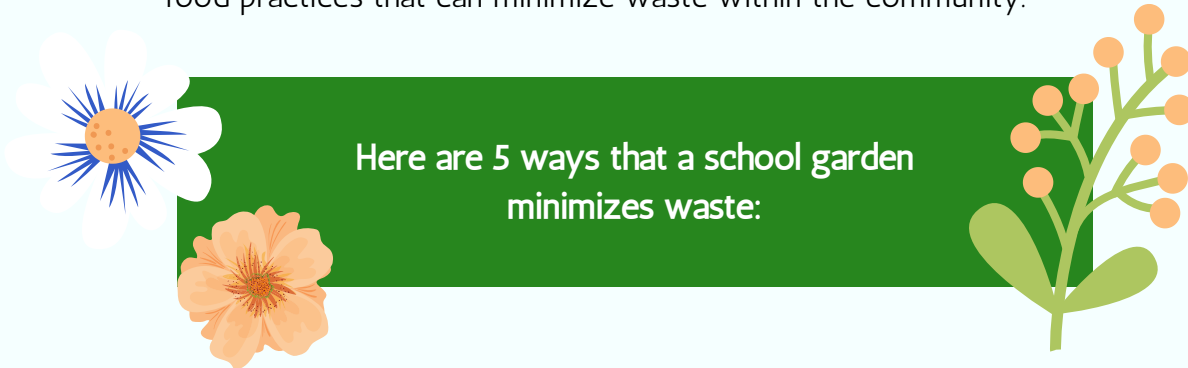
partnerships have the ability to respond faster and more effectively during global crisis. The power of local connection, rooted in shared vision and goals, fostered by the San Luis Obispo County Food System Coalition, enhanced our collective capacity to address emergencies.

- Christine Nelson, San Luis Obispo County Food System Coalition

This article is from the 2020 CAFCP Food Policy Report (<https://drive.google.com/file/d/1Kr8ocFijZ7XiqBnAC1/-GiWuvuy9s9C1/view>)

IN THE GARDEN

We believe that an active school garden is an important step in minimizing waste on campus. Additionally, student participation within the garden also encourages healthy food practices that can minimize waste within the community.



#1

Growing food can be less wasteful than purchasing pre-packaged food

By using the garden to show students that food production can be exciting and rewarding, this can encourage a new, positive attitude towards fruits, and vegetables. Kids may begin to notice that grocery stores and farmer's markets sell the same food items that they just planted, grew and harvested in their own gardens! Because raw fruits and vegetables typically require less packaging than other food products, we can begin to incorporate better zero waste practices.

#2

A garden is a place to compost

There are multiple ways to compost, but in this manual we are going to refer to two different methods: Traditional compost systems and vermicompost systems.

Traditional Composting: This method requires carbon material (browns), nitrogen materials (greens), water, and sunlight. This type of composting requires an aerobic process, which means that air has to be able to enter the pile via turning or mixing.

Tips:

1. Types of containers: Bins that have holes for aeration such as grape crates used at wineries, pallet containments, chicken wire rings, etc.).
2. Ideal carbon to nitrogen ratio: 30:1
3. Do not continually add new materials to a balanced pile. For this reason, it can be best to have a two- or three- part composting system. **Pile #1: Working.** This is where you are continually adding organic waste, keeping the carbon to nitrogen ratio in mind. When the pile is large enough and the ratio is what it will be, it should then be designated as **Pile #2: Resting.** This is the pile where no additional organic waste is added and the pile temperatures are encouraged to rise.
4. Ideal pile temperature: 140 deg. F.
5. When to turn your compost pile: Every 4-7 days. Turn with a pitchfork much like you would toss a salad.

IN THE GARDEN



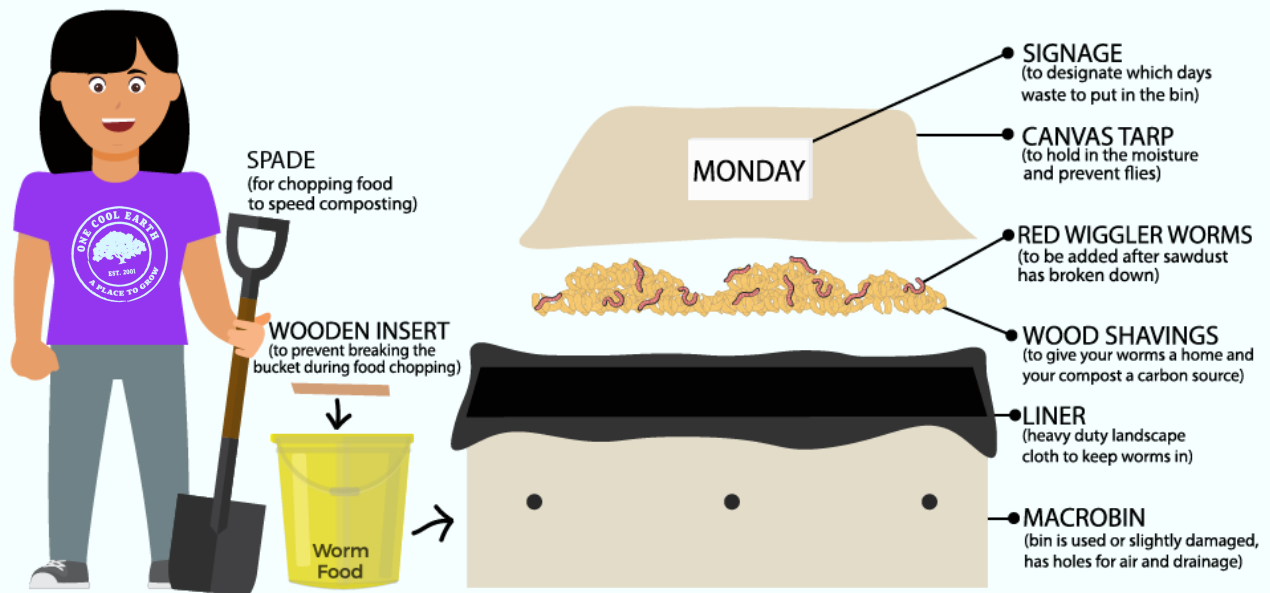
6. Keep your pile moist but not saturated.
 7. How to know when your compost is ready for the garden: There should be no large or identifiable pieces of organic matter (ex. Orange peels, branches, egg shells, etc.).
 8. Items that should go in the compost: **Greens:** grass clippings, natural food waste; and **Browns:** coffee grounds, dried leaves, paper shreds, straw.
- * Do not add meat, bones, breads, weeds, invasive grasses with roots, or large woody plants that take a long time to break down.

Vermicomposting: The process of worms eating food scraps and breaking them down to create worm castings (an enriching compost source that helps provide nutrients to our gardens). Fruit and vegetable scraps, along with newspaper, dried leaves, and other carbon materials are provided to the worms to create both a happy home and a constant food supply for the worms to thrive in.

Vermicompost systems are created by stacking multiple bins that the worms are able to move through. The advantage of the multi-bin system is that you can easily separate the finished compost from the worms once the vermicompost is finished decomposing. As fresh food waste and bedding is added to the upper layers, the worms migrate upwards toward the fresh bin, leaving the bin with finished compost ready to use in the garden!

Pre-made vermicompost systems can be purchased, but they can also be made fairly easily by stacking plastic tubs and drilling holes for the worms to move through each section.

HOW TO COMPOST



This image can be downloaded from our website at (<https://www.onecoolearth.org/zero-waste.html>)

IN THE GARDEN



Steps for creating a DIY Vermicompost System:

1. Acquire 3 plastic tubs that stack easily. The size of the tub should be determined by the amount of food waste you expect to intake, but be aware that the larger vermicompost system you create, the sturdier you will need the plastic bins to be.
2. Drill a pattern of ¼ inch holes around the base and upper edge of the two composting bins to create spaces for worms to crawl in and out of, as well as provide air holes for the worms.
3. If you plan on adding a spout to drain compost tea, you can add a ¾ inch barrel tap, fitted into a small hole drilled underneath the bottom bin. To create easy compost tea harvesting, elevate the entire vermicompost system on bricks so that the tap is easily accessible.
4. Create or repurpose "packers" to help maintain space between the bins. Wood blocks or jars of the same height work well for this and should be placed between each bin to create a few inches of space between the bin and the material beneath it.
5. Once you have stacked and assembled all of the bins, you will begin to prepare your top bin with moist bedding (shredded paper, dried leaves, straw, etc) as well as a few handfuls of compost and moist soil. Next, add food scraps to the top bed, and cover the scraps with an additional layer of bedding.
6. After the system has been active for a while, the worms will multiply and the compost will begin to decompose. Once most of the material in the main bin has decomposed and the compost has a dark, rich color and texture, the bins can be rotated to help move worms out of the finished worm castings. To do so, swap the empty bin in the middle to the top layer and fill it with fresh bedding and food scraps. Over time, the worms will begin to migrate upwards towards the fresh bin, leaving the fully decomposed material to be used in your garden!
7. Keep repeating the process by rotating the top two bins and draining the bottom for compost tea.

Click [HERE](#) for a How-To Video!

Tips for Maintaining a Vermicompost system:

- Red wigglers (*Eisenia foetida*) are the best variety of worms to use for vermicomposting because they eat their weight in food everyday.
- Make sure to keep your vermicompost system damp and well drained at all times to create an environment where the worms will thrive.
- Set up your vermicompost system in a shady, cool area to help maintain a constantly moist environment for the worms.
- Fruit and vegetable scraps, coffee, egg shells, tea bags, and unbleached paper are all great things to add to worm bins. Avoid adding any onion, garlic, citrus, oil, or dairy products. These are more difficult for worms to process and could potentially be harmful to your worm population.
- Smaller sized items are easier for worms to break down, so it may be beneficial to cut fruit and veggie scraps into smaller, more manageable pieces for our little worm friends to eat.
- Since worms have no teeth, adding egg shells or some other type of 'grit' can help worms break down food particles.

The worms were teaching us not to litter because the worms could eat it and die.
- Tristan, 4th grader at Virginia Peterson Elementary School



IN THE GARDEN



Click [HERE](#) for more tips on maintaining your vermicompost

#3

Gardens as living laboratories are known to increase environmental literacy

When students are able to learn outside and experience hands-on opportunities with nature, they are inspired to protect it.



During a garden workday, I had a parent share with me how after a lesson in the garden, their child came home brimming with inspiration to begin composting at home. This is everything. When students are equipped with the knowledge and shown the brilliance of nature, they naturally make caring decisions.

-Natalie Perez, One Cool Earth Garden Educator

#4

Ocean friendly gardens are the way to go

As described by the Surfrider Foundation, ocean friendly gardens 'apply conservation, permeability and retention to landscapes, hardscapes and streets. They allow soil to act like a sponge to help restore the helpful functions of watersheds like protecting local water supplies and preventing pollution

from reaching the ocean. They also reduce flooding during storm events, pull carbon from the air and into plants and soil, and create wildlife habitat.'*10

Some examples of ocean friendly garden enhancements are planting native plants, including permeable surfaces when possible (wood chips vs. decomposed granite or concrete), creating bioswales, etc. For more information about ocean friendly gardens, checkout (<https://www.surfrider.org/programs/ocean-friendly-gardens>).

Working in the garden inspires me to take care of the Earth because then it kinda makes me fascinated by all the plants and helps me grow them and help the Earth so we can grow more plants and be more healthy.

- Nivea, 4th grader at Virginia Peterson Elementary School



IN THE GARDEN



#5

Reuse and refurbish materials

Un-used items that would otherwise be sent to the landfill can be re-purposed to enhance garden spaces. Here are some projects you can do with waste materials:

- Pallet Garden
- Tire spoke and scrap hose flowers
- Tire beds (for non-edible plants)
- Cinder block planters
- Broken glass mosaics



Paloma Creek High School encourages the use of reusable water bottles and used plastic water bottles to be donated for use as seedling starter pots.

PCHS has repurposed most materials left about school for use in the garden, such as old book cases, wiring and wire fencing material, unwanted wood posts/boards, rebar, etc.

-Holly Payne, teacher at Paloma Creek High School in Atascadero, CA

*Del Mar Elementary School
Morro Bay, CA*

A study by Borrelle et al. estimated that in 2016, as much as 23 million metric tons of plastic waste entered the ocean and waterways around the world. This number may feel huge, but it's not the whole picture. It doesn't include marine debris items not made of plastic, or ocean-based marine debris, such as lost fishing gear and vessels.*13 So, the more we can reuse and refurbish, the better.



CASE STUDY

In San Luis Obispo County during 2016, One Cool Earth worked to integrate composting and recycling at 17 schools. It was a big year for Waste Audits! Our efforts to get waste diversion programs off the ground and running continue to make a significant impact today, as those schools are still putting into practice what was adopted in 2016.

The educational impact of a school-wide Waste Audit was summed up perfectly by one student who proclaimed, "I can't believe how much our trash weighed!" She was rightfully astonished. That year alone, students on participating campuses sorted 705 lbs of waste during our Waste Audit activities. With the data collected onsite by students, One Cool Earth calculated that 20,000 lbs of waste can be diverted per year at each school by implementing school-wide waste composting and recycling programs.

We have demonstrated that efficient waste sorting saves money for schools by reducing waste hauling costs. Waste sorting (knowing what to recycle and compost) helps students develop waste awareness and build positive disposal habits. Therefore, it is not only beneficial to the environment to create waste sorting infrastructure, it is also beneficial to schools and students.

Waste diversion infrastructure continues to be fine-tuned at One Cool Earth's participating partner schools, with follow up Waste Audits and continued education for students. In the 2020/2021 school year, students at 16 schools participated in our Waste Audit lesson, reaching over 50 classrooms. In the 2021/2022 school year, community support has grown even larger, and with two entire school districts adopting One Cool Earth's Earth Genius program and curriculum, our reach at 23 schools has been more impactful than ever!

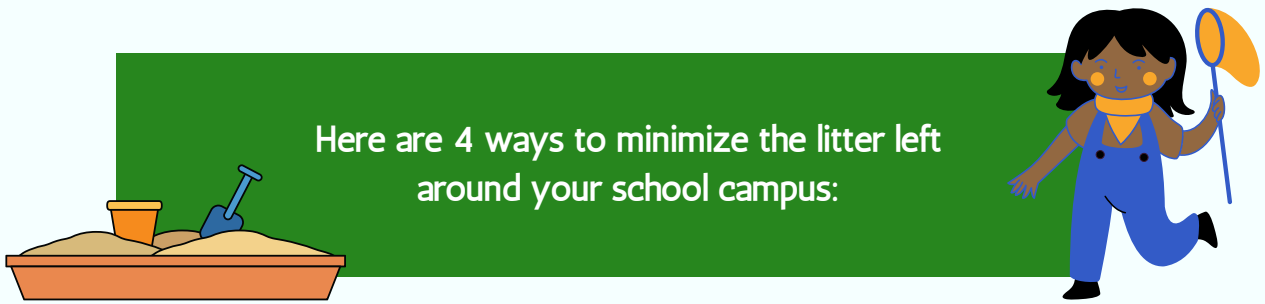
In just the first 6 months of the school year, 8,012 taste tests were served, 839 hands on lessons were delivered, and 875 pounds of produce were collected.

Thank you for making
me a science girl
because I love doing
sciences!
- Student, 2016



ON THE PLAYGROUND

Making sure your playgrounds, blacktops, and lawns are free of litter does more than make your campus clean and inviting. Litter in these areas easily travels to our waterways and oceans, so maintaining a litter-free environment on campus means less waste in our oceans.



Here are 4 ways to minimize the litter left around your school campus:

#1

Have students create signage

This can encourage everyone to be mindful of their waste by using art and helpful words to promote environmental stewardship. You can have students draw/paint their favorite place in nature, favorite animal, waste management images, and encourage their peers not to litter.



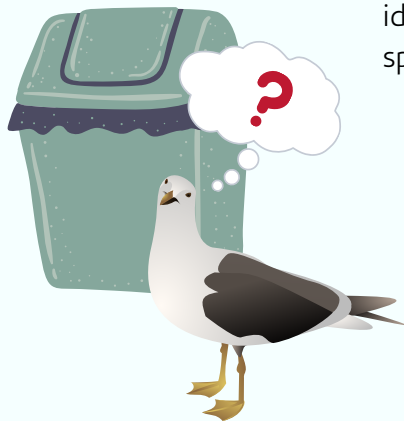
ON THE PLAYGROUND



#2

Keep lids on your trash receptacles

It is important to make sure that waste stays inside these bins. Trash can easily escape a lidless bin on windy days or by means of hungry birds.



As a result of the COVID-19 Pandemic, researchers have identified a rise in PPE (Personal Protective Equipment) waste specifically on school campuses as well as on a national level...

The Keep America Beautiful 2020 National Litter Study estimated 207.1 million PPE (Personal Protective Equipment) items were littered along U.S. roadways and waterways which equates to one piece of PPE litter on the ground for nearly two out of every three U.S. residents. *7

#3

Adopt a spot

Classes can choose or be designated an area on campus that is theirs to keep free of litter. Even designating 10 minutes once a week to visit their area and give it a thorough cleanup, is helpful! Discuss how disposed litter around campus may either be picked up by the custodian (who works hard to keep campuses clean but has a lot of ground to cover), can be blown around by the wind, or carried by water to other places where it can cause more harm.



#4

Host campus cleanups

Spend a good amount of time walking your campus and collect all the litter you can find. Have students use a data collection sheet to identify which types of trash are most prevalent on campus. This is a great opportunity for kids to brainstorm solutions for minimizing the most common types of litter found on campus, and advocate for reducing the usage or finding a better way to dispose of the item(s). If students have an understanding of just how much litter accumulates on their campus, they can be more cautious with their own waste.

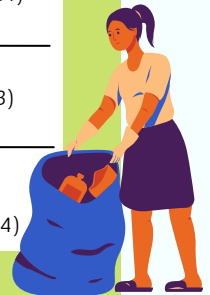
Refer to pg. 40 to find the Campus Cleanup Data Collection Sheet

CASE STUDY



This case study is from San Luis Obispo based non-profit organization, ECOSLO. ECOSLO's annual Creeks to Coast Cleanup is SLO County's largest volunteer event as part of International Coastal Cleanup Day! This local volunteer event is put on in coordination of statewide efforts with the California Coastal Commission and internationally with the Ocean Conservancy. ECOSLO has served as the SLO County Coordinator since 2005. Below is data from 2015 - 2019 Creeks to Coast Cleanup in SLO County.

Year	Number of Locations	Total pounds of trash	Total # of volunteers	Top 3 items:
2019	48	17,718	1,849	1. Cigarette butts(24,977) 2.Pieces of plastic, less than 2.5cm(8,138) 3. Food wrappers(6,526)
2018	36	5,668	1,327	1.Cigarette butts (15,360) 2.Food wrappers (6,091) 3. Pieces of plastic, less than 2.5cm(5,995)
2017	29	6,444	1,370	1.Cigarette butts(14,724) 2. Pieces of plastic, less than 2.5cm(8,631) 3. Food wrappers(5,108)
2016	29	6,507	1,168	1.Cigarette butts (17,259) 2.Pieces of plastic, less than 2.5cm(5,193) 3. Food wrappers (5,170)
2015	28	5,274	1,081	1.Cigarette butts (10,611) 2.Glass pieces (6,524) 3.Pieces of plastic, less than 2.5cm(5,384)

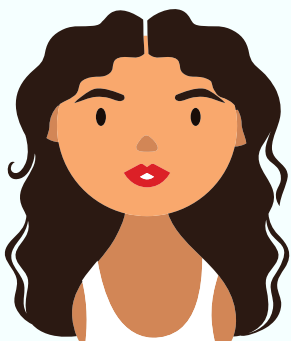


This data is directly from ECOSLO's website (<https://www.ecoslo.org/creeks-to-coast>)

Looking back at past SLO County Creeks to Coast Cleanups:

Last year in 2020, through our two-week event, Creeks to Coast Cleanup proved successful [despite COVID-19 restrictions] as we had over 600 participants, collected 4,934 pounds of trash and recyclables, and saw 267 cleanups county-wide. People participated in cleanups all the way from San Simeon down to Nipomo, from Paso Robles to Santa Margarita, in parks, along creeks, in their neighborhoods, on the coasts, and everywhere in between. It was such a wonderful opportunity to see the community response from these cleanup kits. While we all wish we could be together, it was truly incredible seeing people come together while apart to take care of and protect our beautiful county and planet.

Direct from ECOSLO's website (<https://www.ecoslo.org/creeks-to-coast>)



In my opinion, the most important thing community members can do is decrease the amount of new plastic they buy. Picking alternative products in stores with less plastic packaging produces less waste and puts pressure on companies to make more sustainable packaging.

-Evelyn Barajas-Perez, ECOSLO Sustainability Coordinator

RESOURCES

Garbage	Recycle		Green and Food Waste
<p>All items that Can't go in Blue or Green Bins</p> 	<p>Paper</p>  <p>Plastics</p>  <p>Glass</p>  <p>Metals</p> 		<p>Green Waste</p>  <p>Food Waste</p> 
<p>Please No: Electronic Waste, Batteries, Fluorescent Lighting, Paint, Mercury Thermostats, Medication, Needles, Explosives, Propane cylinders, or hazardous waste.</p>	<p>No: batteries, plastic bags, film wrap, styrofoam products, clothing, PVC pipe, garden hoses.</p>  <p style="font-size: small; text-align: center;">For more info on Recycling</p>		<p>No: plastic/biodegradable bags, paper, pizza boxes, napkins, or plastic utensils</p>  <p style="font-size: small; text-align: center;">For more info on Green Waste</p>
<p>Visit: IWMA.COM for more information about recycling, composting & garbage programs.</p>			

This image is provided by EcoSlo. Printable version at: <https://www.ecoslo.org/recycling-downloads> and more information at IWMA.com

This graphic is a guide for San Luis Obispo county, CA. Check with your local waste management institution to clarify waste sorting policies as they do vary from county to county.

RESOURCES

WASTE AUDIT

Key Topics/Vocabulary: Decomposition, Recyclable, Compostable, Non-Compostable, Biodegradable, Waste, and Landfills.

Grade Levels: All

[Click here for Spanish Lesson Plan or find it on our website!](#)

Lesson Overview:

Students will learn about the impact of school waste on the environment. They will use math to measure some/all of the waste produced in one day on campus, and brainstorm ways to reduce that waste. Additionally, teachers can expand on this lesson by encouraging students to take on leadership roles to organize a campus-wide Waste Audit to collect more data and design and implement solutions for reducing waste on campus (see *extensions* below for more details).



Suggested Activities and Learning Objectives by Grade Level:

- **K: K-ESS-3** Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.* [Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]
- **3: 3-LS4-4** Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.* [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.]
- **LS4.D:** Biodiversity and Humans Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)
- **5: 5-ESS3-1** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- **MS: MS-ESS-4** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. [Clarification Statement: Examples of evidence include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change. The consequences of increases in human populations and consumption of natural resources are described by science, but science does not make the decisions for the actions society takes.]

Essential Questions that Connect CCCs and SEPs:

- What do you think makes up most of the waste that ends up in the school's dumpster? How can we figure out if your guess is correct? (*Planning and Carrying out Investigations*)
- How does what I observe about school waste change at different scales? Does the impact of one student's waste have more or less impact on the environment than the waste of the entire school? Can I think of examples of what I am seeing as bigger or smaller? (*Scale; Asking Questions and Defining Problems*).



RESOURCES

- How can we figure out what the weight of all the waste produced in one school day is? If we weigh a student holding a bucket of waste, what do we need to subtract from that number to know the weight of the waste only? (Using Math and Computational Thinking)
- What were the categories that had the most waste? (Analyzing and Interpreting data; Patterns).

Materials:

- One large tarp or three smaller tarps for sorting
- Scale(s) large enough for students to stand on
- Three waste receptacles for sorting. It is important that kids are able to pick these up and hold them on a scale (small trash cans, 10-gallon buckets, trash bags, etc.)
- Labels for three different types of waste (handwritten labels on recycled paper work great!)
 - **Landfill**
 - **Recyclables**
 - **Compost/Green Waste**
- If you are eager to create sub-categories within these three categories to gain a better understanding of what types of waste you have, refer to these label ideas:
 - *Recyclable Plastics (#1 and #2), Glass, Cardboard/Paper, Compostable Food Waste (Fruits and Veggies), Cartons (Juice, Milk), Wrappers, Non-Compostable Food Waste (NOT Fruits and Veggies - Meat, Dairy, Bread, etc.), Non-recyclable Plastics (everything other than #1 and #2) Miscellaneous/Other Waste and Reusables.*
- Gloves (reusable or compostable)
- Hand sanitizer and soap
- Waste Sorting Form (pg. 33)
- Optional: Waste Sorting Poster (pg. 29)

Prep:

- Scope out a good spot. Ideally this would be flat and shady (unless you are doing this lesson in really cold weather in which case the sun is good!)
- Check in with the custodian at least a few days before your lesson to see if they can set trash aside in your designated sorting area. Alternatively, you can also obtain trash to sort by first having a campus-wide trash pickup.
- Locate the nearest sink and make sure there is adequate soap for hand-washing.
- Create or print sorting station signs (refer to materials section).
- Print the Waste Sorting Form for each student or groups of students.
- Display the Waste Sorting Poster if you have it.
- Set up your different sorting stations with tarps and your choice of waste receptacles.

Activity Procedure:

Engage

Where does waste go when you put it in the trash? The garbage truck takes it to a landfill! What is in our garbage? At school, do you think that we throw things in the trash that shouldn't go to the landfill? What can we do with waste instead of putting it in the trash? We can recycle, reuse or compost it!



RESOURCES

Why is it helpful to learn about what we are throwing away? Why is it important to reduce the amount of waste at our school?

Explore

Have each group look at the different waste stations you've created and the categories you will be sorting waste into.

Explain

We are going to sort and weigh some of the waste from our school to collect data. It is helpful to know what types of things make up the bulk of what we throw away? What can be recycled? Composted? How can we avoid sending so much material to the landfill? For example, if a lot of full milk cartons are being thrown in the trash can, we can see if there is something else students can do with the milk that they haven't consumed.

Action: Sorting

1. It's best to have an alternating group of 4-6 students participate at a time. While the class is working on individual assignments, the waste sorting groups can quietly exit the classroom and spend 5-10 minutes sorting before returning to the classroom to make space for the next group.
2. At the waste sorting station, have all students put on gloves.
3. Open a bag or bags of trash and allow students to sort the waste into the different categories. *Note: it's best not to dump bags of trash out as this creates more chaos. Simply let students reach into the garbage bags or waste receptacles to pull waste out.*
4. When each group has finished sorting, let them take off their gloves and make sure they use hand sanitizer before going to the nearest sink to also wash their hands with soap and water.
5. Once the entire class has participated and finished sorting, have students help you calculate the weight of the trash by stepping onto the scale with the filled receptacles and then stepping on again with an empty receptacle. Show students how to find the weight of the trash by subtracting the weight of the student + empty bucket.
6. Compile your data on the Waste Sorting Form, using the backside of the sheet for computations.
7. Properly dispose of the waste by placing appropriate items in the green waste bin/garden compost system, recycling bin, or bin for the landfill.

Reflect

Share how many pounds of waste you sorted. Was that all of the waste at the school? What was the most types of waste that the school produced (paper, plastic, etc.). What are some ways that we can reduce this waste at the school?

Extension Activities

- Take this lesson to the next level and host a campus-wide Waste Audit!
- Leading up to the Waste Audit, have students join together to plan a campus wide event. They can design posters advertising the event, and also gather facts about recycling and composting. Then, they can prepare a speech to share with the school body via loudspeaker or assembly.
- Start a Green Team to deliver lunch scraps to the compost or worm bins at your school.
- Create recycled art using things found in the Waste Audit.

RESOURCES

WASTE SORTING FORM



School Name: Date:

Where did the waste come from? (If possible circle all that apply):

Cafeteria Office Classrooms Bathrooms Around Campus (Trash Pickup)

How to 'Tare' your scale:

To find the weight of the contents of the receptacle, you need to TARE. To tare, take the weight of your peer holding a receptacle full of waste and subtract the weight of your peer holding an empty receptacle. This will give you the weight of only the waste inside the receptacle.

The math will look like this:

Student holding full receptacle weight in pounds (lbs) **MINUS** the weight of the student holding empty receptacle (lbs) **EQUALS** the weight of waste inside the receptacle in lbs ←this is what you will write in the 'weight of waste (lbs)' column.

Check with your school site to see if they have or wish to adopt "organic recycling" where all organics, including meat/greasy/bread/paper items can be composted. It is a different type of compost and is set up with your waste hauler service.

All Measurements are in Pounds (lbs)	Peer + Waste	Peer + Waste + Empty Receptacle	Weight of Waste #1	Peer + Waste	Peer + Waste + Empty Receptacle	Weight of Waste #2	Peer + Waste	Peer + Waste + Empty Receptacle	Weight of Waste #3	Total lbs of Waste
Recyclables										
Cardboard/Paper										
Glass										
#1 and #2 Plastics										
Compost										
Food Waste (Fruits and Veggies)										
Landfill										
Non-compostable Food Waste										
Milk/Juice Cartons										
Wrappers										
Non-Recyclable Plastics (#3-#7)										
Other Waste										

RESOURCES



GARBOLOGY

Key Topics/Vocabulary: Decomposition, Decomposers, Composting, Prediction, Organic Matter, Fertilizer

Grade Levels: 3rd - 6th (For a K-2nd lesson adaptation, go to our Curriculum page at onecoolearth.org)

Click [HERE](#) for a Spanish version of this lesson (link at bottom)

Lesson Overview

In this lesson, students will learn about which types of matter can and cannot decompose by conducting a simple experiment. Materials will be sealed in a bag with soil for one month, observed, and weighed. Students will: observe changes over time due to decomposition, notice patterns and classify materials based on their ability to decompose, and explain how matter changes throughout decomposition.

Suggested Activities and Learning Objectives by Grade Level:

- **5:** Compost in a bag - Conservation of Matter Focus
 - **5-PS1-2** Is matter conserved during decomposition?
 - **5-PS1-3** Categorize materials based on their ability to decompose.



Essential Questions that Connect CCCs and SEPs:

- Can we design an investigation to study what types of things change over time and what stays the same in the presence of decomposers? (Stability and Change; Planning and Carrying out Investigations)
- Do you notice any patterns that relate the certain kinds of changes to the kinds of substances? *What kind of things are molding? What kinds of things are staying the same?* Is there a pattern to this data in decomposition? (Patterns; Analyzing and Interpreting Data)
- What causes some things to change in this system? What causes things to remain stable or not change, in this system? Why did some things decompose and some not? (Stability and Change; Cause and Effect; Asking questions and Defining Problems)
- If the data shows that the before and after weight of the entire bag remains the same but the individual items have a change in weight, how can I explain how matter changes in the system? *(The difference between how much the item weighed before going in the bag and how much it weighs after it comes out, will equal the amount it has decomposed.)* What is the math showing us? (Systems; Analyzing and Interpreting Data; Construct Explanations and Design Solutions; Using Mathematics and Computational Thinking).

Materials:

- Five Gallon Bucket (or similar sized receptacle)

RESOURCES



- Some sort of lid for the bucket that will allow air to come in (an old t-shirt or bag with a bungee around it works well).
- Healthy, moist soil
- Spray bottle or hose with spraying nozzle
- A variety of compostable, recyclable, and disposable items (best if acquired from your garden/school)
- Masking Tape and a Sharpie
- Scale (optional)

Prep:

- Collect students' food scraps in a bucket prior to the day of the lesson (provide lid to prevent odor). This will be a science experiment on which types of items can decompose, so not all items need to be 'compostable.' You may also want to bring some of your own trash items or collect some waste from the cafeteria/school campus so that you are sure to have an assortment of items to experiment with.
- Schedule time for the class to check on the experiment after a month. They will be ready to view the results of the experiment! You can also bring the bucket back to the classroom at the end of the month.
- Have a plan of where you want to leave your bucket of compost. Ideally, somewhere in the shade to avoid having your compost dry out!

Activity Procedure:

Engage

Have you ever seen food spoil or go bad? What did it look like? What do you think was happening to it?

Explore

Take a look through the garden and see if there are any plants or leaves that look dead. Let students observe and ask them what they think is happening? How is decomposition a part of the cycle of life? While in the garden, let each student pick something natural off the ground (not off of a growing plant) to use in the experiment and then return as a group for an explanation.

Explain

Write the following italicized questions on your board and record student answers:

What is decomposition?

Follow up: Decomposition is a magical process! It is also called rot. It is the result of billions of tiny invisible life forms such as bacteria and fungi as well as some larger decomposers like worms and other bugs breaking down organic matter. These decomposers are often called the 'FBI': fungus, bacteria and invertebrates. The FBI helps break down dead plants and animals into smaller particles called compost, by eating it! What would happen if we didn't have any decomposers? (Without decomposition, dead matter would cover the earth and we wouldn't have the necessary nutrients for new life to grow!)

What is a prediction?

Follow up: A guess of what will happen in the future based on observation, experience, or scientific reason.



Action

1. Put all the items into the bucket or chosen receptacle. Make sure to add some items that will not decompose such as wrappers/packaging. Note: If you wish to get a weight so you can see the difference in before and after weights, first have students weigh themselves with an empty bucket and then subtract this from the weight of the bucket with materials in it.
2. Add a little bit of fresh soil while explaining that one tablespoon of good garden soil has 1 billion bacteria in it!
3. Let students take turns spritzing the bucket with water.
4. Attach a lid to your bucket that will keep critters out but let some air in.
5. Have students help you decide an appropriate location (ideally a shady spot in your garden or shed).
6. Use masking tape and a Sharpie to date it.
7. If necessary, label it with the teacher's name or room number to distinguish it from other classroom experiments.

Reflect

What do you think will have changed in the bucket in a month? Raise your hand if you have a prediction you'd like to share with the class. What items do you think will not decompose - why? If they don't decompose in our experiment, do you think they will decompose in the environment? How do you think this experiment relates to marine debris and what can we do to prevent it?

Extension Activities

- Ask students to do research on decomposers, pick their favorite decomposer, and then write or draw a cartoon strip of the decomposer hard at work in the compost pile.
- Go out to the garden or worm bins to observe decomposers.
- Classes can adopt a space in the garden and conduct a composting experiment to test if compost helps plants grow.

One Cool Earth's Zero Waste Videos:

<http://www.onecoolearth.org/zero-waste.html>

A few other great videos:

<https://www.youtube.com/watch?v=dRXNo7Ieky8>

<https://www.youtube.com/watch?v=ufsbrz8IRgY>

https://www.youtube.com/watch?v=V8miLevRI_o

Spanish version: <https://docs.google.com/document/d/1rDOweOnq0IcmGgpm-hGzH3Up4wxNTy3XuWNSyeeGr4w/edit>



RESOURCES

GARDEN HARVEST CHECKLIST

Materials Checklist

- Harvest Basket
 - Must be made with food-grade, hard plastic such as plastic chopping baskets, food-grade 'Lexan' containers, plastic crates, etc.
 - Do not use straw baskets, wooden containers, or cloth bags.
- Scale
- Garden Harvest Recording Sheet (pg. 38)
- Cutting boards
- Hand clippers
- Knives and peelers for produce
- Disposable Gloves

Harvest Guidelines

Pre-harvest:

Facilitator

- Coordinate with the kitchen staff to determine what should be harvested, how much should be harvested and a day and time to receive garden produce
- All harvest containers should be cleaned and ready to be used
- Have Garden Harvest Recording Sheets ready
- Access to potable water in or near the garden area
- Make sure all students are in good health and have not been absent from school within the last two weeks due to illness

Students

- All students and staff participating in the harvest must wash their hands with soap and water at an indoor sink for at least 10-15 seconds. All cuts must be dressed.
- Make sure that all students and staff are wearing closed-toed shoes to prevent injury
- Cover tool safety by demonstrating the proper handling of tools.
- Show students what will be harvested and demonstrate the correct procedure in taking from the plant without compromising the plants health.

Post-harvest:

- Potable water is used to wash the produce in the harvest baskets, removing large clumps of dirt
- Tools used to harvest are thoroughly washed with soap and potable water
- After all produce is washed, have 1-3 students help weigh and record the weights of produce on the Garden Harvest Recording Sheet
- Bring the produce to the kitchen and have the kitchen manager sign the sheet to acknowledge that the produce was received
- Clean the harvest baskets and put all supplies away



GARDEN HARVEST RECORDING SHEET

Date + Time	Produce Item	Weight	Garden Leader Signature	Food Service Staff Signature

RESOURCES



United States Department of Agriculture

REDUCING FOOD WASTE

WHAT SCHOOLS CAN DO TODAY



USDA's Economic Research Service estimates

31%

of the overall food supply at the retail and consumer level **went uneaten** in the U.S. in 2010



Scheduling recess before lunch can **reduce plate waste by**

AS MUCH AS 30%



Extending lunch periods from

20 TO 30

minutes reduced plate waste by nearly one-third



BEST PRACTICES ACCORDING TO SCHOOL FOOD SERVICE DIRECTORS

Involve students in menu planning and conducting taste tests, implement Offer versus Serve at all grade levels, provide more menu choices, serve foods with familiar flavors, serve ready-to-eat fruit, and invite school staff and teachers to eat meals with students.



SCHOOLS ACROSS THE COUNTRY ARE STEPPING UP TO THE CHALLENGE WITH INNOVATIVE NEW STRATEGIES, SUCH AS:

- Allowing students to keep a lunch or breakfast food item for consumption later in the school day
- Using techniques listed on the [USDA's Guide to Conducting Student Food Waste Audits](#) to help reduce food waste
- Setting up a table for kids to place items they are not going to consume (packaged or pre-portioned items)
- Letting kids self-serve
- Composting food waste for school gardens
- Collaborating with local farmers on composting or food-scrap projects
- Collecting excess wholesome food after mealtimes to donate to charitable organizations

This image is from USDA (U.S Department of Agriculture, 'Reducing Food Waste at K-12 Schools').
<https://www.usda.gov/sites/default/files/documents/reducing-food-waste-infographic.pdf>

RESOURCES



CAMPUS CLEANUP DATA COLLECTION SHEET

Use tally marks to count and add up number of litter items collected

	Total
Milk or Juice Cartons:	
Wrappers (chip, candy, etc.):	
Bottle Caps:	
Pencils/Pens:	
Paper:	
Plastic Bags:	
Erasers:	
Paper Plates:	
Utensils:	
Clothing:	
Microplastics (smaller than eraser head):	
Straws:	
Plastic Foam:	
Other:	
Weight:	

MORE ABOUT US



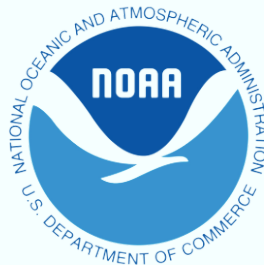
One Cool Earth is a community-based 501(c)3 nonprofit organization operating on the Central Coast of California. Founded in 2001, **we create awesome school garden programs that power Happy, Healthy, and Smart youth.**



Through partnerships with local school districts and support from National Oceanic and Atmospheric Administration's Marine Debris Program, One Cool Earth's previous successes to reduce marine debris and institutionalize sustainability in schools have included:

- Initiated recycling, composting, waste-reduction lessons and student-led campus improvement projects at 30 school sites
- Banned polystyrene foam lunch trays in Paso Robles and Atascadero Unified School Districts
- Won the regional U.S. Green Building Council's Green School Operations Award and was recognized by California state's CalRecycle as a leader in waste education and reduction
- Supported installation of rain barrels, totaling over 10,000 gallons in capacity
- Developed and shared zero waste trainings and resources for schools (www.onecoolearth.org/zero-waste.html) through support from the 2016 NOAA Marine Debris Program
- Created 24 virtual lessons aligned to Next Generation Science Standards relating to environmental literacy, watershed ecology, marine debris prevention, and local food systems
- Delivered trainings to increase garden-based education, focused on watershed health and marine debris prevention, to over 260 public school teachers.

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